HGC ENGINEERING

Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203
Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044

June 8, 2015

Via email mreilly@masoncounty.net

Mary Reilly
Mason County
304 E. Ludington Avenue
Ludington, Michigan
49431

Re: Sound Level Testing, March and April, 2015
Post Construction Sound Survey for the Lake Winds Energy Park, Mason County, MI

Dear Ms. Reilly,

Howe Gastmeier Chapnik Limited ("HGC Engineering") was retained by Mason County to perform additional post construction sound monitoring of the Lake Winds Energy Park ("LWEP") operated by Consumers Energy Company ("Consumers Energy") in Mason County, Michigan. The sound survey was conducted by HGC Engineering personnel in conjunction with Tech Environmental personnel, based on a commitment by Consumers Energy related to the zoning approvals for the project.

An initial sound level assessment of the facility was conducted by HGC Engineering in April and May of 2013. The results of that assessment, presented in the Post Construction Sound Survey, dated August 2, 2013 and a supplementary report dated September 12, 2013, indicated that the sound levels from the LWEP exceeded the 45 dBA standard (for unpooled parcels) at study sites 1, 2, 6 and 7. Measurements conducted at study site 5 were incomplete and not sufficient to allow a conclusion.

Subsequently, Consumers Energy prepared a Sound Mitigation Plan for the LWEP, dated April 18, 2014. The plan committed to operating a number of wind turbine generators in Noise Reduced Operating ("NRO") modes to reduce their sound power emission levels. The sound power levels of turbines 6, 15, 20, 23, 28, 32, and 35 were each reduced by 2 dBA (NRO Mode 2). In practice the actual expected sound level reduction at any receptor is less than 2 dB because only some of the surrounding turbines are operated in NRO Mode 2. The predicted sound level reductions with the mitigation plan are -1.1 dBA, -1.3 dBA, -1.6 dBA and -1.4 dBA for measurement locations 1, 2, 6, and 7, respectively. No mitigation has been put in place to address location 5. As part of the Mitigation Plan, Consumers Energy committed to verifying the predicted sound reductions through sound testing.

Sound level testing was conducted in the fall of 2014 to assess the compliance of the LWEP with the Sound Mitigation Plan. The results of the fall 2014 testing were not conclusive. Wind conditions were not favourable during the testing periods and measurement data was not acquired under

required operating conditions. The recommendation from the Mason County Planning Commission was to schedule additional measurements when weather conditions were suitable.

The most recent sound level testing occurred between March 23 and 29, 2015 and April 6 and 12, 2015. Measurements were conducted at receptor locations identified as Location 1, 2, 5, 6 and 7 as shown in Figure 1.

Test Plan

The testing methodology included sound level testing following the requirement outlined in the Mason County Zoning Ordinance and the procedures of ANSI Standard S12.9/Part 3, with an observer present, and ANSI Standard S12.18. The test procedure included several prearranged turbine-ON and turbine-OFF sequences where 10 minute average (L_{EQ}) sound level measurements were obtained. During the turbine-OFF condition, turbines within an 8000 ft radius of the measurement location were shutdown. Additional details of the test protocol are included under Appendix 2 of the Consumers Energy letter to Mason County, dated April 18, 2014 which was recently updated on May 8, 2015 (attached).

In order for the results of the testing to be considered valid, the turbines operating in NRO Mode 2 must be producing at least 1300 kW to be at maximum sound power level, while turbines operating in unrestricted operation mode (Mode 0) must be producing at least 90% of rated electrical power. Consumers Energy supplied electrical output and hub height wind speeds for the wind turbines within 8000 ft of each test location to assist with determining the validity of each test. This data was to be treated by HGC Engineering as commercially confidential and is not reproduced in full detail here.

Instrumentation

Two Norsonic N-140 Sound Level Meters were used for the attended acoustic measurements. Table 1 provides details of the instrumentation utilized for the testing. The clocks of all instruments were synchronized with the turbine data collection system prior to the measurements.

Table 1: Instrumentation Used for Attended Sound Level Measurements

Instrument Make and Model	Instrument Serial Number
Norsonic N-140 Integrating Sound Level Meter	1405028
Norsonic N-140 Integrating Sound Level Meter	1405033

Correct calibration of all acoustic instrumentation was verified using acoustic calibrators manufactured by Brüel and Kjær. Calibration was carried out prior to the start of each measurement period and at the end of each measurement period. All instruments were equipped with ½" diameter microphones placed at a measurement height of approximately 1.5 meters. 175 mm diameter wind screens were used on all microphones to minimize the contribution of direct wind noise on the microphone.

The sound level meters were configured to record the overall 10 minute L_{EQ} in 1/3 octave band spectrum, with 10 second L_{EQ} data stored for post processing.

Ground level wind speeds, temperature, and humidity during the attended measurements were collected utilizing two Kestrel Weather Meters (type 4500).

Measurements

The sound level measurement campaign was conducted during the evening and overnight hours between March 23 and 29, 2015 and April 6 and 12, 2015. Concurrent sound level testing was completed by Tech Environmental on behalf of Consumers Energy. Where the wind and weather conditions were suitable for measurements, and the output of the LWEP was predicted to be within the prescribed conditions, sound level testing was conducted. The test locations, general wind direction, site observations, electrical power and the measurement validity are identified in Table 2. Measurements are considered valid if the electrical power output of the turbines meets the protocol requirements and the wind conditions are similar for both the ON and OFF testing.

For many of the measurement sites the electrical power was below the required values during the test. However, from all tests the best data set has been selected (highlighted in yellow on Table 2), as the results still provide valuable information regarding the sound level compliance of the LWEP. If the electrical output was less than that prescribed by the testing methodology, but the 45 dBA standard was nonetheless exceeded, then it necessarily follows that the LWEP would be over the 45 dBA standard when the electrical power output is at the higher level prescribed by the testing methodology.

The highlighted data sets from Table 2, are discussed in detail following this section.

Table 2: Attended Sound Level Measurement Summary

Date	Loc.	Wind Direction	Comments	Electrical Power	Valid	Detail
March 24	5	SE	Low ground winds, hub height up to 7.5 m/s.	Below	No	
	6	SE	Low ground winds, hub height up to 7.5 m/s.	Below	No	
March 25	2	SW	Low ground winds, hub height near 10 m/s and dropping.	Below	No	A
	5	SW	Low ground winds, hub height near 10 m/s and dropping.	Below	No	
March 26	1	N	Gusty ground level winds.	Above	No	
	5	N	Gusty ground level winds.	Below	No	
	7	N	Periods of gusty winds at ground.	Below	No	B
	6	N	Periods of gusty winds at ground.	Above	No	
March 28/29	1	S	Low ground winds, 8-11 m/s at hub height.	Below	No	
	5			Below	No	C
	6			Below	No	
April 6/7	6	E	Ground winds moderate. Hub height winds 6 -10 m/s. Significant frogs at both locations (2500 to 4000 Hz). Cooling fans dominate for first couple OFF conditions (250 and 800 Hz). Winds dropping after second ON condition.	Below	No	D
	7			Below	No	E
April 7/8	2	E	Ground winds high at Loc 7, but turbines near full power production. Ground winds higher during OFF than ON. Location 2 - dissimilar wind conditions between OFF and ON. Spotty rain showers from 11:00 to 12:10. Steady rain began around 12:30.	Above	No	
	5			Above	Yes	F
	7			Above	Yes	G
April 8		E	No testing, winds low.	Below	No	
April 9/10	1	S	Rain in evening. Measurements conducted at 03:00 onwards. Very gusty winds including at ground. Insufficient valid data points due to winds gusts.	Above	No	
	5			Above	No	
April 11/12	1	S	Measurements conducted starting at 12:50. South wind started relatively strong but dropped as the morning progressed. Relatively high wind shear. Lots of frogs at a couple locations.	Above	Yes	H
	2			Below	No	
	5			Below	No	
	6			Below	No	

Note that in Tables 3 through 10, the ON-OFF row reflects a logarithmic subtraction of the ON condition with the OFF condition. A 1.5 dB uncertainty factor was subtracted from the background sound in the ON-OFF calculation as per ANSI/ASA S12.9-2013 Part 3 Section 7.3.2 (a). The tables also indicate the number of valid data points which include filters for interfering sound (wind gusts, dog barks, cars, etc.). The minimum number of data points required under the ANSI standard is five minutes of data or 30 data points for a measurement to be considered valid.

During the turbine OFF conditions the cooling fans on the turbines operate and the turbines will occasionally yaw (rotate) to adjust for changes in wind direction. The turbine yawing was noted as interference in the measurement data sets. Because the cooling fans typically operate at discrete frequencies, calculations could be completed to determine the contribution of the cooling fans to the turbine OFF sound levels. The calculations indicate background sound levels, without the contribution of the cooling fans could be approximately 1 dBA quieter. The 1.5 dB uncertainty factor determined above, is sufficient to address the contribution of the cooling fans to the background sound.

