Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
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DEVAL L. PATRICK
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July 8, 2014

Kingston Board of Health
ATTN: Mr. Joseph Casna, Chair
Kingston Town House
26 Evergreen Street
Kingston, MA 02364

RE: Interim Report for Kingston Wind Independence Turbine Acoustical Study (Dated June 13, 2014)

Dear Chairperson Casna;

Enclosed please find an Interim Report for the Kingston Wind Independence Turbine Acoustical Study (dated June 13, 2014). This interim report provides partial results of an acoustical monitoring study of the Kingston Wind Independence (KWI) wind turbine in operation at the wastewater treatment facility located on Cranberry Road in Kingston, Massachusetts. As you know, this Acoustical Study was conducted in response to requests from KWI and the Kingston Board of Health to the Massachusetts Clean Energy Center (MassCEC) and Massachusetts Department of Environmental Protection (MassDEP) to assist with sound sampling. The Acoustical Study has been performed by the consulting firm of Harris, Miller, Miller and Hanson Inc. (HMMH) under contract to MassCEC.

MassDEP and MassCEC requested HMMH to prepare this interim report to make available data from successful monitoring events from October 2013 through April 2014. As you know, the full study has taken longer to complete than anticipated due to persistent weather challenges, turbine operational issues, and problems with background noise contamination. Now that the winter sampling season has ended, the time identified in the scope as appropriate for monitoring worst case scenario sound impacts has also ended. Therefore, HMMH has analyzed results that we believe should be shared and discussed in a timely fashion with the Town and other parties.

This interim report presents results for the two monitoring sites closest to the KWI turbine, and from the two successful sampling nights during which there were moderate to high wind speeds. These locations and wind conditions represent two of the seven monitoring scenarios included in HMMH's scope of work[1]. A final, full report for this study, which will include all of the validated sound data successfully collected, will be available after HMMH completes data validation and then MassDEP and MassCEC subsequently complete review.

MassDEP is providing this interim report to give you timely information from the two nights where the quality-assured data reveals exceedences of MassDEP's noise threshold of 10 dBA over background. The monitoring data shows exceedences on March 2, 2014 (Scenario #2) and March 15, 2014 (Scenario #3), both at the 13 Schofield Road monitoring location. The exceedences occurred with winds from the South and Southwest at moderate and high speeds of 8 to 10.3 meters/second at hub height. On March 2, 2014, the data collected indicates that there was a 15 dBA difference between the L90 Background and the LMax sound from the KWI wind turbine. On March 15, 2014, the data collected indicates that there was a 13.7 dBA difference between the L90 background and the LMax sound from the KWI wind turbine.

Our agency review of the monitoring data in the attached interim report focused on determining compliance with MassDEP regulations and policy, and did so in accordance with the agency's current monitoring protocols. Specifically, MassDEP evaluated only the A-weighted broadband sound data collected on the slow meter setting. MassDEP's determination of exceedences is based on a comparison of the L90 background sound including the sound of traffic from Route 3 compared to the LMax sound levels excluding any source of interference sound (traffic).

As you will see in the attached interim report, additional recorded sound data was collected on these two sampling nights by HMMH. This data was collected and included in the attached report in accordance with the monitoring scope developed by HMMH and MassCEC with input from MassCEC's stakeholder engagement process. This additional data includes sound levels using various filters, speciated sound by octave band, and sampling conducted on the fast meter setting. MassDEP has not validated this additional information.

The remaining data from successful sampling for scenarios #1 and #7 is still undergoing validation by HMMH but, according to HMMH, the preliminary findings in this interim report represent the only exceedences of MassDEP's regulations and policy in the sampling to date. Given the amount of time it has taken to successfully collect the data for Scenarios #1, #2, #3, and #7, and given the exceedences found in the data presented in this preliminary report -- along with HMMH's preliminary conclusion that no other exceedences of greater than 10 dBA have been identified -- MassDEP is not planning to request additional sound sampling beyond what has already been successfully conducted. HMMH has indicated that it may be able to estimate impacts for the uncompleted scenarios via modeling based on data that has been collected, including some ambient sound sampling.

[1] All scenario references are to those described in HMMH's February 6, 2014 memorandum to MassCEC and MassDEP. Table 1 of the Interim Report includes a description of the scenarios.

A final, full report for this study will include all of the validated sound data successfully collected to date. The full report will include additional analysis not directly related to compliance with MassDEP's noise policy but contained in HMMH's overall scope of work based upon MassCEC's stakeholder engagement process. MassDEP hopes that HMMH will supply the full report with the remaining data to us shortly so we can begin our review in the coming weeks, and we hope that MassCEC and MassDEP will be able to provide the Town, KWI and other stakeholders with the reviewed report shortly thereafter.

MassDEP is available to discuss this interim report and the options for moving forward to address the exceedences identified herein. We look forward to meeting with the Board after you have reviewed the contents in order to answer any questions you may have about our assessment of the findings. To follow up on next steps, and should you have any questions regarding MassDEP's assessment of the enclosed report, please feel free to contact me at 617-292-5792.

Sincerely,

Douglas Fine
Assistant Commissioner for Planning and Evaluation

Enc: Interim Report for Kingston Wind Independence Turbine Acoustical Study (Dated June 13, 2014)

Cc: Tom Bott, Planning Director, Kingston
Bradford Cleaves, Kingston Wind Independence
Kially Ruiz, Kingston Wind Independence
Duncan Peterson, Kingston Wind Independence
Phil Weinberg, Regional Director, Southeast Regional Office, MassDEP
Nancy Seidman, Assistant Commissioner, Bureau of Waste Prevention, MassDEP
Nils Bolgen, Massachusetts Clean Energy Center (MassCEC)
Christopher Menge, Harris Miller Miller & Hanson (HMMH)
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TECHNICAL MEMORANDUM

To: Nils Bolgen, Massachusetts Clean Energy Center
Douglas Fine, Laurel Carlson, Massachusetts Department of Environmental Protection
From: Christopher Menge and Eric Cox
Subject: Interim Report for Kingston Wind Independence Turbine Acoustical Study
Reference: HMMH No. 305270.001
Date: June 13, 2014

1. INTRODUCTION

This technical memorandum provides an interim report on the results of an acoustical monitoring study of the Kingston Wind Independence (KWI) wind turbine in operation at the wastewater treatment facility located on Cranberry Road in Kingston, MA. This study is being conducted in cooperation with the Massachusetts Department of Environmental Protection (MassDEP), the Massachusetts Clean Energy Center (MassCEC), the Town of Kingston Board of Health, and the KWI wind turbine project operator.

This interim report presents A-weighted sound level results for the two monitoring sites closest to the KWI turbine and for two nights with moderate to high wind speeds. information on the acoustical monitoring program including locations, monitoring conditions, instrumentation, procedures, and a summary of monitoring activities are outlined in Section 2 of this report. Technical specifications of the KWI wind turbine are discussed in Section 3. Details of the data analysis methodology as well as the acoustical monitoring results are presented in Section 4.

Referenced figures and tables are included at the end of this report. Monitoring site photographs and detailed acoustical data are attached as Appendices A and B, respectively, and a detailed description of the noise metrics used in this report is attached as Appendix C.

2. ACOUSTICAL MONITORING PROGRAM

HMMH has collected acoustical data during nighttime hours under a variety of wind conditions at several monitoring locations both with the KWI turbine in normal operation and also with the wind turbine shut down. The two specific acoustical monitoring locations discussed in this interim report are the residential sites shown in Figure 1, attached at the end of this memo. Supplemental site photographs are included in Appendix A.

2.1 Monitoring Locations & Conditions

The monitoring site at 13 Schofield Road is located at a multi-family town-house style residential development approximately 740 feet to the northeast from the base of the KWI wind turbine. The monitoring site at 3 Leland Road is located at a single-family home about 990 feet to the northeast from KWI. Route 3 runs from northwest to southeast between the KWI turbine and the residential monitoring sites, about 520 feet away from KWI. Noise sources typically observable at the two monitoring locations include vehicles on Route 3, local traffic, aircraft overflights, and MTBA commuter train horns. During the quietest nighttime hours other distant noise sources are occasionally audible such as commercial or industrial equipment, the No Fossil Fuel wind turbines, and commuter trains that idle during very cold weather at the MBTA layover facility located beyond the end of both Copper Beech Drive and Marion Drive and adjacent to Country Club Way.

Please note that idling MBTA trains were not audible at either measurement location at any time during the two nights of acoustical monitoring included in this interim report. The No Fossil Fuel wind turbines were occasionally audible at both measurement sites on both nights of monitoring but did not at any time appear to dominate the ambient sound environment.

Table 1 presents target conditions for acoustical monitoring of the KWI turbine as outlined in the HMMH memorandum dated February 6, 2014, entitled "Revised Acoustical Monitoring Scenarios for Kingston Wind Independence Turbine". This table lists the scenarios for compliance testing of the wind turbine and incorporates some modifications from the August 5, 2013 HMMH letter with subject "Revised Scope for Acoustical Monitoring of Kingston Wind Independence Turbine" regarding appropriate ranges of wind speed and direction for conducting acoustical monitoring. The February 6, 2014 revisions provided the flexibility necessary to complete data collection for the Kingston acoustical study in a timely fashion while also providing sufficient information regarding compliance of the wind turbine under various conditions.

Results for Scenarios 2 and 3 at two of four monitoring locations are presented in this interim report. Acoustical monitoring was conducted during additional periods at the 13 Schofield Road and 3 Leland Road monitoring sites and also at additional locations on Leland Road, Prospect Street, Copper Beech Drive, and the Kingston Intermediate School. Results from this monitoring will be presented in a forthcoming comprehensive report.

2.2 Procedures & Instrumentation

The protocols for acoustical monitoring of the KWI turbine were outlined in the January 23, 2014 HMMH memorandum with subject "Kingston KWI Turbine Acoustical Monitoring Protocol – Proposed Revisions". This memo presented some modifications from the August 5, 2013 "Revised Scope for Acoustical Monitoring of Kingston Wind Independence Turbine" that were needed to address issues identified during the initial nights of monitoring, which include heavy volumes of overnight traffic on Route 3 and also noise generated by auxiliary equipment that operates for several minutes after the wind turbine has been shut down[1].

The revised acoustical monitoring procedures were as follows:

During each night of monitoring, HMMH consultants collected data between the hours of approximately 1 AM and 3 AM, when traffic on Route 3 is lightest. At each site, we first measured with the KWI turbine and all auxiliary equipment fully shut down for about 20 minutes to allow for collection of ambient acoustical data. We then measured with the wind turbine in operation for a period of about 30 minutes. It typically took a few minutes for the remote operators to initiate the wind turbine startup and another couple of minutes for the blades to begin to turn at full speed, so the initial five minutes of KWI monitoring have not been carefully analyzed and we generally focused analysis efforts on the subsequent 20 minutes. An additional five minutes of data was then also collected for contingency purposes (this data was utilized for the monitoring at 3 Leland Road due to the heavy volumes of traffic on Route 3 during the measurements as well as several extended periods of wind generated noise during measurements at higher wind speeds).

An HMMH consultant attended all measurements at all sites. HMMH generally deployed two consultants and sound level monitors to allow us to measure at two locations simultaneously during the quietest nighttime hours with the least amount of traffic on Route 3. During the data collection,

[1] During nighttime acoustical monitoring conducted on January 20, 2014, the HMMH consultant noticed that auxiliary equipment in the wind turbine nacelle continued operating for 10 or more minutes after the turbine was shut down and the blades stopped spinning. HMMH concluded that there was a small but non-negligible effect on the ambient sound levels that were collected while this secondary equipment was still operating. Therefore, to ensure valid and conservative measurement of ambient background sound, HMMH modified the acoustical monitoring procedures to make certain the wind turbine was completely shut down (blades stopped turning and auxiliary equipment off) before conducting any subsequent nighttime ambient sound level monitoring.

the HMMH consultants logged the noise sources that appeared to dominate measured sound levels on a moment-to-moment basis and also noted wind speeds that occurred near the ground at each site.

The acoustical monitoring was conducted using ANSI Type 1 "Precision" Bruel & Kjaer model 2250 sound level analyzer kits including a microphone, pre-amplifier, microphone stand, 7-inch windscreen, and an acoustical calibrator. All of the noise measurement instrumentation is owned by HMMH, conforms to ANSI Standard S1.4 for Type 1 (Precision) sound level meters, and have current calibrations traceable to the U.S. National Institute of Standards and Technology (NIST). Additional field calibrations of the instruments were carried out before and after each nighttime measurement using a NIST-certified acoustical calibrator.

In addition, the measurements were conducted in accordance with industry best practices and in general compliance with appropriate professional standards such as ANSI S12.18 "Procedures for Outdoor Measurement of Sound Pressure Level" and ASTM E 1779-96a (Reapproved 2004) "Standard Guide for Preparing a Measurement Plan for Conducting Outdoor Sound Measurements".

Noise measurement microphones were tripod-mounted at a 5-6 foot elevation and placed a sufficient distance away from reflecting surfaces and with a direct line of sight to the turbine. The HMMH consultant operating the sound analyzer was located at least 25-50 feet away from the microphone position and remained silent at all times to prevent interference with the data collection. Anemometers used to monitor wind speeds near ground level were tripod-mounted at a 3-4 foot elevation and placed near to the consultant for easy observation.

The acoustical instrumentation measured sound levels continuously in the frequency range from 6.3 Hz to 20,000 Hz. The instruments were programmed to report (store) both slow-response and fast-response broadband A-weighted and C-weighted sound levels as well as unweighted octave-band and one-third octave-band spectral data in 1-second intervals. The fast-response broadband A-weighted sound level was also logged simultaneously at a 1/10-second rate.

During all of the acoustical monitoring, we captured high-quality audio recordings in addition to collecting sound metric data and making in-person attended observations, such that the sounds heard during all measurements could be listened to with proprietary software provided to HMMH by the manufacturer of our sound analyzer instrumentation. This was a helpful approach since any of the measurements could then be reviewed, even more than once if necessary, to further identify noise sources and select time periods with appropriate data for detailed analysis.

2.3 Monitoring Schedule & Summary

After several delays due to operational issues with the KWI turbine, the acoustic monitoring study commenced in December 2013. The schedule for acoustical monitoring of the wind turbine was finalized in the March 28, 2014 "Extended Acoustical Monitoring Schedule for Kingston Wind Independence Turbine". This memo provided notification of an extended the timeframe for acoustical monitoring into mid-April 2014, with the final night of measurements subsequently conducted on Wednesday April 9, 2014.

A complete timeline and summary of our efforts to conduct acoustical monitoring is as follows:

- Successful data-collection efforts:
  - **February 18, 2014** – successful daytime acoustical monitoring was conducted at the Kingston Intermediate School (Scenario #7)
  - **March 2, 2014** – successful nighttime acoustical monitoring with moderate wind speeds was conducted in the Schofield/Leland/Prospect neighborhood (Scenario #2)
  - **March 15, 2014** – successful nighttime acoustical monitoring with higher wind speeds was conducted in the Schofield/Leland/Prospect neighborhood (Scenario #3)

- **March 22, 2014** – additional nighttime acoustical monitoring with moderate wind speeds was conducted in the Schofield/Leland/Prospect neighborhood (Scenario #2)
- **April 7, 2014** – successful nighttime acoustical monitoring with low wind speeds was conducted in the Schofield/Leland/Prospect neighborhood (Scenario #1)
- **April 9, 2014** – successful nighttime ambient acoustical monitoring was conducted in the Copper Beech Drive neighborhood

- Notes on other data-collection efforts:
  - **December 13, 2013** – data initially thought to be useful, but later, ambient sound levels were found to be affected by KWI auxiliary equipment noise during shutdown periods
  - **January 20, 2014** – wind direction and speeds that were forecast did not develop and ambient sound levels again affected by KWI auxiliary equipment noise
  - **February 20, 2014** – monitoring unsuccessful due to nearby atypical noise (snow removal)
  - **February 22, 2014** – monitoring cancelled due to technical issue with auto-lubrication system rendering KWI turbine non-operable
  - **February 28, 2014** – high wind speeds were forecast (Scenario #3), but only moderate wind speeds occasionally approaching higher speeds developed, so additional monitoring was conducted on March 15, 2014 with stronger and more steady wind speeds (to capture turbine full-power conditions as requested by residents and agreed to by MassDEP and MassCEC)
  - **March 22, 2014** – low wind speeds were forecast (Scenario #1), but moderate wind speeds actually developed (Scenario #2, which had already been measured on March 2, 2014), so additional monitoring during low wind conditions was conducted on April 7, 2014
  - **April 3 and April 4, 2014** – the wind speeds that were forecast did not develop, so monitoring was cancelled

Results for the acoustical monitoring conducted on March 2 and 15, 2014 are presented in this interim report.

3. KWI TURBINE TECHNICAL SPECIFICATIONS

The KWI wind turbine is in operation at the wastewater treatment facility located on Cranberry Road in Kingston. It is a Hyundai Heavy Industries HQ2000 WT86 2.0 Megawatt wind turbine with an approximately 80 meter tower height. Some further technical specifications of the KWI turbine are discussed in the subsections below.

3.1 Power Curve

The power curve shown in Figure 2 indicates the power produced by the KWI turbine as a function of the wind speed at the 80 meter hub-height. At wind speeds above 10 m/s the turbine approaches full power generation. The KWI turbine reaches maximum 2000 kW production levels at hub-height wind speeds above 12 m/s.

3.2 Sound Power Levels

The sound power level curve shown in Figure 3 indicates the acoustical sound power produced by the KWI turbine as a function of the wind speed at the 80 meter hub-height. At wind speeds above 10 m/s the turbine approaches its maximum sound power level. The KWI turbine reaches the maximum sound power level of 105 dBA at hub-height wind speeds above 14 m/s.

3.3 Supervisory Control and Data Acquisition (SCADA)

HMMH was provided hub-height wind speed and direction data for each monitoring period in 10-minute intervals via the KWI turbine Supervisory Control and Data Acquisition (SCADA) system, as well as energy production and other additional metrological and operational data.

We were also able to collect wind speed and direction data in 1-second intervals from the real-time KWI SCADA system output. This data could not be provided to us in a digital format, so generating a screen capture video of the SCADA system utility software was the only feasible way to record this data for later review. Our subsequent analysis indicated that maximum sound levels attributable to the KWI turbine generally occurred at wind speeds comparable to 10-minute average wind speed values and were typically not associated with short-term wind gusts. Please note that the maximum sound level attributable to the KWI wind turbine in each 5-minute monitoring period as well as corresponding hub-height wind speeds are shown in red text on the detailed acoustical monitoring reports included in Appendix B.

4. ANALYSIS OF ACOUSTICAL MONITORING DATA

The methodology for analysis of the KWI wind turbine acoustical monitoring data was outlined in the August 5, 2013 "Revised Scope for Acoustical Monitoring of Kingston Wind Independence Turbine". The following subsections describe the data analysis methodology and measurement uncertainty and also present the acoustical monitoring results.

4.1 Data Analysis Methodology

As discussed previously, HMMH conducted nighttime measurements with the KWI wind turbine shut down for about 20 minutes to allow collection of ambient acoustical data, followed by about 20 minutes of monitoring with the wind turbine operating.

The acoustical instrumentation had been programmed to measure continuously from 6.3 Hz to 20,000 Hz and to report both slow-response and fast-response broadband A-weighted and C-weighted sound levels as well as unweighted octave-band and one-third octave-band spectral data in 1-second intervals. The fast-response broadband A-weighted sound level was also logged simultaneously at a 1/10-second rate. In addition, G-weighted and Z-weighted (unweighted) broadband sound levels were computed from the 1-second spectral data.

The measured acoustical data were then analyzed in 5-minute and 20-minute intervals[2]. Detailed acoustical data are attached as Appendix B. For each individual 5-minute and total 20-minute measurement period with the turbine on or off, a detailed monitoring report is included presenting the acoustical data both graphically and numerically. The date and time span of each measurement are clearly indicated, as well as the average wind speed and direction, and other useful information such as the air temperature and the turbine energy production. A log of noise events is also included.

We report broadband sound levels in A-, C-, and G-weightings for a variety of acoustical metrics, including the maximum (L_{max}), equivalent (energy-average) (L_{eq}), and statistical percentile sound levels (L_n, denoting the sound level exceeded n-percent of the time). Statistical noise levels of particular interest are the L_{01}, which represents typical maximum noise levels, the L_{50}, which represents the median sound level, and the L_{90}, which represents the ambient "background" noise

[2] Throughout this interim report, we refer to "5-minute" and "20-minute" measurement periods both with the wind turbine operating and shut down. Results calculated over these time periods will typically not correspond to exactly 5 minutes or 20 minutes in total duration since the measurements are adjusted to remove any uncharacteristic sound events and are then presented both including and also excluding periods of Route 3 traffic noise, making them shorter in duration. Therefore, the "5-minute" and "20-minute" periods cited throughout this report refer to approximate periods of time. The actual percentage of time included for results calculated over these periods are shown on the detailed acoustical monitoring reports provided in Appendix B.

from relatively continuous sources. In addition, the maximum (L_{max}) sound levels reported for each 5-minute period have been averaged to determine an average maximum (Avg L_{max}) sound level for each corresponding 20-minute period. We also report unweighted octave-band data as well as corresponding one-third octave-band data and overall Z-weighted (unweighted) broadband sound levels. A detailed description of the noise metrics used in this report is attached as Appendix C.

For each measurement, we also include a summary of the acoustical metric data calculated over both the 20-minute period with the KWI turbine shut down and the subsequent 20 minutes with the turbine operating normally. We then provide a comparison summary between the different sound metrics reported for the 20-minute ambient period and the 20-minute period of turbine operation.

The same set of acoustical metrics was developed for each measurement under two conditions relative to ambient noise. One condition with the KWI turbine operating included all ambient sound (most significantly from traffic on Route 3) along with the noise generated by the wind turbine; the other condition included only periods when the turbine dominated the sound level and other sounds (such as traffic on Route 3) were not noticeable, which is useful in determining the noise levels directly attributable to the KWI turbine.

Similarly, one set of metrics with all ambient sound present was developed for the entire measurement period with the KWI turbine shut down; another set of metrics was developed for those periods when traffic noise from Route 3 was not noticeable. Ambient background L_{90} sound levels are only very slightly influenced by Route 3 traffic noise and will be very similar for either data set. However, other acoustical metrics such as average maximum (Avg L_{max}) and equivalent (L_{eq}) sound levels will be dominated by traffic noise from Route 3 in one data set and will be representative of sound levels generated by other less dominate and generally more distant noise sources for the other data set, which is useful in comparing noise levels produced by the KWI turbine to sound levels associated with Route 3 traffic and also sound levels attributable to other ambient noise sources.

Please note that this interim report presents acoustical monitoring data collected simultaneously using both slow-response and fast-response sound level meter settings, however the results are otherwise limited to A-weighted sound levels only. Discussion of C-, G-, and Z-weighted sound levels and sound level modulation depth will be included in a forthcoming comprehensive report.

4.2 Measurement Uncertainty

Instrumentation field calibrations were carried out before and after each nighttime measurement and included all microphone extension cables in the signal chain. Calibration drift was less than 0.1 dB during all measurements at all monitoring sites. In addition, we used 7-inch windscreens that are rated for accurate measurement of A-weighted sound levels with up to 5 m/s wind speeds near the ground. We generally did not encounter wind gusts of more than 3 to 4 m/s near ground level during the overnight acoustical monitoring. Overall, our Bruel & Kjaer model 2250 Type 1 (Precision) sound level meters can measure sound levels to an accuracy of about ±1 dBA.

Additionally, our acoustical monitoring procedures included measuring corresponding turbine-on/off periods as contiguously as possible and with the same instrumentation. This approach results in reduced uncertainty when cross comparing the acoustical data.

4.3 Results

The results of acoustical monitoring of the KWI wind turbine at 13 Schofield Rd. and 3 Leland Rd. on March 2 and 15, 2014 for Scenario 2 (moderate winds) and Scenario 3 (higher wind speeds) are presented in Tables 2 through 5. Detailed acoustical data supporting and supplementing those tables are attached as Appendix B. Note that ambient sound levels are observed to vary by several decibels between the two measurement sites due to the narrower view angle to Route 3 from 13 Schofield Rd. as well as the increased shielding provided by local terrain and several nearby residential buildings.

Tables 2 and 3 indicate that wind speeds and directions were quite similar during the comparable monitoring periods at 13 Schofield Road with the KWI turbine shutdown and with the wind turbine operating. Overall, A-weighted L_{90} sound levels increased by 10 dB or more from ambient background levels when the KWI wind turbine was operating. When sound levels dominated by noise from traffic on Route 3 were eliminated from the KWI measurement data sets, the average maximum (Avg L_{max}) and equivalent (L_{eq}) sound levels attributable only to the KWI wind turbine were also more than 10 dBA above ambient background L_{90} sound levels. Note that the ambient background sound levels referred to here were calculated over the entire measurement period with the KWI turbine shut down, including periods with traffic traveling on Route 3. Also, there were no octave-band pure-tone conditions observed for the data collected at this monitoring site.

Review of the detailed data included in Appendix B indicates that sounds from the KWI turbine dominate over any distant noise sources at the 13 Schofield Road monitoring location. The wind turbine produces average maximum (Avg L_{max}) sound levels at this site that are comparable to the maximum sound levels generated by vehicles traveling on Route 3. However, the KWI wind turbine produces average maximum (Avg L_{max}) and equivalent (L_{eq}) sound levels several decibels higher than the equivalent sound levels generated by traffic on Route 3.

Tables 4 and 5 indicate that wind speeds and directions were also quite similar during comparable monitoring periods at 3 Leland Road with the KWI turbine shutdown and with the wind turbine operating. Overall, A-weighted L_{90} sound levels increased by about 4 to 8 dB from ambient background levels when the KWI wind turbine was operating. When sound levels dominated by noise from traffic on Route 3 were eliminated from the KWI measurement data sets, the average maximum (Avg L_{max}) and equivalent (L_{eq}) sound levels attributable only to the KWI wind turbine were 4 to 11 dBA above ambient background L_{90} sound levels. Again, note that the ambient background sound levels referred to here were calculated over the entire measurement period with the KWI turbine shut down, including periods with traffic traveling on Route 3. Also, there were no octave-band pure-tone conditions observed for the data collected at this monitoring site.

Review of the detailed data included in Appendix B indicates that sounds from the KWI turbine nearly dominate over any distant noise sources at the 3 Leland Road monitoring location. The wind turbine produces average maximum (Avg L_{max}) sound levels at this site that are less than the maximum sound levels generated by vehicles traveling on Route 3. The KWI wind turbine also produces average maximum (Avg L_{max}) and equivalent (L_{eq}) sound levels that are comparable to or slightly greater than the equivalent sound levels generated by traffic on Route 3.

4.4 Kingston Intermediate and Elementary Schools

Detailed results of the daytime acoustical monitoring conducted at the Kingston Intermediate School will be presented in a forthcoming comprehensive report. However, a preliminary review of the measurements conducted on February 18, 2014 indicates no significant increase in ambient background L_{90} sound levels due to operation of the KWI wind turbine. Our observations were that the wind turbine was generally not audible over the continuous noise generated by traffic on Route 3 and that the KWI turbine did not dominate the ambient noise environment at any time during the acoustical monitoring. Please note that these findings are preliminary pending full qualification, analysis, validation and quality-assurance of the acoustical monitoring data.

Table 1. Acoustical Monitoring Locations and Conditions

Scenario	Location	Monitoring Sites	Season	Wind Speed	Wind Direction (note 2)	Receptor position to turbine
1	Schofield Rd, Leland Rd, Prospect St.	4 nighttime	Winter (note 2)	4-6 m/s	S-NW 180°-225°-315°	Downwind approaching Crosswind
2	Schofield Rd, Leland Rd, Prospect St.	4 nighttime	Winter (note 2)	7-9 m/s	S-NW 180°-225°-315°	Downwind approaching Crosswind
3	Schofield Rd, Leland Rd, Prospect St.	4 nighttime	Winter (note 2)	10+ m/s	S-NW 180°-225°-315°	Downwind approaching Crosswind
4	Copper Beech Dr.	2 nighttime	Winter	4-6 m/s	NE-S 45°-135°-180°	Downwind approaching Crosswind
5	Copper Beech Dr.	2 nighttime	Winter	7-9 m/s	NE-S 45°-135°-180°	Downwind approaching Crosswind
6	Copper Beech Dr.	2 nighttime	Winter	10+ m/s	NE-S 45°-135°-180°	Downwind approaching Crosswind
7 (note 1)	Kingston Elementary & Intermediate School	1 daytime	Winter	Any	E-S 90°-135°-180°	Approx. Downwind

Notes:

Table 1 was previously included in the February 6, 2014 HMMH memorandum with subject “Revised Acoustical Monitoring Scenarios for Kingston Wind Independence Turbine”.

1. Winds from this direction are somewhat rare, thus it may be difficult to capture this scenario. If conditions have not allowed for sampling at the Kingston schools to occur by the end of February 2014 or shortly thereafter, then the monitoring schedule will be re-evaluated.
2. Based on the results of acoustical monitoring of the KWI turbine during the winter, additional compliance measurements may also be considered, including during the summer.

Figure 1. Acoustical Monitoring Sites

HMMH Project # 305270.001 - Kingston Wind Independence Turbine Acoustical Study

Figure 2. KWI Wind Turbine Power Curve
Hyundai Heavy Industries HQ2000 WT86 2.0 MW Wind Turbine

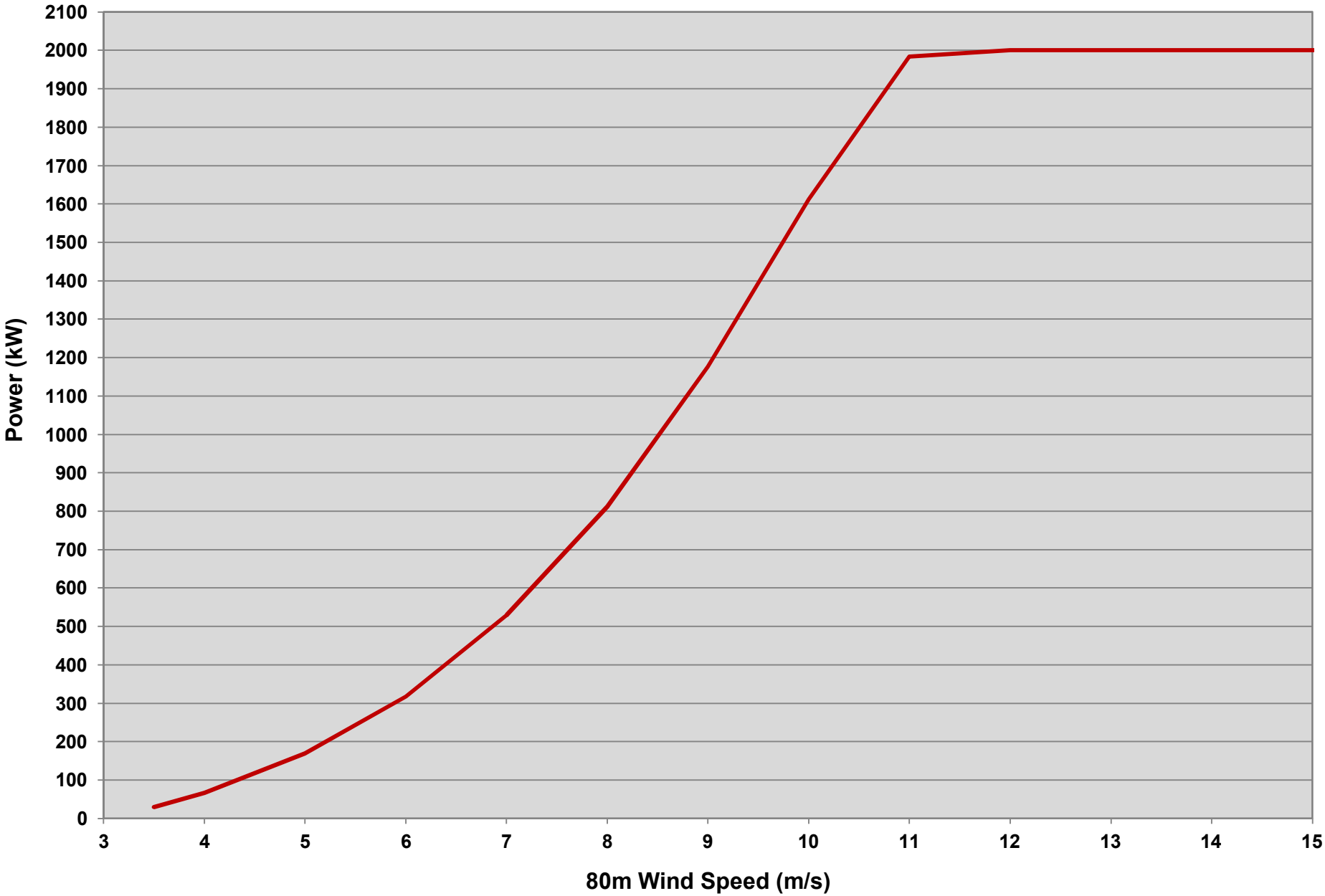


Figure 3. KWI WInd Turbine Sound Power Levels

Hyundai Heavy Industries HQ2000 WT86 2.0 MW Wind Turbine

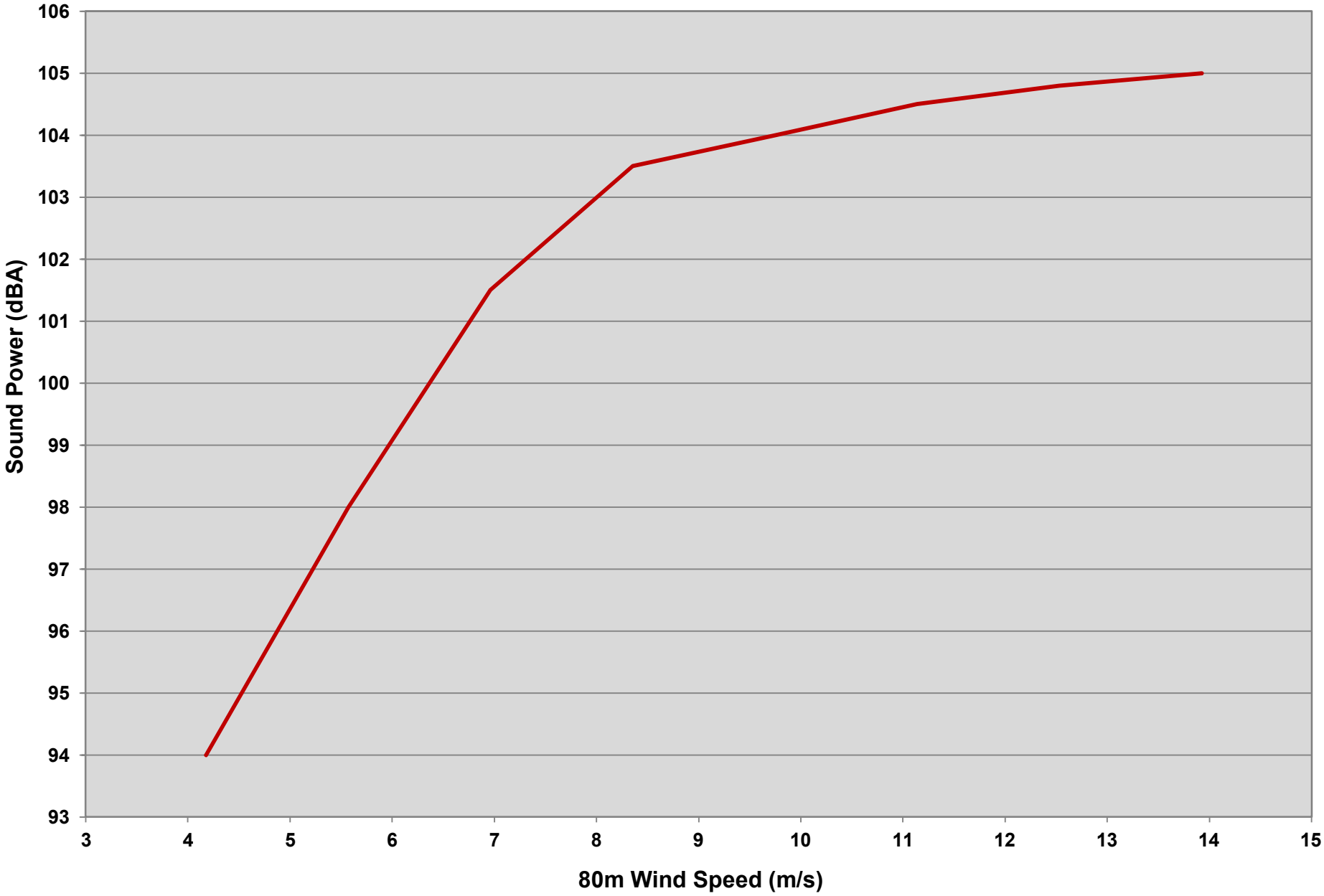


Table 1. Summary of Acoustical Monitoring at 13 Schofield Rd. on March 2, 2014

Date	Time	Scenario	KWI Turbine SHUTDOWN		KWI Turbine OPERATING		
			10-min Avg Wind Speeds (m/s)	Wind Direction (deg)	10-min Avg Wind Speeds (m/s)	Wind Direction (deg)	10-min Avg Power Levels (kW)
3/2/2014	2:20 to 3:05 AM	Scenario # 2	8 to 9	SSW	8 to 9	SSW	831 to 1026

Sound Level Meter Response	20-min Ambient L90 with KWI Wind Turbine SHUTDOWN (dBA) (incl. Route 3 traffic)	20-min L90 with KWI Wind Turbine OPERATING (dBA) (incl. Route 3 traffic)	L90 to L90 Increase (dBA)	20-min Acoustical Metrics KWI Wind Turbine ONLY (dBA) (excluding Route 3 traffic noise)		Increase from Ambient L90 (incl. Rt. 3 traffic) (dBA)	Pure-tone Condition?
Slow	34.1	44.2	10.1	Avg Lmax	49.2	15.0	No
				Leq	46.3	12.2	
				L90	42.7	8.6	
Fast	34.7	44.7	10.0	Avg Lmax	50.8	16.2	No
				Leq	47.4	12.7	
				L90	43.4	8.7	

Notes:

1) Detailed acoustical monitoring data are provided in **Appendix B**.