Location 1

Measurement Set H, April 12, 2015

Sound level measurements on April 12 commenced at 00:45. Electrical power output for the closest turbines were above the required level. Ground level winds were moderate with the ON and OFF both having an average of 2.6 m/s which provided a good separation of the ON and OFF sound level data. Table 3 shows the overall results. Additional details are included in Figures 2 and 3 and in Appendix A.

Table 3: Sound Level Summary April 12, 2015, Location 1

Date	Start Time	L_{AEQ}	Valid Data	Condition
12-Apr-15	00:48:00	45.0	43	ON
12-Apr-15	01:42:00	38.5	56	OFF
		44.3		ON-OFF

The sound level measurements and subsequent review of the turbine data indicate the LWEP is in compliance at Location 1. Nonetheless, sound level mitigation, in the form of the 1.1 dBA reduction, is required to maintain compliance with the 45 dBA standard at Location 1.

Location 2

Measurement Set A, March 25, 2015

Sound level measurements conducted on March 25 starting at 20:00 were completed with wind speeds at hub height producing electrical power slightly less than that required. The closest Mode 2 turbines were operating slightly below the required output, as were the two closest Mode 0 turbines.

Ground level winds were low (ie. there was high wind shear) which resulted in a good separation between the ON and OFF measurements and there was very little interfering sound (only two data points) during the measurements. Overall this data represents an excellent condition for testing. Table 4 shows the overall results. Additional details are included in Figures 4 and 5 and in Appendix A.

Table 4: Sound Level Summary March 25, 2015, Location 2

Date	Start Time	L_{AEQ}	Valid Data Points	Condition
25-Mar-15	20:09:40	45.2	60	ON
25-Mar-15	20:44:50	37.0	58	OFF
		44.7		ON-OFF

The sound level measurements, under the observed turbine electrical output, indicate the LWEP is operating in compliance at Location 2. Note that an increase in the electrical power output to the minimum required levels for the testing protocol, using straight line interpolation, is predicted to increase the sound power level of each of the closest surrounding wind turbines by approximately 0.3 dBA. If the measured data are increased by the estimated amount, the sound level from the LWEP would be operating at the sound level criteria. This strongly indicates that the current sound level mitigation, in the form of the overall 1.3 dBA reduction, is both necessary and sufficient to comply with the 45 dBA standard at Location 2.

Location 5

Measurement Set C, March 29, 2015

Sound level measurements on March 29 commenced at 03:00 under a south wind, where wind speeds at hub height and the electrical power output were slightly below required. Ground level winds were low with an average of approximately 1.7 m/s for both the ON and OFF measurements. A good sound level separation was measured between the ON and OFF data with very little interference. Table 5 shows the overall results. Additional details are included in Figures 6 and 7 and in Appendix A.

Table 5: Sound Level Summary March 29, 2015, Location 5

Date	Start Time	L_{AEQ}	Valid Data	Condition
29-Mar-15	04:27:40	44.8	60	ON
29-Mar-15	05:03:10	32.2	55	OFF
		44.6		ON-OFF

Although the required power output was not achieved during this measurement set, the sound level measurements and subsequent review of the turbine data indicate that an increase to full sound power level for the closest turbine (straight line interpolation) could result in an increase of 0.6 dBA and potentially a minor exceedance of the 45 dBA standard by 0.2 dBA at Location 5. Reaching this

conclusion requires interpolation, however, the same conclusion is supported by the additional data set presented below, which does not require interpolation.

Measurement Set F, April 7, 2015

Sound level measurements on April 7 commenced at 20:00. Wind speeds at hub height and the electrical power output were above the required level. Ground level winds were moderate with the ON and OFF having averages of 3.4 and 3.2 m/s, respectively. There was good sound level separation between the ON and OFF measurements with a moderate level of interference during the ON condition. Table 6 shows the overall results. Additional details are included in Figures 8 and 9 and in Appendix A.

Table 6: Sound Level Summary April 7, 2015, Location 5

Date	Start Time	L_{AEQ}	Valid Data	Condition
07-Apr-15	21:48:00	45.8	43	ON
07-Apr-15	20:53:10	36.9	56	OFF
		45.4		ON-OFF

The sound level measurements and subsequent review of the turbine data indicate a minor exceedance of the 45 dBA standard by approximately 0.4 dBA at Location 5, which could be corrected if the noise mitigation plan is expanded further over the entire project.

Location 6

Measurement Set D, April 6, 2015

Sound level measurements on April 6 commenced at 22:00, where wind speeds at hub height and the electrical power output were slightly below required. Ground level winds were moderate during the ON condition at 2.8 m/s and during the two off periods were 2.9 and 1.9 m/s, respectively. There was a high degree of variability in the wind speeds over the measurement window and as a result a poor separation between the ON and OFF data. Data for two OFF conditions are included in the analysis. Both data sets for the OFF condition are not ideal, as either the hub height winds changed by approximately 1.5 m/s or the ground level winds decreased by 0.8 m/s. The measurements presented below are chosen on the basis of the most similar wind speeds. Table 7 shows the overall results. Additional details are included in Figures 10, 11 and 12, and in Appendix A.

Table 7: Sound Level Summary April 6, 2015, Location 6

Date	Start Time	L_{AEQ}	Valid Data	Condition
06-Apr-15	22:00:00	45.5	55	ON
06-Apr-15	23:10:00	43.2	53	OFF_A
07-Apr-15	00:02:00	39.3	57	OFF_B
		43.2		$ON\text{-}OFF_A$
		44.7		$ON\text{-}OFF_B$

The two results are both within compliance by 1.8 and 0.3 dBA respectively. While the analysis does not strictly follow the requirements of the testing protocol, it suggests that mitigation in the form of a 1.6 dBA overall reduction is necessary and sufficient to maintain compliance with the 45 dBA standard at Location 6.

Location 7

Measurement Set B, March 26, 2015

Sound level measurements on March 26 commenced at 20:00, where hub height wind speeds and the electrical power output met the requirements for one Mode 2 turbine and were slightly below for the second. The closest Mode 0 turbine was operating moderately below the required output. Ground level winds were high, with an average of 5 m/s for both the ON and OFF measurements. There was a moderate level of interference in the data sets due to wind gusts and other interfering sound. Table 8 shows the overall results. Additional details are included in Figures 13 and 14 and in Appendix A.

Table 8: Sound Level Summary March 26, 2015, Location 7

Date	Start Time	L_{AEQ}	Valid Data	Condition
26-Mar-15	20:30:30	46.0	37	ON
26-Mar-15	21:02:00	40.3	38	OFF
		45.1		ON-OFF

As the electrical power of the closest wind turbines was slightly less than required, a review of the sound level measurements and adjustments for increased sound power level of the turbines indicates a minor exceedance of the 45 dBA standard by 0.1 dBA at Location 7, for this data set.

Measurement Set E, April 6, 2015

Sound level measurements on April 6 commenced at 21:50. Wind speeds at hub height and the electrical power output were slightly below required. Ground level winds were moderate with the ON and OFF data sets having averages of 3.4 and 3.2 m/s, respectively. This data set is the best data set for Location 7 as there was less interfering sound during this measurement set than on March 26

or April 7, which provided for an adequate separation between the ON and OFF data. Table 9 shows the overall results. Additional details are included in Figures 15 and 16 and in Appendix A.

Table 9: Sound Level Summary April 6, 2015, Location 7

Date	Start Time	L_{AEQ}	Valid Data	Condition
06-Apr-15	21:53:00	46.0	55	ON
07-Apr-15	22:57:00	40.6	50	OFF
		45.0		ON-OFF

The result is identically at the compliance limit, but as with Location 6, as the electrical power of the closest wind turbines was slightly less than required, there may be a minor exceedance of the 45 dBA standard at Location 7, for this data set.

Measurement Set G, April 7, 2015

Sound level measurements on April 7 commenced at 20:00. Electrical power output for the closest turbines were above the required level. Ground level winds were strong with the ON and OFF having averages of 4.4 and 4.7 m/s, respectively. There was a significant amount of interference during these measurement sets due to ground level wind gusts (low wind shear) and is therefore a weak data set. Table 10 shows the overall results. Additional details are included in Figures 17 and 18 and in Appendix A.

Table 10: Sound Level Summary April 7, 2015, Location 7

Date	Start Time	L_{AEQ}	Valid Data	Condition
7-Apr-15	21:48:00	47.0	39	ON
7-Apr-15	20:51:20	43.9	31	OFF
		45.2		ON-OFF

The sound level measurements and subsequent review of the turbine data again indicates a minor exceedance of the 45 dBA standard at Location 7. This is consistent with the measurement results presented under Set B and E when considering the slight increase in sound power level for full electrical output on the closest turbines.

Conclusions

HGC Engineering conducted a sound level monitoring campaign at the Lake Winds Energy Project during the weeks of March 23-29, 2015 and April 6-12, 2015. Sound level testing was conducted at five locations during nighttime hours when wind and weather conditions were suitable during prearranged turbine-ON and turbine-OFF sequences.