2) Values in table are highlighted in **bold red** in **Appendix B**.

Table 2. Summary of Acoustical Monitoring at 13 Schofield Rd. on March 15, 2014

Date	Time	Scenario	KWI Turbine SHUTDOWN		KWI Turbine OPERATING		
			10-min Avg Wind Speeds (m/s)	Wind Direction (deg)	10-min Avg Wind Speeds (m/s)	Wind Direction (deg)	10-min Avg Power Levels (kW)
3/15/2014	2:20 to 3:05 AM	Scenario # 3	10	South	10	South	1505 to 1805

Sound Level Meter Response	20-min Ambient L90 with KWI Wind Turbine SHUTDOWN (dBA) (incl. Route 3 traffic)	20-min L90 with KWI Wind Turbine OPERATING (dBA) (incl. Route 3 traffic)	L90 to L90 Increase (dBA)	20-min Acoustical Metrics KWI Wind Turbine ONLY (dBA) (excluding Route 3 traffic noise)		Increase from Ambient L90 (incl. Rt. 3 traffic) (dBA)	Pure-tone Condition?
Slow	39.1	49.5	10.4	Avg Lmax	52.8	13.7	No
				Leq	50.5	11.3	
				L90	49.2	10.1	
Fast	39.5	50.4	10.9	Avg Lmax	55.2	15.7	No
				Leq	51.7	12.2	
				L90	50.1	10.6	

Notes:

1) Detailed acoustical monitoring data are provided in **Appendix B**.

2) Values in table are highlighted in **bold red** in **Appendix B**.

Table 3. Summary of Acoustical Monitoring at 3 Leland Rd. on March 2, 2014

Date	Time	Scenario	KWI Turbine SHUTDOWN		KWI Turbine OPERATING		
			10-min Avg Wind Speeds (m/s)	Wind Direction (deg)	10-min Avg Wind Speeds (m/s)	Wind Direction (deg)	10-min Avg Power Levels (kW)
3/2/2014	1:00 to 1:50 AM	Scenario # 2	9	SSW	8 to 9	SSW	827 to 1139

Sound Level Meter Response	20-min Ambient L90 with KWI Wind Turbine SHUTDOWN (dBA) (incl. Route 3 traffic)	20-min L90 with KWI Wind Turbine OPERATING (dBA) (incl. Route 3 traffic)	L90 to L90 Increase (dBA)	20-min Acoustical Metrics KWI Wind Turbine ONLY (dBA) (excluding Route 3 traffic noise)		Increase from Ambient L90 (incl. Rt. 3 traffic) (dBA)	Pure-tone Condition?
Slow	41.2	45.2	3.9	Avg Lmax	46.0	4.8	No
				Leq	45.4	4.2	
				L90	44.3	3.1	
Fast	41.5	45.9	4.3	Avg Lmax	47.9	6.4	No
				Leq	46.4	4.9	
				L90	45.0	3.4	

Notes:

1) Detailed acoustical monitoring data are provided in **Appendix B**.

2) Values in table are highlighted in **bold red** in **Appendix B**.

Table 4. Summary of Acoustical Monitoring at 3 Leland Rd. on March 15, 2014

Date	Time	Scenario	KWI Turbine SHUTDOWN		KWI Turbine OPERATING		
			10-min Avg Wind Speeds (m/s)	Wind Direction (deg)	10-min Avg Wind Speeds (m/s)	Wind Direction (deg)	10-min Avg Power Levels (kW)
3/15/2014	2:20 to 3:10 AM	Scenario # 3	10	South	10	South	1505 to 1805

Sound Level Meter Response	20-min Ambient L90 with KWI Wind Turbine SHUTDOWN (dBA) (incl. Route 3 traffic)	20-min L90 with KWI Wind Turbine OPERATING (dBA) (incl. Route 3 traffic)	L90 to L90 Increase (dBA)	20-min Acoustical Metrics KWI Wind Turbine ONLY (dBA) (excluding Route 3 traffic noise)		Increase from Ambient L90 (incl. Rt. 3 traffic) (dBA)	Pure-tone Condition?
Slow	40.5	47.6	7.1	Avg Lmax	49.3	8.8	No
				Leq	48.1	7.6	
				L90	47.1	6.6	
Fast	40.8	48.5	7.7	Avg Lmax	51.6	10.8	No
				Leq	49.4	8.6	
				L90	47.9	7.1	

Notes:

1) Detailed acoustical monitoring data are provided in **Appendix B**.

2) Values in table are highlighted in **bold red** in **Appendix B**.

APPENDIX A – ACOUSTICAL MONITORING SITE PHOTOGRAPHS

Acoustical Monitoring Site #1 - 13 Schofield Rd.

Acoustical Monitoring Site #2 - 3 Leland Rd.

APPENDIX B – DETAILED ACOUSTICAL MONITORING DATA

Each eight-page set of data presents information for a specific monitoring location on a specific date.

For example, pages B-1 through B-8 present the following information for the acoustical monitoring conducted at 13 Schofield Road on March 2, 2014:

Data collected using a slow-response sound level meter setting:

• **Page B-1**: Summary of 20-minute sound level metrics for acoustical monitoring conducted with the wind turbine operating and shut down. Metrics are calculated both including and excluding periods of noise generated by Route 3 traffic.

• **Page B-2**: Summary of A-weighted and octave-band sound level comparisons between 20-minute acoustical metrics calculated over periods with the wind turbine operating and shut down.

• **Page B-3**: Detailed acoustical monitoring report for measurements conducted with the wind turbine operating which includes both 5-minute and 20-minute sound level metrics and both graphical and numerical presentation of acoustical data.

• **Page B-4**: Detailed acoustical monitoring report for measurements conducted with the wind turbine shut down which includes both 5-minute and 20-minute sound level metrics and both graphical and numerical presentation of acoustical data.

Data collected using a fast-response sound level meter setting:

• **Pages B-5 to B-8**: Same as pages B-1 through B-4, but presenting fast-response acoustical data.

Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-1: Wind Turbine Acoustical Monitoring Summary (slow response)

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/2/2014 between 2:20 AM and 3:05 AM with KWI Turbine OPERATING and SHUTDOWN

Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine OPERATING

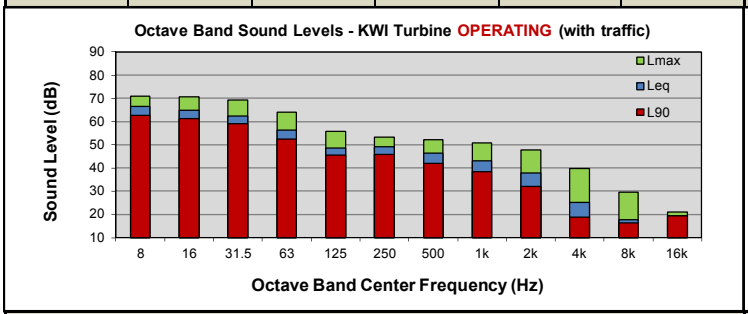
Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 8.9 m/s	Wind Direction: 200°	Average Power Level: 949 kW	Air Temperature: 33 °F
Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 8.4 m/s	Wind Direction: 201°	Average Power Level: 1026 kW	Air Temperature: 33 °F
Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 7.7 m/s	Wind Direction: 205°	Average Power Level: 831 kW	Air Temperature: 33 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine OPERATING (wind turbine plus traffic)

2:45 to 3:05 AM (100% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	52.8	66.5	73.3	77.2	5.7
L01	53.3	66.2	73.0	76.4	4.5
Leq	47.6	62.4	69.9	72.9	2.0
L50	47.1	62.4	69.9	72.7	1.1
L90	44.2	59.3	66.7	69.6	1.1
Lmin	38.3	54.4	61.9	64.1	0.4

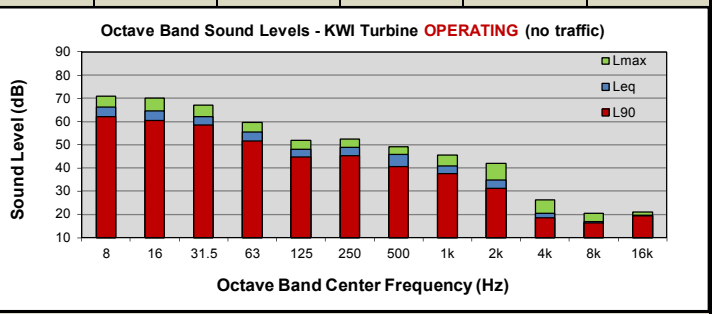


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine OPERATING (wind turbine only)

2:45 to 3:05 AM (65% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	49.2	64.9	72.8	76.7	5.7
L01	49.1	64.9	72.7	76.3	4.9
Leq	46.3	62.1	69.7	72.7	2.2
L50	46.4	62.1	69.7	72.6	2.1
L90	42.7	58.7	65.8	68.8	1.2
Lmin	38.3	54.4	61.9	64.1	0.5



Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine SHUTDOWN

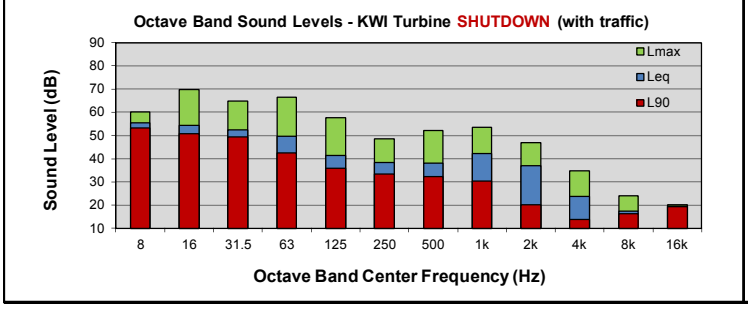
Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 7.8 m/s	Wind Direction: 197°	Average Power Level: 000 kW	Air Temperature: 33 °F
Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 8.7 m/s	Wind Direction: 199°	Average Power Level: 000 kW	Air Temperature: 33 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - with traffic)

2:20 to 2:40 AM (90% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	51.3	61.3	66.0	70.2	4.1
L01	52.1	63.4	66.7	71.4	3.2
Leq	44.3	53.8	59.8	62.8	1.2
L50	41.4	51.3	58.7	61.2	1.1
L90	34.1	49.3	57.0	59.3	0.6
Lmin	32.3	47.4	55.3	56.8	0.3

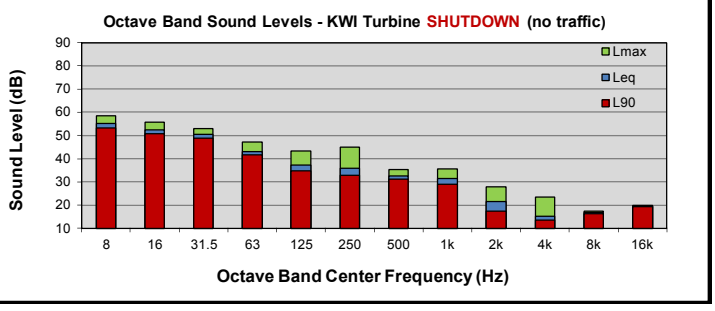


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - no traffic)

2:20 to 2:40 AM (21% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	37.2	51.7	60.0	63.1	3.0
L01	37.0	52.2	60.4	63.1	2.9
Leq	34.7	50.0	58.1	60.8	1.1
L50	34.4	49.9	57.9	60.7	1.0
L90	33.0	48.6	56.6	59.0	0.6
Lmin	32.3	47.4	55.4	56.8	0.3



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-2: Summary of A-weighted and Octave Band Sound Level Comparisons (slow response)

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/2/2014 between 2:20 AM and 3:05 AM with KWI Turbine OPERATING and SHUTDOWN

Operating - Shutdown Differences (including traffic on Route 3)

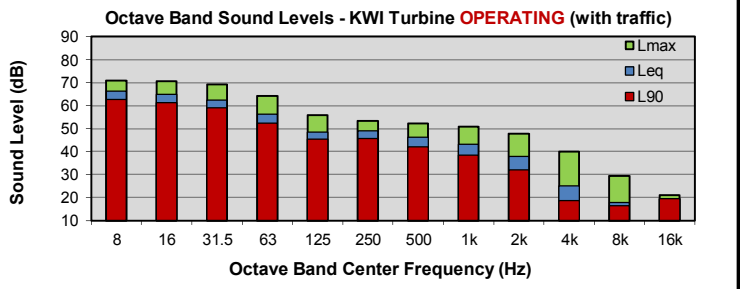
Vertical: KWI Turbine OPERATING (wind turbine plus traffic)
Horizontal: KWI Turbine SHUTDOWN (ambient - with traffic)

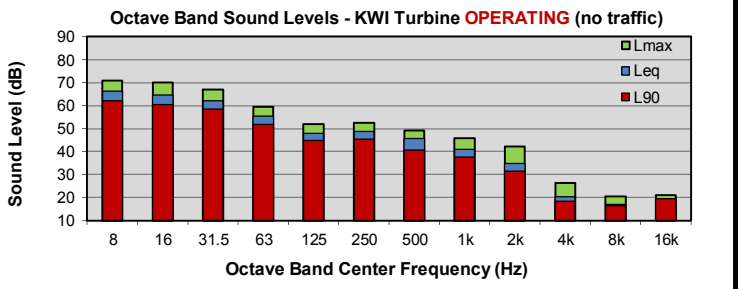
SLOW Response A-levels	KWI Turbine SHUTDOWN (with traffic)					
KWI Turbine OPERATING (with traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	1.6	0.7	8.5	11.5	18.7	20.5
L01	2.0	1.2	9.0	11.9	19.2	21.0
Leq	-3.6	-4.5	3.3	6.3	13.5	15.3
L50	-4.2	-5.0	2.8	5.7	12.9	14.7
L90	-7.1	-7.9	-0.1	2.8	10.1	11.9
Lmin	-13.0	-13.8	-6.0	-3.1	4.2	6.0

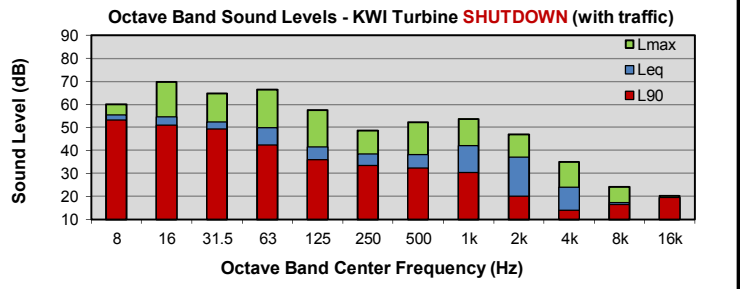
Operating - Shutdown Differences (excluding traffic on Route 3)

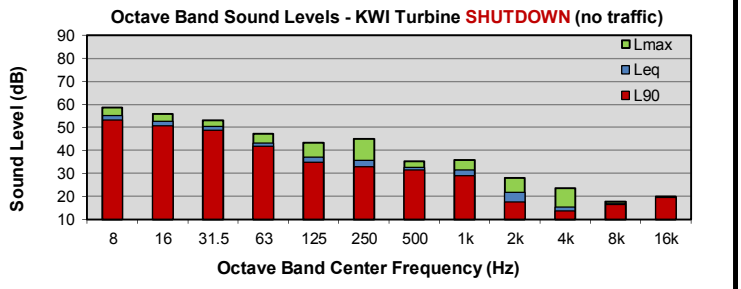
Vertical: KWI Turbine OPERATING (wind turbine only)
Horizontal: KWI Turbine SHUTDOWN (ambient - no traffic)

SLOW Response A-levels	KWI Turbine SHUTDOWN (no traffic)					
KWI Turbine OPERATING (no traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	11.9	12.2	14.4	14.7	16.1	16.8
L01	11.9	12.2	14.4	14.7	16.1	16.8
Leq	9.1	9.4	11.6	11.9	13.3	14.0
L50	9.1	9.4	11.7	11.9	13.3	14.0
L90	5.5	5.7	8.0	8.3	9.7	10.4
Lmin	1.1	1.3	3.6	3.9	5.3	6.0









Operating - Shutdown Differences: Overall Comparison

Vertical: KWI Turbine ONLY (excluding traffic on Route 3)
Horizontal: Ambient Sound Levels (including traffic on Route 3)

SLOW Response A-levels	KWI Turbine SHUTDOWN (with traffic)					
KWI Turbine OPERATING (no traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	-2.1	-2.9	4.8	7.8	15.0	16.8
L01	-2.1	-3.0	4.8	7.8	15.0	16.8
Leq	-4.9	-5.7	2.0	5.0	12.2	14.0
L50	-4.9	-5.7	2.1	5.0	12.2	14.0
L90	-8.6	-9.4	-1.6	1.4	8.6	10.4
Lmin	-13.0	-13.8	-6.0	-3.1	4.2	6.0

Octave Band Sound Level Comparison: Pure-tone Check

Including traffic on Route 3:

L90 Octave Band Check: KWI Turbine OPERATING		NO KWI PURE TONE	L90 Octave Band Check KWI Turbine SHUTDOWN	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Excluding traffic on Route 3:

Leq Octave Band Check: KWI Turbine ONLY		NO KWI PURE TONE	Leq Octave Band Check Ambient (no traffic)	
Leq Pure-tone?	NO		Leq Pure-tone?	NO
L90 Octave Band Check KWI Turbine ONLY		**NO KWI PURE TONE**	**L90 Octave Band Check Ambient (no traffic)**	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Acoustical Monitoring Study of Kingston Wind Independence Turbine

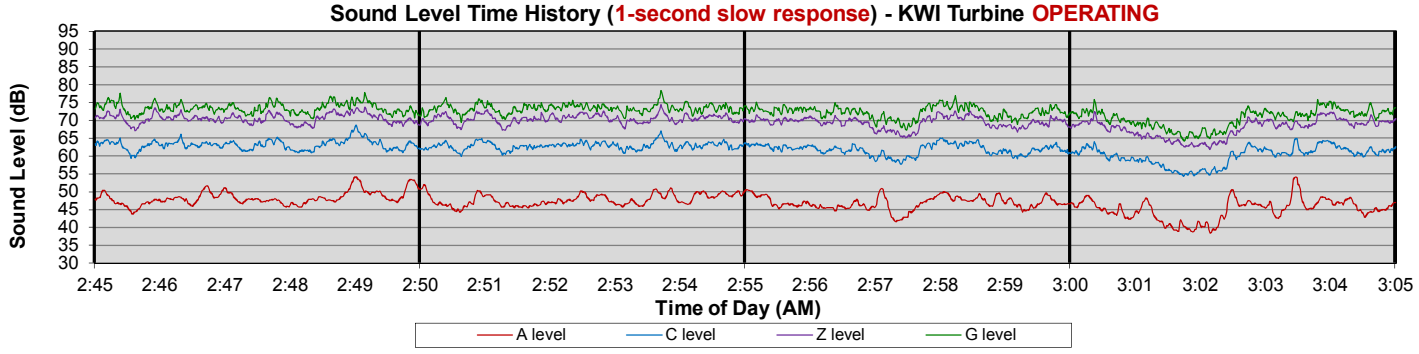
Page B-3: Detailed Acoustical Monitoring Report (slow response) - Wind Turbine Operating

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/2/2014 from 2:45 to 3:05 AM with KWI Turbine OPERATING

Site data		Supervisory Control and Data Acquisition (SCADA) data									
Distance from KWI:	740 ft	Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 8.9 m/s	Wind Direction: 200°	Avg Power Level: 949 kW	Air Temperature: 33 °F
Wind Speed Range:	0-3 m/s	Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 8.4 m/s	Wind Direction: 201°	Avg Power Level: 1026 kW	Air Temperature: 33 °F
		Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 7.7 m/s	Wind Direction: 205°	Avg Power Level: 831 kW	Air Temperature: 33 °F

Sound Level Time History (1-second slow response) - KWI Turbine OPERATING



Event Log

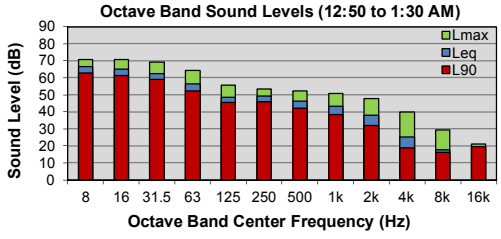
Traffic on Route 3 throughout

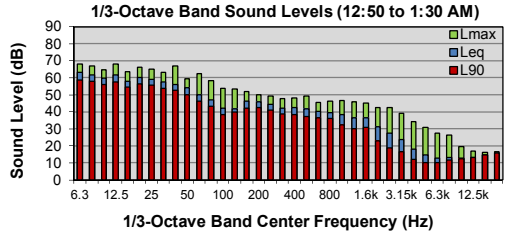
Loud wind chime from 2:54:30 to 2:54:31 (EXCLUDE)

Slow Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine OPERATING

2:45 to 2:50 AM (100% included)						2:50 to 2:55 AM (99% included)						2:55 to 3:00 AM (100% included)						3:00 to 3:05 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	54.2	68.7	73.7	77.8	6.3	Lmax	52.1	67.1	74.3	78.3	5.1	Lmax	50.9	65.1	72.7	76.9	5.4	Lmax	54.2	64.9	72.4	75.9	6.0
L01	53.7	67.3	73.5	76.7	5.0	L01	51.0	65.8	73.0	76.4	4.2	L01	50.6	64.6	72.4	75.6	4.4	L01	53.4	64.4	72.3	75.3	4.5
Leq	48.8	63.4	70.7	73.7	2.0	Leq	48.1	63.0	70.6	73.5	2.0	Leq	47.2	62.1	69.6	72.6	2.0	Leq	46.0	60.7	68.4	71.2	2.0
L50	47.9	63.2	70.5	73.3	1.9	L50	47.4	62.9	70.5	73.4	1.9	L50	46.6	62.0	69.6	72.5	1.9	L50	45.4	60.7	68.4	71.2	1.9
L90	46.2	61.4	68.7	71.6	1.1	L90	46.0	61.6	69.1	71.8	1.1	L90	44.9	59.6	67.1	70.0	1.1	L90	40.1	55.8	63.6	66.3	1.1
Lmin	43.8	59.3	67.1	70.4	0.4	Lmin	44.3	59.9	67.2	69.5	0.4	Lmin	41.6	57.7	65.0	67.3	0.4	Lmin	38.3	54.4	61.9	64.1	0.5

2:45 to 3:05 AM (100% included)					
Avg	A	C	Z	G	MD
Lmax	52.8	66.5	73.3	77.2	5.7
L01	53.3	66.2	73.0	76.4	4.5
Leq	47.6	62.4	69.9	72.9	2.0
L50	47.1	62.4	69.9	72.7	1.1
L90	44.2	59.3	66.7	69.6	1.1
Lmin	38.3	54.4	61.9	64.1	0.4

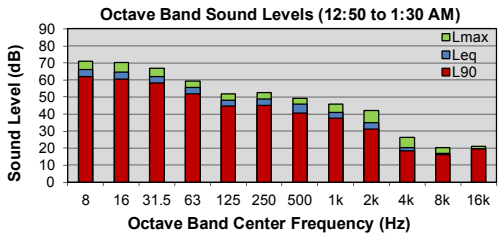


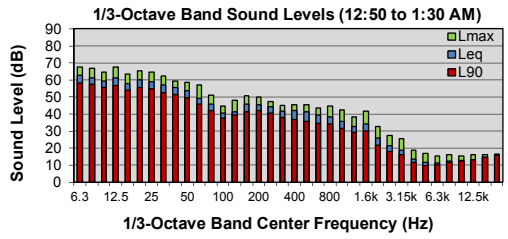


Slow Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine OPERATING

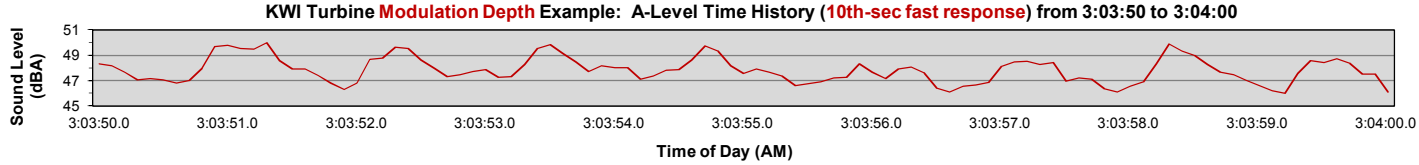
2:45 to 2:50 AM (65% included)						2:50 to 2:55 AM (48% included)						2:55 to 3:00 AM (70% included)						3:00 to 3:05 AM (76% included)					
8.8 m/s	A	C	Z	G	MD	8.4 m/s	A	C	Z	G	MD	8.6 m/s	A	C	Z	G	MD	7.8 m/s	A	C	Z	G	MD
Lmax	49.9	66.2	73.5	77.6	6.3	Lmax	48.6	64.4	72.5	76.4	5.1	Lmax	49.6	64.5	72.7	76.9	5.4	Lmax	48.6	64.4	72.4	75.9	6.0
L01	49.6	65.1	73.1	76.5	5.3	L01	48.3	64.1	72.4	75.8	4.1	L01	49.4	64.4	72.5	75.1	4.7	L01	48.5	64.2	72.3	75.3	4.8
Leq	47.4	63.1	70.6	73.6	2.3	Leq	46.6	62.6	70.3	73.4	2.2	Leq	46.5	62.0	69.7	72.7	2.2	Leq	44.7	60.4	68.4	71.2	2.1
L50	47.5	63.0	70.4	73.1	2.2	L50	46.5	62.8	70.3	73.3	2.1	L50	46.3	62.0	69.8	72.6	2.2	L50	44.6	60.5	68.4	71.2	2.0
L90	45.9	61.4	68.6	71.6	1.3	L90	45.6	61.3	68.3	71.6	1.2	L90	44.4	59.6	66.8	69.9	1.2	L90	39.9	55.5	63.3	66.1	1.1
Lmin	43.8	59.3	67.1	70.4	0.6	Lmin	44.3	59.9	67.2	69.5	0.5	Lmin	41.6	57.7	65.0	67.3	0.5	Lmin	38.3	54.4	61.9	64.1	0.5

2:45 to 3:05 AM (65% included)					
Avg	A	C	Z	G	MD
Lmax	49.2	64.9	72.8	76.7	5.7
L01	49.1	64.9	72.7	76.3	4.9
Leq	46.3	62.1	69.7	72.7	2.2
L50	46.4	62.1	69.7	72.6	2.1
L90	42.7	58.7	65.8	68.8	1.2
Lmin	38.3	54.4	61.9	64.1	0.5





KWI Turbine Modulation Depth Example: A-Level Time History (10th-sec fast response) from 3:03:50 to 3:04:00



Acoustical Monitoring Study of Kingston Wind Independence Turbine

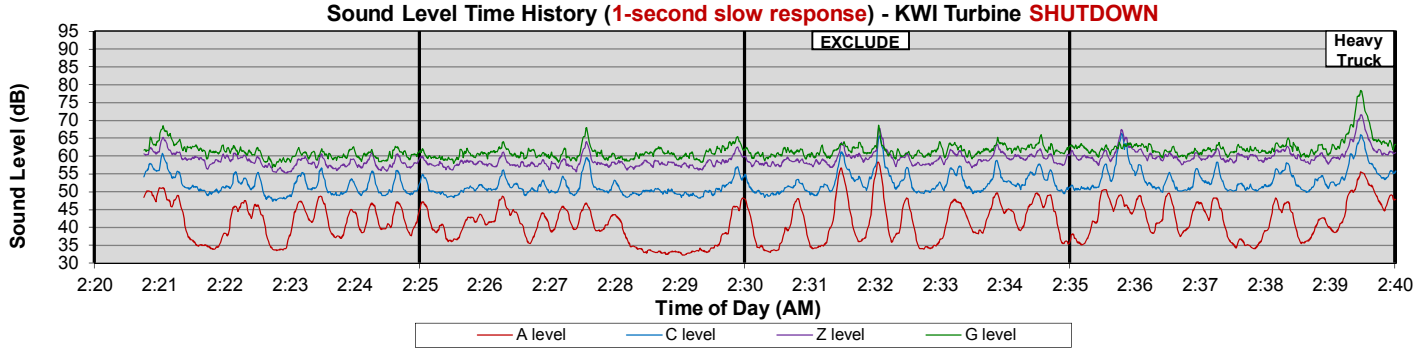
Page B-4: Detailed Acoustical Monitoring Report (slow response) - Wind Turbine Shutdown

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/2/2014 from 2:20 to 2:40 AM with KWI Turbine SHUTDOWN

Site data		Supervisory Control and Data Acquisition (SCADA) data							
Distance from KWI:	740 ft	Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 7.8 m/s	Wind Direction: 197°	Avg Power Level: 000 kW	Air Temperature: 33 °F
Wind Speed Range:	0-3 m/s	Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 8.7 m/s	Wind Direction: 199°	Avg Power Level: 000 kW	Air Temperature: 33 °F

Sound Level Time History (1-second slow response) - KWI Turbine SHUTDOWN



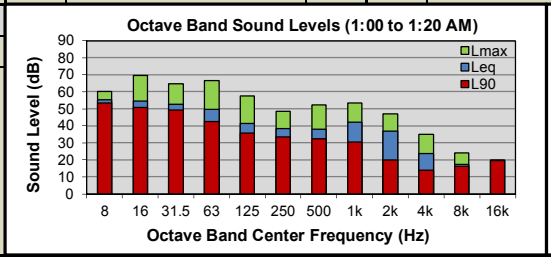
Event Log

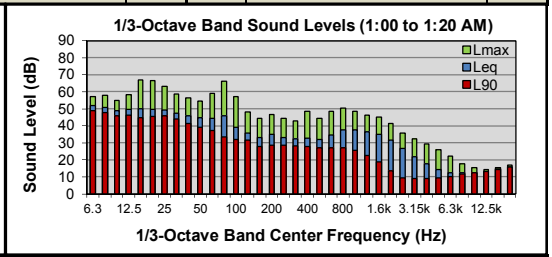
Monitoring initiated at 2:20:45
Traffic on Route 3 throughout
Local vehicle from 2:31:13 to 2:32:17 (EXCLUDE)
Loud wind chime from 2:34:58 to 2:35:08 (EXCLUDE)

Slow Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine SHUTDOWN

2:20 to 2:25 AM (85% included)						2:25 to 2:30 AM (100% included)						2:30 to 2:35 AM (78% included)						2:35 to 2:40 AM (97% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	51.2	60.8	65.3	68.5	3.9	Lmax	48.7	59.6	64.0	67.9	3.6	Lmax	49.7	58.8	63.4	65.9	4.1	Lmax	55.5	66.3	71.5	78.4	4.9
L01	51.1	59.4	64.3	67.4	3.1	L01	48.2	58.4	62.5	65.5	2.8	L01	49.5	58.1	62.4	64.9	3.5	L01	55.0	65.8	70.4	76.8	3.3
Leq	44.4	52.8	59.0	61.6	1.3	Leq	41.7	51.6	58.2	61.0	1.2	Leq	43.7	52.8	59.2	61.6	1.3	Leq	46.2	56.2	61.7	65.2	1.3
L50	42.3	51.1	58.4	61.0	1.2	L50	39.7	50.4	57.8	60.5	1.1	L50	40.4	51.5	58.8	61.3	1.1	L50	43.3	53.0	60.0	62.1	1.1
L90	34.7	48.9	56.3	58.8	0.6	L90	33.1	49.0	56.8	59.1	0.6	L90	34.2	49.6	57.4	59.8	0.6	L90	35.8	50.5	58.6	60.5	0.6
Lmin	33.6	47.4	55.3	56.8	0.3	Lmin	32.3	48.2	55.6	58.0	0.3	Lmin	33.1	48.5	56.7	58.6	0.3	Lmin	34.0	49.8	57.4	59.2	0.3

2:20 to 2:40 AM (90% included)					
Avg	A	C	Z	G	MD
Lmax	51.3	61.3	66.0	70.2	4.1
L01	52.1	63.4	66.7	71.4	3.2
Leq	44.3	53.8	59.8	62.8	1.2
L50	41.4	51.3	58.7	61.2	1.1
L90	34.1	49.3	57.0	59.3	0.6
Lmin	32.3	47.4	55.3	56.8	0.3

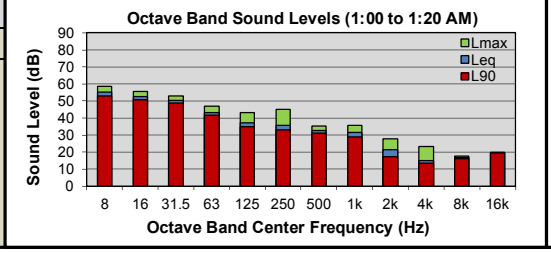


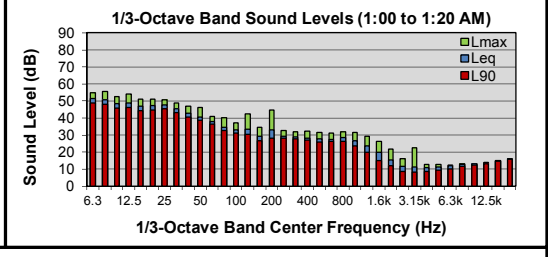


Slow Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine SHUTDOWN

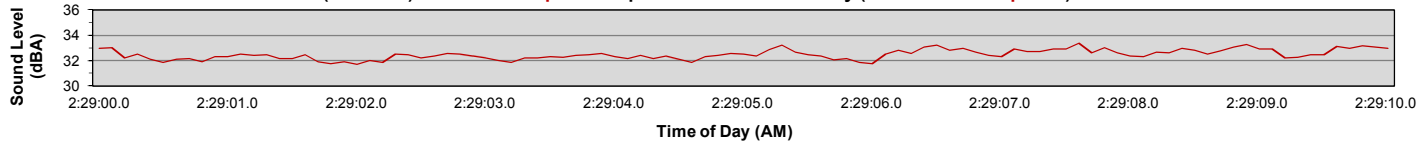
2:20 to 2:25 AM (14% included)						2:25 to 2:30 AM (33% included)						2:30 to 2:35 AM (21% included)						2:35 to 2:40 AM (16% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	37.0	51.9	59.9	63.2	3.1	Lmax	37.7	51.0	59.1	62.6	2.9	Lmax	36.8	51.5	60.4	63.0	3.9	Lmax	37.4	52.4	60.8	63.5	2.2
L01	36.9	51.7	59.9	63.0	3.1	L01	36.9	51.0	58.9	62.3	2.5	L01	36.6	51.5	59.7	62.7	3.2	L01	37.1	52.3	60.7	63.4	2.0
Leq	34.8	49.8	58.1	60.8	1.2	Leq	34.2	49.6	57.5	60.3	1.1	Leq	34.6	49.9	58.0	60.7	1.1	Leq	35.6	50.9	59.5	61.6	1.1
L50	34.6	49.9	58.0	61.1	1.1	L50	33.4	49.4	57.4	60.3	1.0	L50	34.4	49.7	57.8	60.6	1.0	L50	35.5	50.7	59.5	61.5	1.0
L90	33.7	47.9	55.7	58.0	0.6	L90	32.8	48.6	56.4	58.9	0.6	L90	33.5	49.0	57.3	59.8	0.7	L90	34.4	50.2	58.3	60.2	0.6
Lmin	33.6	47.4	55.4	56.8	0.4	Lmin	32.3	48.2	56.1	58.0	0.4	Lmin	33.1	48.5	57.0	58.6	0.4	Lmin	34.0	49.9	57.7	59.8	0.3

2:20 to 2:40 AM (21% included)					
Avg	A	C	Z	G	MD
Lmax	37.2	51.7	60.0	63.1	3.0
L01	37.0	52.2	60.4	63.1	2.9
Leq	34.7	50.0	58.1	60.8	1.1
L50	34.4	49.9	57.9	60.7	1.0
L90	33.0	48.6	56.6	59.0	0.6
Lmin	32.3	47.4	55.4	56.8	0.3





Ambient (no traffic) Modulation Depth Example: A-Level Time History (10th-sec fast response) from 2:29:00 to 2:29:10



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-5: Wind Turbine Acoustical Monitoring Summary (fast response)

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/2/2014 between 2:20 AM and 3:05 AM with KWI Turbine OPERATING and SHUTDOWN

Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine OPERATING

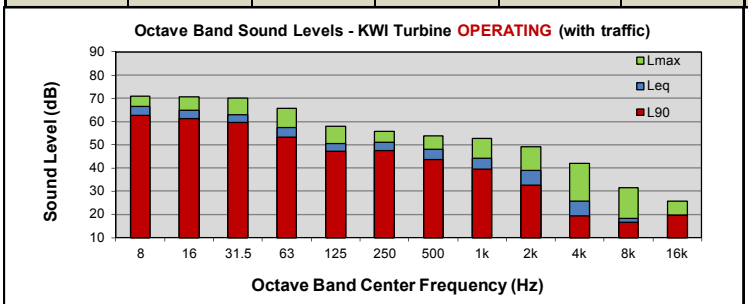
Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 8.9 m/s	Wind Direction: 200°	Average Power Level: 949 kW	Air Temperature: 33 °F
Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 8.4 m/s	Wind Direction: 201°	Average Power Level: 1026 kW	Air Temperature: 33 °F
Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 7.7 m/s	Wind Direction: 205°	Average Power Level: 831 kW	Air Temperature: 33 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine OPERATING (wind turbine plus traffic)

2:45 to 3:05 AM (100% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	53.8	69.5	73.5	77.3	5.7
L01	53.6	68.4	73.3	76.4	4.5
Leq	48.5	64.4	70.2	72.9	2.0
L50	48.1	64.1	70.1	72.8	1.1
L90	44.7	60.6	66.9	69.7	1.1
Lmin	38.0	55.5	62.2	64.2	0.4

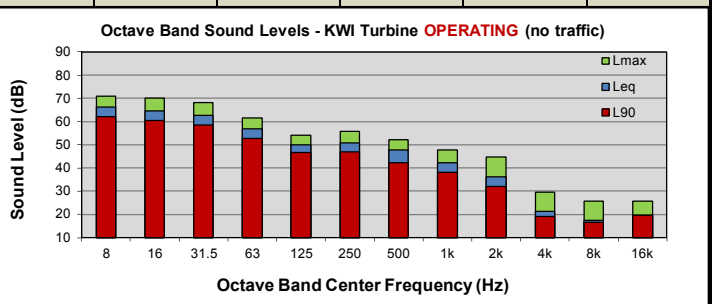


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine OPERATING (wind turbine only)

2:45 to 3:05 AM (65% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	50.8	68.5	72.9	76.8	5.7
L01	50.5	67.8	72.9	76.4	4.9
Leq	47.4	64.1	69.9	72.8	2.2
L50	47.3	63.9	70.0	72.7	2.1
L90	43.4	59.9	66.1	69.0	1.2
Lmin	38.0	55.5	62.2	64.2	0.5



Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine SHUTDOWN

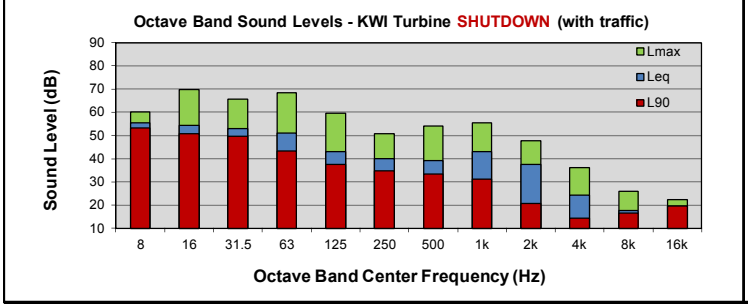
Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 7.8 m/s	Wind Direction: 197°	Average Power Level: 000 kW	Air Temperature: 33 °F
Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 8.7 m/s	Wind Direction: 199°	Average Power Level: 000 kW	Air Temperature: 33 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - with traffic)

2:20 to 2:40 AM (90% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	52.3	63.9	66.7	70.2	4.1
L01	52.3	65.0	67.5	71.4	3.2
Leq	44.7	55.2	60.1	62.9	1.2
L50	41.6	52.9	58.9	61.3	1.1
L90	34.7	50.6	57.2	59.4	0.6
Lmin	32.7	48.2	55.4	57.0	0.3

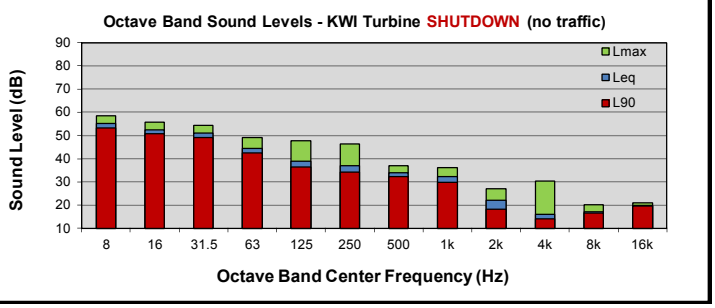


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - no traffic)

2:20 to 2:40 AM (21% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	37.7	55.2	60.2	63.1	3.0
L01	37.5	54.7	60.6	63.1	2.9
Leq	35.1	51.7	58.3	60.8	1.1
L50	34.9	51.5	58.0	60.7	1.0
L90	33.5	50.1	56.8	59.1	0.6
Lmin	32.7	48.8	55.7	57.0	0.3



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-6: Summary of A-weighted and Octave Band Sound Level Comparisons (fast response)

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/2/2014 between 2:20 AM and 3:05 AM with KWI Turbine OPERATING and SHUTDOWN

Operating - Shutdown Differences (including traffic on Route 3)

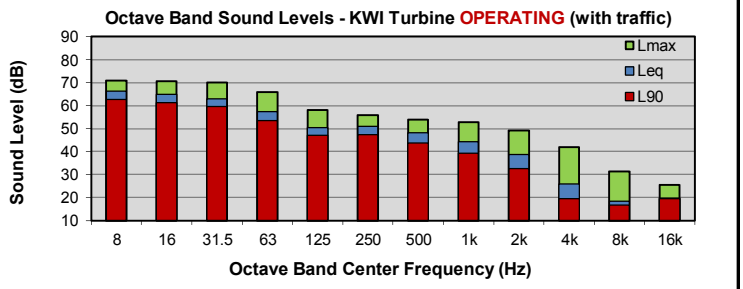
Vertical: KWI Turbine OPERATING (wind turbine plus traffic)
Horizontal: KWI Turbine SHUTDOWN (ambient - with traffic)

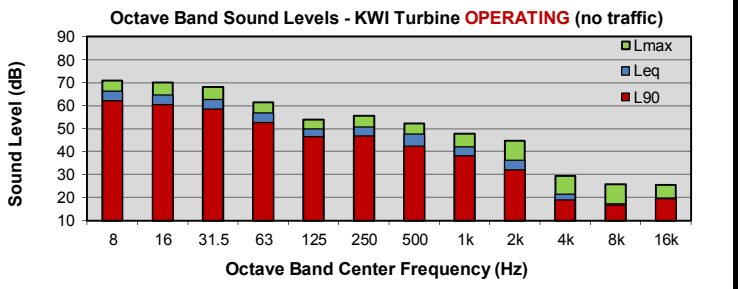
FAST Response A-levels		KWI Turbine SHUTDOWN (with traffic)					
		Avg Lmax	L01	Leq	L50	L90	Lmin
KWI Turbine OPERATING (with traffic)	Avg Lmax	1.4	1.4	9.0	12.2	19.1	21.1
	L01	1.3	1.3	8.9	12.1	19.0	21.0
	Leq	-3.9	-3.9	3.8	6.9	13.8	15.8
	L50	-4.3	-4.3	3.3	6.5	13.4	15.4
	L90	-7.7	-7.7	0.0	3.1	10.0	12.0
	Lmin	-14.3	-14.3	-6.7	-3.6	3.4	5.3

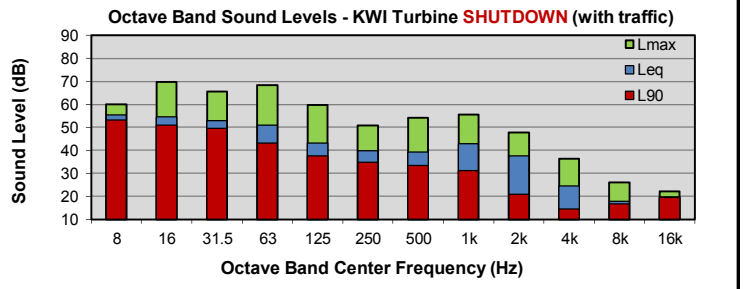
Operating - Shutdown Differences (excluding traffic on Route 3)

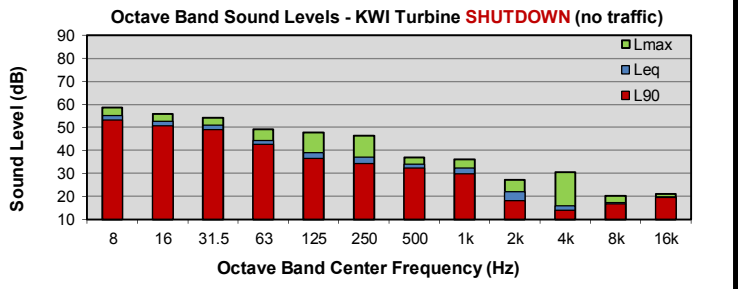
Vertical: KWI Turbine OPERATING (wind turbine only)
Horizontal: KWI Turbine SHUTDOWN (ambient - no traffic)

FAST Response A-levels		KWI Turbine SHUTDOWN (no traffic)					
		Avg Lmax	L01	Leq	L50	L90	Lmin
KWI Turbine OPERATING (no traffic)	Avg Lmax	13.2	13.3	15.7	15.9	17.3	18.2
	L01	12.8	12.9	15.3	15.5	16.9	17.8
	Leq	9.7	9.8	12.2	12.4	13.9	14.7
	L50	9.6	9.8	12.1	12.3	13.8	14.6
	L90	5.7	5.8	8.2	8.4	9.8	10.7
	Lmin	0.3	0.5	2.9	3.1	4.5	5.3









Operating - Shutdown Differences: Overall Comparison

Vertical: KWI Turbine ONLY (excluding traffic on Route 3)
Horizontal: Ambient Sound Levels (including traffic on Route 3)

FAST Response A-levels		KWI Turbine SHUTDOWN (with traffic)					
		Avg Lmax	L01	Leq	L50	L90	Lmin
KWI Turbine OPERATING (no traffic)	Avg Lmax	-1.5	-1.5	6.1	9.3	16.2	18.2
	L01	-1.9	-1.9	5.7	8.9	15.8	17.8
	Leq	-5.0	-5.0	2.7	5.8	12.7	14.7
	L50	-5.1	-5.1	2.6	5.7	12.6	14.6
	L90	-9.0	-9.0	-1.4	1.8	8.7	10.7
	Lmin	-14.3	-14.3	-6.7	-3.6	3.4	5.3

Octave Band Sound Level Comparison: Pure-tone Check

Including traffic on Route 3:

L90 Octave Band Check: KWI Turbine OPERATING		NO KWI PURE TONE	L90 Octave Band Check KWI Turbine SHUTDOWN	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Excluding traffic on Route 3:

Leq Octave Band Check: KWI Turbine ONLY		NO KWI PURE TONE	Leq Octave Band Check Ambient (no traffic)	
Leq Pure-tone?	NO		Leq Pure-tone?	NO
L90 Octave Band Check KWI Turbine ONLY		**NO KWI PURE TONE**	**L90 Octave Band Check Ambient (no traffic)**	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Acoustical Monitoring Study of Kingston Wind Independence Turbine

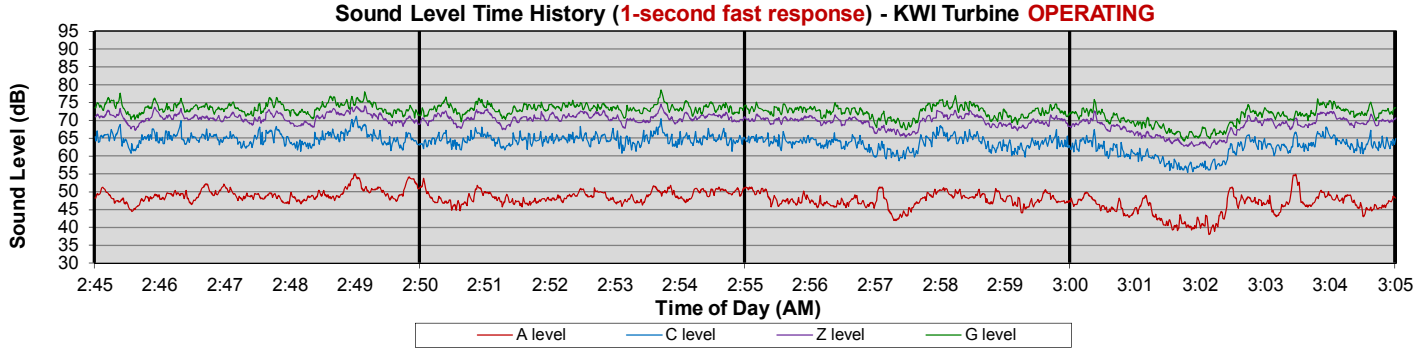
Page B-7: Detailed Acoustical Monitoring Report (fast response) - Wind Turbine Operating

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/2/2014 from 2:45 to 3:05 AM with KWI Turbine OPERATING

Site data		Supervisory Control and Data Acquisition (SCADA) data									
Distance from KWI:	740 ft	Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 8.9 m/s	Wind Direction: 200°	Avg Power Level: 949 kW	Air Temperature: 33 °F
Wind Speed Range:	0-3 m/s	Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 8.4 m/s	Wind Direction: 201°	Avg Power Level: 1026 kW	Air Temperature: 33 °F
		Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 7.7 m/s	Wind Direction: 205°	Avg Power Level: 831 kW	Air Temperature: 33 °F

Sound Level Time History (1-second fast response) - KWI Turbine OPERATING



Event Log

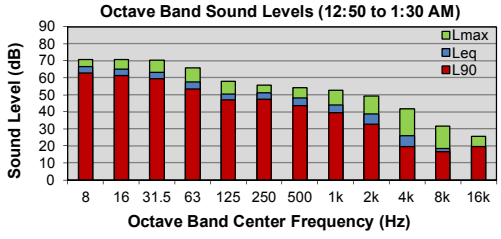
Traffic on Route 3 throughout

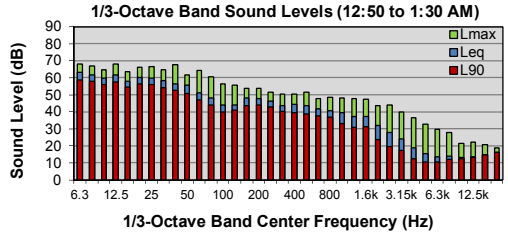
Loud wind chime from 2:54:30 to 2:54:31 (EXCLUDE)

Fast Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine OPERATING

2:45 to 2:50 AM (100% included)						2:50 to 2:55 AM (99% included)						2:55 to 3:00 AM (100% included)						3:00 to 3:05 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	55.1	71.2	74.0	77.9	6.3	Lmax	53.8	70.4	74.6	78.5	5.1	Lmax	51.4	68.4	72.9	76.9	5.4	Lmax	54.9	68.1	72.6	76.0	6.0
L01	54.2	69.9	73.6	76.8	5.0	L01	51.8	68.2	73.2	76.5	4.2	L01	51.2	67.7	72.7	75.7	4.4	L01	53.6	67.2	72.4	75.4	4.5
Leq	49.6	65.4	71.0	73.8	2.0	Leq	48.9	65.0	70.8	73.6	2.0	Leq	48.1	64.0	69.8	72.7	2.0	Leq	46.8	62.6	68.6	71.3	2.0
L50	48.9	65.0	70.7	73.4	1.9	L50	48.4	64.7	70.7	73.4	1.9	L50	47.6	63.8	69.9	72.6	1.9	L50	46.3	62.2	68.6	71.2	1.9
L90	47.1	63.0	68.9	71.6	1.1	L90	46.8	62.8	69.3	71.8	1.1	L90	45.6	61.0	67.3	70.0	1.1	L90	40.7	57.2	63.8	66.4	1.1
Lmin	44.4	60.8	67.3	70.4	0.4	Lmin	44.6	60.8	67.5	69.5	0.4	Lmin	41.9	58.7	65.4	67.4	0.4	Lmin	38.0	55.5	62.2	64.2	0.5

2:45 to 3:05 AM (100% included)					
Avg	A	C	Z	G	MD
Lmax	53.8	69.5	73.5	77.3	5.7
L01	53.6	68.4	73.3	76.4	4.5
Leq	48.5	64.4	70.2	72.9	2.0
L50	48.1	64.1	70.1	72.8	1.1
L90	44.7	60.6	66.9	69.7	1.1
Lmin	38.0	55.5	62.2	64.2	0.4

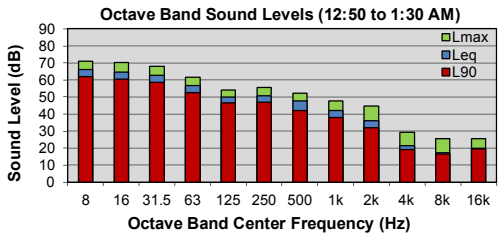


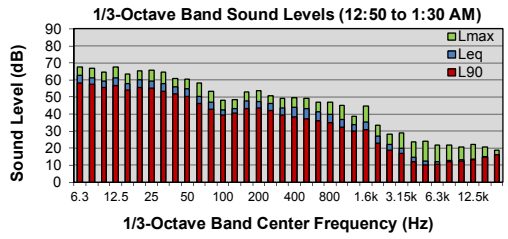


Fast Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine OPERATING

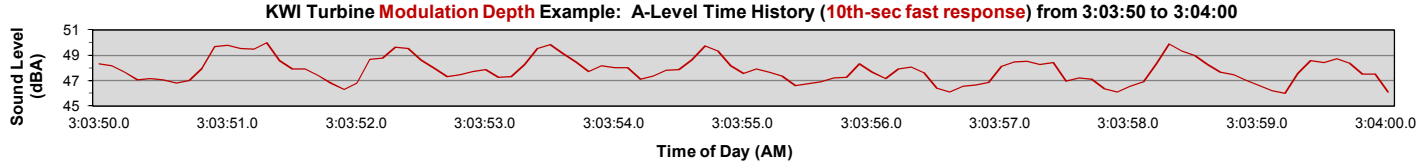
2:45 to 2:50 AM (65% included)						2:50 to 2:55 AM (48% included)						2:55 to 3:00 AM (70% included)						3:00 to 3:05 AM (76% included)					
8.8 m/s	A	C	Z	G	MD	8.4 m/s	A	C	Z	G	MD	8.6 m/s	A	C	Z	G	MD	7.8 m/s	A	C	Z	G	MD
Lmax	51.3	69.9	73.6	77.6	6.3	Lmax	50.7	67.7	72.7	76.5	5.1	Lmax	51.0	68.2	72.9	76.9	5.4	Lmax	50.3	68.1	72.6	76.0	6.0
L01	50.4	68.3	73.3	76.6	5.3	L01	50.2	67.3	72.6	75.9	4.1	L01	50.7	67.0	72.7	75.3	4.7	L01	49.9	67.3	72.5	75.5	4.8
Leq	48.5	65.1	70.8	73.7	2.3	Leq	47.6	64.6	70.5	73.5	2.2	Leq	47.6	64.0	69.9	72.7	2.2	Leq	45.7	62.4	68.6	71.3	2.1
L50	48.4	64.8	70.6	73.2	2.2	L50	47.4	64.4	70.5	73.4	2.1	L50	47.2	63.9	70.1	72.7	2.2	L50	45.5	62.1	68.6	71.3	2.0
L90	46.9	62.8	68.8	71.6	1.3	L90	46.4	62.7	68.6	71.7	1.2	L90	45.1	61.1	67.0	70.0	1.2	L90	40.5	57.0	63.5	66.2	1.1
Lmin	44.4	60.8	67.3	70.4	0.6	Lmin	44.6	60.8	67.5	69.5	0.5	Lmin	41.9	58.7	65.4	67.4	0.5	Lmin	38.0	55.5	62.2	64.2	0.5

2:45 to 3:05 AM (65% included)					
Avg	A	C	Z	G	MD
Lmax	50.8	68.5	72.9	76.8	5.7
L01	50.5	67.8	72.9	76.4	4.9
Leq	47.4	64.1	69.9	72.8	2.2
L50	47.3	63.9	70.0	72.7	2.1
L90	43.4	59.9	66.1	69.0	1.2
Lmin	38.0	55.5	62.2	64.2	0.5





KWI Turbine Modulation Depth Example: A-Level Time History (10th-sec fast response) from 3:03:50 to 3:04:00



Acoustical Monitoring Study of Kingston Wind Independence Turbine

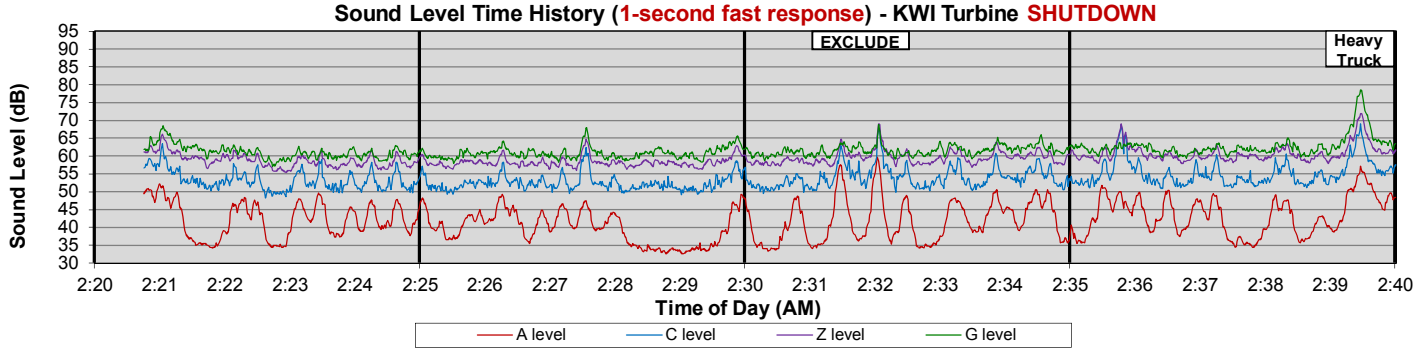
Page B-8: Detailed Acoustical Monitoring Report (fast response) - Wind Turbine Shutdown

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/2/2014 from 2:20 to 2:40 AM with KWI Turbine SHUTDOWN

Site data		Supervisory Control and Data Acquisition (SCADA) data							
Distance from KWI:	740 ft	Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 7.8 m/s	Wind Direction: 197°	Avg Power Level: 000 kW	Air Temperature: 33 °F
Wind Speed Range:	0-3 m/s	Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 8.7 m/s	Wind Direction: 199°	Avg Power Level: 000 kW	Air Temperature: 33 °F

Sound Level Time History (1-second fast response) - KWI Turbine SHUTDOWN



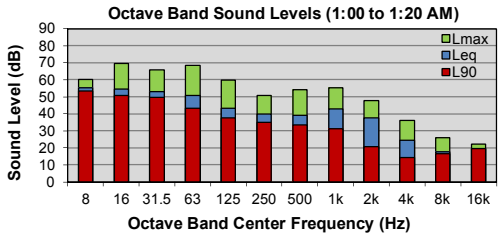
Event Log

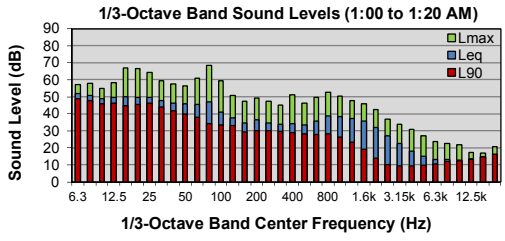
Monitoring initiated at 2:20:45
Traffic on Route 3 throughout
Local vehicle from 2:31:13 to 2:32:17 (EXCLUDE)
Loud wind chime from 2:34:58 to 2:35:08 (EXCLUDE)

Fast Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine SHUTDOWN

2:20 to 2:25 AM (85% included)						2:25 to 2:30 AM (100% included)						2:30 to 2:35 AM (78% included)						2:35 to 2:40 AM (97% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	52.2	63.5	66.1	68.6	3.9	Lmax	49.4	62.4	64.8	68.0	3.6	Lmax	50.6	60.8	63.9	65.9	4.1	Lmax	57.2	69.0	71.9	78.5	4.9
L01	51.5	60.7	65.0	67.5	3.1	L01	48.7	60.0	63.0	65.6	2.8	L01	50.5	59.4	63.1	65.0	3.5	L01	55.4	67.0	70.6	76.9	3.3
Leq	44.8	54.3	59.3	61.7	1.3	Leq	42.1	53.1	58.5	61.1	1.2	Leq	44.0	54.1	59.4	61.7	1.3	Leq	46.7	57.6	62.0	65.3	1.3
L50	42.2	52.6	58.7	61.1	1.2	L50	40.0	51.9	58.0	60.6	1.1	L50	40.5	53.2	59.0	61.3	1.1	L50	43.5	54.3	60.2	62.2	1.1
L90	35.1	50.1	56.5	58.9	0.6	L90	33.7	50.3	57.0	59.2	0.6	L90	34.5	50.8	57.6	59.9	0.6	L90	36.2	51.9	58.7	60.5	0.6
Lmin	34.2	48.2	55.4	57.0	0.3	Lmin	32.7	49.2	55.9	57.9	0.3	Lmin	33.4	49.4	56.8	58.6	0.3	Lmin	34.4	50.9	57.9	59.3	0.3

2:20 to 2:40 AM (90% included)					
Avg	A	C	Z	G	MD
Lmax	52.3	63.9	66.7	70.2	4.1
L01	52.3	65.0	67.5	71.4	3.2
Leq	44.7	55.2	60.1	62.9	1.2
L50	41.6	52.9	58.9	61.3	1.1
L90	34.7	50.6	57.2	59.4	0.6
Lmin	32.7	48.2	55.4	57.0	0.3

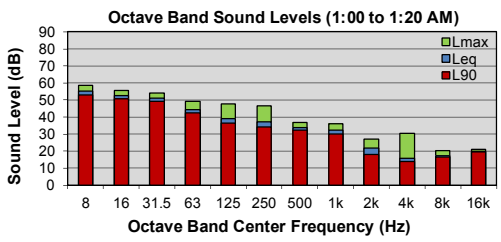


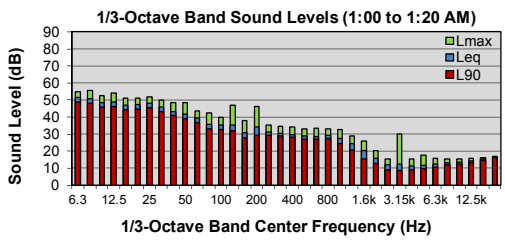


Fast Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine SHUTDOWN

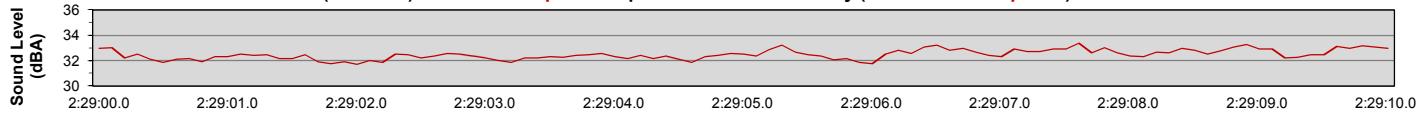
2:20 to 2:25 AM (14% included)						2:25 to 2:30 AM (33% included)						2:30 to 2:35 AM (21% included)						2:35 to 2:40 AM (16% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	37.1	54.5	60.1	63.2	3.1	Lmax	37.9	54.9	59.2	62.6	2.9	Lmax	37.5	55.7	60.5	63.1	3.9	Lmax	38.1	55.9	61.0	63.6	2.2
L01	37.1	54.2	60.0	63.1	3.1	L01	37.5	54.3	59.0	62.4	2.5	L01	37.2	54.9	59.9	62.8	3.2	L01	37.8	55.2	61.0	63.4	2.0
Leq	35.3	51.5	58.2	60.9	1.2	Leq	34.7	51.3	57.7	60.4	1.1	Leq	35.0	51.8	58.1	60.7	1.1	Leq	36.1	52.7	59.6	61.7	1.1
L50	35.0	51.3	58.2	61.2	1.1	L50	34.1	51.0	57.5	60.4	1.0	L50	34.8	51.4	58.0	60.7	1.0	L50	35.9	52.4	59.7	61.5	1.0
L90	34.4	49.4	55.9	58.1	0.6	L90	33.2	50.0	56.6	58.9	0.6	L90	34.0	50.3	57.4	59.8	0.7	L90	35.0	51.6	58.5	60.2	0.6
Lmin	34.2	48.8	55.7	57.0	0.4	Lmin	32.7	49.2	56.3	57.9	0.4	Lmin	33.4	49.4	57.1	58.6	0.4	Lmin	34.4	51.1	58.0	59.7	0.3

2:20 to 2:40 AM (21% included)					
Avg	A	C	Z	G	MD
Lmax	37.7	55.2	60.2	63.1	3.0
L01	37.5	54.7	60.6	63.1	2.9
Leq	35.1	51.7	58.3	60.8	1.1
L50	34.9	51.5	58.0	60.7	1.0
L90	33.5	50.1	56.8	59.1	0.6
Lmin	32.7	48.8	55.7	57.0	0.3





Ambient (no traffic) Modulation Depth Example: A-Level Time History (10th-sec fast response) from 2:29:00 to 2:29:10



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-9: Wind Turbine Acoustical Monitoring Summary (slow response)

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/15/2014 between 2:20 AM and 3:05 AM with KWI Turbine OPERATING and SHUTDOWN

Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine OPERATING

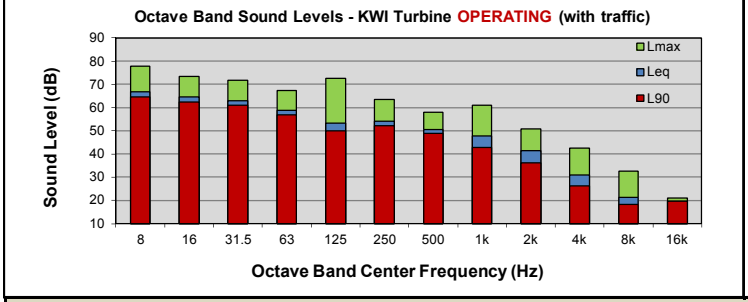
Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 176°	Average Power Level: 1505 kW	Air Temperature: 40 °F
Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 10.2 m/s	Wind Direction: 177°	Average Power Level: 1805 kW	Air Temperature: 40 °F
Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 9.8 m/s	Wind Direction: 179°	Average Power Level: 1624 kW	Air Temperature: 40 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine OPERATING (wind turbine plus traffic)

2:45 to 3:05 AM (100% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	58.4	70.7	76.6	79.3	6.8
L01	59.3	69.5	75.7	78.4	5.2
Leq	52.1	64.0	70.5	73.0	2.4
L50	51.0	63.4	70.0	72.5	1.3
L90	49.5	62.2	68.7	70.9	1.2
Lmin	48.0	61.0	67.5	67.8	0.4

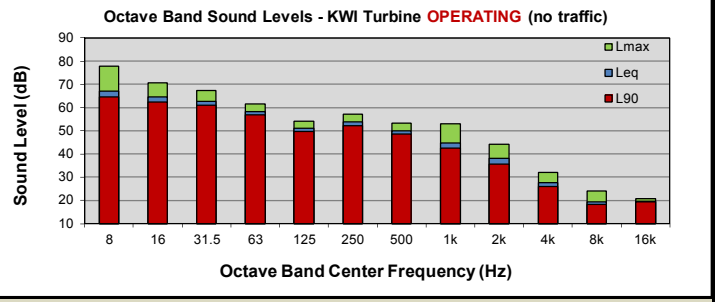


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine OPERATING (wind turbine only)

2:45 to 3:05 AM (54% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	52.8	65.8	75.7	76.8	5.8
L01	53.5	65.7	75.5	76.4	5.4
Leq	50.5	63.4	70.4	72.8	2.7
L50	50.3	63.3	70.0	72.4	2.5
L90	49.2	62.2	68.7	70.9	1.5
Lmin	48.0	61.1	67.5	67.8	0.5



Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine SHUTDOWN

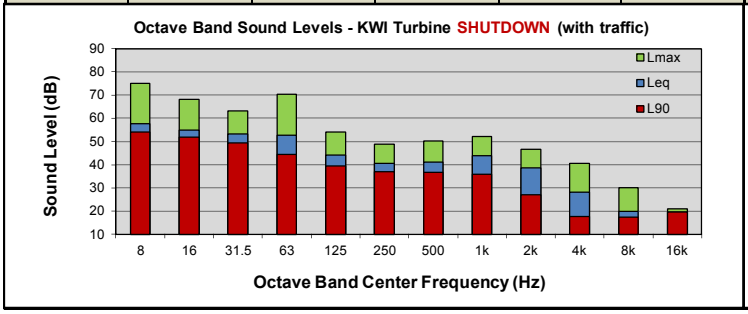
Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 10.0 m/s	Wind Direction: 178°	Average Power Level: 000 kW	Air Temperature: 40 °F
Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 177°	Average Power Level: 000 kW	Air Temperature: 40 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - with traffic)

2:20 to 2:40 AM (100% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	52.8	65.5	71.6	71.8	5.0
L01	52.7	65.6	69.9	71.1	3.2
Leq	46.2	55.6	61.4	63.3	1.2
L50	44.1	52.7	59.5	61.9	1.0
L90	39.1	50.7	58.0	60.3	0.6
Lmin	36.2	48.5	55.5	58.0	0.2