The results were collected and obtained using methodologies and testing protocols that strictly complied with the Mitigation Plan that the County and Consumers Energy Company had jointly

approved in advance, as set forth above, at Page 2 of this report. The only exception is that some of the results were obtained when the electrical power of the turbines was slightly less than that prescribed by the testing methodology. In those few instances, HGC relied on the data obtained during periods that were closest to the requirements of the testing protocol.

The testing results support all of the following conclusions:

Location 1: The measurements collected at Location 1, under mitigated conditions, show compliance with the 45 dBA standard of the Mason County Zoning Ordinance. The measurements further show that the NRO modes for turbines WTG20 and WTG23 and the resulting predicted 1.1 dBA reduction, is both necessary and sufficient to maintain compliance with the 45 dBA standard.

Location 2: The measurements collected at Location 2, under mitigated conditions, show compliance with the 45 dBA standard of the Mason County Zoning Ordinance. These results were obtained, however, when the electrical power was slightly less than that prescribed by the testing methodology. When consideration is given to the increased sound power levels under full operating conditions, the LWEP is predicted to be nearly identical to the 45 dBA standard. Therefore, the NRO modes of WTG6 and WTG15, and the resulting predicted sound level reduction of 1.3 dBA, is both necessary and sufficient to maintain compliance with the 45 dBA standard.

Location 5: The measurements collected at Location 5 indicate a minor exceedance of the 45 dBA standard of the Mason County Zoning Ordinance, by levels of up to 0.4 dBA. Currently there are no mitigation measures implemented on the surrounding turbines. Accordingly, NRO modes should be considered in the vicinity of Location 5. The minor sound exceedance at Location 5 could be corrected by placing additional turbines in NRO modes at such time when the mitigation plan is implemented throughout the entire LWEP project.

Location 6: The measurements collected at Location 6, under mitigated conditions, indicate compliance with the 45 dBA standard of the Mason County Zoning Ordinance. These results were obtained, however, when the electrical power was slightly less than prescribed by the testing methodology. When consideration is given to the increased sound power levels under full power operating conditions, the sound level measurements indicate that the NRO mode for WTG28, and the resulting predicted sound level reduction of 1.6 dBA, is both necessary and sufficient to maintain compliance with the 45 dBA standard.

Location 7: The measurements collected at Location 7, under mitigated conditions, indicate a minor exceedance of the 45 dBA standard of the Mason County Zoning Ordinance. The NRO modes for turbines WTG32 and WTG35, and the resulting predicted 1.4 dBA reduction are necessary and should be kept in place. In addition, however, the minor exceedance at Location 7 should be addressed by placing additional turbines in NRO modes, at such time when the mitigation plan is implemented throughout the entire LWEP project.

It is clear from the measurement data and analysis that the sound level mitigation introduced by Consumers Energy is necessary for the LWEP to maintain compliance with the 45 dBA standard of the Mason County Zoning Ordinance. Further, given the minor sound exceedances at Location 5, which has not as yet had any neighboring turbines placed in NRO modes, and at Location 7, which has some neighboring turbines placed in NRO modes, it would be beneficial to expand the mitigation plan over a larger area of the LWEP, so as to ensure full and continuous compliance with the 45 dBA standard.

We trust this meets your current requirements and look forward to discussing the results.

Yours truly,
Howe Gastmeier Chapnik Limited

Ian Bonsma, PEng

Brian Howe, MEng, MBA, PEng

Attachments: Detailed Results
Test Protocol

548000 548500 549000 549500 550000 550500 551000 551500 552000 552500 553000 553500 554000 554500 555000 555500 556000 556500

4861000 4860500 4860000 4859500 4859000 4858500 4858000 4857500 4857000 4856500

1 2 3 4 5 6 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

Location 1 Location 2 Location 5 Location 6 Location 7

W Kinney Rd W Kistler Rd W Hawley Rd. W Meisenheimer Rd W Derren Rd

S Pere Marquette Hwy S Brye Rd S Morton Rd S Stiles Rd S Schwass Rd

Google earth

FRAME COORDINATES ARE UTM IN METRES

548000 548500 549000 549500 550000 550500 551000 551500 552000 552500 553000 553500 554000 554500 555000 555500 556000 556500

Figure 1

Figure 2: Sound Level Measurements at Location 1, Turbines ON
LWEP, Mason County, April 12, 2015

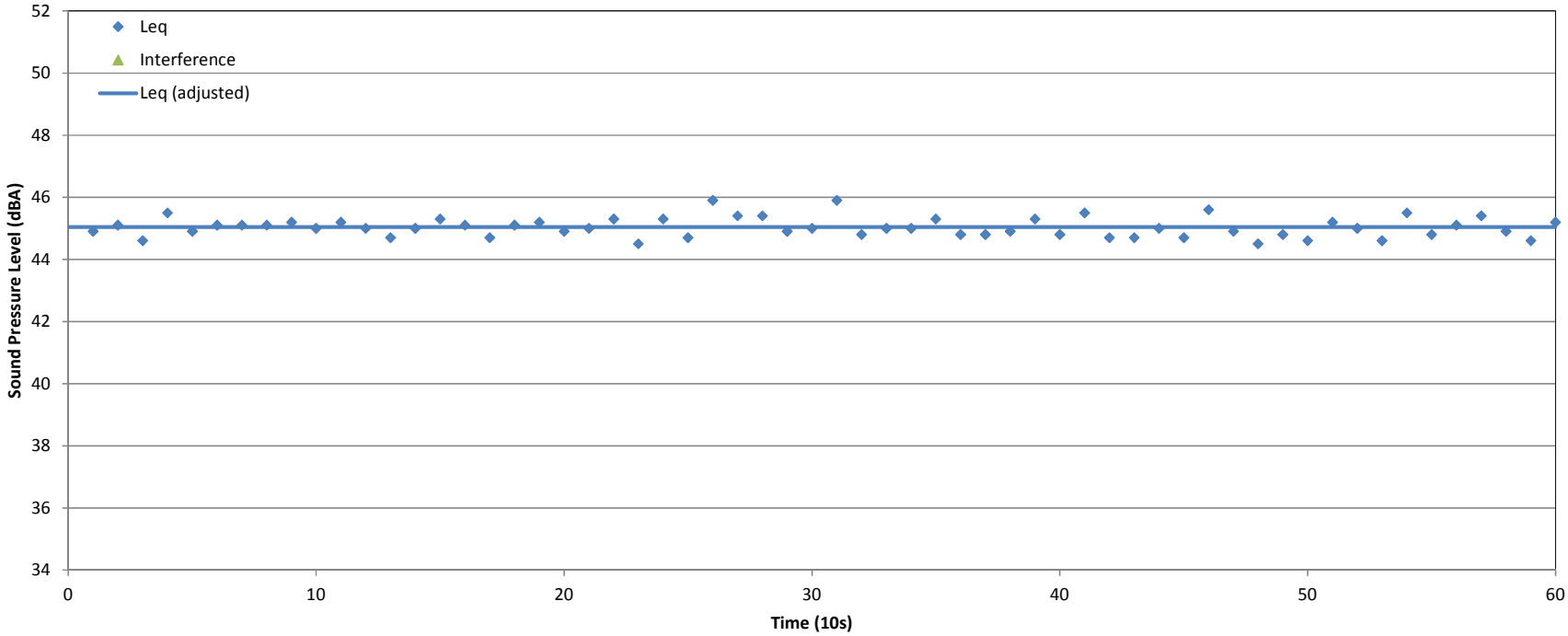


Figure 3: Sound Level Measurements at Location 1, Turbines OFF
LWEP, Mason County, April 12, 2015