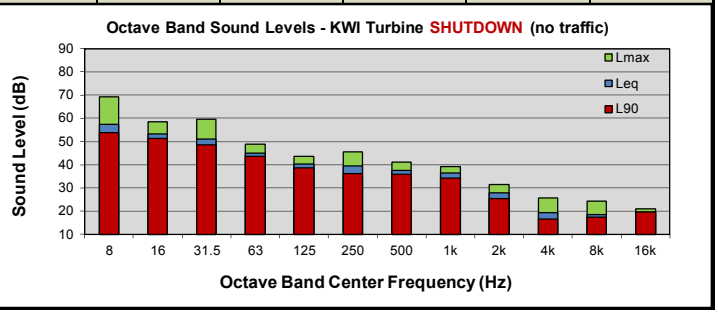


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - no traffic)

2:20 to 2:40 AM (24% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	41.3	54.1	64.3	64.7	2.9
L01	41.6	56.5	66.9	65.5	2.2
Leq	39.5	51.6	59.8	61.6	1.0
L50	39.6	51.2	58.6	61.2	0.9
L90	37.6	49.8	57.4	59.6	0.6
Lmin	36.2	48.5	55.5	58.0	0.3



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-10: Summary of A-weighted and Octave Band Sound Level Comparisons (slow response)

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/15/2014 between 2:20 AM and 3:05 AM with KWI Turbine OPERATING and SHUTDOWN

Operating - Shutdown Differences (including traffic on Route 3)

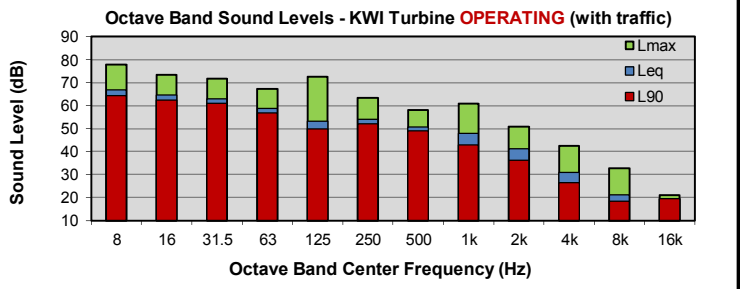
Vertical: KWI Turbine OPERATING (wind turbine plus traffic)
Horizontal: KWI Turbine SHUTDOWN (ambient - with traffic)

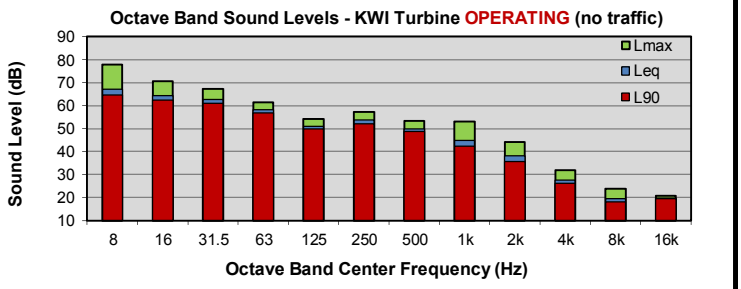
SLOW Response A-levels	KWI Turbine SHUTDOWN (with traffic)					
KWI Turbine OPERATING (with traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	5.6	5.7	12.2	14.3	19.3	22.2
L01	6.5	6.6	13.1	15.2	20.2	23.2
Leq	-0.8	-0.7	5.8	8.0	12.9	15.9
L50	-1.9	-1.8	4.7	6.9	11.8	14.8
L90	-3.3	-3.2	3.3	5.4	10.4	13.3
Lmin	-4.9	-4.8	1.7	3.9	8.8	11.8

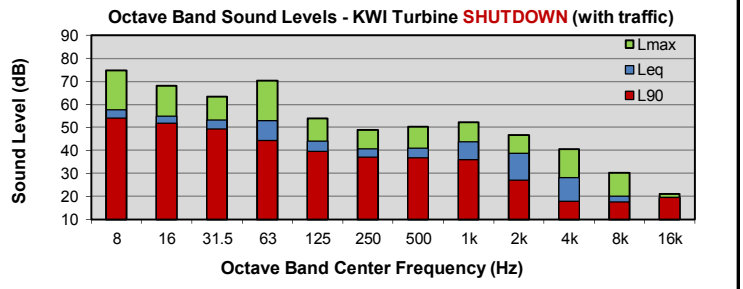
Operating - Shutdown Differences (excluding traffic on Route 3)

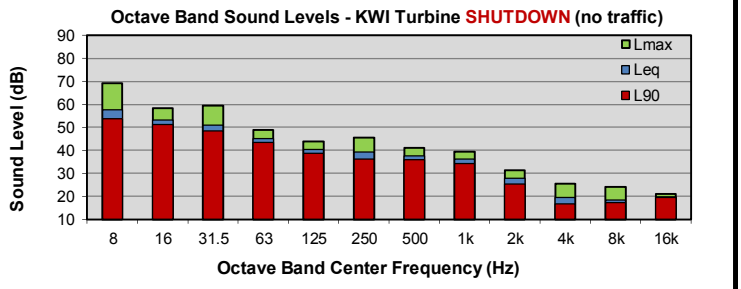
Vertical: KWI Turbine OPERATING (wind turbine only)
Horizontal: KWI Turbine SHUTDOWN (ambient - no traffic)

SLOW Response A-levels	KWI Turbine SHUTDOWN (no traffic)					
KWI Turbine OPERATING (no traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	11.5	11.2	13.4	13.3	15.2	16.7
L01	12.2	11.9	14.1	14.0	15.9	17.4
Leq	9.1	8.8	11.0	10.9	12.9	14.3
L50	9.0	8.7	10.8	10.7	12.7	14.1
L90	7.9	7.6	9.8	9.7	11.6	13.1
Lmin	6.6	6.3	8.5	8.4	10.4	11.8









Operating - Shutdown Differences: Overall Comparison

Vertical: KWI Turbine ONLY (excluding traffic on Route 3)
Horizontal: Ambient Sound Levels (including traffic on Route 3)

SLOW Response A-levels	KWI Turbine SHUTDOWN (with traffic)					
KWI Turbine OPERATING (no traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	0.0	0.1	6.6	8.7	13.7	16.7
L01	0.7	0.8	7.3	9.4	14.4	17.4
Leq	-2.4	-2.3	4.3	6.4	11.3	14.3
L50	-2.5	-2.4	4.1	6.2	11.2	14.1
L90	-3.6	-3.5	3.0	5.1	10.1	13.1
Lmin	-4.9	-4.8	1.7	3.9	8.8	11.8

Octave Band Sound Level Comparison: Pure-tone Check

Including traffic on Route 3:

L90 Octave Band Check: KWI Turbine OPERATING		NO KWI PURE TONE	L90 Octave Band Check KWI Turbine SHUTDOWN	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Excluding traffic on Route 3:

Leq Octave Band Check: KWI Turbine ONLY		NO KWI PURE TONE	Leq Octave Band Check Ambient (no traffic)	
Leq Pure-tone?	NO		Leq Pure-tone?	NO
L90 Octave Band Check KWI Turbine ONLY		NO KWI PURE TONE	L90 Octave Band Check Ambient (no traffic)	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Acoustical Monitoring Study of Kingston Wind Independence Turbine

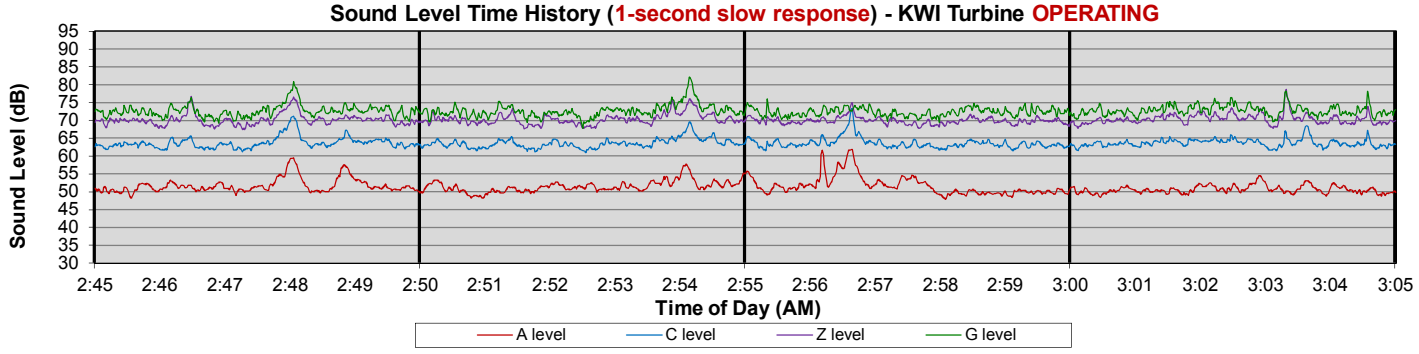
Page B-11: Detailed Acoustical Monitoring Report (slow response) - Wind Turbine Operating

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/15/2014 from 2:45 to 3:05 AM with KWI Turbine OPERATING

Site data		Supervisory Control and Data Acquisition (SCADA) data									
Distance from KWI:	740 ft	Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 176°	Avg Power Level: 1505 kW	Air Temperature: 40 °F
Wind Speed Range:	0-3 m/s	Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 10.2 m/s	Wind Direction: 177°	Avg Power Level: 1805 kW	Air Temperature: 40 °F
		Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 9.8 m/s	Wind Direction: 179°	Avg Power Level: 1624 kW	Air Temperature: 40 °F

Sound Level Time History (1-second slow response) - KWI Turbine OPERATING



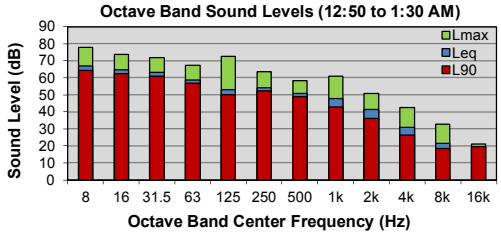
Event Log

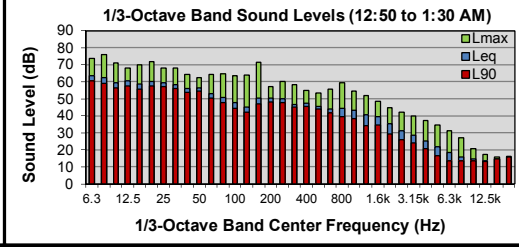
Traffic on Route 3 throughout

Slow Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine OPERATING

2:45 to 2:50 AM (100% included)						2:50 to 2:55 AM (100% included)						2:55 to 3:00 AM (100% included)						3:00 to 3:05 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	59.5	71.1	76.8	80.9	5.9	Lmax	57.7	69.7	76.0	82.1	5.9	Lmax	61.9	73.4	75.0	76.1	9.6	Lmax	54.5	68.6	78.7	78.2	5.7
L01	59.3	70.6	75.8	79.0	4.6	L01	57.3	68.4	75.7	80.4	5.3	L01	61.7	70.0	72.7	74.8	5.7	L01	54.0	67.4	75.7	77.4	5.1
Leq	52.4	64.1	70.5	73.1	2.1	Leq	51.8	63.8	70.6	73.3	2.4	Leq	53.0	64.0	70.0	72.5	2.3	Leq	50.8	63.8	70.7	73.1	2.6
L50	51.1	63.4	70.0	72.5	2.0	L50	51.3	63.4	70.1	72.5	2.2	L50	51.0	63.3	69.8	72.2	2.2	L50	50.5	63.6	70.3	72.7	2.4
L90	50.0	62.1	68.5	70.7	1.1	L90	49.8	62.1	68.6	70.7	1.2	L90	49.3	62.3	68.7	71.0	1.2	L90	49.4	62.5	68.9	71.2	1.3
Lmin	48.2	61.1	67.5	69.2	0.4	Lmin	48.2	61.0	67.6	67.8	0.4	Lmin	48.0	61.5	67.8	69.5	0.5	Lmin	48.4	61.5	67.7	69.6	0.6

2:45 to 3:05 AM (100% included)					
Avg	A	C	Z	G	MD
Lmax	58.4	70.7	76.6	79.3	6.8
L01	59.3	69.5	75.7	78.4	5.2
Leq	52.1	64.0	70.5	73.0	2.4
L50	51.0	63.4	70.0	72.5	1.3
L90	49.5	62.2	68.7	70.9	1.2
Lmin	48.0	61.0	67.5	67.8	0.4

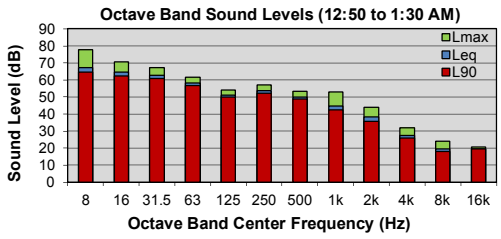


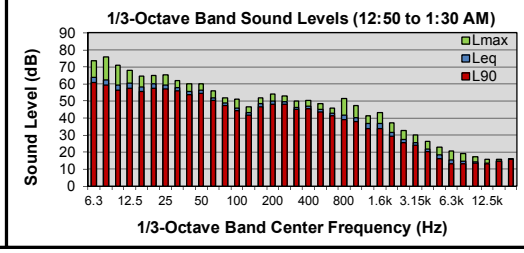


Slow Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine OPERATING

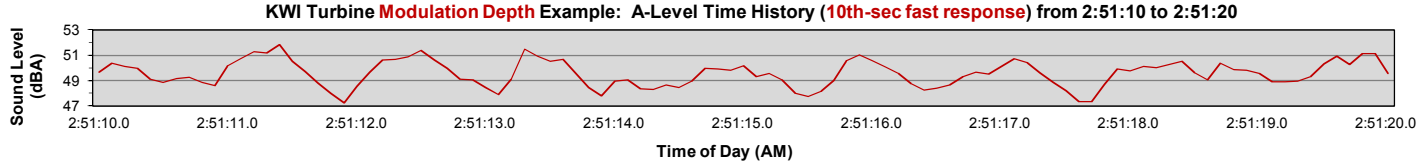
2:45 to 2:50 AM (45% included)						2:50 to 2:55 AM (50% included)						2:55 to 3:00 AM (48% included)						3:00 to 3:05 AM (72% included)					
10.1 m/s	A	C	Z	G	MD	9.7 m/s	A	C	Z	G	MD	9.6 m/s	A	C	Z	G	MD	9.4 m/s	A	C	Z	G	MD
Lmax	52.1	65.7	76.8	76.4	5.9	Lmax	54.4	65.7	75.9	76.6	5.9	Lmax	52.4	64.7	71.7	76.1	5.7	Lmax	52.4	67.3	78.7	78.2	5.7
L01	51.9	65.4	75.4	75.7	5.4	L01	54.3	65.7	75.0	76.0	5.6	L01	52.3	64.7	71.3	74.8	5.5	L01	52.0	66.6	77.0	77.7	5.1
Leq	50.6	63.3	70.4	72.5	2.5	Leq	51.0	63.6	70.7	73.0	2.7	Leq	50.0	63.1	69.7	72.4	2.6	Leq	50.2	63.6	70.6	73.0	2.7
L50	50.6	63.2	70.0	72.3	2.4	L50	50.7	63.5	70.2	72.8	2.6	L50	49.8	63.0	69.6	72.2	2.5	L50	50.2	63.4	70.0	72.5	2.6
L90	49.8	62.1	68.6	70.7	1.4	L90	49.0	62.2	69.0	71.0	1.5	L90	49.0	62.1	68.7	71.0	1.5	L90	49.2	62.4	68.8	71.1	1.5
Lmin	48.2	61.1	67.5	69.6	0.7	Lmin	48.2	61.5	67.7	67.8	0.5	Lmin	48.0	61.5	68.1	69.5	0.5	Lmin	48.4	61.5	67.7	69.6	0.8

2:45 to 3:05 AM (54% included)					
Avg	A	C	Z	G	MD
Lmax	52.8	65.8	75.7	76.8	5.8
L01	53.5	65.7	75.5	76.4	5.4
Leq	50.5	63.4	70.4	72.8	2.7
L50	50.3	63.3	70.0	72.4	2.5
L90	49.2	62.2	68.7	70.9	1.5
Lmin	48.0	61.1	67.5	67.8	0.5





KWI Turbine Modulation Depth Example: A-Level Time History (10th-sec fast response) from 2:51:10 to 2:51:20



Acoustical Monitoring Study of Kingston Wind Independence Turbine

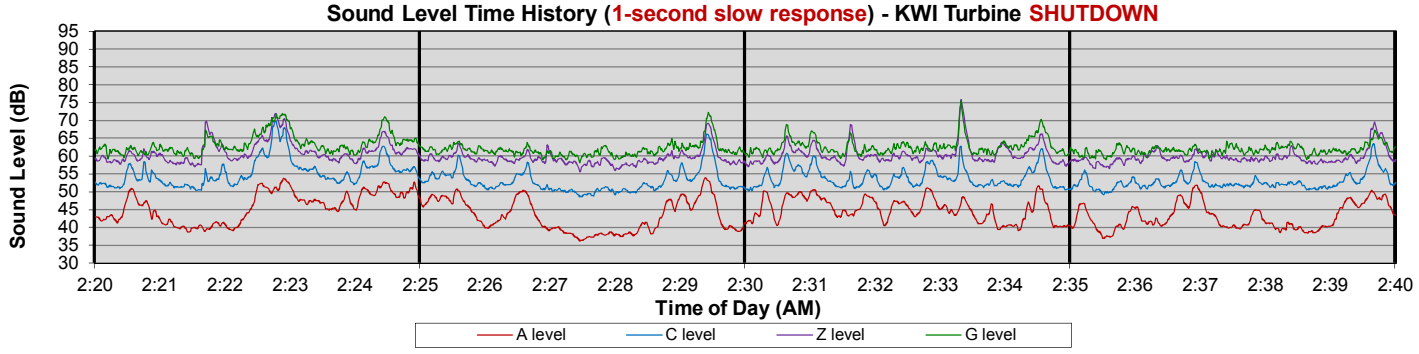
Page B-12: Detailed Acoustical Monitoring Report (slow response) - Wind Turbine Shutdown

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/15/2014 from 2:20 to 2:40 AM with KWI Turbine SHUTDOWN

Site data		Supervisory Control and Data Acquisition (SCADA) data							
Distance from KWI:	740 ft	Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 10.0 m/s	Wind Direction: 178°	Avg Power Level: 000 kW	Air Temperature: 40 °F
Wind Speed Range:	0-3 m/s	Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 177°	Avg Power Level: 000 kW	Air Temperature: 40 °F

Sound Level Time History (1-second slow response) - KWI Turbine SHUTDOWN



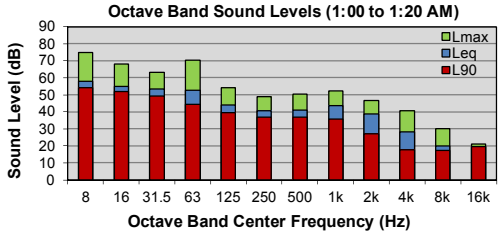
Event Log

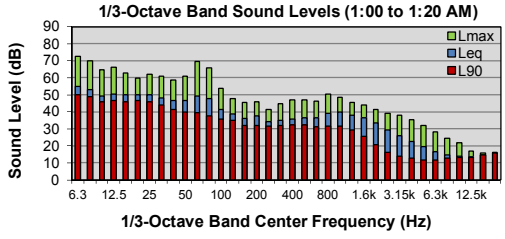
Traffic on Route 3 throughout

Slow Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine SHUTDOWN

2:20 to 2:25 AM (100% included)						2:25 to 2:30 AM (100% included)						2:30 to 2:35 AM (100% included)						2:35 to 2:40 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	53.7	69.8	72.0	71.9	4.9	Lmax	54.1	66.1	69.3	72.3	4.2	Lmax	51.6	62.8	75.8	75.6	6.0	Lmax	51.9	63.5	69.5	67.3	4.8
L01	53.3	68.4	70.6	71.6	3.6	L01	53.3	65.0	68.5	70.6	2.9	L01	50.9	62.0	72.5	70.5	3.7	L01	51.3	62.1	67.8	65.9	3.0
Leq	47.8	58.1	62.7	64.7	1.2	Leq	45.6	54.6	59.9	62.4	1.1	Leq	46.3	54.9	62.2	63.7	1.3	Leq	44.6	53.5	60.3	61.9	1.2
L50	46.4	54.5	60.5	62.6	1.0	L50	41.8	51.9	59.0	61.4	1.0	L50	45.0	53.2	59.9	62.2	1.1	L50	41.8	52.1	59.2	61.6	1.0
L90	40.0	51.4	58.2	60.6	0.6	L90	37.9	49.9	57.5	59.9	0.6	L90	40.5	51.2	58.2	60.6	0.6	L90	39.0	50.8	58.1	60.2	0.6
Lmin	38.8	50.3	57.1	59.2	0.2	Lmin	36.2	48.5	55.5	58.0	0.3	Lmin	39.1	50.2	57.1	59.4	0.3	Lmin	36.9	49.1	56.5	59.0	0.3

2:20 to 2:40 AM (100% included)					
Avg	A	C	Z	G	MD
Lmax	52.8	65.5	71.6	71.8	5.0
L01	52.7	65.6	69.9	71.1	3.2
Leq	46.2	55.6	61.4	63.3	1.2
L50	44.1	52.7	59.5	61.9	1.0
L90	39.1	50.7	58.0	60.3	0.6
Lmin	36.2	48.5	55.5	58.0	0.2

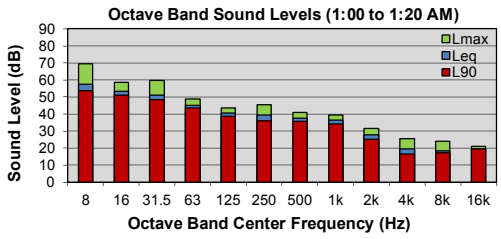


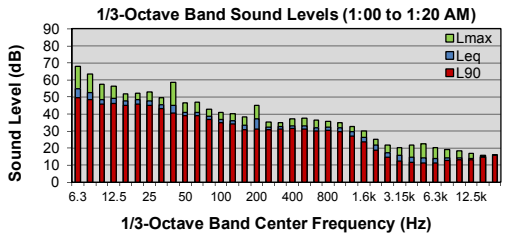


Slow Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine SHUTDOWN

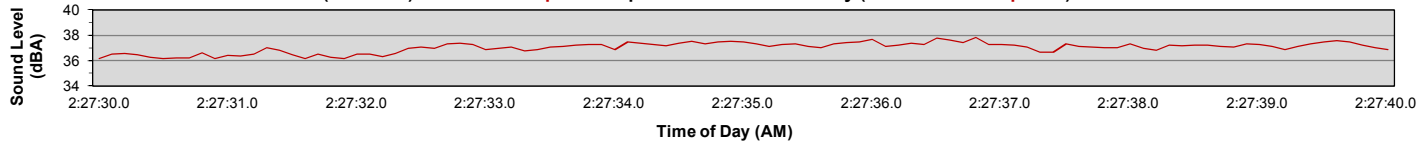
2:20 to 2:25 AM (20% included)						2:25 to 2:30 AM (41% included)						2:30 to 2:35 AM (8% included)						2:35 to 2:40 AM (29% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	41.6	57.7	69.7	67.3	2.2	Lmax	41.9	52.6	63.0	62.9	3.2	Lmax	40.8	53.3	63.9	64.2	2.8	Lmax	41.0	53.0	60.5	64.2	3.3
L01	41.5	57.6	69.5	66.9	2.1	L01	41.8	52.4	62.3	62.9	2.1	L01	40.8	53.2	63.9	64.2	2.6	L01	40.7	52.8	60.5	64.0	2.2
Leq	40.1	53.0	62.2	62.5	1.0	Leq	38.9	50.6	58.4	60.8	1.0	Leq	40.2	52.2	61.6	62.8	1.1	Leq	39.4	51.4	58.8	61.6	1.0
L50	40.0	52.0	59.2	61.8	0.9	L50	38.5	50.6	58.2	60.6	0.9	L50	40.2	52.1	61.4	62.8	1.0	L50	39.6	51.4	58.6	61.3	1.0
L90	39.1	50.7	57.6	60.0	0.6	L90	37.3	49.3	57.1	59.4	0.6	L90	39.4	51.6	59.3	61.7	0.7	L90	37.6	50.0	57.5	59.9	0.6
Lmin	38.8	50.3	57.1	59.3	0.4	Lmin	36.2	48.5	55.5	58.0	0.3	Lmin	39.1	51.3	59.3	61.0	0.4	Lmin	36.9	49.1	56.5	59.0	0.3

2:20 to 2:40 AM (24% included)					
Avg	A	C	Z	G	MD
Lmax	41.3	54.1	64.3	64.7	2.9
L01	41.6	56.5	66.9	65.5	2.2
Leq	39.5	51.6	59.8	61.6	1.0
L50	39.6	51.2	58.6	61.2	0.9
L90	37.6	49.8	57.4	59.6	0.6
Lmin	36.2	48.5	55.5	58.0	0.3





Ambient (no traffic) Modulation Depth Example: A-Level Time History (10th-sec fast response) from 2:27:30 to 2:27:40



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-13: Wind Turbine Acoustical Monitoring Summary (fast response)

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/15/2014 between 2:20 AM and 3:05 AM with KWI Turbine OPERATING and SHUTDOWN

Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine OPERATING

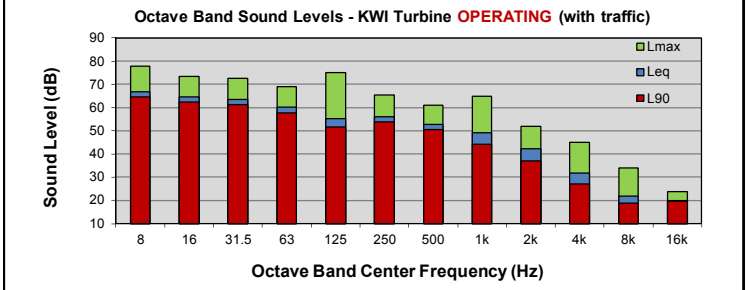
Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 176°	Average Power Level: 1505 kW	Air Temperature: 40 °F
Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 10.2 m/s	Wind Direction: 177°	Average Power Level: 1805 kW	Air Temperature: 40 °F
Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 9.8 m/s	Wind Direction: 179°	Average Power Level: 1624 kW	Air Temperature: 40 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine OPERATING (wind turbine plus traffic)

2:45 to 3:05 AM (100% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	60.2	73.5	77.1	79.5	6.8
L01	59.9	70.9	76.0	78.6	5.2
Leq	53.0	65.6	70.8	73.1	2.4
L50	52.0	65.0	70.3	72.5	1.3
L90	50.4	63.4	69.0	71.0	1.2
Lmin	48.4	61.1	67.8	67.8	0.4

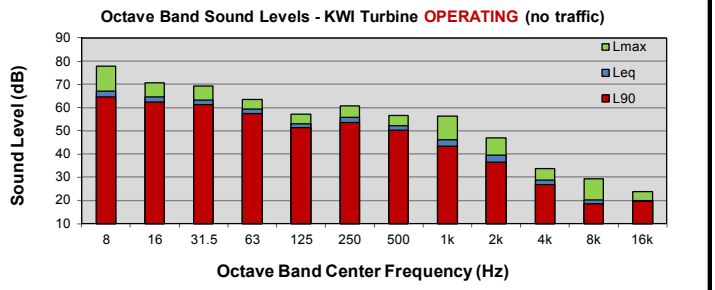


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine OPERATING (wind turbine only)

2:45 to 3:05 AM (54% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	55.2	70.0	75.9	77.0	5.8
L01	55.1	68.8	75.7	76.5	5.4
Leq	51.7	65.2	70.7	72.9	2.7
L50	51.4	64.8	70.3	72.5	2.5
L90	50.1	63.4	69.1	71.0	1.5
Lmin	48.4	62.1	67.8	67.8	0.5



Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine SHUTDOWN

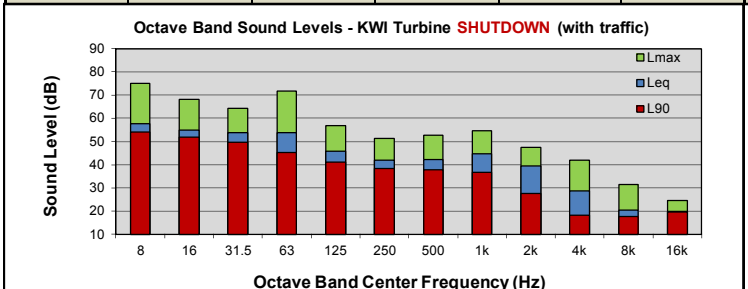
Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 10.0 m/s	Wind Direction: 178°	Average Power Level: 000 kW	Air Temperature: 40 °F
Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 177°	Average Power Level: 000 kW	Air Temperature: 40 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - with traffic)

2:20 to 2:40 AM (100% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	53.7	68.2	72.1	71.8	5.0
L01	53.3	66.8	70.1	71.2	3.2
Leq	46.6	56.9	61.8	63.4	1.2
L50	44.5	53.9	59.7	62.0	1.0
L90	39.5	51.9	58.2	60.3	0.6
Lmin	36.3	49.4	55.8	58.2	0.2

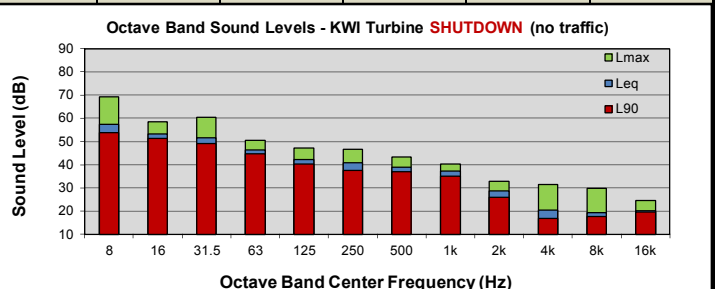


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - no traffic)

2:20 to 2:40 AM (24% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	42.1	57.3	64.4	64.7	2.9
L01	42.4	57.7	66.9	65.5	2.2
Leq	39.9	53.0	60.0	61.7	1.0
L50	39.9	52.5	58.8	61.3	0.9
L90	38.0	50.9	57.6	59.7	0.6
Lmin	36.3	49.4	55.8	58.2	0.3



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-14: Summary of A-weighted and Octave Band Sound Level Comparisons (fast response)

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/15/2014 between 2:20 AM and 3:05 AM with KWI Turbine OPERATING and SHUTDOWN

Operating - Shutdown Differences (including traffic on Route 3)

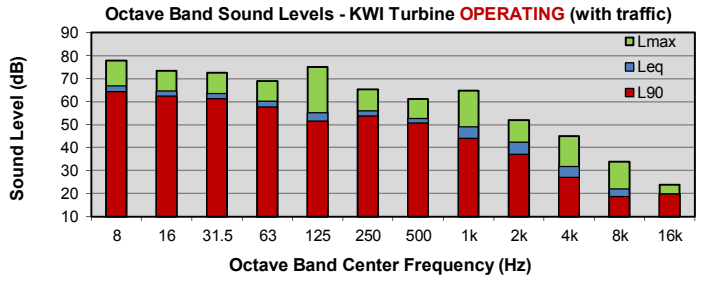
Vertical: KWI Turbine OPERATING (wind turbine plus traffic)
Horizontal: KWI Turbine SHUTDOWN (ambient - with traffic)

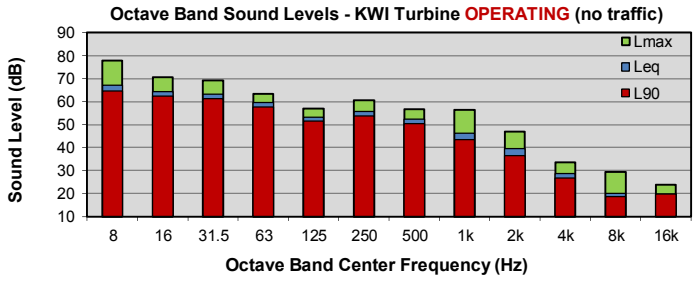
FAST Response A-levels		KWI Turbine SHUTDOWN (with traffic)					
		Avg Lmax	L01	Leq	L50	L90	Lmin
KWI Turbine OPERATING (with traffic)	Avg Lmax	6.5	6.9	13.5	15.7	20.7	23.9
	L01	6.2	6.6	13.2	15.4	20.4	23.6
	Leq	-0.6	-0.3	6.4	8.6	13.6	16.8
	L50	-1.6	-1.3	5.4	7.6	12.6	15.8
	L90	-3.3	-2.9	3.8	5.9	10.9	14.1
	Lmin	-5.2	-4.9	1.8	4.0	9.0	12.2

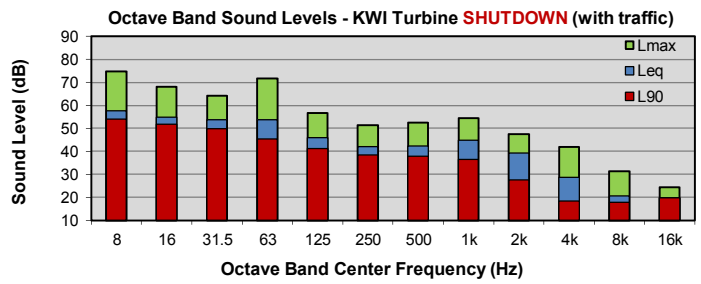
Operating - Shutdown Differences (excluding traffic on Route 3)

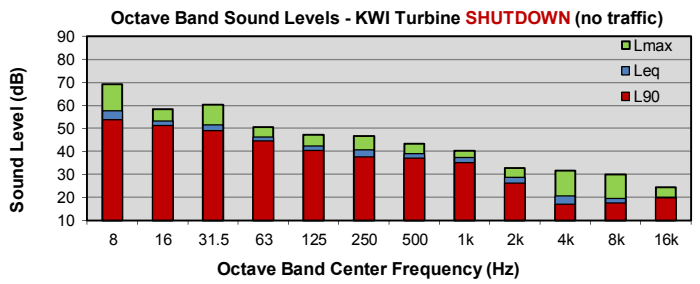
Vertical: KWI Turbine OPERATING (wind turbine only)
Horizontal: KWI Turbine SHUTDOWN (ambient - no traffic)

FAST Response A-levels		KWI Turbine SHUTDOWN (no traffic)					
		Avg Lmax	L01	Leq	L50	L90	Lmin
KWI Turbine OPERATING (no traffic)	Avg Lmax	13.1	12.8	15.2	15.2	17.2	18.9
	L01	13.1	12.7	15.2	15.2	17.1	18.8
	Leq	9.6	9.3	11.8	11.8	13.7	15.4
	L50	9.3	9.0	11.5	11.4	13.4	15.1
	L90	8.0	7.7	10.2	10.1	12.1	13.8
	Lmin	6.4	6.1	8.5	8.5	10.4	12.2









Operating - Shutdown Differences: Overall Comparison

Vertical: KWI Turbine ONLY (excluding traffic on Route 3)
Horizontal: Ambient Sound Levels (including traffic on Route 3)

FAST Response A-levels		KWI Turbine SHUTDOWN (with traffic)					
		Avg Lmax	L01	Leq	L50	L90	Lmin
KWI Turbine OPERATING (no traffic)	Avg Lmax	1.5	1.8	8.5	10.7	15.7	18.9
	L01	1.5	1.8	8.5	10.6	15.7	18.8
	Leq	-2.0	-1.6	5.0	7.2	12.2	15.4
	L50	-2.3	-1.9	4.7	6.9	11.9	15.1
	L90	-3.6	-3.2	3.4	5.6	10.6	13.8
	Lmin	-5.2	-4.9	1.8	4.0	9.0	12.2

Octave Band Sound Level Comparison: Pure-tone Check

Including traffic on Route 3:

L90 Octave Band Check: KWI Turbine OPERATING		NO KWI PURE TONE	L90 Octave Band Check KWI Turbine SHUTDOWN	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Excluding traffic on Route 3:

Leq Octave Band Check: KWI Turbine ONLY		NO KWI PURE TONE	Leq Octave Band Check Ambient (no traffic)	
Leq Pure-tone?	NO		Leq Pure-tone?	NO
L90 Octave Band Check KWI Turbine ONLY		**NO KWI PURE TONE**	**L90 Octave Band Check Ambient (no traffic)**	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Acoustical Monitoring Study of Kingston Wind Independence Turbine

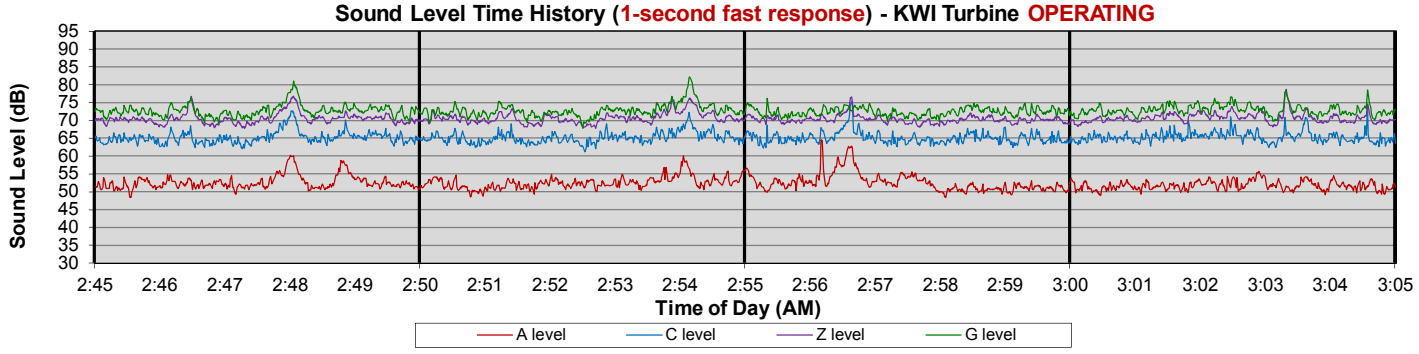
Page B-15: Detailed Acoustical Monitoring Report (fast response) - Wind Turbine Operating

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/15/2014 from 2:45 to 3:05 AM with KWI Turbine OPERATING

Site data		Supervisory Control and Data Acquisition (SCADA) data							
Distance from KWI:	740 ft	Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 176°	Avg Power Level: 1505 kW	Air Temperature: 40 °F
Wind Speed Range:	0-3 m/s	Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 10.2 m/s	Wind Direction: 177°	Avg Power Level: 1805 kW	Air Temperature: 40 °F
		Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 9.8 m/s	Wind Direction: 179°	Avg Power Level: 1624 kW	Air Temperature: 40 °F

Sound Level Time History (1-second fast response) - KWI Turbine OPERATING



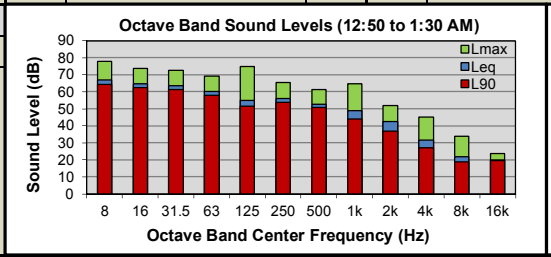
Event Log

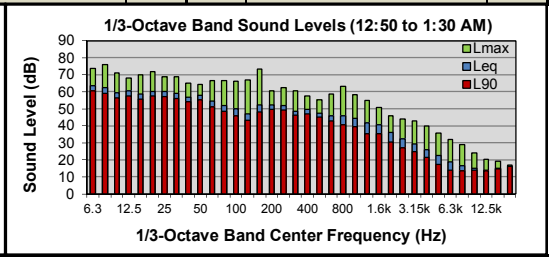
Traffic on Route 3 throughout

Fast Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine OPERATING

2:45 to 2:50 AM (100% included)						2:50 to 2:55 AM (100% included)						2:55 to 3:00 AM (100% included)						3:00 to 3:05 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	60.2	72.6	76.8	81.0	5.9	Lmax	60.1	72.2	76.2	82.2	5.9	Lmax	64.6	75.3	76.5	76.2	9.6	Lmax	55.8	73.7	78.7	78.6	5.7
L01	59.8	71.4	76.3	78.9	4.6	L01	58.4	69.6	75.8	80.4	5.3	L01	62.7	70.7	73.8	74.8	5.7	L01	55.1	70.9	75.8	77.5	5.1
Leq	53.2	65.6	70.9	73.1	2.1	Leq	52.9	65.5	71.0	73.3	2.4	Leq	53.9	65.6	70.4	72.6	2.3	Leq	52.0	65.7	71.0	73.2	2.6
L50	52.2	64.9	70.4	72.6	2.0	L50	52.4	65.0	70.4	72.6	2.2	L50	52.1	64.8	70.1	72.3	2.2	L50	51.7	65.2	70.6	72.7	2.4
L90	50.8	63.3	68.9	70.8	1.1	L90	50.6	63.4	69.0	70.9	1.2	L90	50.1	63.4	69.1	71.1	1.2	L90	50.2	63.8	69.3	71.3	1.3
Lmin	48.4	62.1	67.8	69.2	0.4	Lmin	48.6	61.1	67.8	67.8	0.4	Lmin	48.5	62.2	68.2	69.5	0.5	Lmin	49.0	62.4	68.2	69.7	0.6

2:45 to 3:05 AM (100% included)					
Avg	A	C	Z	G	MD
Lmax	60.2	73.5	77.1	79.5	6.8
L01	59.9	70.9	76.0	78.6	5.2
Leq	53.0	65.6	70.8	73.1	2.4
L50	52.0	65.0	70.3	72.5	1.3
L90	50.4	63.4	69.0	71.0	1.2
Lmin	48.4	61.1	67.8	67.8	0.4

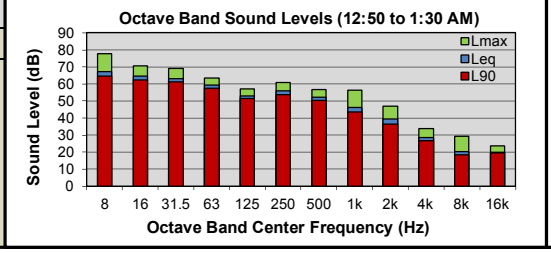


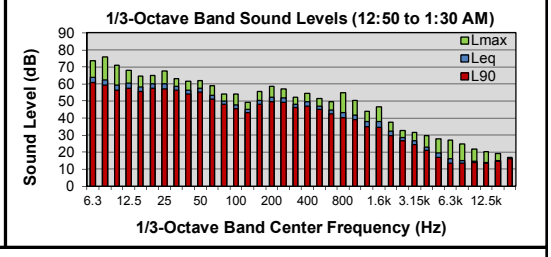


Fast Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine OPERATING

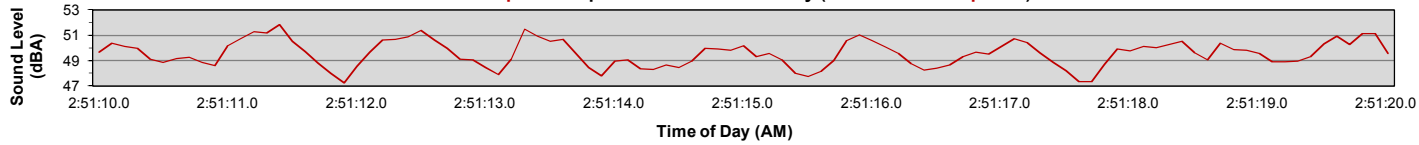
2:45 to 2:50 AM (45% included)						2:50 to 2:55 AM (50% included)						2:55 to 3:00 AM (48% included)						3:00 to 3:05 AM (72% included)					
10.1 m/s	A	C	Z	G	MD	9.7 m/s	A	C	Z	G	MD	9.6 m/s	A	C	Z	G	MD	9.4 m/s	A	C	Z	G	MD
Lmax	54.4	68.4	76.8	76.4	5.9	Lmax	56.9	69.1	76.0	76.7	5.9	Lmax	55.0	68.7	72.1	76.2	5.7	Lmax	54.4	73.7	78.7	78.6	5.7
L01	54.3	67.7	75.5	75.7	5.4	L01	56.3	68.6	75.2	76.1	5.6	L01	54.3	68.1	71.6	74.8	5.5	L01	54.1	70.8	77.1	77.8	5.1
Leq	51.8	64.9	70.7	72.6	2.5	Leq	52.3	65.4	71.0	73.0	2.7	Leq	51.2	64.9	70.1	72.5	2.6	Leq	51.5	65.6	70.9	73.1	2.7
L50	51.5	64.7	70.3	72.4	2.4	L50	51.8	65.1	70.6	72.8	2.6	L50	50.9	64.6	70.0	72.2	2.5	L50	51.3	65.1	70.4	72.6	2.6
L90	50.6	63.3	68.9	70.7	1.4	L90	50.4	63.3	69.4	71.2	1.5	L90	49.8	63.3	69.0	71.1	1.5	L90	50.0	63.6	69.1	71.2	1.5
Lmin	48.4	62.1	67.8	69.5	0.7	Lmin	48.6	62.4	68.1	67.8	0.5	Lmin	48.5	62.2	68.3	69.5	0.5	Lmin	49.0	62.4	68.2	69.7	0.8

2:45 to 3:05 AM (54% included)					
Avg	A	C	Z	G	MD
Lmax	55.2	70.0	75.9	77.0	5.8
L01	55.1	68.8	75.7	76.5	5.4
Leq	51.7	65.2	70.7	72.9	2.7
L50	51.4	64.8	70.3	72.5	2.5
L90	50.1	63.4	69.1	71.0	1.5
Lmin	48.4	62.1	67.8	67.8	0.5





KWI Turbine Modulation Depth Example: A-Level Time History (10th-sec fast response) from 2:51:10 to 2:51:20



Acoustical Monitoring Study of Kingston Wind Independence Turbine

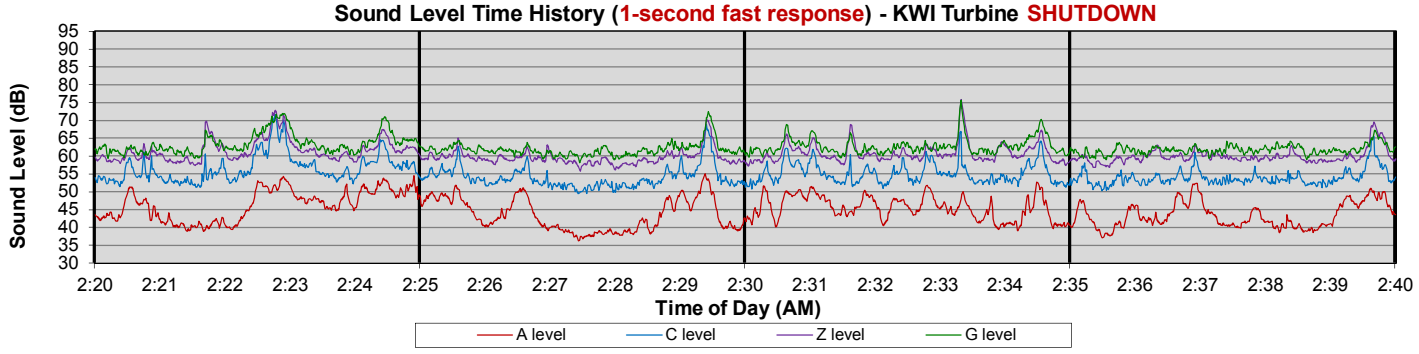
Page B-16: Detailed Acoustical Monitoring Report (fast response) - Wind Turbine Shutdown

HMMH Project # 305270.001

Measurement at Site 1: 13 Schofield Rd. on 3/15/2014 from 2:20 to 2:40 AM with KWI Turbine SHUTDOWN

Site data		Supervisory Control and Data Acquisition (SCADA) data							
Distance from KWI:	740 ft	Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 10.0 m/s	Wind Direction: 178°	Avg Power Level: 000 kW	Air Temperature: 40 °F
Wind Speed Range:	0-3 m/s	Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 177°	Avg Power Level: 000 kW	Air Temperature: 40 °F

Sound Level Time History (1-second fast response) - KWI Turbine SHUTDOWN



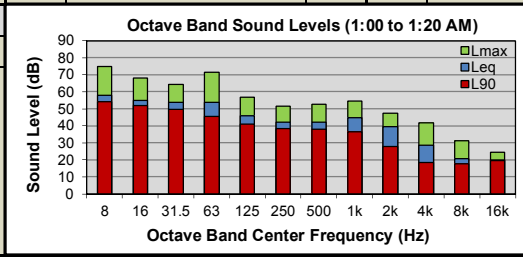
Event Log

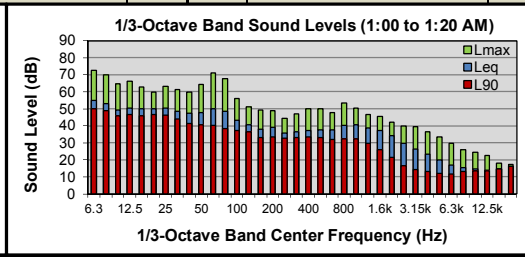
Traffic on Route 3 throughout

Fast Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine SHUTDOWN

2:20 to 2:25 AM (100% included)						2:25 to 2:30 AM (100% included)						2:30 to 2:35 AM (100% included)						2:35 to 2:40 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	54.6	71.6	72.8	71.9	4.9	Lmax	55.0	68.9	70.1	72.4	4.2	Lmax	52.8	66.8	75.8	75.6	6.0	Lmax	52.3	65.5	69.5	67.3	4.8
L01	53.9	70.1	71.6	71.7	3.6	L01	53.7	66.3	68.7	70.8	2.9	L01	51.7	63.8	72.5	70.5	3.7	L01	52.1	61.7	68.2	66.0	3.0
Leq	48.3	59.3	63.1	64.8	1.2	Leq	46.0	55.8	60.3	62.5	1.1	Leq	46.7	56.3	62.4	63.8	1.3	Leq	45.0	54.8	60.6	62.0	1.2
L50	46.8	55.5	60.9	62.7	1.0	L50	42.2	53.2	59.2	61.5	1.0	L50	45.5	54.5	60.2	62.2	1.1	L50	42.2	53.5	59.5	61.6	1.0
L90	40.4	52.6	58.5	60.7	0.6	L90	38.2	51.0	57.7	60.0	0.6	L90	40.8	52.1	58.5	60.6	0.6	L90	39.4	51.9	58.3	60.2	0.6
Lmin	38.9	51.3	57.4	59.4	0.2	Lmin	36.3	49.4	55.8	58.2	0.3	Lmin	39.1	50.8	57.3	59.4	0.3	Lmin	37.1	50.1	56.8	59.0	0.3

2:20 to 2:40 AM (100% included)					
Avg	A	C	Z	G	MD
Lmax	53.7	68.2	72.1	71.8	5.0
L01	53.3	66.8	70.1	71.2	3.2
Leq	46.6	56.9	61.8	63.4	1.2
L50	44.5	53.9	59.7	62.0	1.0
L90	39.5	51.9	58.2	60.3	0.6
Lmin	36.3	49.4	55.8	58.2	0.2

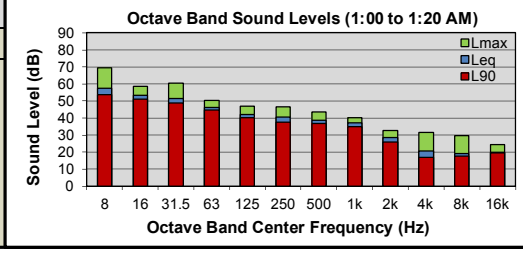


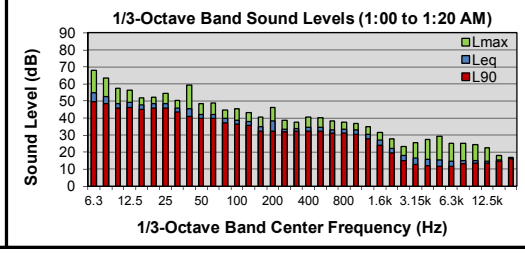


Fast Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine SHUTDOWN

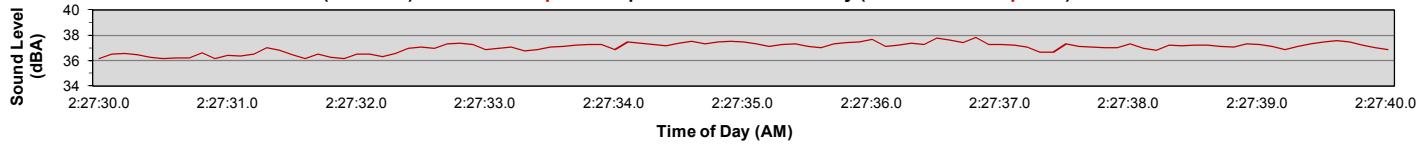
2:20 to 2:25 AM (20% included)						2:25 to 2:30 AM (41% included)						2:30 to 2:35 AM (8% included)						2:35 to 2:40 AM (29% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	42.8	60.7	69.7	67.3	2.2	Lmax	42.4	55.9	63.1	63.0	3.2	Lmax	41.7	56.7	64.0	64.4	2.8	Lmax	41.4	56.0	60.7	64.3	3.3
L01	42.7	59.9	69.5	67.0	2.1	L01	42.2	54.3	62.3	63.0	2.1	L01	41.7	56.3	64.0	64.3	2.6	L01	41.3	55.8	60.7	64.0	2.2
Leq	40.6	54.5	62.3	62.6	1.0	Leq	39.4	52.0	58.6	60.8	1.0	Leq	40.7	53.7	61.7	62.9	1.1	Leq	39.9	52.8	59.0	61.7	1.0
L50	40.4	53.4	59.4	61.9	0.9	L50	39.1	51.9	58.5	60.7	0.9	L50	40.8	53.6	61.5	62.9	1.0	L50	39.9	52.7	58.9	61.5	1.0
L90	39.3	51.9	57.8	60.0	0.6	L90	37.5	50.4	57.2	59.5	0.6	L90	39.6	52.5	59.6	61.8	0.7	L90	38.3	51.5	57.7	60.0	0.6
Lmin	38.9	51.3	57.4	59.4	0.4	Lmin	36.3	49.4	55.8	58.2	0.3	Lmin	39.1	51.4	59.4	61.0	0.4	Lmin	37.1	50.1	56.8	59.0	0.3

2:20 to 2:40 AM (24% included)					
Avg	A	C	Z	G	MD
Lmax	42.1	57.3	64.4	64.7	2.9
L01	42.4	57.7	66.9	65.5	2.2
Leq	39.9	53.0	60.0	61.7	1.0
L50	39.9	52.5	58.8	61.3	0.9
L90	38.0	50.9	57.6	59.7	0.6
Lmin	36.3	49.4	55.8	58.2	0.3





Ambient (no traffic) Modulation Depth Example: A-Level Time History (10th-sec fast response) from 2:27:30 to 2:27:40



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-17: Wind Turbine Acoustical Monitoring Summary (slow response)

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/2/2014 between 1:00 AM and 1:50 AM with KWI Turbine OPERATING and SHUTDOWN

Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine OPERATING

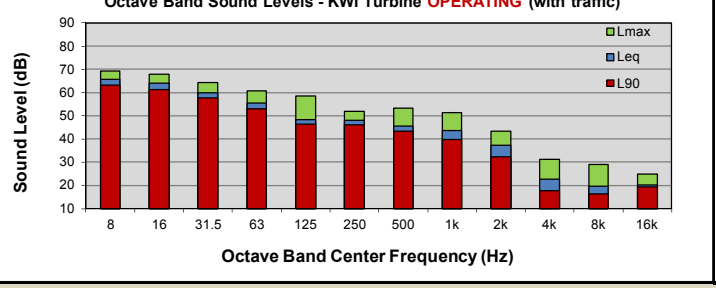
Time: 1:20 to 1:30 AM	Calibrated Wind Speed: 8.4 m/s	Wind Direction: 199°	Average Power Level: 827 kW	Air Temperature: 33 °F
Time: 1:30 to 1:40 AM	Calibrated Wind Speed: 8.5 m/s	Wind Direction: 200°	Average Power Level: 1054 kW	Air Temperature: 33 °F
Time: 1:40 to 1:50 AM	Calibrated Wind Speed: 8.8 m/s	Wind Direction: 199°	Average Power Level: 1139 kW	Air Temperature: 33 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine OPERATING (wind turbine plus traffic)

1:30 to 1:50 AM (100% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	51.7	63.3	71.5	74.6	4.6
L01	51.0	63.3	71.4	74.3	3.6
Leq	47.4	61.0	68.9	71.5	1.7
L50	46.9	60.9	68.8	71.3	0.9
L90	45.2	59.0	66.9	69.2	0.8
Lmin	42.2	57.1	63.8	66.1	0.3

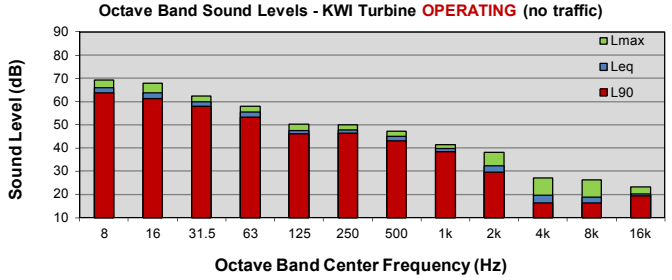


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine OPERATING (wind turbine only)

1:30 to 1:50 AM (16% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	46.0	62.1	70.6	73.7	4.3
L01	46.6	62.4	71.2	74.1	4.3
Leq	45.4	60.7	69.0	71.4	2.2
L50	45.4	60.7	68.8	71.3	2.2
L90	44.3	59.2	67.3	69.3	1.4
Lmin	42.2	57.9	66.6	68.2	0.7



Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine SHUTDOWN

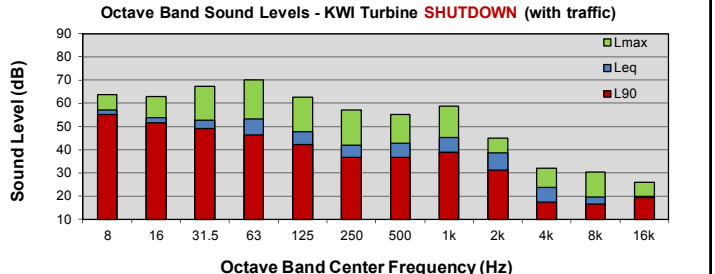
Time: 1:00 to 1:10 AM	Calibrated Wind Speed: 8.9 m/s	Wind Direction: 197°	Average Power Level: 000 kW	Air Temperature: 33 °F
Time: 1:10 to 1:20 AM	Calibrated Wind Speed: 8.5 m/s	Wind Direction: 196°	Average Power Level: 000 kW	Air Temperature: 33 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - with traffic)

1:00 to 1:20 AM (97% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	54.3	64.8	67.6	67.7	5.7
L01	54.9	64.5	67.0	66.4	3.7
Leq	47.3	56.1	61.1	61.7	1.2
L50	46.1	54.2	60.4	61.2	1.1
L90	41.2	51.4	58.7	59.6	0.6
Lmin	37.2	49.9	57.2	57.9	0.2

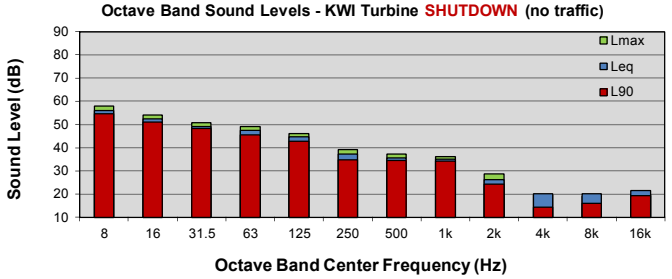


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - no traffic)

1:00 to 1:20 AM (2% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	38.8	51.7	58.9	60.8	1.7
L01	38.9	52.7	59.8	61.5	2.4
Leq	38.1	51.5	58.8	60.2	0.8
L50	38.0	51.3	58.9	60.0	0.8
L90	37.4	50.2	57.5	59.0	0.5
Lmin	37.2	50.0	57.2	58.4	0.3



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-18: Summary of A-weighted and Octave Band Sound Level Comparisons (slow response)

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/2/2014 between 1:00 AM and 1:50 AM with KWI Turbine OPERATING and SHUTDOWN

Operating - Shutdown Differences (including traffic on Route 3)

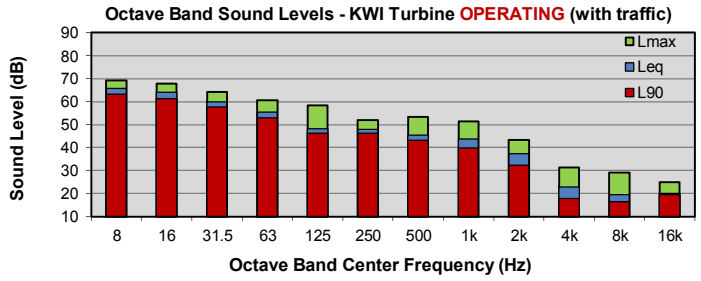
Vertical: KWI Turbine OPERATING (wind turbine plus traffic)
Horizontal: KWI Turbine SHUTDOWN (ambient - with traffic)

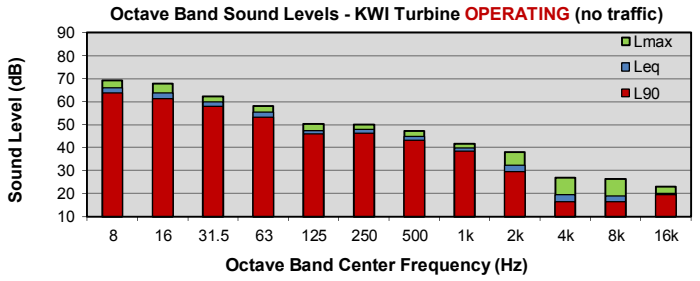
SLOW Response A-levels	KWI Turbine SHUTDOWN (with traffic)					
KWI Turbine OPERATING (with traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	-2.6	-3.3	4.3	5.5	10.4	14.5
L01	-3.3	-3.9	3.7	4.9	9.8	13.9
Leq	-6.9	-7.5	0.1	1.3	6.2	10.3
L50	-7.4	-8.0	-0.4	0.8	5.7	9.8
L90	-9.2	-9.8	-2.2	-1.0	3.9	8.0
Lmin	-12.1	-12.7	-5.1	-3.9	1.0	5.0

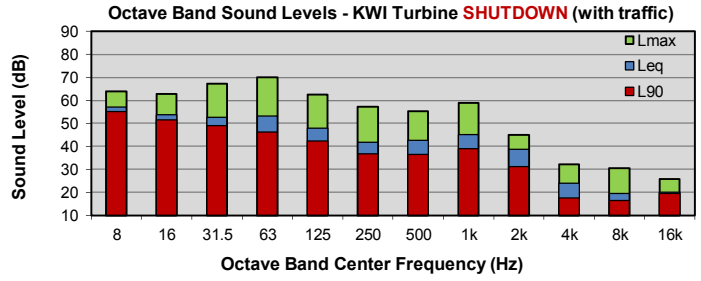
Operating - Shutdown Differences (excluding traffic on Route 3)

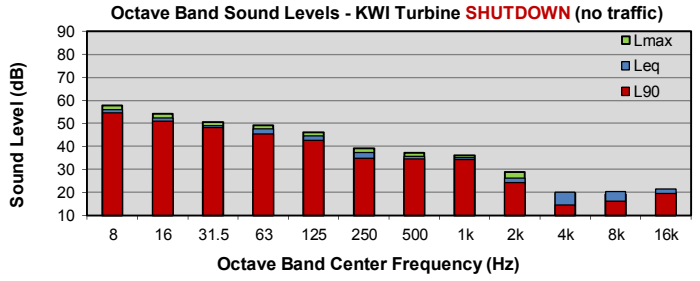
Vertical: KWI Turbine OPERATING (wind turbine only)
Horizontal: KWI Turbine SHUTDOWN (ambient - no traffic)

SLOW Response A-levels	KWI Turbine SHUTDOWN (no traffic)					
KWI Turbine OPERATING (no traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	7.3	7.2	7.9	8.1	8.7	8.9
L01	7.9	7.8	8.5	8.7	9.2	9.5
Leq	6.6	6.5	7.3	7.4	8.0	8.2
L50	6.6	6.5	7.3	7.4	8.0	8.2
L90	5.5	5.4	6.2	6.3	6.9	7.1
Lmin	3.4	3.3	4.1	4.2	4.8	5.0









Operating - Shutdown Differences: Overall Comparison

Vertical: KWI Turbine ONLY (excluding traffic on Route 3)
Horizontal: Ambient Sound Levels (including traffic on Route 3)

SLOW Response A-levels	KWI Turbine SHUTDOWN (with traffic)					
KWI Turbine OPERATING (no traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	-8.3	-8.9	-1.3	-0.1	4.8	8.9
L01	-7.7	-8.3	-0.7	0.5	5.4	9.5
Leq	-8.9	-9.5	-1.9	-0.7	4.2	8.2
L50	-8.9	-9.5	-1.9	-0.7	4.2	8.2
L90	-10.0	-10.6	-3.0	-1.8	3.1	7.1
Lmin	-12.1	-12.7	-5.1	-3.9	1.0	5.0

Octave Band Sound Level Comparison: Pure-tone Check

Including traffic on Route 3:

L90 Octave Band Check: KWI Turbine OPERATING		NO KWI PURE TONE	L90 Octave Band Check KWI Turbine SHUTDOWN	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Excluding traffic on Route 3:

Leq Octave Band Check: KWI Turbine ONLY		NO KWI PURE TONE	Leq Octave Band Check Ambient (no traffic)	
Leq Pure-tone?	NO		Leq Pure-tone?	NO
L90 Octave Band Check KWI Turbine ONLY		**NO KWI PURE TONE**	**L90 Octave Band Check Ambient (no traffic)**	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Acoustical Monitoring Study of Kingston Wind Independence Turbine

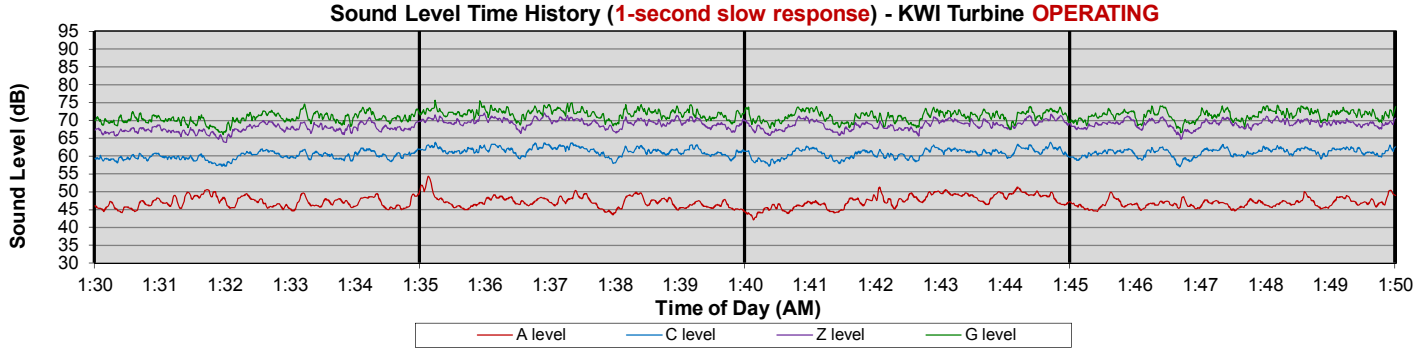
Page B-19: Detailed Acoustical Monitoring Report (slow response) - Wind Turbine Operating

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/2/2014 from 1:30 to 1:50 AM with KWI Turbine OPERATING

Site data		Supervisory Control and Data Acquisition (SCADA) data									
Distance from KWI:	990 ft	Time: 1:20 to 1:30 AM	Calibrated Wind Speed: 8.4 m/s	Wind Direction: 199°	Avg Power Level: 827 kW	Air Temperature: 33 °F
Wind Speed Range:	0-1 m/s	Time: 1:30 to 1:40 AM	Calibrated Wind Speed: 8.5 m/s	Wind Direction: 200°	Avg Power Level: 1054 kW	Air Temperature: 33 °F
		Time: 1:40 to 1:50 AM	Calibrated Wind Speed: 8.8 m/s	Wind Direction: 199°	Avg Power Level: 1139 kW	Air Temperature: 33 °F

Sound Level Time History (1-second slow response) - KWI Turbine OPERATING



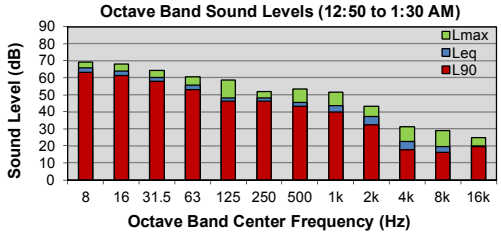
Event Log

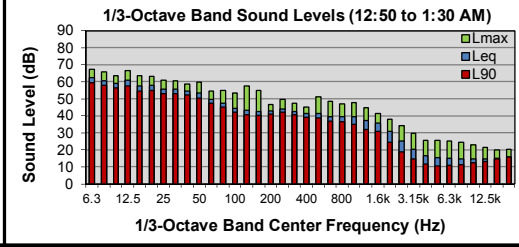
Traffic on Route 3 throughout

Slow Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine OPERATING

1:30 to 1:35 AM (100% included)						1:35 to 1:40 AM (100% included)						1:40 to 1:45 AM (100% included)						1:45 to 1:50 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	50.6	62.3	70.9	74.6	3.8	Lmax	54.4	63.8	72.1	75.6	5.0	Lmax	51.3	63.9	71.7	73.9	4.5	Lmax	50.4	63.3	71.3	74.2	5.0
L01	50.4	62.1	70.0	73.6	3.3	L01	52.9	63.7	71.6	74.8	4.3	L01	51.0	63.1	71.3	73.7	3.6	L01	50.0	62.9	71.0	74.1	3.5
Leq	47.3	60.0	67.7	70.7	1.4	Leq	47.5	61.7	69.6	72.2	1.8	Leq	47.9	60.9	68.9	71.4	1.6	Leq	46.9	61.1	69.2	71.7	1.9
L50	46.8	59.9	67.5	70.4	1.3	L50	47.0	61.6	69.6	72.1	1.7	L50	47.6	61.0	68.7	71.3	1.5	L50	46.6	61.2	69.2	71.6	1.8
L90	45.3	58.6	66.0	68.7	0.7	L90	45.2	59.9	67.8	70.1	0.9	L90	44.5	58.8	67.0	68.9	0.8	L90	45.3	59.4	67.6	69.5	1.0
Lmin	44.2	57.1	63.8	66.1	0.3	Lmin	43.7	57.9	66.4	68.5	0.3	Lmin	42.2	57.2	65.7	67.4	0.3	Lmin	44.5	57.1	64.7	66.5	0.4

1:30 to 1:50 AM (100% included)					
Avg	A	C	Z	G	MD
Lmax	51.7	63.3	71.5	74.6	4.6
L01	51.0	63.3	71.4	74.3	3.6
Leq	47.4	61.0	68.9	71.5	1.7
L50	46.9	60.9	68.8	71.3	0.9
L90	45.2	59.0	66.9	69.2	0.8
Lmin	42.2	57.1	63.8	66.1	0.3