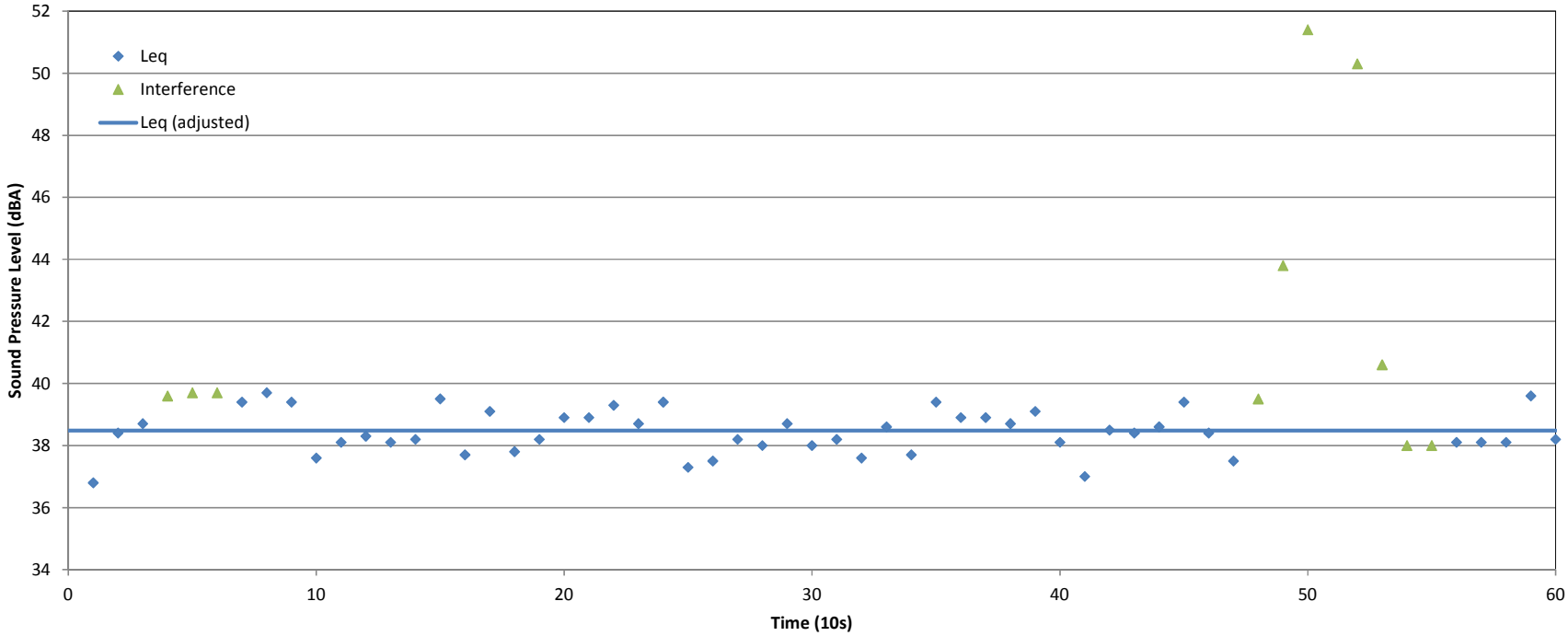


Figure 4: Sound Level Measurements at Location 2, Turbines ON
LWEP, Mason County, March 25, 2015

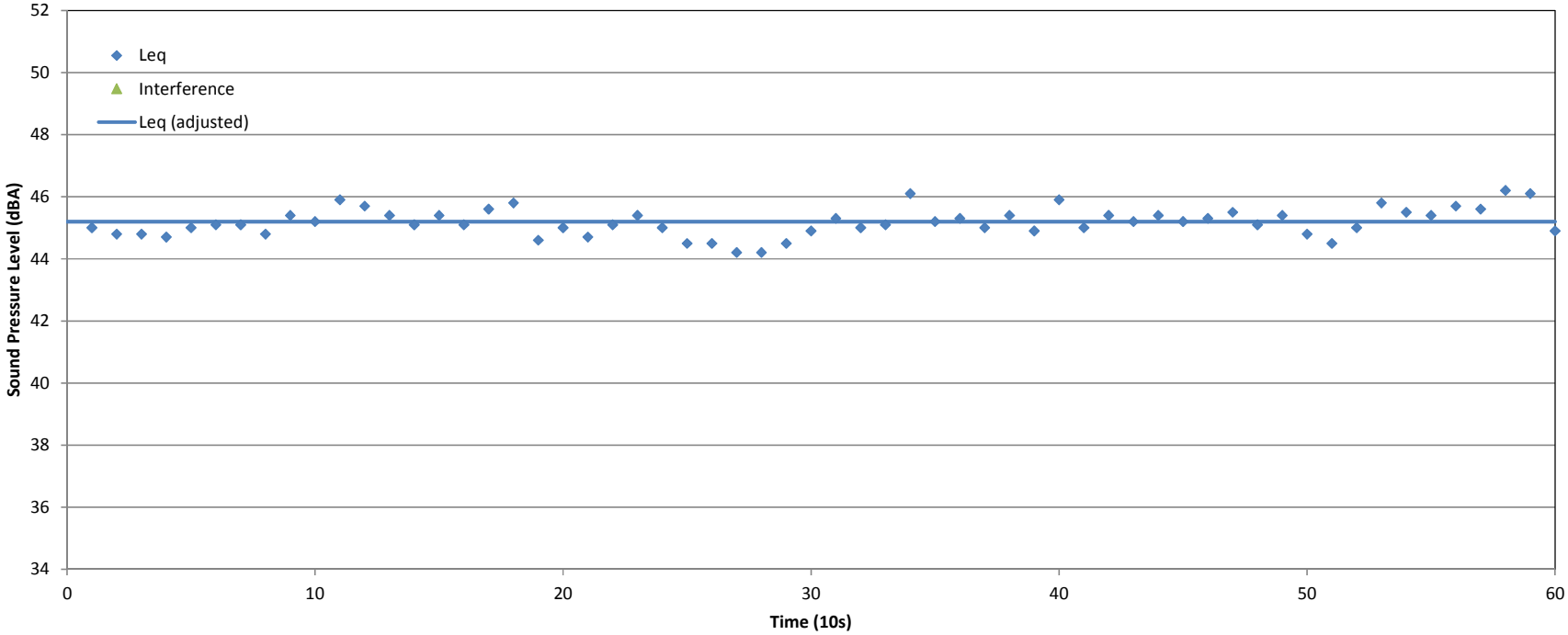


Figure 5: Sound Level Measurements at Location 2, Turbines OFF
LWEP, Mason County, March 25, 2015

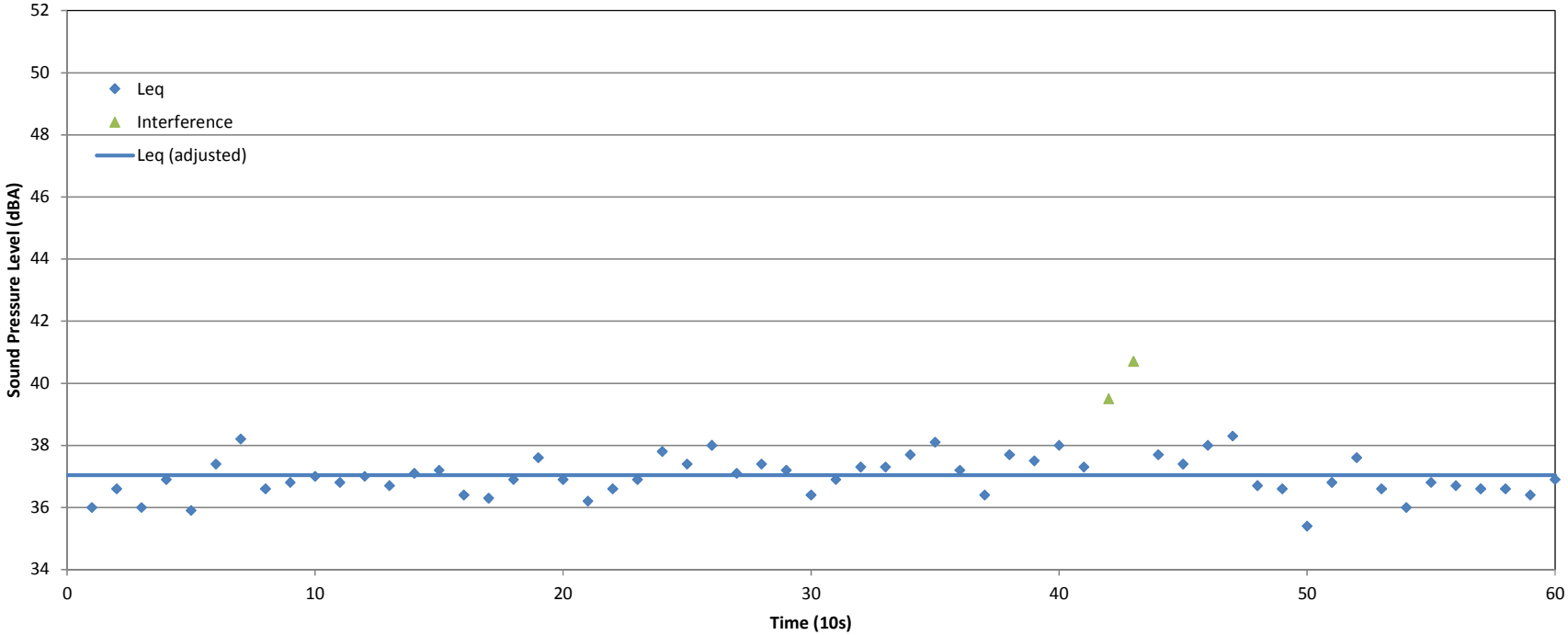


Figure 6: Sound Level Measurements at Location 5, Turbines ON
LWEP, Mason County, March 29, 2015