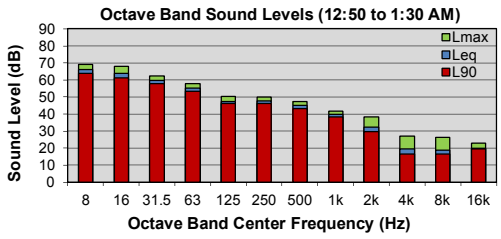


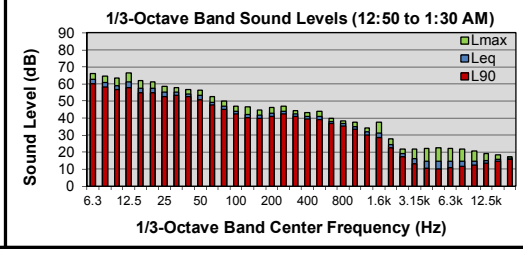


Slow Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine OPERATING

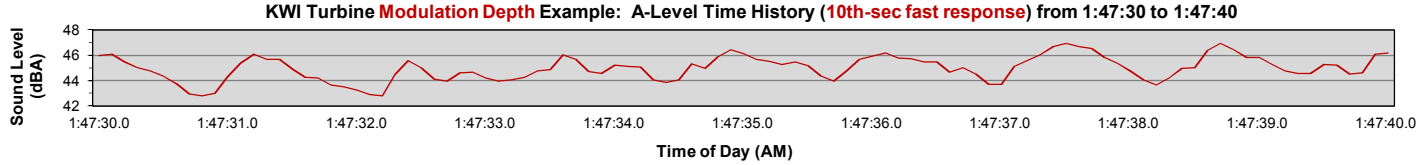
1:30 to 1:35 AM (6% included)						1:35 to 1:40 AM (21% included)						1:40 to 1:45 AM (8% included)						1:45 to 1:50 AM (28% included)					
8.4 m/s	A	C	Z	G	MD	8.3 m/s	A	C	Z	G	MD	8.5 m/s	A	C	Z	G	MD	8.8 m/s	A	C	Z	G	MD
Lmax	46.2	61.7	69.8	72.8	3.1	Lmax	46.6	62.4	71.4	74.1	5.0	Lmax	44.7	61.5	70.0	73.6	4.0	Lmax	46.8	62.9	71.3	74.2	5.0
L01	46.1	61.6	69.8	72.8	3.1	L01	46.5	62.3	71.3	73.5	5.0	L01	44.7	61.5	70.0	73.6	4.0	L01	46.7	62.6	71.2	74.1	4.3
Leq	45.5	60.7	68.5	71.3	1.9	Leq	45.3	60.9	69.0	71.5	2.2	Leq	44.1	59.8	67.9	71.1	2.1	Leq	45.7	60.9	69.3	71.4	2.3
L50	45.5	60.5	68.3	71.4	1.8	L50	45.3	61.0	68.9	71.6	2.1	L50	44.2	59.5	67.6	70.6	2.1	L50	45.7	60.7	69.2	71.1	2.3
L90	44.7	59.6	67.3	69.9	1.2	L90	44.4	59.2	67.1	69.4	1.4	L90	43.4	58.6	66.7	69.0	1.3	L90	44.9	59.4	67.7	69.4	1.6
Lmin	44.6	59.3	67.1	69.5	1.1	Lmin	43.7	57.9	66.7	68.5	0.7	Lmin	42.2	58.4	66.6	68.9	0.8	Lmin	44.5	58.9	67.3	68.2	0.7

1:30 to 1:50 AM (16% included)					
Avg	A	C	Z	G	MD
Lmax	46.0	62.1	70.6	73.7	4.3
L01	46.6	62.4	71.2	74.1	4.3
Leq	45.4	60.7	69.0	71.4	2.2
L50	45.4	60.7	68.8	71.3	2.2
L90	44.3	59.2	67.3	69.3	1.4
Lmin	42.2	57.9	66.6	68.2	0.7





KWI Turbine Modulation Depth Example: A-Level Time History (10th-sec fast response) from 1:47:30 to 1:47:40



Acoustical Monitoring Study of Kingston Wind Independence Turbine

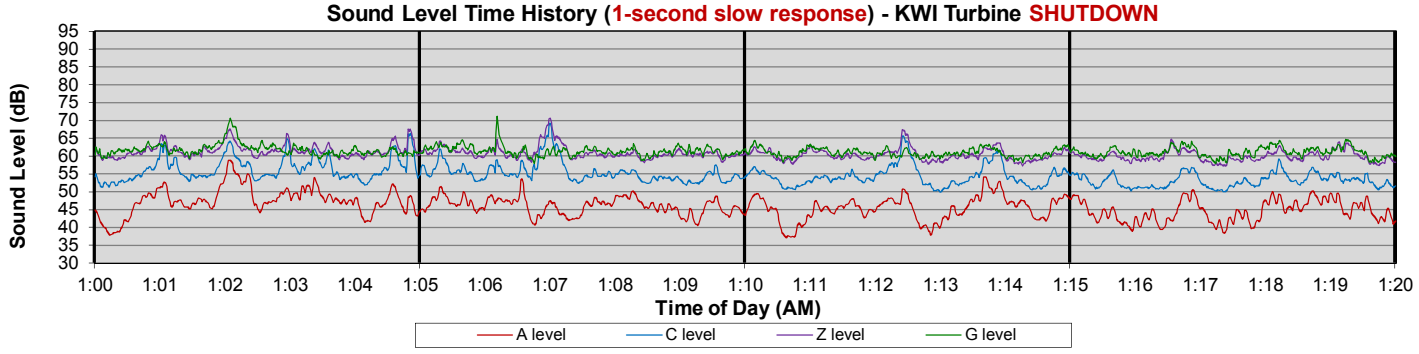
Page B-20: Detailed Acoustical Monitoring Report (slow response) - Wind Turbine Shutdown

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/2/2014 from 1:00 to 1:20 AM with KWI Turbine SHUTDOWN

Site data		Supervisory Control and Data Acquisition (SCADA) data									
Distance from KWI:	990 ft	Time: 1:00 to 1:10 AM	Calibrated Wind Speed: 8.9 m/s	Wind Direction: 197°	Avg Power Level: 000 kW	Air Temperature: 33 °F
Wind Speed Range:	0-1 m/s	Time: 1:10 to 1:20 AM	Calibrated Wind Speed: 8.5 m/s	Wind Direction: 196°	Avg Power Level: 000 kW	Air Temperature: 33 °F

Sound Level Time History (1-second slow response) - KWI Turbine SHUTDOWN



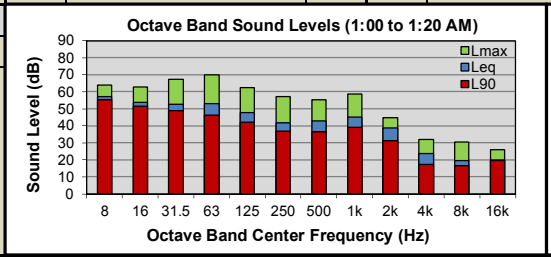
Event Log

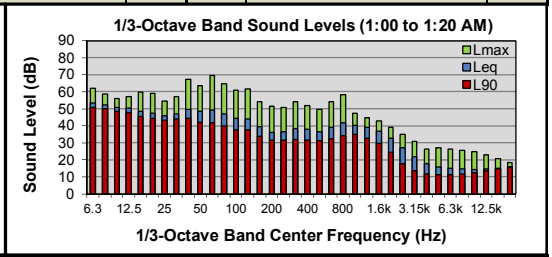
Traffic on Route 3 throughout
Local vehicle from 1:04:32 to 1:05:06 (EXCLUDE)
Loud animal in leaves noise from 1:12:15 to 1:12:22 (EXCLUDE)

Slow Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine SHUTDOWN

	1:00 to 1:05 AM (91% included)					1:05 to 1:10 AM (98% included)						1:10 to 1:15 AM (98% included)						1:15 to 1:20 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	58.9	65.0	67.5	70.6	5.7	Lmax	53.6	69.3	70.6	71.1	6.7	Lmax	54.2	65.6	67.4	64.4	6.0	Lmax	50.6	59.1	64.8	64.7	4.3
L01	58.5	64.1	66.7	69.1	4.0	L01	51.5	66.0	68.8	65.9	3.3	L01	53.7	64.2	66.3	63.3	3.2	L01	50.2	57.0	63.8	64.3	3.6
Leq	49.5	57.2	61.7	62.4	1.3	Leq	46.7	57.1	61.6	61.7	1.2	Leq	46.6	55.7	60.7	61.1	1.1	Leq	45.6	53.5	60.1	61.3	1.3
L50	47.5	54.9	61.0	61.6	1.2	L50	46.3	54.7	60.5	61.3	1.0	L50	45.7	53.8	60.0	60.8	1.0	L50	44.5	52.8	59.6	60.9	1.1
L90	41.8	52.8	59.5	60.3	0.6	L90	42.6	52.8	59.4	59.8	0.6	L90	40.5	51.0	58.4	59.5	0.6	L90	40.7	51.0	58.2	59.4	0.6
Lmin	37.8	51.3	58.7	59.1	0.3	Lmin	40.5	51.8	58.1	57.9	0.2	Lmin	37.2	49.9	57.3	58.1	0.2	Lmin	38.5	50.0	57.2	58.0	0.2

1:00 to 1:20 AM (97% included)					
Avg	A	C	Z	G	MD
Lmax	54.3	64.8	67.6	67.7	5.7
L01	54.9	64.5	67.0	66.4	3.7
Leq	47.3	56.1	61.1	61.7	1.2
L50	46.1	54.2	60.4	61.2	1.1
L90	41.2	51.4	58.7	59.6	0.6
Lmin	37.2	49.9	57.2	57.9	0.2

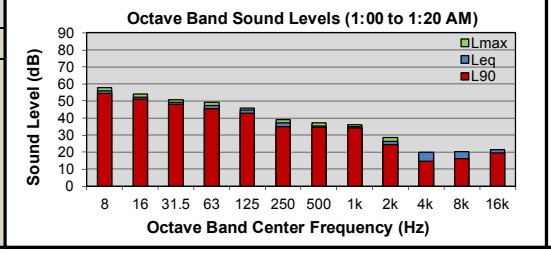


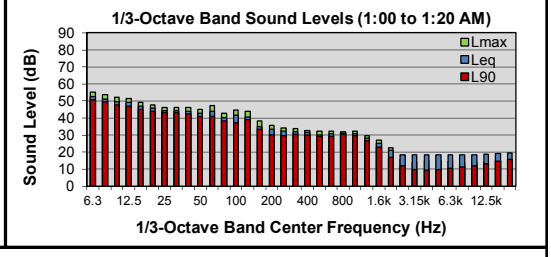


Slow Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine SHUTDOWN

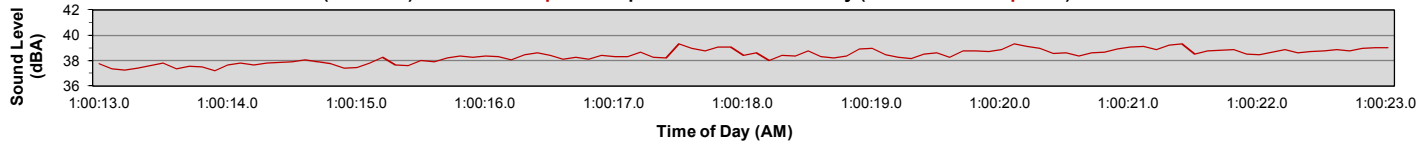
	1:00 to 1:05 AM (3% included)					1:05 to 1:10 AM (0% included)						1:10 to 1:15 AM (4% included)						1:15 to 1:20 AM (1% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	38.9	52.8	59.8	61.6	1.3	Lmax	-	-	-	-	-	Lmax	38.7	52.3	59.4	61.4	2.5	Lmax	38.7	50.1	57.5	59.4	1.3
L01	38.9	52.7	59.8	61.6	1.3	L01	-	-	-	-	-	L01	38.6	52.3	59.4	61.2	2.5	L01	38.7	50.0	57.5	59.4	1.3
Leq	38.4	52.2	59.3	61.0	0.9	Leq	-	-	-	-	-	Leq	37.7	51.3	58.7	59.9	0.8	Leq	38.6	50.0	57.3	58.9	0.8
L50	38.6	52.0	59.3	61.1	0.9	L50	-	-	-	-	-	L50	37.5	51.1	58.8	59.8	0.7	L50	38.5	50.0	57.2	58.7	0.8
L90	37.9	51.6	58.9	60.2	0.6	L90	-	-	-	-	-	L90	37.3	50.8	57.9	59.3	0.5	L90	38.5	50.0	57.2	58.5	0.4
Lmin	37.8	51.4	58.8	60.0	0.5	Lmin	-	-	-	-	-	Lmin	37.2	50.7	57.8	58.9	0.3	Lmin	38.5	50.0	57.2	58.4	0.4

1:00 to 1:20 AM (2% included)					
Avg	A	C	Z	G	MD
Lmax	38.8	51.7	58.9	60.8	1.7
L01	38.9	52.7	59.8	61.5	2.4
Leq	38.1	51.5	58.8	60.2	0.8
L50	38.0	51.3	58.9	60.0	0.8
L90	37.4	50.2	57.5	59.0	0.5
Lmin	37.2	50.0	57.2	58.4	0.3





Ambient (no traffic) Modulation Depth Example: A-Level Time History (10th-sec fast response) from 1:00:13 to 1:00:23



Acoustical Monitoring Study of Kingston Wind Independence Turbine
Page B-21: Wind Turbine Acoustical Monitoring Summary (fast response)
HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/2/2014 between 1:00 AM and 1:50 AM with KWI Turbine OPERATING and SHUTDOWN

Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine OPERATING

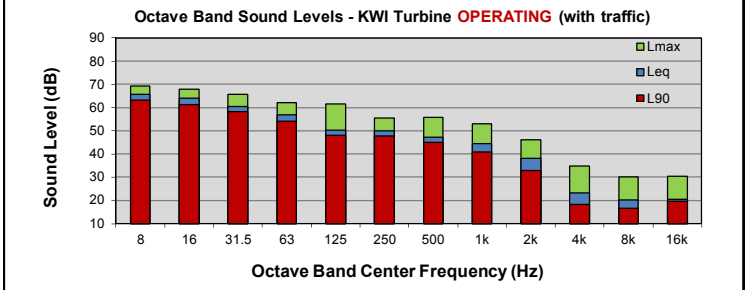
Time: 1:20 to 1:30 AM	Calibrated Wind Speed: 8.4 m/s	Wind Direction: 199°	Average Power Level: 827 kW	Air Temperature: 33 °F
Time: 1:30 to 1:40 AM	Calibrated Wind Speed: 8.5 m/s	Wind Direction: 200°	Average Power Level: 1054 kW	Air Temperature: 33 °F
Time: 1:40 to 1:50 AM	Calibrated Wind Speed: 8.8 m/s	Wind Direction: 199°	Average Power Level: 1139 kW	Air Temperature: 33 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine OPERATING (wind turbine plus traffic)

1:30 to 1:50 AM (100% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	53.0	66.5	71.7	74.6	4.6
L01	51.7	66.0	71.5	74.4	3.6
Leq	48.1	62.7	69.1	71.6	1.7
L50	47.7	62.5	69.0	71.4	0.9
L90	45.9	60.2	67.1	69.3	0.8
Lmin	43.2	58.0	64.0	66.1	0.3

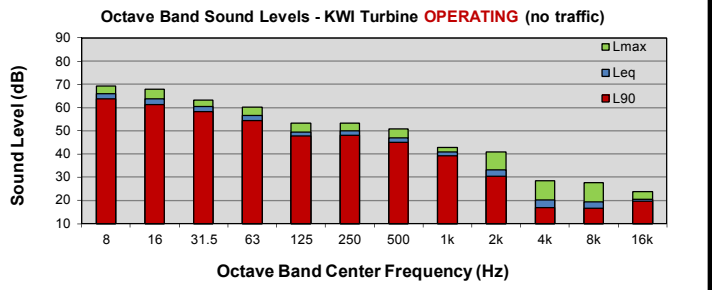


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine OPERATING (wind turbine only)

1:30 to 1:50 AM (16% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	47.9	64.5	70.8	73.7	4.3
L01	48.5	65.1	71.4	74.1	4.3
Leq	46.4	62.5	69.2	71.4	2.2
L50	46.4	62.4	69.0	71.3	2.2
L90	45.0	60.3	67.4	69.4	1.4
Lmin	43.2	58.0	66.8	68.3	0.7



Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine SHUTDOWN

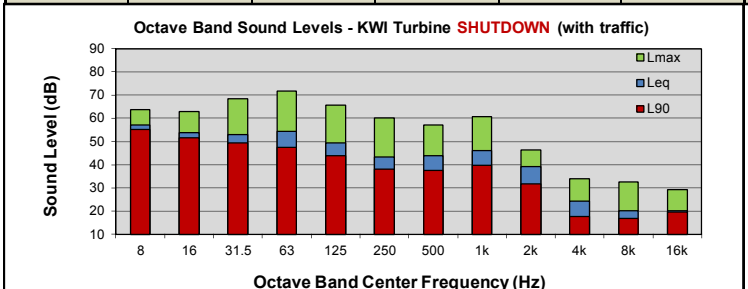
Time: 1:00 to 1:10 AM	Calibrated Wind Speed: 8.9 m/s	Wind Direction: 197°	Average Power Level: 000 kW	Air Temperature: 33 °F
Time: 1:10 to 1:20 AM	Calibrated Wind Speed: 8.5 m/s	Wind Direction: 196°	Average Power Level: 000 kW	Air Temperature: 33 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - with traffic)

1:00 to 1:20 AM (97% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	56.2	66.9	68.6	67.7	5.7
L01	56.0	66.3	67.9	66.4	3.7
Leq	47.8	57.3	61.5	61.7	1.2
L50	46.5	55.2	60.7	61.3	1.1
L90	41.5	52.6	59.0	59.7	0.6
Lmin	37.4	50.5	57.5	58.0	0.2

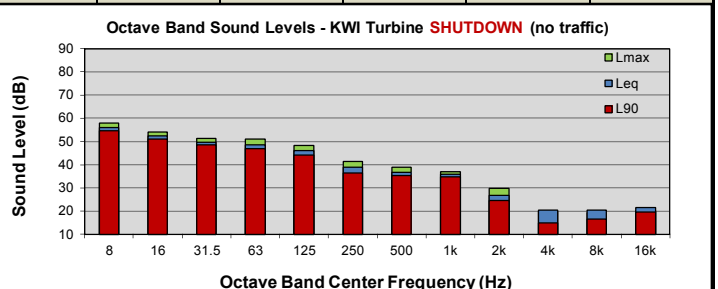


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - no traffic)

1:00 to 1:20 AM (2% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	39.4	53.6	59.2	60.9	1.7
L01	39.6	55.1	60.1	61.6	2.4
Leq	38.5	52.9	59.0	60.3	0.8
L50	38.3	52.5	59.1	60.0	0.8
L90	37.7	51.4	57.8	59.0	0.5
Lmin	37.4	50.9	57.5	58.5	0.3



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-22: Summary of A-weighted and Octave Band Sound Level Comparisons (fast response)

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/2/2014 between 1:00 AM and 1:50 AM with KWI Turbine OPERATING and SHUTDOWN

Operating - Shutdown Differences (including traffic on Route 3)

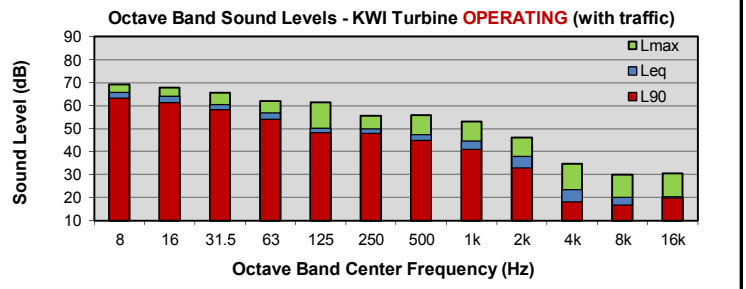
Vertical: KWI Turbine OPERATING (wind turbine plus traffic)
Horizontal: KWI Turbine SHUTDOWN (ambient - with traffic)

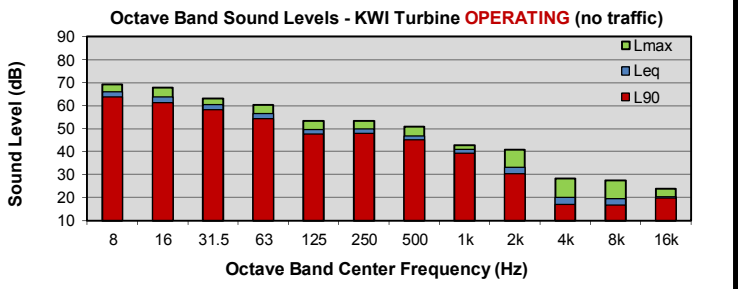
FAST Response A-levels	KWI Turbine SHUTDOWN (with traffic)					
KWI Turbine OPERATING (with traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	-3.2	-3.0	5.1	6.5	11.4	15.6
L01	-4.4	-4.2	3.9	5.3	10.2	14.3
Leq	-8.0	-7.9	0.3	1.7	6.6	10.7
L50	-8.5	-8.3	-0.2	1.2	6.1	10.3
L90	-10.3	-10.1	-2.0	-0.6	4.3	8.5
Lmin	-13.0	-12.8	-4.7	-3.3	1.6	5.8

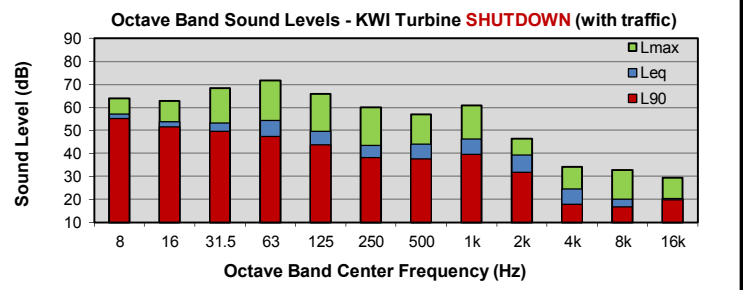
Operating - Shutdown Differences (excluding traffic on Route 3)

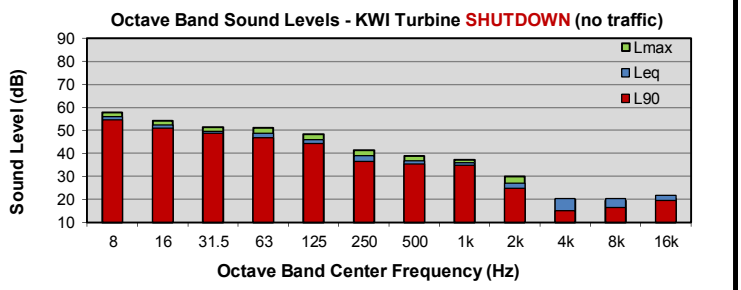
Vertical: KWI Turbine OPERATING (wind turbine only)
Horizontal: KWI Turbine SHUTDOWN (ambient - no traffic)

FAST Response A-levels	KWI Turbine SHUTDOWN (no traffic)					
KWI Turbine OPERATING (no traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	8.5	8.3	9.4	9.6	10.2	10.5
L01	9.1	8.9	10.0	10.2	10.8	11.1
Leq	7.0	6.9	7.9	8.2	8.8	9.0
L50	7.0	6.8	7.9	8.1	8.7	9.0
L90	5.5	5.4	6.4	6.7	7.3	7.5
Lmin	3.8	3.6	4.6	4.9	5.5	5.8









Operating - Shutdown Differences: Overall Comparison

Vertical: KWI Turbine ONLY (excluding traffic on Route 3)
Horizontal: Ambient Sound Levels (including traffic on Route 3)

FAST Response A-levels	KWI Turbine SHUTDOWN (with traffic)					
KWI Turbine OPERATING (no traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	-8.3	-8.1	0.1	1.4	6.4	10.5
L01	-7.6	-7.5	0.7	2.0	7.0	11.1
Leq	-9.7	-9.5	-1.4	0.0	4.9	9.0
L50	-9.8	-9.6	-1.4	-0.1	4.9	9.0
L90	-11.2	-11.0	-2.9	-1.5	3.4	7.5
Lmin	-13.0	-12.8	-4.7	-3.3	1.6	5.8

Octave Band Sound Level Comparison: Pure-tone Check

Including traffic on Route 3:

L90 Octave Band Check: KWI Turbine OPERATING		NO KWI PURE TONE	L90 Octave Band Check KWI Turbine SHUTDOWN	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Excluding traffic on Route 3:

Leq Octave Band Check: KWI Turbine ONLY		NO KWI PURE TONE	Leq Octave Band Check Ambient (no traffic)	
Leq Pure-tone?	NO		Leq Pure-tone?	NO
L90 Octave Band Check KWI Turbine ONLY		**NO KWI PURE TONE**	**L90 Octave Band Check Ambient (no traffic)**	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Acoustical Monitoring Study of Kingston Wind Independence Turbine

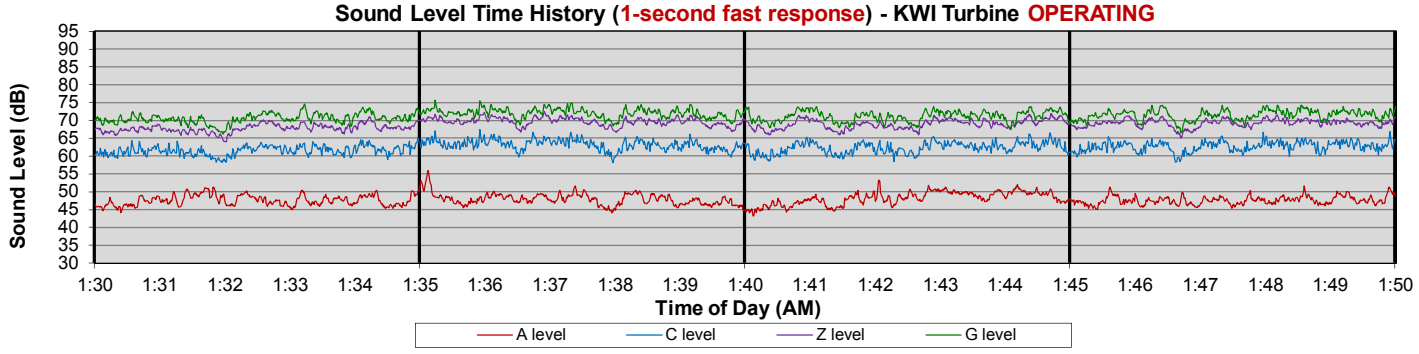
Page B-23: Detailed Acoustical Monitoring Report (fast response) - Wind Turbine Operating

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/2/2014 from 1:30 to 1:50 AM with KWI Turbine OPERATING

Site data		Supervisory Control and Data Acquisition (SCADA) data									
Distance from KWI:	990 ft	Time: 1:20 to 1:30 AM	Calibrated Wind Speed: 8.4 m/s	Wind Direction: 199°	Avg Power Level: 827 kW	Air Temperature: 33 °F
Wind Speed Range:	0-1 m/s	Time: 1:30 to 1:40 AM	Calibrated Wind Speed: 8.5 m/s	Wind Direction: 200°	Avg Power Level: 1054 kW	Air Temperature: 33 °F
		Time: 1:40 to 1:50 AM	Calibrated Wind Speed: 8.8 m/s	Wind Direction: 199°	Avg Power Level: 1139 kW	Air Temperature: 33 °F

Sound Level Time History (1-second fast response) - KWI Turbine OPERATING



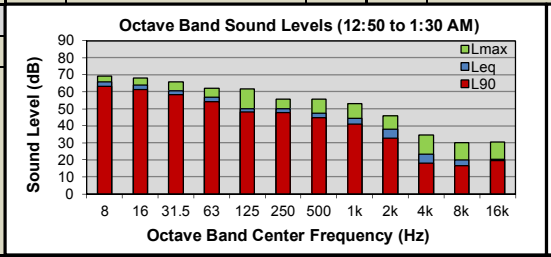
Event Log

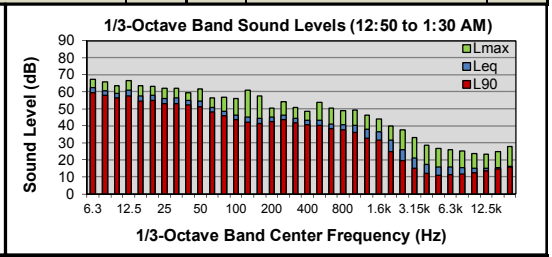
Traffic on Route 3 throughout

Fast Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine OPERATING

1:30 to 1:35 AM (100% included)						1:35 to 1:40 AM (100% included)						1:40 to 1:45 AM (100% included)						1:45 to 1:50 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	51.2	65.1	71.0	74.6	3.8	Lmax	55.9	67.3	72.4	75.7	5.0	Lmax	53.2	66.6	71.9	73.9	4.5	Lmax	51.6	66.8	71.5	74.3	5.0
L01	51.0	64.4	70.1	73.6	3.3	L01	53.2	66.7	71.7	74.8	4.3	L01	51.9	65.8	71.4	73.8	3.6	L01	51.1	65.6	71.2	74.2	3.5
Leq	47.8	61.7	67.9	70.7	1.4	Leq	48.3	63.4	69.8	72.2	1.8	Leq	48.6	62.6	69.1	71.4	1.6	Leq	47.8	62.9	69.3	71.7	1.9
L50	47.4	61.6	67.7	70.4	1.3	L50	47.8	63.3	69.8	72.1	1.7	L50	48.4	62.4	68.9	71.3	1.5	L50	47.5	62.8	69.4	71.6	1.8
L90	45.8	59.7	66.2	68.7	0.7	L90	46.1	61.3	67.9	70.2	0.9	L90	45.5	60.0	67.2	69.0	0.8	L90	46.3	60.8	67.8	69.5	1.0
Lmin	44.1	58.2	64.0	66.1	0.3	Lmin	44.2	58.0	66.7	68.4	0.3	Lmin	43.2	58.4	65.9	67.4	0.3	Lmin	45.0	58.3	65.0	66.5	0.4

1:30 to 1:50 AM (100% included)					
Avg	A	C	Z	G	MD
Lmax	53.0	66.5	71.7	74.6	4.6
L01	51.7	66.0	71.5	74.4	3.6
Leq	48.1	62.7	69.1	71.6	1.7
L50	47.7	62.5	69.0	71.4	0.9
L90	45.9	60.2	67.1	69.3	0.8
Lmin	43.2	58.0	64.0	66.1	0.3

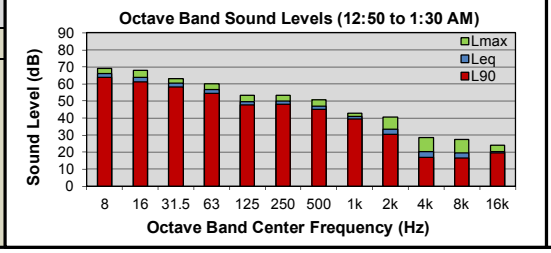


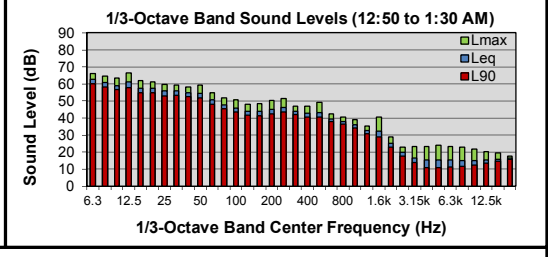


Fast Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine OPERATING

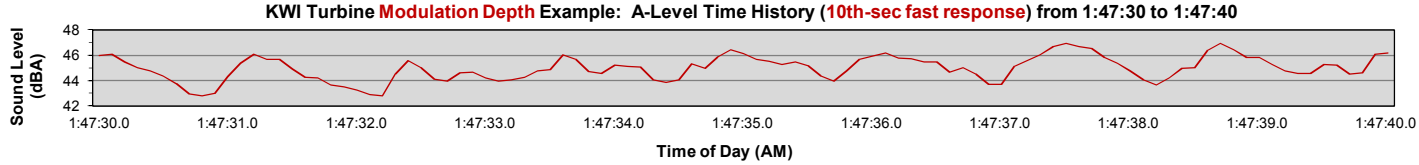
1:30 to 1:35 AM (6% included)						1:35 to 1:40 AM (21% included)						1:40 to 1:45 AM (8% included)						1:45 to 1:50 AM (28% included)					
8.4 m/s	A	C	Z	G	MD	8.3 m/s	A	C	Z	G	MD	8.5 m/s	A	C	Z	G	MD	8.8 m/s	A	C	Z	G	MD
Lmax	47.4	63.4	70.0	72.8	3.1	Lmax	48.5	65.4	71.5	74.1	5.0	Lmax	46.3	63.6	70.1	73.7	4.0	Lmax	49.4	65.6	71.5	74.3	5.0
L01	47.4	63.4	70.0	72.8	3.1	L01	48.3	65.2	71.3	73.5	5.0	L01	46.1	63.5	70.0	73.7	4.0	L01	48.7	64.9	71.4	74.2	4.3
Leq	46.5	62.4	68.7	71.3	1.9	Leq	46.3	62.7	69.2	71.6	2.2	Leq	45.0	61.5	68.1	71.1	2.1	Leq	46.8	62.6	69.5	71.5	2.3
L50	46.4	62.7	68.5	71.5	1.8	L50	46.3	62.6	69.1	71.7	2.1	L50	45.0	61.2	67.8	70.7	2.1	L50	46.7	62.2	69.4	71.1	2.3
L90	45.7	60.8	67.5	70.0	1.2	L90	44.9	60.2	67.3	69.5	1.4	L90	44.2	59.7	66.9	69.1	1.3	L90	45.8	60.5	67.9	69.4	1.6
Lmin	45.1	60.3	67.2	69.6	1.1	Lmin	44.2	58.0	66.9	68.4	0.7	Lmin	43.2	59.3	66.8	68.9	0.8	Lmin	45.0	60.2	67.4	68.3	0.7

1:30 to 1:50 AM (16% included)					
Avg	A	C	Z	G	MD
Lmax	47.9	64.5	70.8	73.7	4.3
L01	48.5	65.1	71.4	74.1	4.3
Leq	46.4	62.5	69.2	71.4	2.2
L50	46.4	62.4	69.0	71.3	2.2
L90	45.0	60.3	67.4	69.4	1.4
Lmin	43.2	58.0	66.8	68.3	0.7





KWI Turbine Modulation Depth Example: A-Level Time History (10th-sec fast response) from 1:47:30 to 1:47:40



Acoustical Monitoring Study of Kingston Wind Independence Turbine

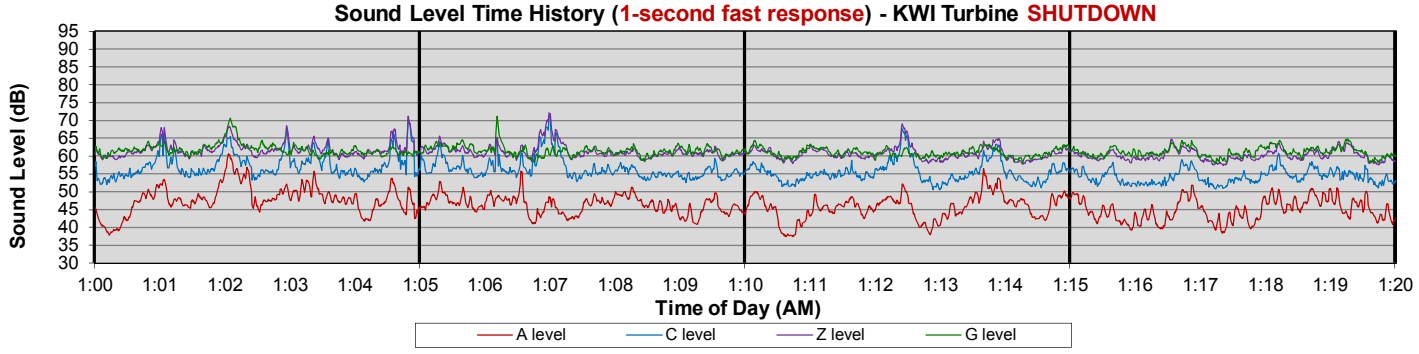
Page B-24: Detailed Acoustical Monitoring Report (fast response) - Wind Turbine Shutdown

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/2/2014 from 1:00 to 1:20 AM with KWI Turbine SHUTDOWN

Site data		Supervisory Control and Data Acquisition (SCADA) data									
Distance from KWI:	990 ft	Time: 1:00 to 1:10 AM	Calibrated Wind Speed: 8.9 m/s	Wind Direction: 197°	Avg Power Level: 000 kW	Air Temperature: 33 °F
Wind Speed Range:	0-1 m/s	Time: 1:10 to 1:20 AM	Calibrated Wind Speed: 8.5 m/s	Wind Direction: 196°	Avg Power Level: 000 kW	Air Temperature: 33 °F

Sound Level Time History (1-second fast response) - KWI Turbine SHUTDOWN



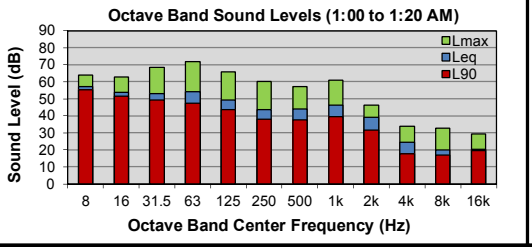
Event Log

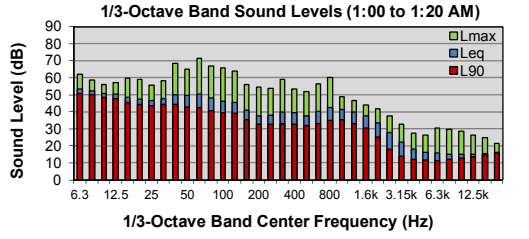
Traffic on Route 3 throughout
Local vehicle from 1:04:32 to 1:05:06 (EXCLUDE)
Loud animal in leaves noise from 1:12:15 to 1:12:22 (EXCLUDE)

Fast Response Acoustical Metrics (including traffic on Route 3) - KWI Turbine SHUTDOWN

	1:00 to 1:05 AM (91% included)					1:05 to 1:10 AM (98% included)						1:10 to 1:15 AM (98% included)						1:15 to 1:20 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	60.6	68.1	68.4	70.7	5.7	Lmax	55.8	71.4	72.1	71.2	6.7	Lmax	56.4	67.5	69.1	64.4	6.0	Lmax	51.8	60.7	64.8	64.7	4.3
L01	59.1	65.9	68.0	69.1	4.0	L01	52.5	68.0	69.7	66.1	3.3	L01	54.3	66.4	67.6	63.4	3.2	L01	51.1	59.0	64.0	64.3	3.6
Leq	50.2	58.4	62.2	62.5	1.3	Leq	47.2	58.4	62.1	61.8	1.2	Leq	47.1	56.9	61.1	61.2	1.1	Leq	46.0	54.7	60.4	61.4	1.3
L50	47.8	56.2	61.4	61.7	1.2	L50	46.7	55.6	60.8	61.4	1.0	L50	46.0	54.9	60.3	60.9	1.0	L50	44.6	53.8	59.8	61.0	1.1
L90	42.0	53.9	59.9	60.3	0.6	L90	42.9	54.0	59.7	59.9	0.6	L90	40.4	52.2	58.7	59.5	0.6	L90	40.7	51.8	58.4	59.4	0.6
Lmin	37.9	51.9	58.9	59.2	0.3	Lmin	40.9	52.5	58.5	58.1	0.2	Lmin	37.4	50.5	57.7	58.1	0.2	Lmin	38.4	50.7	57.5	58.0	0.2

1:00 to 1:20 AM (97% included)					
Avg	A	C	Z	G	MD
Lmax	56.2	66.9	68.6	67.7	5.7
L01	56.0	66.3	67.9	66.4	3.7
Leq	47.8	57.3	61.5	61.7	1.2
L50	46.5	55.2	60.7	61.3	1.1
L90	41.5	52.6	59.0	59.7	0.6
Lmin	37.4	50.5	57.5	58.0	0.2

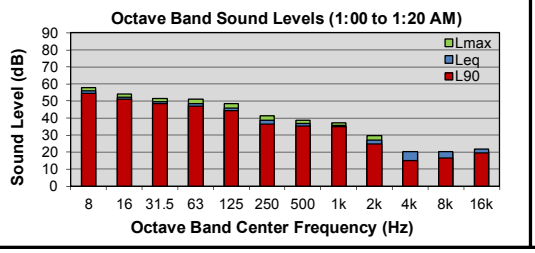


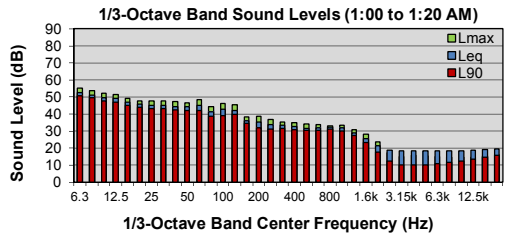


Fast Response Acoustical Metrics (excluding traffic on Route 3) - KWI Turbine SHUTDOWN

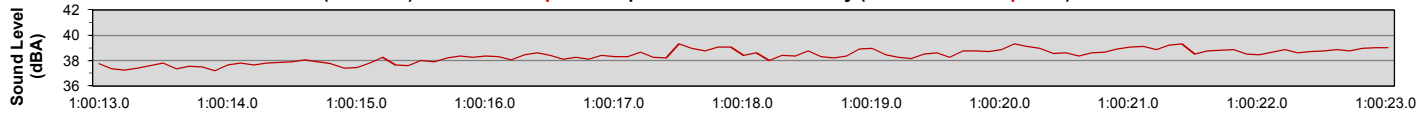
	1:00 to 1:05 AM (3% included)					1:05 to 1:10 AM (0% included)						1:10 to 1:15 AM (4% included)						1:15 to 1:20 AM (1% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	39.6	55.3	60.1	61.6	1.3	Lmax	-	-	-	-	-	Lmax	39.3	54.3	59.6	61.4	2.5	Lmax	39.4	51.4	57.8	59.6	1.3
L01	39.6	55.2	60.1	61.6	1.3	L01	-	-	-	-	-	L01	39.2	54.2	59.6	61.3	2.5	L01	39.4	51.4	57.8	59.6	1.3
Leq	39.0	53.9	59.6	61.0	0.9	Leq	-	-	-	-	-	Leq	38.0	52.4	58.9	59.9	0.8	Leq	39.0	51.1	57.6	59.0	0.8
L50	39.0	53.9	59.6	61.1	0.9	L50	-	-	-	-	-	L50	37.8	52.0	58.9	59.8	0.7	L50	39.0	51.0	57.5	58.7	0.8
L90	38.2	52.7	59.1	60.2	0.6	L90	-	-	-	-	-	L90	37.5	51.7	58.2	59.3	0.5	L90	38.6	50.9	57.5	58.5	0.4
Lmin	37.9	52.5	59.0	60.0	0.5	Lmin	-	-	-	-	-	Lmin	37.4	51.5	57.9	58.9	0.3	Lmin	38.6	50.9	57.5	58.5	0.4

1:00 to 1:20 AM (2% included)					
Avg	A	C	Z	G	MD
Lmax	39.4	53.6	59.2	60.9	1.7
L01	39.6	55.1	60.1	61.6	2.4
Leq	38.5	52.9	59.0	60.3	0.8
L50	38.3	52.5	59.1	60.0	0.8
L90	37.7	51.4	57.8	59.0	0.5
Lmin	37.4	50.9	57.5	58.5	0.3





Ambient (no traffic) Modulation Depth Example: A-Level Time History (10th-sec fast response) from 1:00:13 to 1:00:23



Acoustical Monitoring Study of Kingston Wind Independence Turbine
Page B-25: Wind Turbine Acoustical Monitoring Summary (slow response)
HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/15/2014 between 2:20 AM and 3:10 AM with KWI Turbine OPERATING and SHUTDOWN

Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine OPERATING

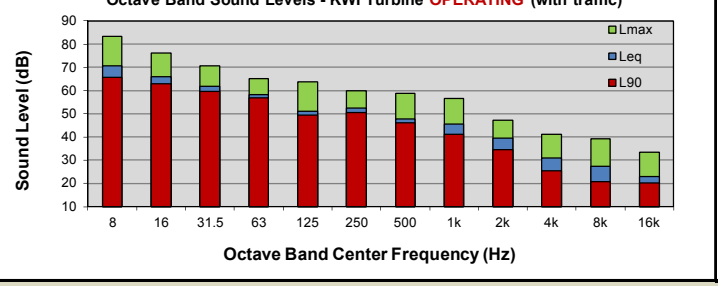
Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 176°	Average Power Level: 1505 kW	Air Temperature: 40 °F
Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 10.2 m/s	Wind Direction: 177°	Average Power Level: 1805 kW	Air Temperature: 40 °F
Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 9.8 m/s	Wind Direction: 179°	Average Power Level: 1624 kW	Air Temperature: 40 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine OPERATING (wind turbine plus traffic)

2:50 to 3:10 AM (100% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	54.5	70.6	82.3	82.6	6.4
L01	56.7	68.3	80.8	80.9	5.2
Leq	49.9	63.5	72.6	73.9	2.2
L50	49.2	62.8	70.7	72.9	1.1
L90	47.6	61.7	69.2	71.0	1.1
Lmin	46.0	59.8	67.0	69.0	0.3

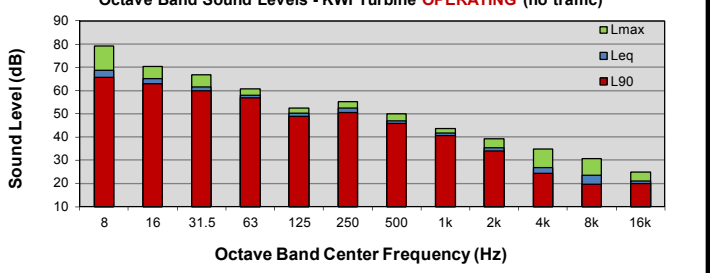


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine OPERATING (wind turbine only)

2:50 to 3:10 AM (30% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	49.3	65.4	75.3	77.1	5.6
L01	49.6	65.3	76.9	77.5	5.3
Leq	48.1	62.9	71.2	73.0	2.7
L50	48.0	62.7	70.5	72.6	2.6
L90	47.1	61.6	69.0	71.0	1.5
Lmin	46.0	59.8	67.3	69.1	0.4



Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine SHUTDOWN

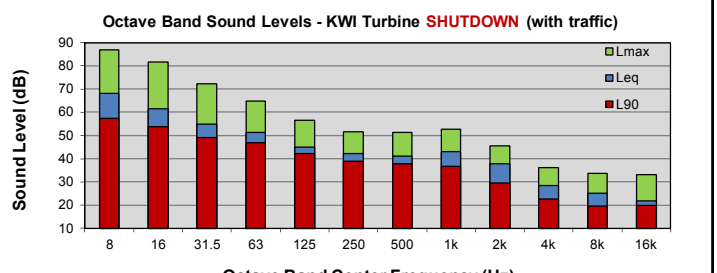
Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 10.0 m/s	Wind Direction: 178°	Average Power Level: 000 kW	Air Temperature: 40 °F
Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 177°	Average Power Level: 000 kW	Air Temperature: 40 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - with traffic)

2:20 to 2:40 AM (99% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	51.8	69.8	82.1	82.1	4.0
L01	51.5	67.4	80.6	80.1	2.9
Leq	45.7	58.1	69.3	69.7	1.0
L50	44.5	54.8	63.9	64.9	0.9
L90	40.5	52.4	60.4	61.9	0.5
Lmin	38.3	50.1	58.4	59.9	0.2

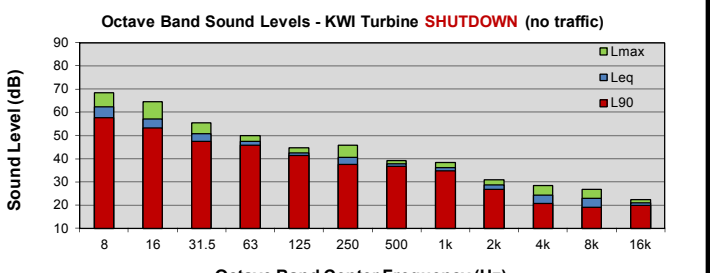


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - no traffic)

2:20 to 2:40 AM (8% included)

SLOW Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	41.1	56.6	67.5	68.5	1.7
L01	41.4	58.9	69.0	71.9	2.0
Leq	39.9	53.6	64.0	65.1	0.9
L50	39.8	52.7	62.4	63.3	0.9
L90	38.9	51.1	59.9	61.2	0.5
Lmin	38.3	50.1	59.0	60.1	0.3



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-26: Summary of A-weighted and Octave Band Sound Level Comparisons (slow response)

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/15/2014 between 2:20 AM and 3:10 AM with KWI Turbine OPERATING and SHUTDOWN

Operating - Shutdown Differences (including traffic on Route 3)

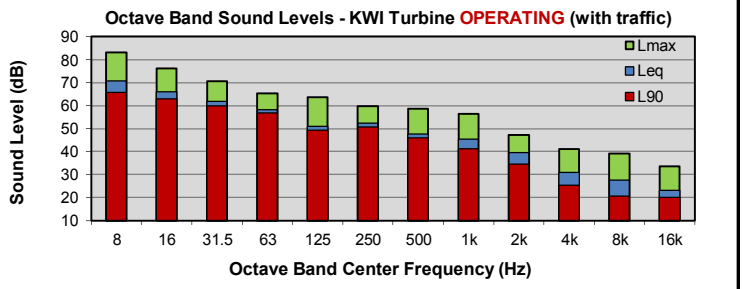
Vertical: KWI Turbine OPERATING (wind turbine plus traffic)
Horizontal: KWI Turbine SHUTDOWN (ambient - with traffic)

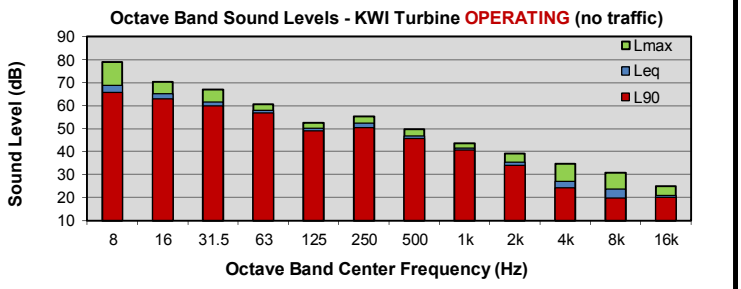
SLOW Response A-levels	KWI Turbine SHUTDOWN (with traffic)					
KWI Turbine OPERATING (with traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	2.7	3.0	8.8	10.0	14.0	16.2
L01	4.9	5.2	11.0	12.3	16.2	18.4
Leq	-1.8	-1.6	4.2	5.5	9.4	11.6
L50	-2.6	-2.3	3.5	4.7	8.7	10.9
L90	-4.2	-4.0	1.9	3.1	7.1	9.3
Lmin	-5.8	-5.5	0.3	1.5	5.5	7.7

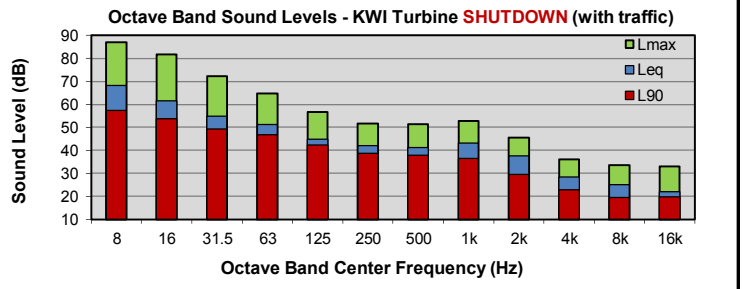
Operating - Shutdown Differences (excluding traffic on Route 3)

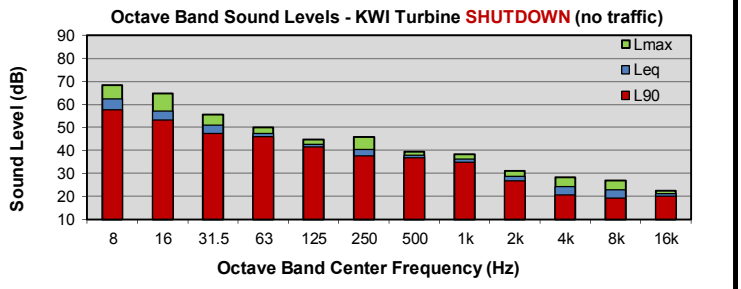
Vertical: KWI Turbine OPERATING (wind turbine only)
Horizontal: KWI Turbine SHUTDOWN (ambient - no traffic)

SLOW Response A-levels	KWI Turbine SHUTDOWN (no traffic)					
KWI Turbine OPERATING (no traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	8.2	7.9	9.4	9.5	10.3	11.0
L01	8.5	8.3	9.8	9.9	10.7	11.3
Leq	7.0	6.7	8.2	8.3	9.2	9.8
L50	6.9	6.6	8.1	8.2	9.0	9.7
L90	6.0	5.7	7.2	7.3	8.1	8.8
Lmin	4.9	4.6	6.1	6.2	7.0	7.7









Operating - Shutdown Differences: Overall Comparison

Vertical: KWI Turbine ONLY (excluding traffic on Route 3)
Horizontal: Ambient Sound Levels (including traffic on Route 3)

SLOW Response A-levels	KWI Turbine SHUTDOWN (with traffic)					
KWI Turbine OPERATING (no traffic)	Avg Lmax	L01	Leq	L50	L90	Lmin
Avg Lmax	-2.5	-2.2	3.6	4.8	8.8	11.0
L01	-2.1	-1.9	3.9	5.2	9.1	11.3
Leq	-3.7	-3.4	2.4	3.6	7.6	9.8
L50	-3.8	-3.5	2.3	3.5	7.5	9.7
L90	-4.7	-4.4	1.4	2.6	6.6	8.8
Lmin	-5.8	-5.5	0.3	1.5	5.5	7.7

Octave Band Sound Level Comparison: Pure-tone Check

Including traffic on Route 3:

L90 Octave Band Check: KWI Turbine OPERATING		NO KWI PURE TONE	L90 Octave Band Check KWI Turbine SHUTDOWN	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Excluding traffic on Route 3:

Leq Octave Band Check: KWI Turbine ONLY		NO KWI PURE TONE	Leq Octave Band Check Ambient (no traffic)	
Leq Pure-tone?	NO		Leq Pure-tone?	NO
L90 Octave Band Check KWI Turbine ONLY		NO KWI PURE TONE	L90 Octave Band Check Ambient (no traffic)	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Acoustical Monitoring Study of Kingston Wind Independence Turbine

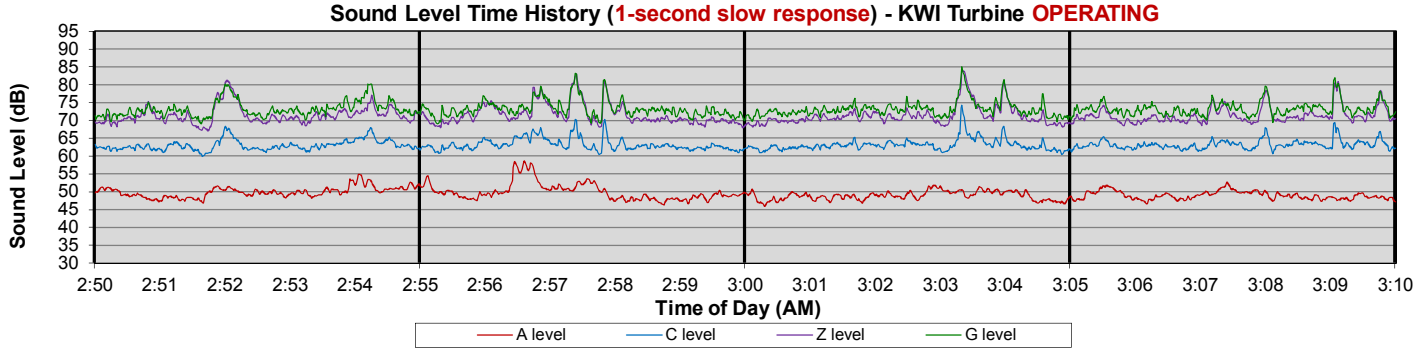
Page B-27: Detailed Acoustical Monitoring Report (slow response) - Wind Turbine Operating

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/15/2014 from 2:50 to 3:10 AM with KWI Turbine OPERATING

Site data		Supervisory Control and Data Acquisition (SCADA) data							
Distance from KWI:	990 ft	Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 176°	Avg Power Level: 1505 kW	Air Temperature: 40 °F
Wind Speed Range:	0-1 m/s	Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 10.2 m/s	Wind Direction: 177°	Avg Power Level: 1805 kW	Air Temperature: 40 °F
		Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 9.8 m/s	Wind Direction: 179°	Avg Power Level: 1624 kW	Air Temperature: 40 °F

Sound Level Time History (1-second slow response) - KWI Turbine OPERATING



Event Log

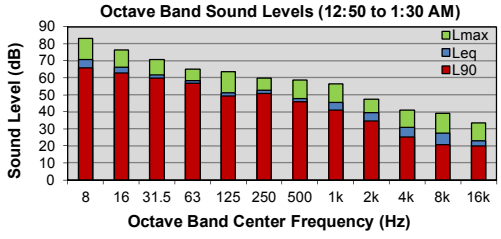
Traffic on Route 3 throughout

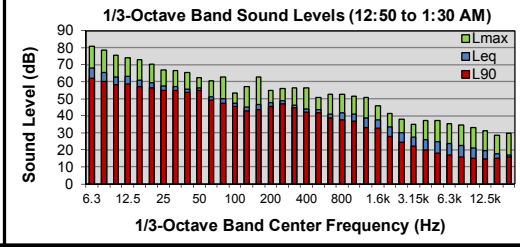
Intermittent wind-generated noise throughout

Slow Response Acoustical Metrics (including traffic on Route 3 and wind noise) - KWI Turbine OPERATING

2:50 to 2:55 AM (100% included)						2:55 to 3:00 AM (100% included)						3:00 to 3:05 AM (100% included)						3:05 to 3:10 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	54.9	68.3	81.2	80.2	6.7	Lmax	58.6	70.4	83.0	83.2	5.6	Lmax	51.9	74.2	84.1	85.0	7.6	Lmax	52.7	69.4	80.9	81.9	5.8
L01	54.5	67.8	80.5	80.1	4.7	L01	58.0	69.6	81.0	81.1	5.2	L01	51.6	70.8	83.1	82.5	5.3	L01	51.8	67.9	79.3	79.6	5.1
Leq	50.2	63.3	72.4	73.9	1.9	Leq	51.0	63.6	73.0	74.1	2.1	Leq	49.1	63.7	72.8	74.0	2.4	Leq	49.1	63.4	72.1	73.8	2.4
L50	49.9	62.8	70.9	72.7	1.8	L50	49.4	62.8	70.6	72.8	1.9	L50	48.9	62.9	70.6	72.8	2.2	L50	48.7	63.0	70.8	73.0	2.2
L90	48.1	61.6	69.2	71.0	0.9	L90	47.6	61.7	69.1	70.9	1.0	L90	47.2	61.6	68.9	71.1	1.2	L90	47.7	61.9	69.4	71.2	1.2
Lmin	46.7	59.8	67.0	69.1	0.3	Lmin	46.3	60.5	67.9	69.0	0.4	Lmin	46.0	60.4	68.1	69.5	0.3	Lmin	46.6	60.6	68.4	69.3	0.4

2:50 to 3:10 AM (100% included)					
Avg	A	C	Z	G	MD
Lmax	54.5	70.6	82.3	82.6	6.4
L01	56.7	68.3	80.8	80.9	5.2
Leq	49.9	63.5	72.6	73.9	2.2
L50	49.2	62.8	70.7	72.9	1.1
L90	47.6	61.7	69.2	71.0	1.1
Lmin	46.0	59.8	67.0	69.0	0.3

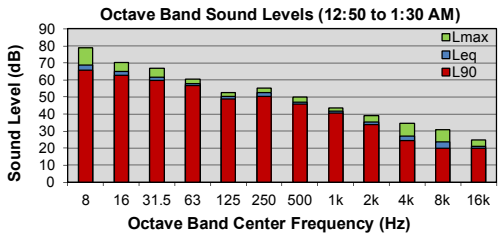


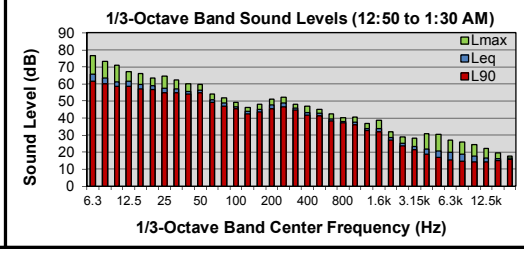


Slow Response Acoustical Metrics (excluding traffic on Route 3 and wind noise) - KWI Turbine OPERATING

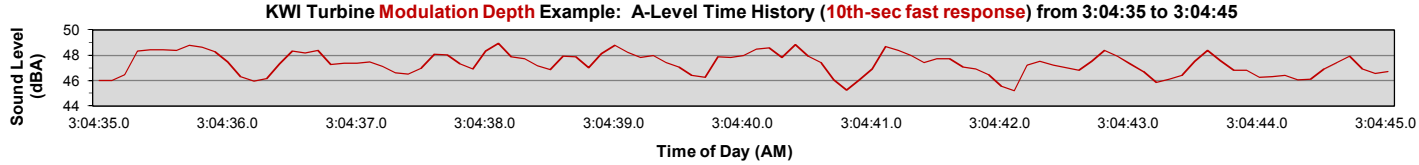
2:50 to 2:55 AM (12% included)						2:55 to 3:00 AM (20% included)						3:00 to 3:05 AM (38% included)						3:05 to 3:10 AM (49% included)					
10.2 m/s	A	C	Z	G	MD	9.3 m/s	A	C	Z	G	MD	9.6 m/s	A	C	Z	G	MD	9.8 m/s	A	C	Z	G	MD
Lmax	49.0	64.0	72.8	74.6	5.8	Lmax	48.9	65.3	75.3	77.1	5.2	Lmax	49.3	65.3	73.3	77.4	5.6	Lmax	50.0	66.8	79.7	79.0	5.8
L01	49.0	64.0	72.6	74.4	5.8	L01	48.8	65.2	75.0	77.1	5.1	L01	49.2	65.2	73.0	77.2	5.4	L01	49.7	66.3	78.2	78.1	5.3
Leq	48.1	62.6	70.3	72.2	2.8	Leq	47.8	62.7	71.3	73.1	2.5	Leq	47.8	62.6	70.4	72.8	2.8	Leq	48.4	63.2	71.8	73.3	2.7
L50	48.3	62.5	70.4	72.3	2.7	L50	47.9	62.5	70.5	72.6	2.3	L50	47.6	62.5	70.2	72.5	2.7	L50	48.3	63.0	70.8	72.8	2.7
L90	47.5	60.9	67.8	70.2	1.8	L90	47.0	61.9	69.7	71.6	1.4	L90	46.9	61.4	68.6	70.8	1.5	L90	47.5	61.9	69.5	71.2	1.5
Lmin	46.7	59.8	67.3	69.1	1.2	Lmin	46.3	61.4	69.2	70.9	0.7	Lmin	46.0	60.4	68.1	69.5	0.8	Lmin	46.6	60.6	68.7	69.3	0.4

2:50 to 3:10 AM (30% included)					
Avg	A	C	Z	G	MD
Lmax	49.3	65.4	75.3	77.1	5.6
L01	49.6	65.3	76.9	77.5	5.3
Leq	48.1	62.9	71.2	73.0	2.7
L50	48.0	62.7	70.5	72.6	2.6
L90	47.1	61.6	69.0	71.0	1.5
Lmin	46.0	59.8	67.3	69.1	0.4





KWI Turbine Modulation Depth Example: A-Level Time History (10th-sec fast response) from 3:04:35 to 3:04:45



Acoustical Monitoring Study of Kingston Wind Independence Turbine

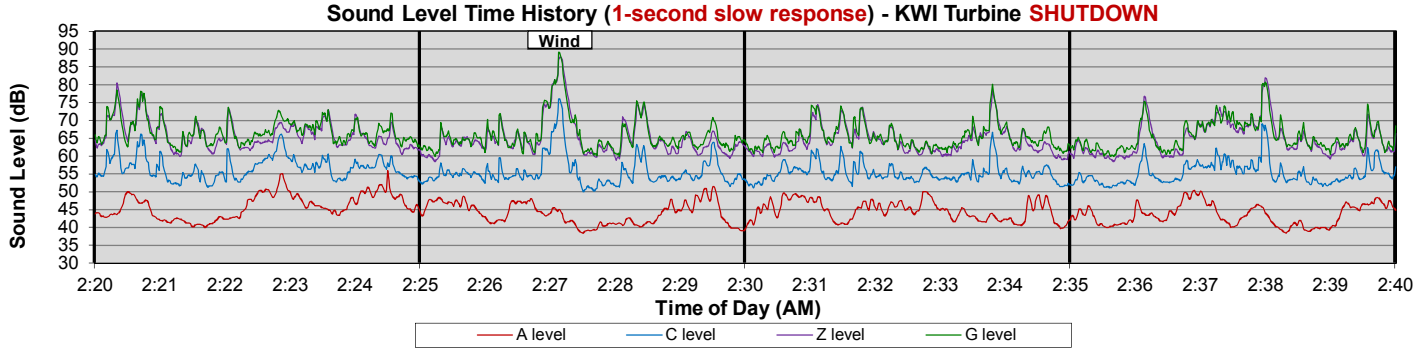
Page B-28: Detailed Acoustical Monitoring Report (slow response) - Wind Turbine Shutdown

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/15/2014 from 2:20 to 2:40 AM with KWI Turbine SHUTDOWN

Site data		Supervisory Control and Data Acquisition (SCADA) data							
Distance from KWI:	990 ft	Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 10.0 m/s	Wind Direction: 178°	Avg Power Level: 000 kW	Air Temperature: 40 °F
Wind Speed Range:	0-1 m/s	Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 177°	Avg Power Level: 000 kW	Air Temperature: 40 °F

Sound Level Time History (1-second slow response) - KWI Turbine SHUTDOWN



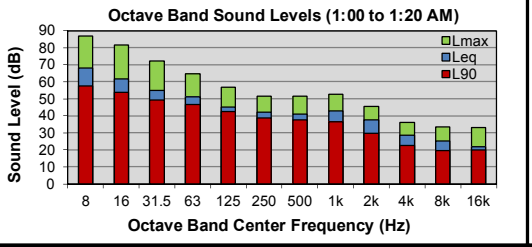
Event Log

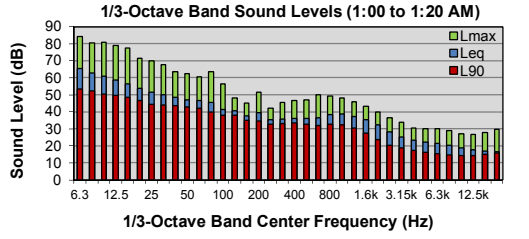
Traffic on Route 3 throughout
Intermittent wind-generated noise throughout
Loud breaking branch noise from 2:24:27 to 2:24:36 (EXCLUDE)

Slow Response Acoustical Metrics (including traffic on Route 3 and wind noise) - KWI Turbine SHUTDOWN

2:20 to 2:25 AM (97% included)						2:25 to 2:30 AM (100% included)						2:30 to 2:35 AM (100% included)						2:35 to 2:40 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	55.1	67.3	80.4	78.6	3.0	Lmax	51.5	76.1	87.7	89.1	4.1	Lmax	50.1	66.7	78.3	80.2	5.4	Lmax	50.3	69.1	81.9	80.7	3.6
L01	54.1	66.1	77.5	77.7	2.2	L01	50.9	73.1	86.9	85.9	3.2	L01	50.0	63.0	74.4	76.2	3.5	L01	50.1	67.3	79.8	79.8	2.5
Leq	47.2	58.2	68.3	68.8	0.9	Leq	45.0	60.1	72.1	72.4	1.0	Leq	45.6	56.1	66.3	67.3	1.1	Leq	44.6	57.0	68.4	68.4	1.0
L50	45.5	56.5	65.2	66.3	0.8	L50	44.0	54.4	63.5	64.5	0.8	L50	44.9	54.6	63.3	64.4	0.9	L50	43.3	54.3	63.6	64.4	0.9
L90	41.4	53.1	62.1	63.1	0.5	L90	39.8	52.3	60.2	61.7	0.5	L90	41.0	52.7	60.4	62.0	0.6	L90	40.0	52.1	59.9	61.5	0.5
Lmin	40.0	51.4	59.9	61.2	0.2	Lmin	38.3	50.1	58.4	60.0	0.2	Lmin	39.6	51.1	59.0	60.6	0.3	Lmin	38.4	51.2	58.5	59.9	0.2

2:20 to 2:40 AM (99% included)					
Avg	A	C	Z	G	MD
Lmax	51.8	69.8	82.1	82.1	4.0
L01	51.5	67.4	80.6	80.1	2.9
Leq	45.7	58.1	69.3	69.7	1.0
L50	44.5	54.8	63.9	64.9	0.9
L90	40.5	52.4	60.4	61.9	0.5
Lmin	38.3	50.1	58.4	59.9	0.2

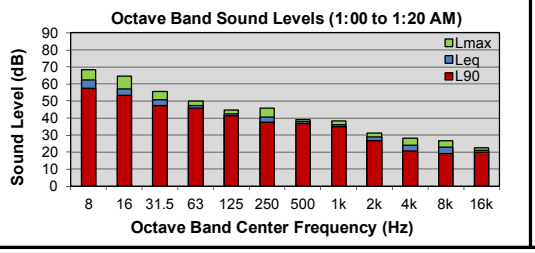


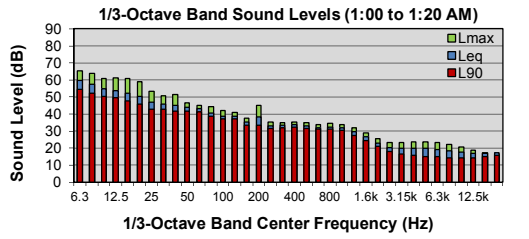


Slow Response Acoustical Metrics (excluding traffic on Route 3 and wind noise) - KWI Turbine SHUTDOWN

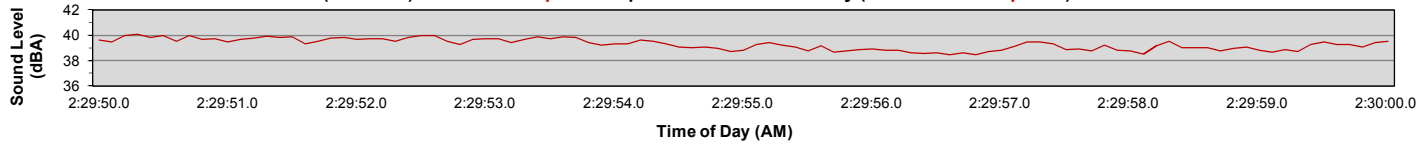
2:20 to 2:25 AM (3% included)						2:25 to 2:30 AM (12% included)						2:30 to 2:35 AM (3% included)						2:35 to 2:40 AM (15% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	41.0	56.2	69.0	68.0	1.2	Lmax	41.5	55.8	67.3	67.7	2.0	Lmax	40.9	55.7	64.7	65.8	1.5	Lmax	41.0	58.9	69.0	72.5	2.3
L01	41.0	56.2	68.9	68.0	1.2	L01	41.5	55.7	67.1	67.6	1.9	L01	40.9	55.5	64.5	65.6	1.4	L01	41.0	58.9	69.0	72.2	2.1
Leq	40.6	54.6	67.4	66.6	0.7	Leq	39.7	53.0	63.1	64.2	0.9	Leq	40.4	52.9	61.7	63.2	0.9	Leq	39.7	54.0	64.0	65.7	1.0
L50	40.7	54.5	67.6	66.8	0.7	L50	39.3	53.0	62.6	63.8	0.8	L50	40.6	52.8	61.7	62.8	0.9	L50	39.9	52.5	62.3	63.1	0.9
L90	40.0	52.8	65.9	64.8	0.5	L90	38.9	50.4	60.2	61.0	0.6	L90	39.8	51.4	59.1	61.4	0.5	L90	38.9	51.5	59.8	61.3	0.5
Lmin	40.0	52.7	64.8	64.3	0.3	Lmin	38.3	50.1	59.7	60.2	0.3	Lmin	39.7	51.4	59.0	60.7	0.4	Lmin	38.4	51.2	59.2	60.1	0.3