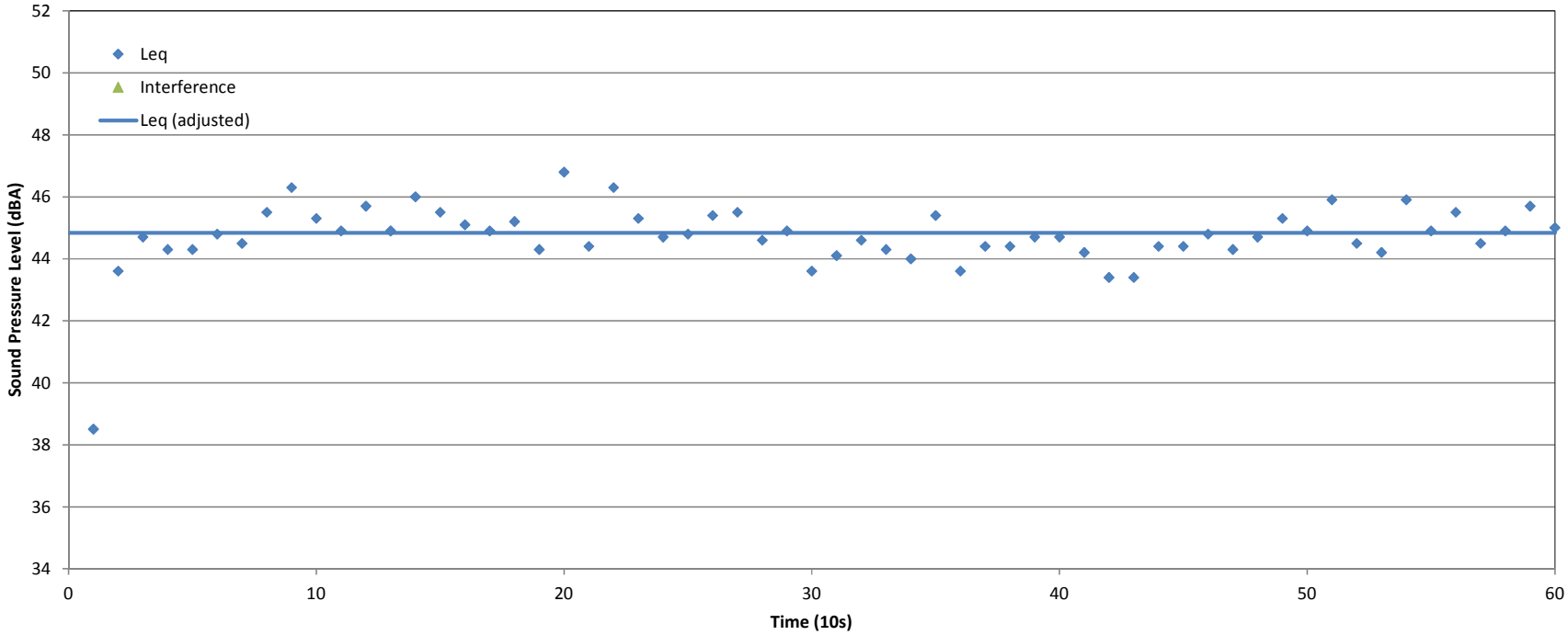


Figure 7: Sound Level Measurements at Location 5, Turbines OFF
LWEP, Mason County, March 29, 2015

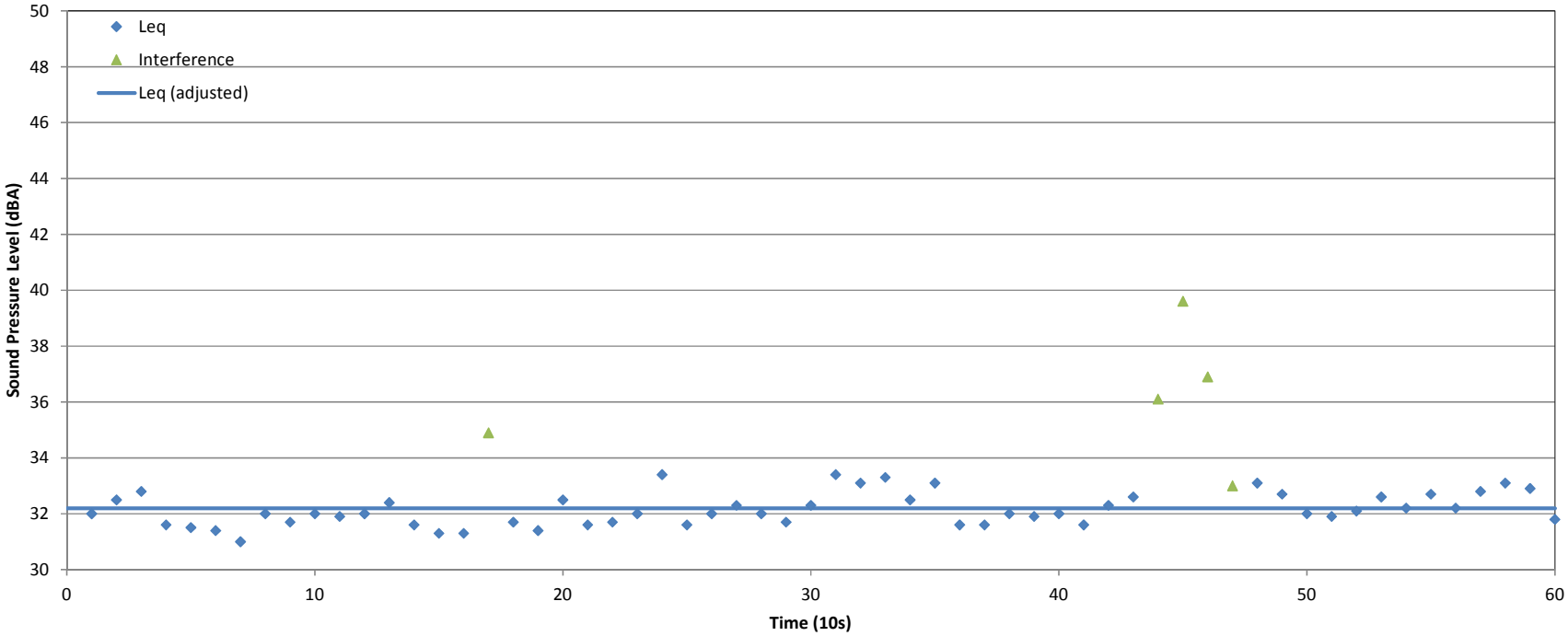


Figure 8: Sound Level Measurements at Location 5, Turbines ON
LWEP, Mason County, April 7, 2015

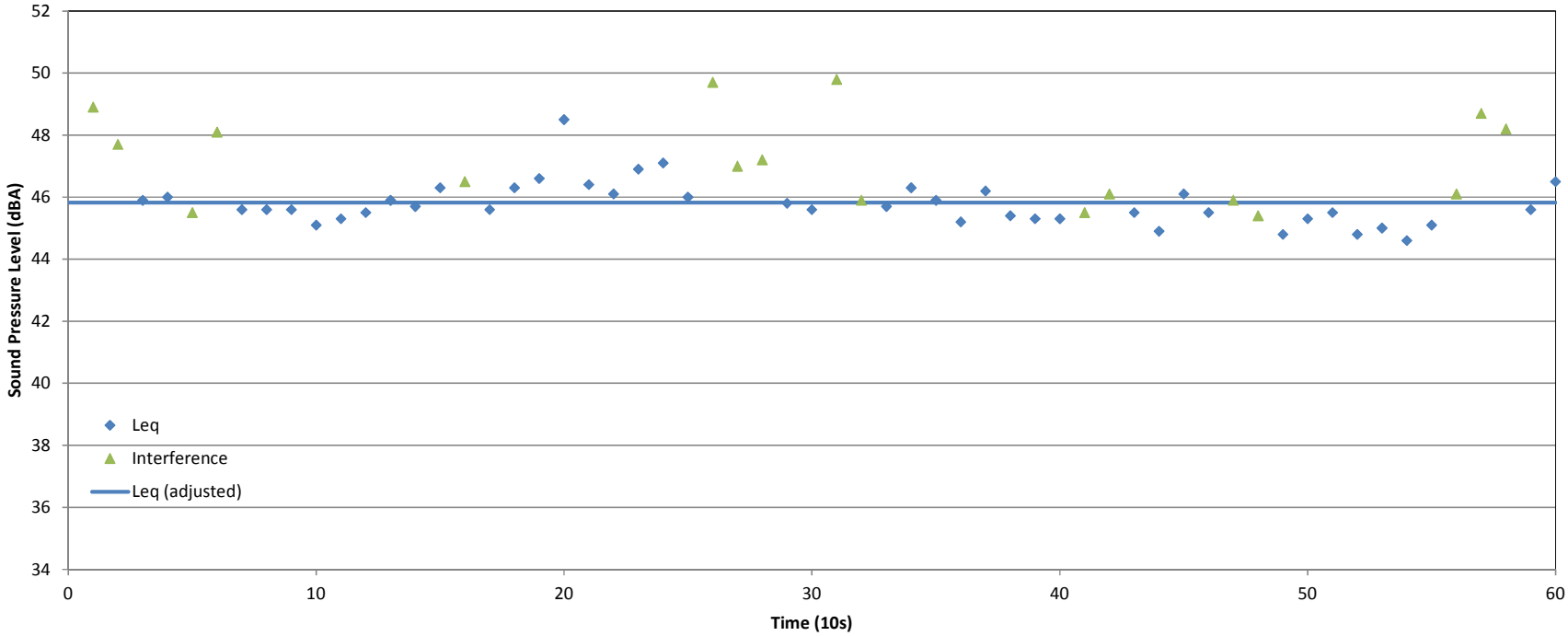


Figure 9: Sound Level Measurements at Location 5, Turbines OFF
LWEP, Mason County, April 7, 2015