2:20 to 2:40 AM (8% included)					
Avg	A	C	Z	G	MD
Lmax	41.1	56.6	67.5	68.5	1.7
L01	41.4	58.9	69.0	71.9	2.0
Leq	39.9	53.6	64.0	65.1	0.9
L50	39.8	52.7	62.4	63.3	0.9
L90	38.9	51.1	59.9	61.2	0.5
Lmin	38.3	50.1	59.0	60.1	0.3





Ambient (no traffic) Modulation Depth Example: A-Level Time History (10th-sec fast response) from 2:29:50 to 2:30:00



Acoustical Monitoring Study of Kingston Wind Independence Turbine
Page B-29: Wind Turbine Acoustical Monitoring Summary (fast response)
HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/15/2014 between 2:20 AM and 3:10 AM with KWI Turbine OPERATING and SHUTDOWN

Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine OPERATING

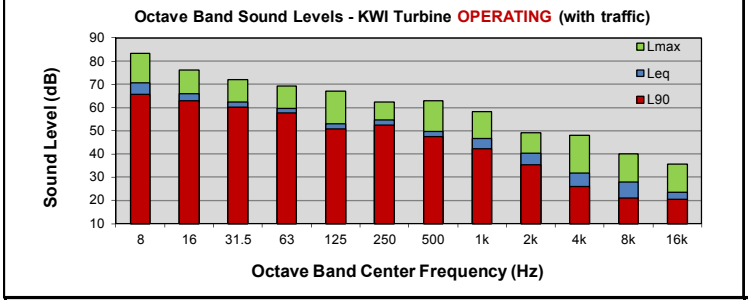
Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 176°	Average Power Level: 1505 kW	Air Temperature: 40 °F
Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 10.2 m/s	Wind Direction: 177°	Average Power Level: 1805 kW	Air Temperature: 40 °F
Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 9.8 m/s	Wind Direction: 179°	Average Power Level: 1624 kW	Air Temperature: 40 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine OPERATING (wind turbine plus traffic)

2:50 to 3:10 AM (100% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	56.6	75.2	82.3	82.6	6.4
L01	56.9	71.4	80.9	80.9	5.2
Leq	50.9	65.4	72.8	74.0	2.2
L50	50.3	64.4	71.0	72.9	1.1
L90	48.5	62.8	69.4	71.1	1.1
Lmin	46.7	60.8	67.4	69.0	0.3

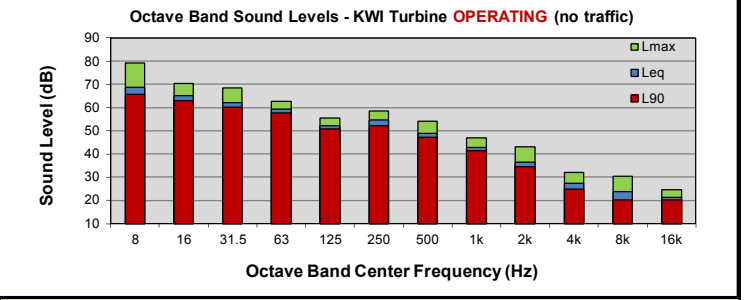


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine OPERATING (wind turbine only)

2:50 to 3:10 AM (30% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	51.6	69.2	75.4	77.1	5.6
L01	51.9	68.7	77.0	77.7	5.3
Leq	49.4	64.6	71.4	73.1	2.7
L50	49.1	64.2	70.7	72.7	2.6
L90	47.9	62.6	69.3	71.1	1.5
Lmin	46.7	60.8	67.5	69.1	0.4



Supervisory Control and Data Acquisition (SCADA) data - KWI Wind Turbine SHUTDOWN

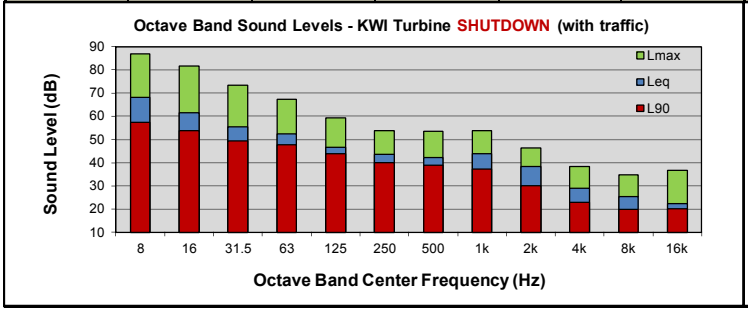
Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 10.0 m/s	Wind Direction: 178°	Average Power Level: 000 kW	Air Temperature: 40 °F
Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 177°	Average Power Level: 000 kW	Air Temperature: 40 °F

20-minute Acoustical Metrics (including traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - with traffic)

2:20 to 2:40 AM (99% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	52.8	74.6	82.1	82.2	4.0
L01	52.3	70.8	80.6	80.1	2.9
Leq	46.1	60.3	69.4	69.7	1.0
L50	44.8	55.9	64.1	64.9	0.9
L90	40.8	53.4	60.6	61.9	0.5
Lmin	38.7	50.8	58.8	59.9	0.2

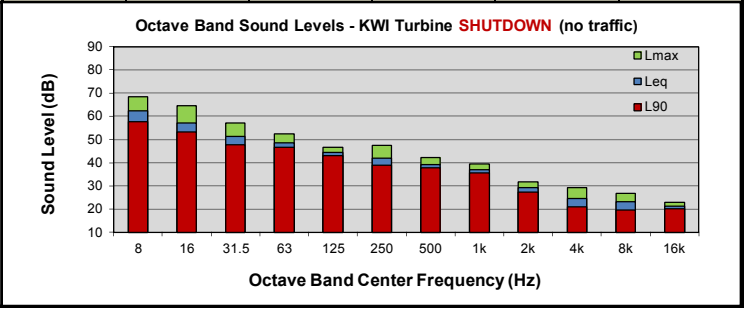


20-minute Acoustical Metrics (excluding traffic on Route 3)

KWI Turbine SHUTDOWN (ambient - no traffic)

2:20 to 2:40 AM (8% included)

FAST Response	A	C	Z	G	Modulation Depth (fast)
Avg Lmax	41.9	60.7	67.5	68.5	1.7
L01	42.2	63.1	69.0	71.9	2.0
Leq	40.3	55.5	64.0	65.1	0.9
L50	40.1	53.8	62.5	63.4	0.9
L90	39.3	51.9	60.0	61.2	0.5
Lmin	38.7	50.8	59.2	60.1	0.3



Acoustical Monitoring Study of Kingston Wind Independence Turbine

Page B-30: Summary of A-weighted and Octave Band Sound Level Comparisons (fast response)

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/15/2014 between 2:20 AM and 3:10 AM with KWI Turbine OPERATING and SHUTDOWN

Operating - Shutdown Differences (including traffic on Route 3)

Vertical: KWI Turbine OPERATING (wind turbine plus traffic)
Horizontal: KWI Turbine SHUTDOWN (ambient - with traffic)

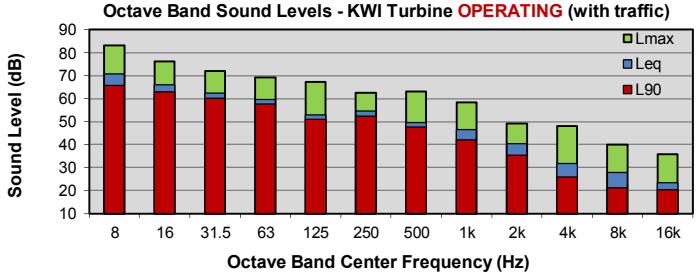
FAST Response A-levels		KWI Turbine SHUTDOWN (with traffic)					
		Avg Lmax	L01	Leq	L50	L90	Lmin
KWI Turbine OPERATING (with traffic)	Avg Lmax	3.8	4.4	10.5	11.9	15.8	18.0
	L01	4.1	4.7	10.8	12.2	16.1	18.3
	Leq	-2.0	-1.4	4.8	6.1	10.1	12.2
	L50	-2.6	-2.0	4.2	5.5	9.5	11.6
	L90	-4.3	-3.8	2.4	3.8	7.7	9.9
	Lmin	-6.2	-5.6	0.6	1.9	5.9	8.0

Operating - Shutdown Differences (excluding traffic on Route 3)

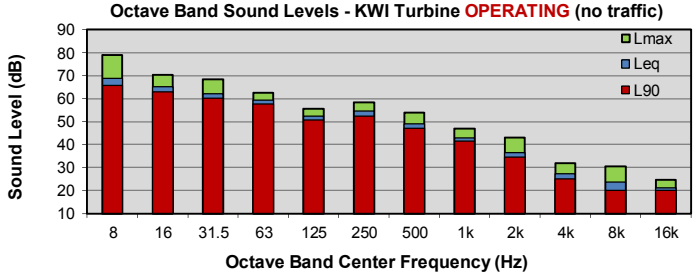
Vertical: KWI Turbine OPERATING (wind turbine only)
Horizontal: KWI Turbine SHUTDOWN (ambient - no traffic)

FAST Response A-levels		KWI Turbine SHUTDOWN (no traffic)					
		Avg Lmax	L01	Leq	L50	L90	Lmin
KWI Turbine OPERATING (no traffic)	Avg Lmax	9.8	9.4	11.3	11.5	12.3	13.0
	L01	10.0	9.6	11.5	11.7	12.6	13.2
	Leq	7.5	7.2	9.1	9.3	10.1	10.7
	L50	7.3	6.9	8.8	9.0	9.9	10.5
	L90	6.1	5.7	7.6	7.8	8.6	9.3
	Lmin	4.8	4.5	6.3	6.5	7.4	8.0

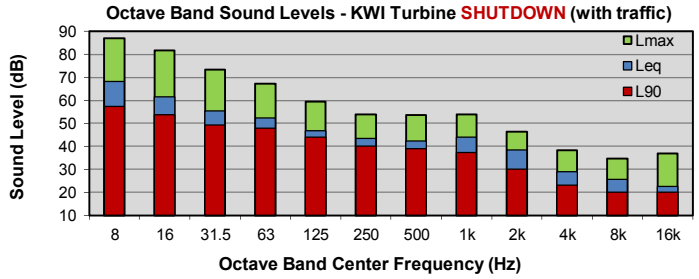
Octave Band Sound Levels - KWI Turbine OPERATING (with traffic)



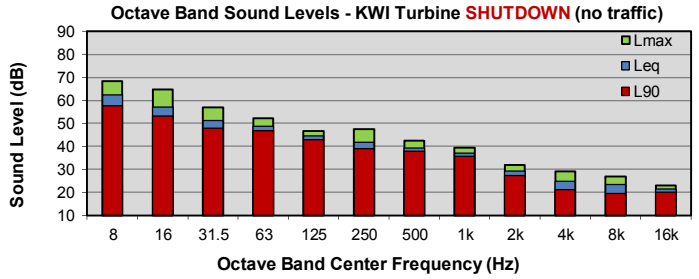
Octave Band Sound Levels - KWI Turbine OPERATING (no traffic)



Octave Band Sound Levels - KWI Turbine SHUTDOWN (with traffic)



Octave Band Sound Levels - KWI Turbine SHUTDOWN (no traffic)



Operating - Shutdown Differences: Overall Comparison

Vertical: KWI Turbine ONLY (excluding traffic on Route 3)
Horizontal: Ambient Sound Levels (including traffic on Route 3)

FAST Response A-levels		KWI Turbine SHUTDOWN (with traffic)					
		Avg Lmax	L01	Leq	L50	L90	Lmin
KWI Turbine OPERATING (no traffic)	Avg Lmax	-1.2	-0.7	5.5	6.8	10.8	13.0
	L01	-1.0	-0.4	5.8	7.1	11.1	13.2
	Leq	-3.4	-2.9	3.3	4.6	8.6	10.7
	L50	-3.7	-3.1	3.0	4.4	8.3	10.5
	L90	-4.9	-4.3	1.8	3.2	7.1	9.3
	Lmin	-6.2	-5.6	0.6	1.9	5.9	8.0

Octave Band Sound Level Comparison: Pure-tone Check

Including traffic on Route 3:

L90 Octave Band Check: KWI Turbine OPERATING		NO KWI PURE TONE	L90 Octave Band Check KWI Turbine SHUTDOWN	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Excluding traffic on Route 3:

Leq Octave Band Check: KWI Turbine ONLY		NO KWI PURE TONE	Leq Octave Band Check Ambient (no traffic)	
Leq Pure-tone?	NO		Leq Pure-tone?	NO
L90 Octave Band Check KWI Turbine ONLY		**NO KWI PURE TONE**	**L90 Octave Band Check Ambient (no traffic)**	
L90 Pure-tone?	NO		L90 Pure-tone?	NO

Acoustical Monitoring Study of Kingston Wind Independence Turbine

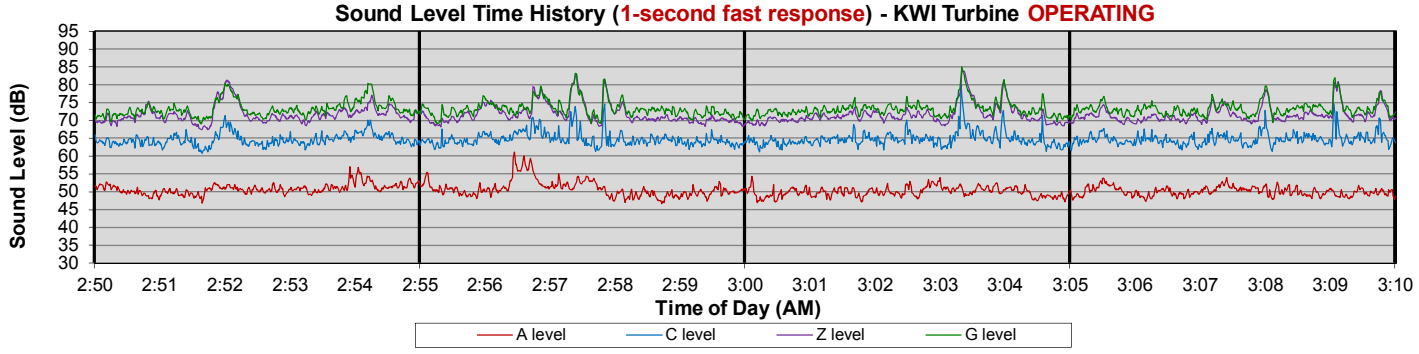
Page B-31: Detailed Acoustical Monitoring Report (fast response) - Wind Turbine Operating

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/15/2014 from 2:50 to 3:10 AM with KWI Turbine OPERATING

Site data		Supervisory Control and Data Acquisition (SCADA) data							
Distance from KWI:	990 ft	Time: 2:40 to 2:50 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 176°	Avg Power Level: 1505 kW	Air Temperature: 40 °F
Wind Speed Range:	0-1 m/s	Time: 2:50 to 3:00 AM	Calibrated Wind Speed: 10.2 m/s	Wind Direction: 177°	Avg Power Level: 1805 kW	Air Temperature: 40 °F
		Time: 3:00 to 3:10 AM	Calibrated Wind Speed: 9.8 m/s	Wind Direction: 179°	Avg Power Level: 1624 kW	Air Temperature: 40 °F

Sound Level Time History (1-second fast response) - KWI Turbine OPERATING



Event Log

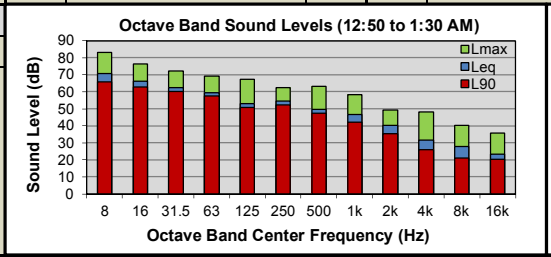
Traffic on Route 3 throughout

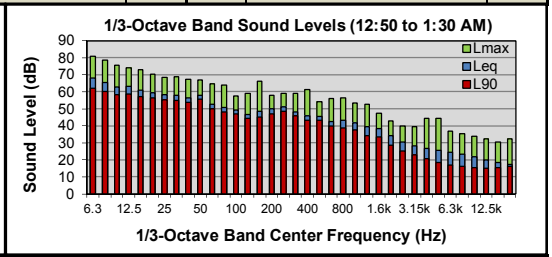
Intermittent wind-generated noise throughout

Fast Response Acoustical Metrics (including traffic on Route 3 and wind noise) - KWI Turbine OPERATING

2:50 to 2:55 AM (100% included)						2:55 to 3:00 AM (100% included)						3:00 to 3:05 AM (100% included)						3:05 to 3:10 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	57.1	71.3	81.2	80.3	6.7	Lmax	61.2	74.6	83.0	83.3	5.6	Lmax	54.3	80.0	84.2	85.0	7.6	Lmax	54.1	74.8	80.9	82.0	5.8
L01	55.4	69.9	80.6	80.1	4.7	L01	59.4	72.4	81.2	81.1	5.2	L01	53.2	72.9	83.1	82.6	5.3	L01	53.2	72.0	79.3	79.7	5.1
Leq	51.1	64.9	72.6	73.9	1.9	Leq	51.8	65.4	73.2	74.1	2.1	Leq	50.1	65.8	72.9	74.1	2.4	Leq	50.3	65.3	72.3	73.8	2.4
L50	50.7	64.4	71.2	72.8	1.8	L50	50.5	64.5	70.8	72.9	1.9	L50	49.8	64.4	70.8	72.8	2.2	L50	50.0	64.5	71.0	73.0	2.2
L90	49.1	62.7	69.4	71.1	0.9	L90	48.4	62.9	69.4	71.0	1.0	L90	48.2	62.7	69.2	71.1	1.2	L90	48.5	63.0	69.6	71.2	1.2
Lmin	46.8	60.8	67.4	69.1	0.3	Lmin	46.7	61.3	68.2	69.0	0.4	Lmin	47.0	61.2	68.5	69.5	0.3	Lmin	47.4	61.4	68.8	69.4	0.4

2:50 to 3:10 AM (100% included)					
Avg	A	C	Z	G	MD
Lmax	56.6	75.2	82.3	82.6	6.4
L01	56.9	71.4	80.9	80.9	5.2
Leq	50.9	65.4	72.8	74.0	2.2
L50	50.3	64.4	71.0	72.9	1.1
L90	48.5	62.8	69.4	71.1	1.1
Lmin	46.7	60.8	67.4	69.0	0.3

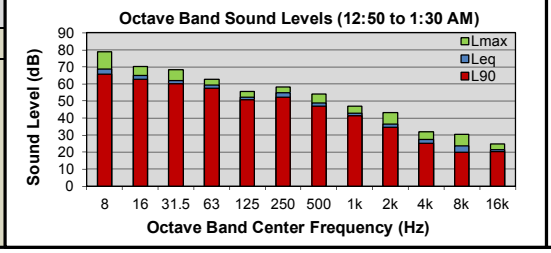


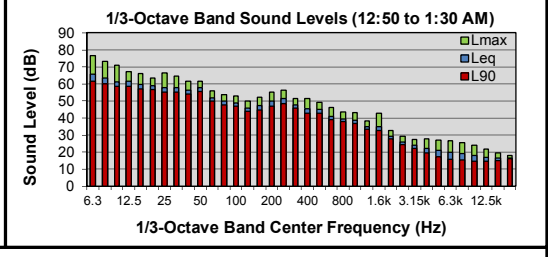


Fast Response Acoustical Metrics (excluding traffic on Route 3 and wind noise) - KWI Turbine OPERATING

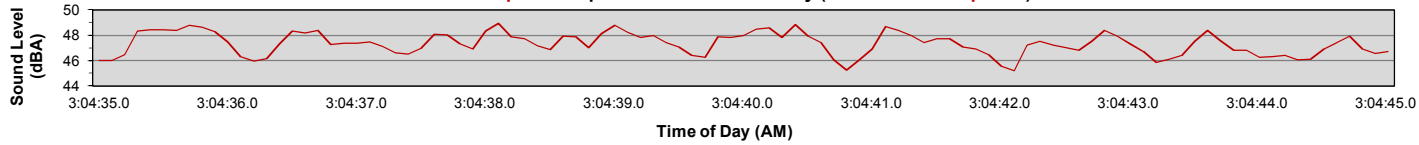
2:50 to 2:55 AM (12% included)						2:55 to 3:00 AM (20% included)						3:00 to 3:05 AM (38% included)						3:05 to 3:10 AM (49% included)					
10.2 m/s	A	C	Z	G	MD	9.3 m/s	A	C	Z	G	MD	9.6 m/s	A	C	Z	G	MD	9.8 m/s	A	C	Z	G	MD
Lmax	50.9	67.5	72.9	74.7	5.8	Lmax	50.8	67.2	75.4	77.2	5.2	Lmax	52.0	71.3	73.7	77.5	5.6	Lmax	52.7	70.7	79.8	79.0	5.8
L01	50.9	67.3	72.7	74.5	5.8	L01	50.8	67.2	75.1	77.1	5.1	L01	51.4	68.7	73.2	77.3	5.4	L01	51.9	69.4	78.2	78.1	5.3
Leq	49.4	64.3	70.6	72.2	2.8	Leq	49.0	64.4	71.5	73.2	2.5	Leq	49.1	64.3	70.6	72.8	2.8	Leq	49.8	64.9	72.0	73.4	2.7
L50	49.4	64.2	70.6	72.4	2.7	L50	48.8	64.0	70.7	72.7	2.3	L50	48.9	64.0	70.5	72.6	2.7	L50	49.6	64.5	71.1	72.9	2.7
L90	48.3	61.6	68.0	70.2	1.8	L90	47.5	62.9	69.9	71.7	1.4	L90	47.5	62.3	69.0	70.9	1.5	L90	48.4	63.1	69.8	71.3	1.5
Lmin	46.8	60.8	67.5	69.1	1.2	Lmin	46.7	62.6	69.4	70.9	0.7	Lmin	47.0	61.2	68.5	69.5	0.8	Lmin	47.4	61.4	69.0	69.4	0.4

2:50 to 3:10 AM (30% included)					
Avg	A	C	Z	G	MD
Lmax	51.6	69.2	75.4	77.1	5.6
L01	51.9	68.7	77.0	77.7	5.3
Leq	49.4	64.6	71.4	73.1	2.7
L50	49.1	64.2	70.7	72.7	2.6
L90	47.9	62.6	69.3	71.1	1.5
Lmin	46.7	60.8	67.5	69.1	0.4





KWI Turbine Modulation Depth Example: A-Level Time History (10th-sec fast response) from 3:04:35 to 3:04:45



Acoustical Monitoring Study of Kingston Wind Independence Turbine

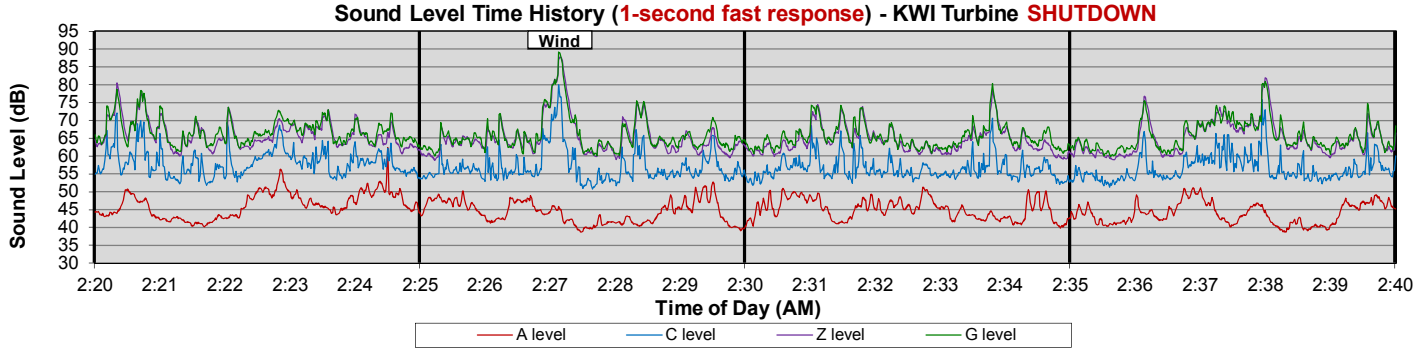
Page B-32: Detailed Acoustical Monitoring Report (fast response) - Wind Turbine Shutdown

HMMH Project # 305270.001

Measurement at Site 2: 3 Leland Rd. on 3/15/2014 from 2:20 to 2:40 AM with KWI Turbine SHUTDOWN

Site data		Supervisory Control and Data Acquisition (SCADA) data							
Distance from KWI:	990 ft	Time: 2:20 to 2:30 AM	Calibrated Wind Speed: 10.0 m/s	Wind Direction: 178°	Avg Power Level: 000 kW	Air Temperature: 40 °F
Wind Speed Range:	0-1 m/s	Time: 2:30 to 2:40 AM	Calibrated Wind Speed: 10.3 m/s	Wind Direction: 177°	Avg Power Level: 000 kW	Air Temperature: 40 °F

Sound Level Time History (1-second fast response) - KWI Turbine SHUTDOWN



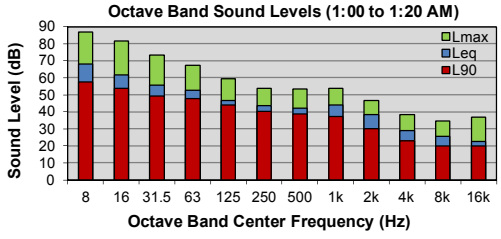
Event Log

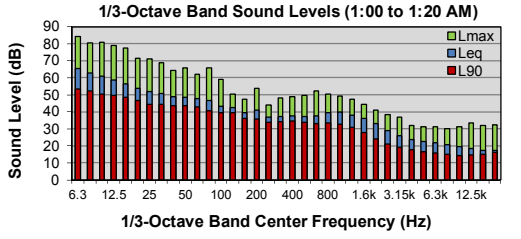
Traffic on Route 3 throughout
Intermittent wind-generated noise throughout
Loud breaking branch noise from 2:24:27 to 2:24:36 (EXCLUDE)

Fast Response Acoustical Metrics (including traffic on Route 3 and wind noise) - KWI Turbine SHUTDOWN

	2:20 to 2:25 AM (97% included)					2:25 to 2:30 AM (100% included)						2:30 to 2:35 AM (100% included)						2:35 to 2:40 AM (100% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	56.3	72.0	80.5	78.6	3.0	Lmax	52.7	79.9	87.7	89.1	4.1	Lmax	51.3	70.7	78.4	80.3	5.4	Lmax	51.2	75.8	82.0	80.8	3.6
L01	54.7	69.6	77.6	77.7	2.2	L01	51.6	76.1	86.9	85.8	3.2	L01	50.7	67.1	74.4	76.2	3.5	L01	50.8	68.8	79.8	79.9	2.5
Leq	47.6	60.4	68.4	68.8	0.9	Leq	45.4	62.3	72.1	72.4	1.0	Leq	46.0	58.0	66.3	67.3	1.1	Leq	44.9	59.4	68.5	68.4	1.0
L50	45.8	57.7	65.4	66.4	0.8	L50	44.0	55.6	63.6	64.5	0.8	L50	45.1	55.6	63.5	64.4	0.9	L50	43.5	55.3	63.8	64.4	0.9
L90	41.7	53.8	62.3	63.2	0.5	L90	40.3	53.1	60.5	61.7	0.5	L90	41.4	53.6	60.7	62.1	0.6	L90	40.2	53.2	60.2	61.5	0.5
Lmin	40.1	51.8	60.1	61.2	0.2	Lmin	38.7	50.8	58.8	60.0	0.2	Lmin	39.8	51.9	59.2	60.7	0.3	Lmin	38.7	51.4	58.9	59.9	0.2

2:20 to 2:40 AM (99% included)					
Avg	A	C	Z	G	MD
Lmax	52.8	74.6	82.1	82.2	4.0
L01	52.3	70.8	80.6	80.1	2.9
Leq	46.1	60.3	69.4	69.7	1.0
L50	44.8	55.9	64.1	64.9	0.9
L90	40.8	53.4	60.6	61.9	0.5
Lmin	38.7	50.8	58.8	59.9	0.2

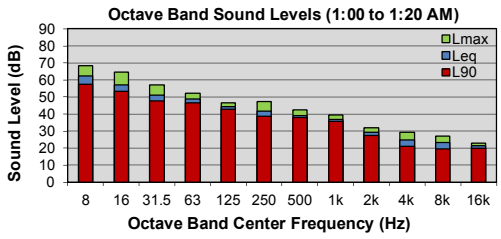


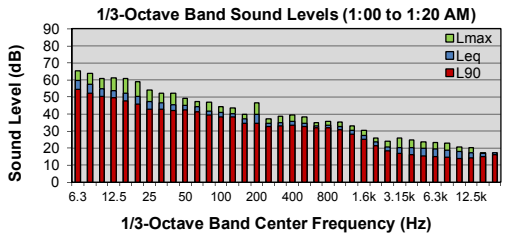


Fast Response Acoustical Metrics (excluding traffic on Route 3 and wind noise) - KWI Turbine SHUTDOWN

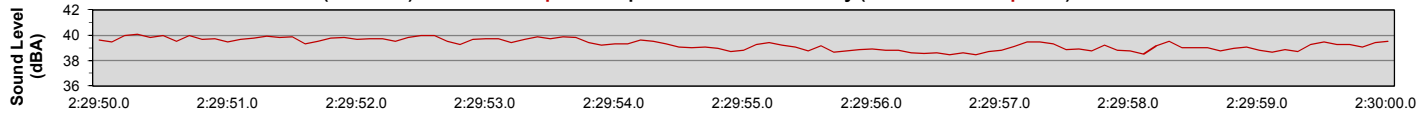
	2:20 to 2:25 AM (3% included)					2:25 to 2:30 AM (12% included)						2:30 to 2:35 AM (3% included)						2:35 to 2:40 AM (15% included)					
	A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD		A	C	Z	G	MD
Lmax	41.4	60.9	69.0	68.0	1.2	Lmax	42.0	59.5	67.3	67.7	2.0	Lmax	41.4	58.9	64.8	65.9	1.5	Lmax	42.5	63.7	69.1	72.5	2.3
L01	41.4	60.7	68.9	68.0	1.2	L01	41.9	59.1	67.1	67.6	1.9	L01	41.4	58.7	64.6	65.7	1.4	L01	42.4	63.4	69.1	72.2	2.1
Leq	40.9	57.0	67.4	66.6	0.7	Leq	40.1	54.9	63.2	64.2	0.9	Leq	40.9	54.7	61.8	63.3	0.9	Leq	40.2	55.7	64.1	65.8	1.0
L50	41.0	55.1	67.6	66.8	0.7	L50	40.0	54.1	62.7	63.8	0.8	L50	41.1	53.3	61.8	62.9	0.9	L50	40.2	53.8	62.5	63.1	0.9
L90	40.3	52.9	65.9	64.8	0.5	L90	39.2	51.5	60.4	61.0	0.6	L90	40.0	52.5	59.3	61.4	0.5	L90	39.2	52.4	60.0	61.3	0.5
Lmin	40.1	52.7	64.9	64.3	0.3	Lmin	38.7	50.8	59.9	60.2	0.3	Lmin	39.8	52.3	59.2	60.7	0.4	Lmin	38.7	51.4	59.4	60.1	0.3

2:20 to 2:40 AM (8% included)					
Avg	A	C	Z	G	MD
Lmax	41.9	60.7	67.5	68.5	1.7
L01	42.2	63.1	69.0	71.9	2.0
Leq	40.3	55.5	64.0	65.1	0.9
L50	40.1	53.8	62.5	63.4	0.9
L90	39.3	51.9	60.0	61.2	0.5
Lmin	38.7	50.8	59.2	60.1	0.3





Ambient (no traffic) Modulation Depth Example: A-Level Time History (10th-sec fast response) from 2:29:50 to 2:30:00



APPENDIX C – DESCRIPTION OF NOISE METRICS

This Appendix describes the noise terminology and metrics used in this report.

Decibels (dB), Frequency and the A-weighted Sound Level (dBA)

Loudness is a subjective quantity that enables a listener to order the magnitude of different sounds on a scale from soft to loud. Although the perceived loudness of a sound is based somewhat on its frequency and duration, chiefly it depends upon the sound pressure level. Sound pressure level is a measure of the sound pressure at a point relative to a standard reference value; sound pressure level is always expressed in decibels (dB).

Decibels are logarithmic quantities, so combining decibels is unlike common arithmetic. For example, if two sound sources each produce 100 dB operating individually and they are then operated together, they produce 103 dB. Each doubling of the number of sources produces another three decibels of noise. A tenfold increase in the number of sources makes the sound pressure level go up 10 dB, and a hundredfold increase makes the level go up 20 dB. If two sources differ in sound pressure level by more than 10 decibels, then operating together, the total level will approximately equal the level of the louder source; the quieter source doesn't contribute significantly to the total.

People hear changes in sound level according to the following rules of thumb: 1) a change of 1 decibel or less in a given sound's level is generally not readily perceptible except in a laboratory setting; 2) a 5-dB change in a sound is considered to be generally noticeable in a community setting; and 3) it takes approximately a 10-dB change to be heard as a doubling or halving of a sound's loudness.

Another important characteristic of sound is its frequency, or "pitch." This is the rate of repetition of sound pressure oscillations as they reach our ears. Frequency is expressed in units known as Hertz (abbreviated "Hz" and equivalent to one cycle per second). Sounds heard in the environment usually consist of a range of frequencies. The distribution of sound energy as a function of frequency is termed the "frequency spectrum."

The human ear does not respond equally to identical noise levels at different frequencies. Although the normal frequency range of hearing for most people extends from a low of about 20 Hz to a high of 10,000 Hz to 20,000 Hz, people are most sensitive to sounds in the voice range, between about 500 Hz to 2,000 Hz. Therefore, to correlate the amplitude of a sound with its level as perceived by people, the sound energy spectrum is adjusted, or "weighted."

The weighting system most commonly used to correlate with people's response to noise is "A-weighting" (or the "A-filter") and the resultant noise level is called the "A-weighted noise level" (dBA). A-weighting significantly de-emphasizes those parts of the frequency spectrum from a noise source that occurs both at lower frequencies (those below about 500 Hz) and at very high frequencies (above 10,000 Hz) where we do not hear as well. The filter has very little effect, or is nearly "flat," in the middle range of frequencies between 500 and 10,000 Hz. In addition to representing human hearing sensitivity, A-weighted sound levels have been found to correlate better than other weighting networks with human perception of "noisiness." One of the primary reasons for this is that the A-weighting network emphasizes the frequency range where human speech occurs, and noise in this range interferes with speech communication. Another reason is that the increased hearing sensitivity makes noise more annoying in this frequency range.

Maximum Sound Level (L_{max})

The variation in sound level over time often makes it convenient to describe a particular noise "event" by its maximum sound level, abbreviated as $L_{max.}$ The maximum level describes only one dimension of an event; it provides no information on the cumulative noise exposure. In fact, two events with identical maxima may produce very different total exposures. One may be of very short duration, while the other may continue for an extended period and be judged more annoying.

Equivalent Sound Level (L_{eq})

The Equivalent Sound Level, abbreviated L_{eq}, is a measure of the total exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest -- for example, an hour, an 8-hour school day, nighttime, or a full 24-hour day. However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric.

L_{eq} may be thought of as a constant sound level over the period of interest that contains as much sound energy as (is “equivalent” to) the actual time-varying sound level with its normal peaks and valleys. It is important to recognize, however, that the two signals (the constant one and the time-varying one) would sound very different from each other. Also, the “average” sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic, or “energy-averaged” sound level. Thus, the loudest events may dominate the noise environment described by the metric, depending on the relative loudness of the events.

Statistical Sound Level Descriptors

Statistical descriptors of the time-varying sound level are often used to provide more information about how the sound level varied during the time period of interest. The descriptor includes a subscript that indicates the percentage of time the sound level is exceeded during the period. The L_{50} is an example, which represents the sound level exceeded 50 percent of the time, and equals the median sound level. Another commonly used descriptor is the L_{01}, which represents the sound level exceeded 1 percent of the measurement period and describes the sound level during the loudest portions of the period. The L_{90} is often used to describe the quieter background sound levels that occurred, since it represents the level exceeded 90 percent of the period.