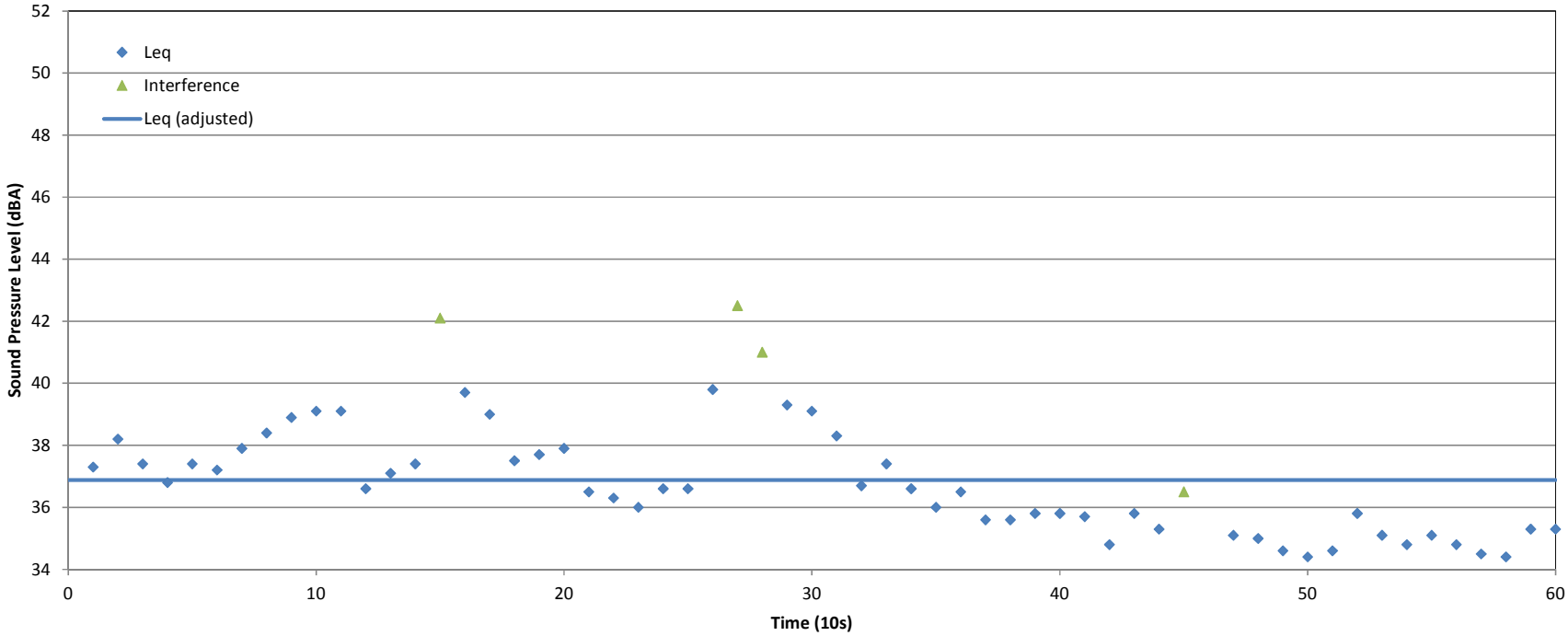


Figure 10: Sound Level Measurements at Location 6, Turbines ON
LWEP, Mason County, April 6, 2015

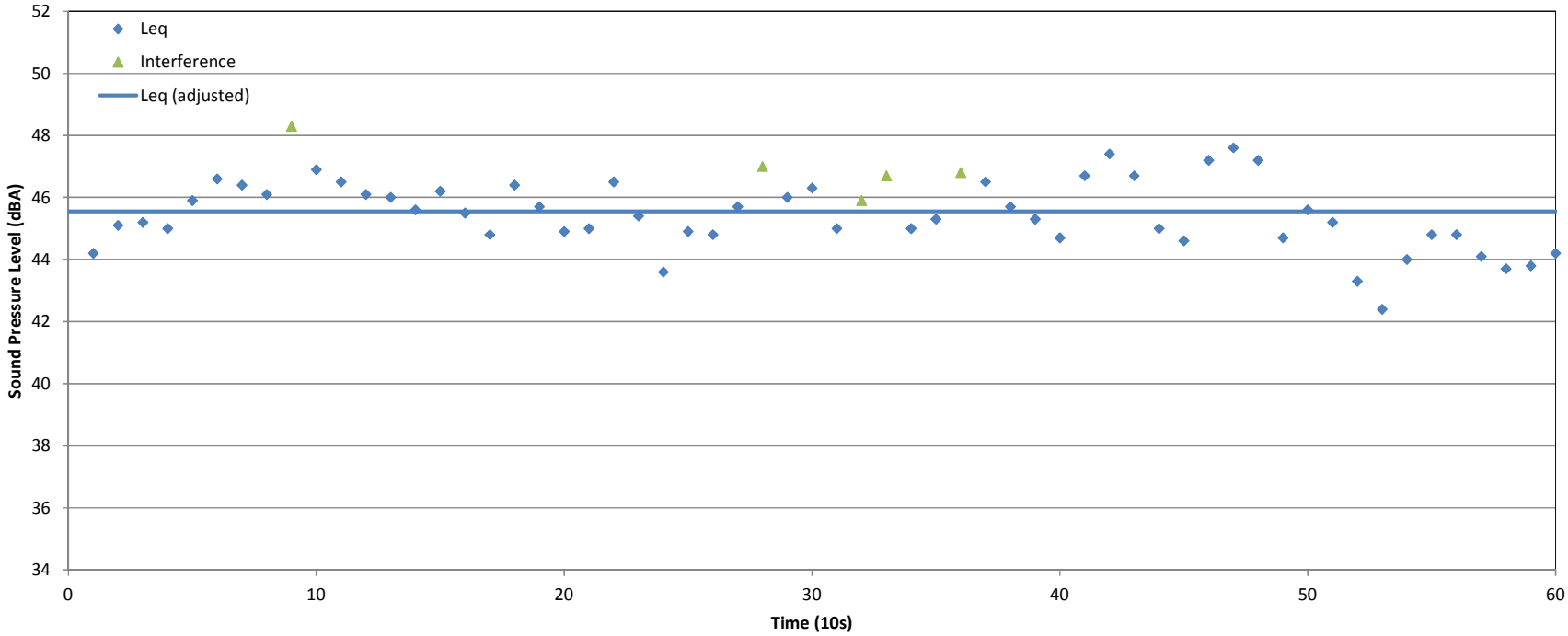


Figure 11: Sound Level Measurements at Location 6, Turbines OFF_A
LWEP, Mason County, April 6, 2015

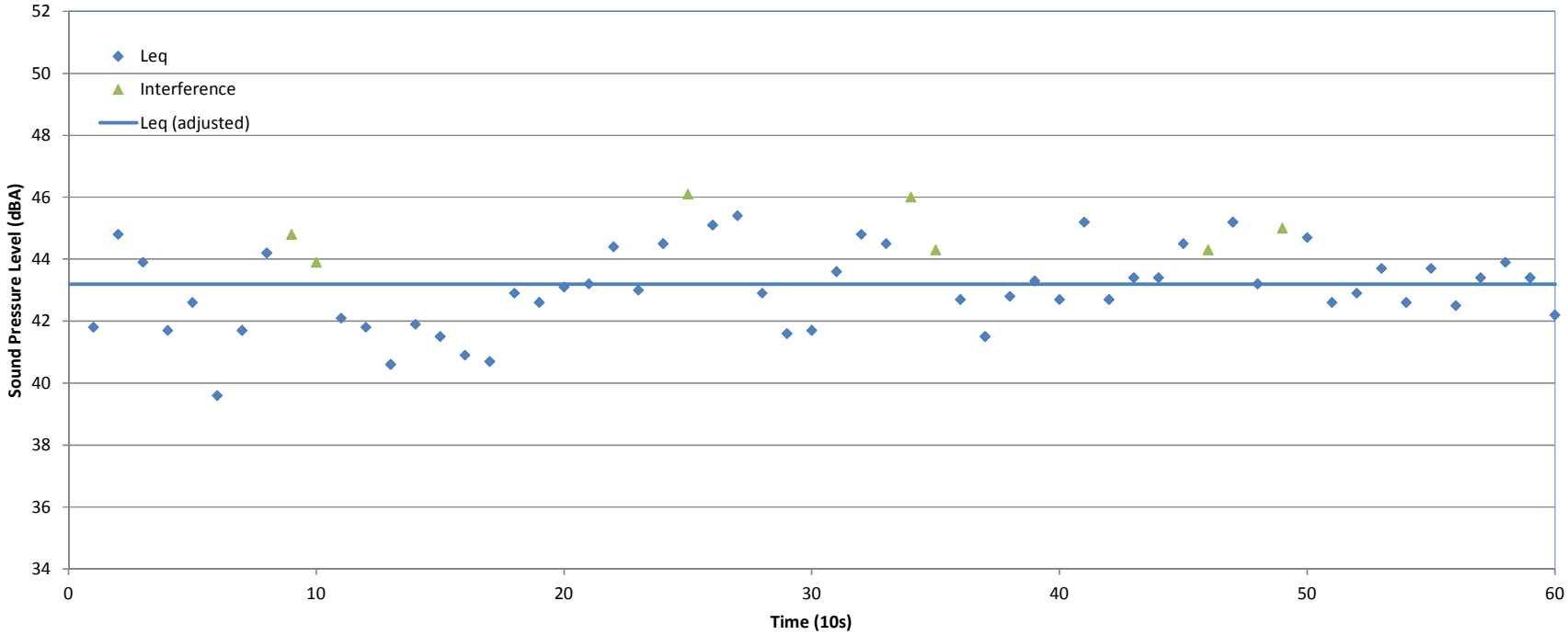


Figure 12: Sound Level Measurements at Location 6, Turbines OFF_B
LWEP, Mason County, April 6, 2015

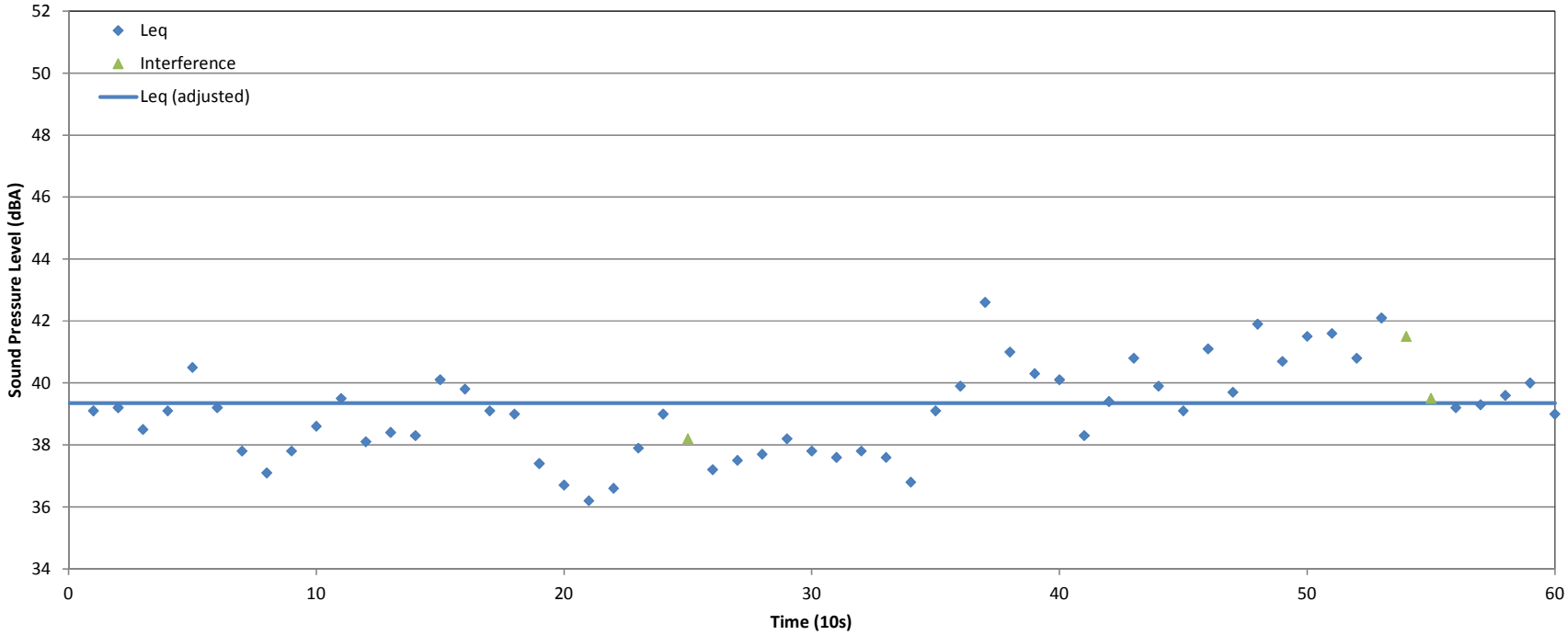


Figure 13: Sound Level Measurements at Location 7, Turbines ON
LWEP, Mason County, March 26, 2015

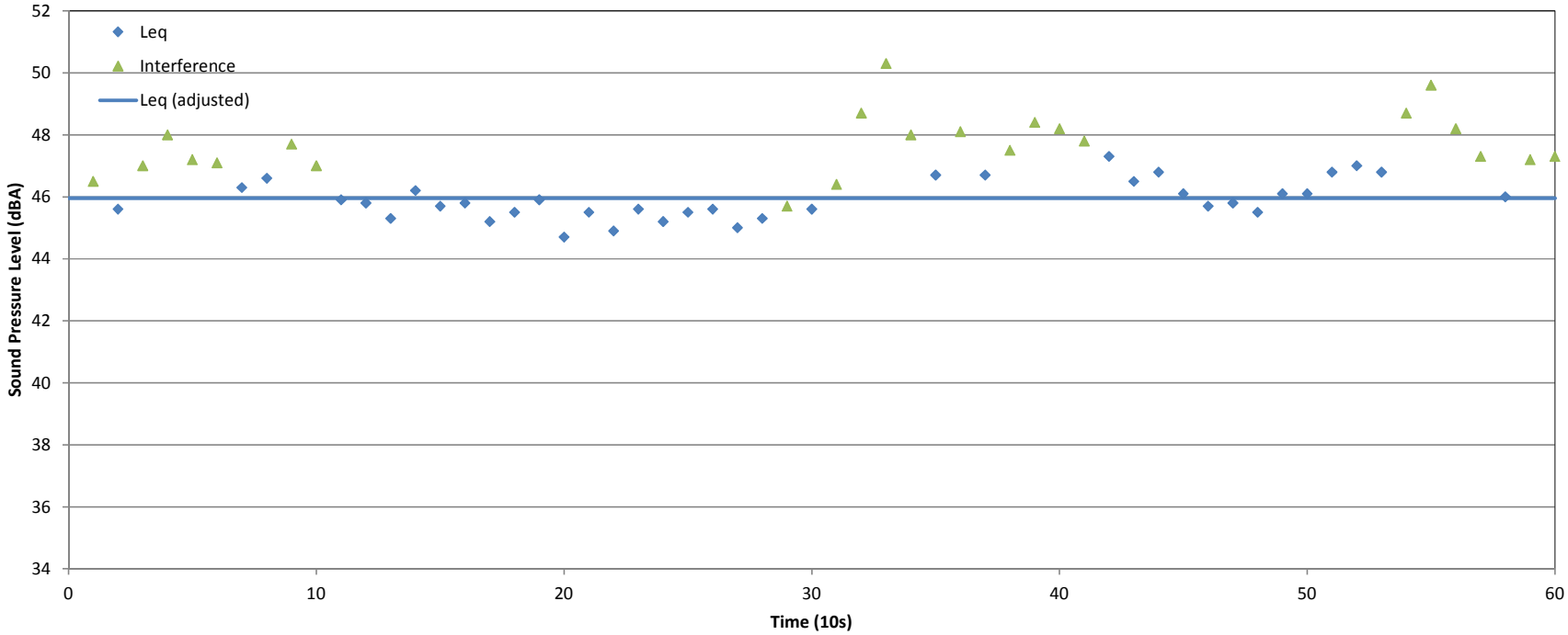


Figure 14: Sound Level Measurements at Location 7, Turbines OFF
LWEP, Mason County, March 26, 2015

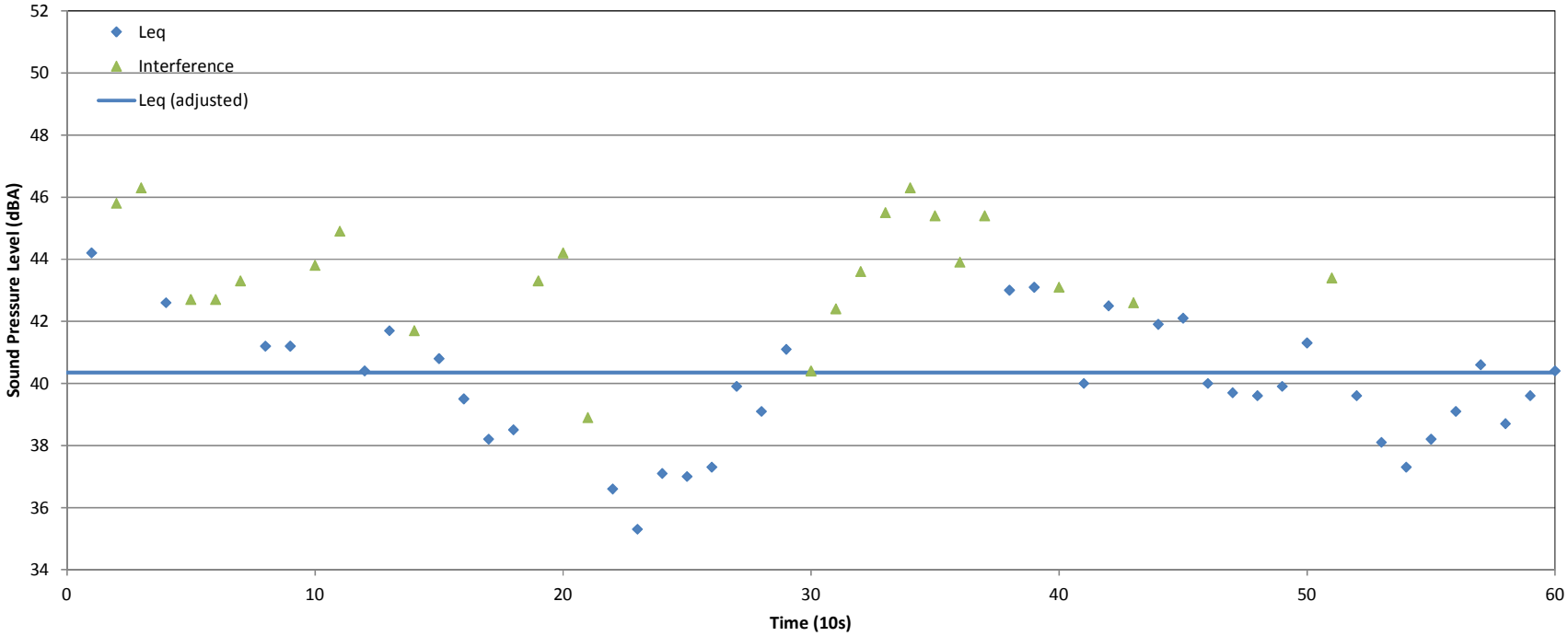


Figure 15: Sound Level Measurements at Location 7, Turbines ON
LWEP, Mason County, April 6, 2015

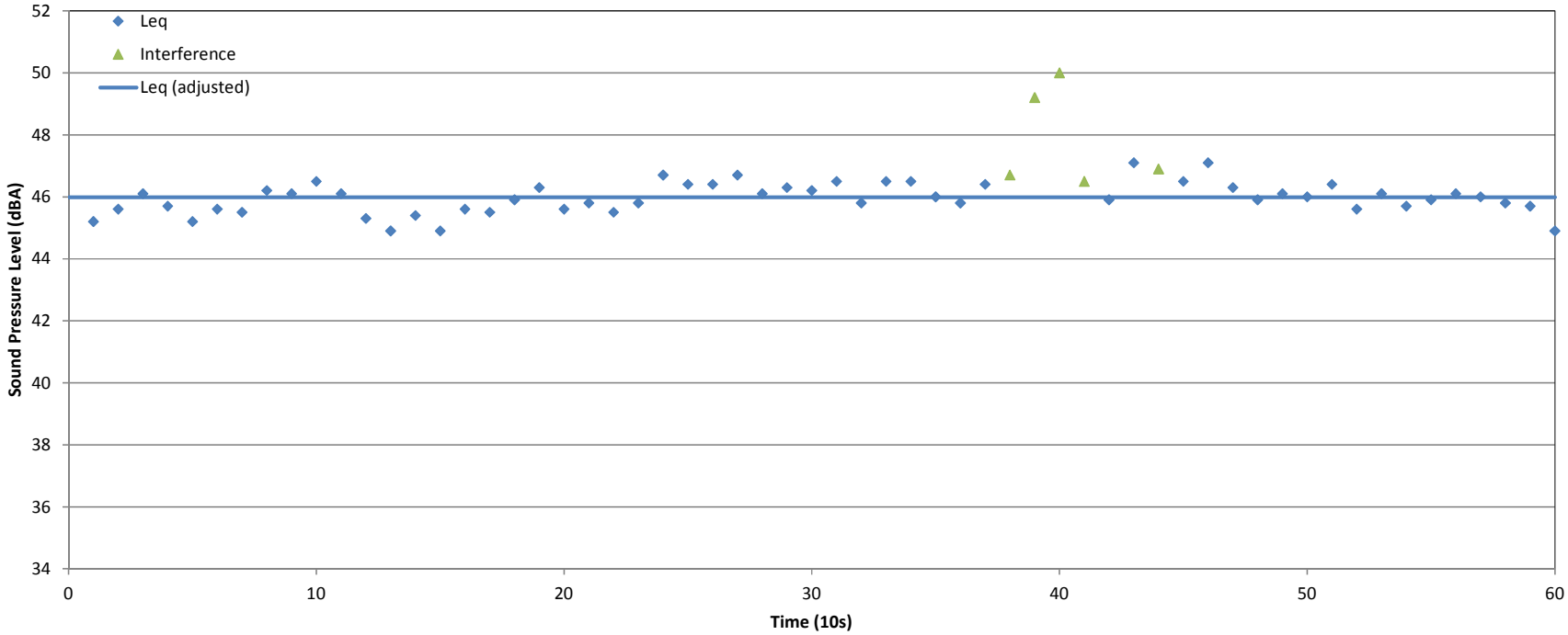


Figure 16: Sound Level Measurements at Location 7, Turbines OFF
LWEP, Mason County, April 6, 2015

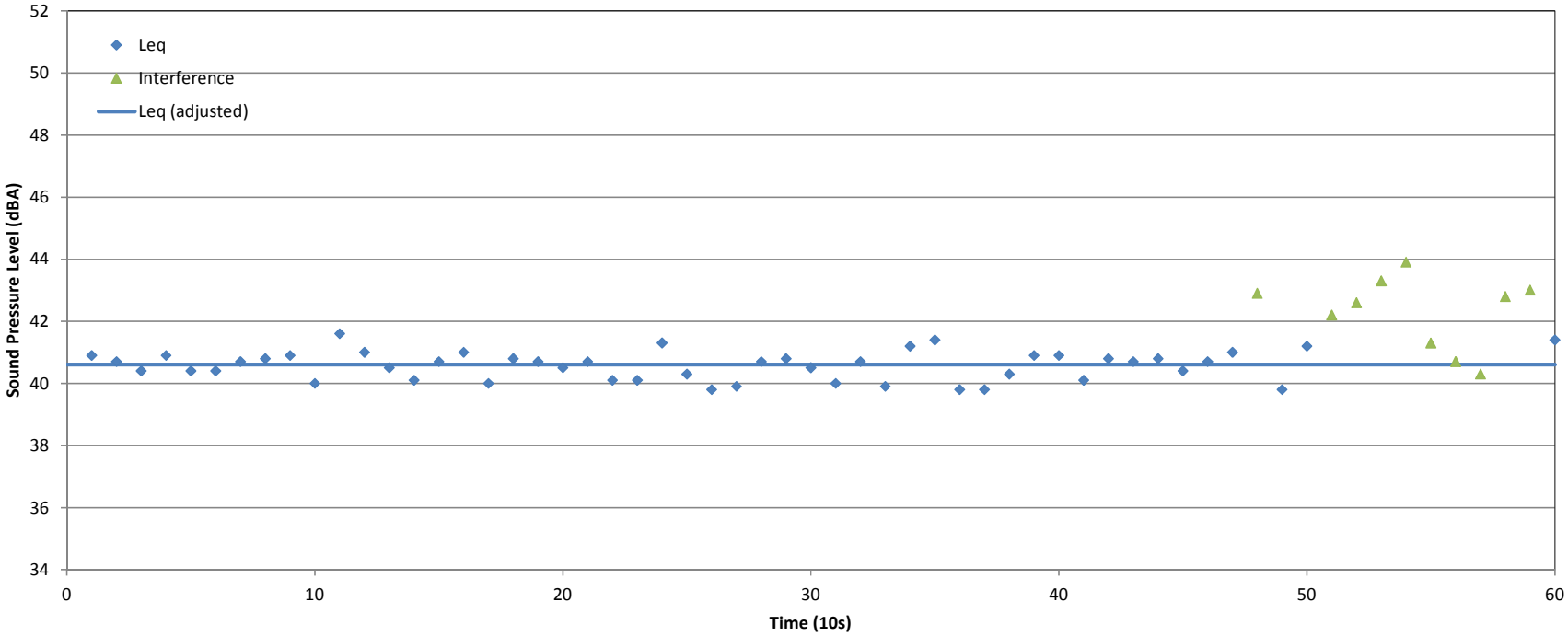


Figure 17: Sound Level Measurements at Location 7, Turbines ON
LWEP, Mason County, April 7, 2015

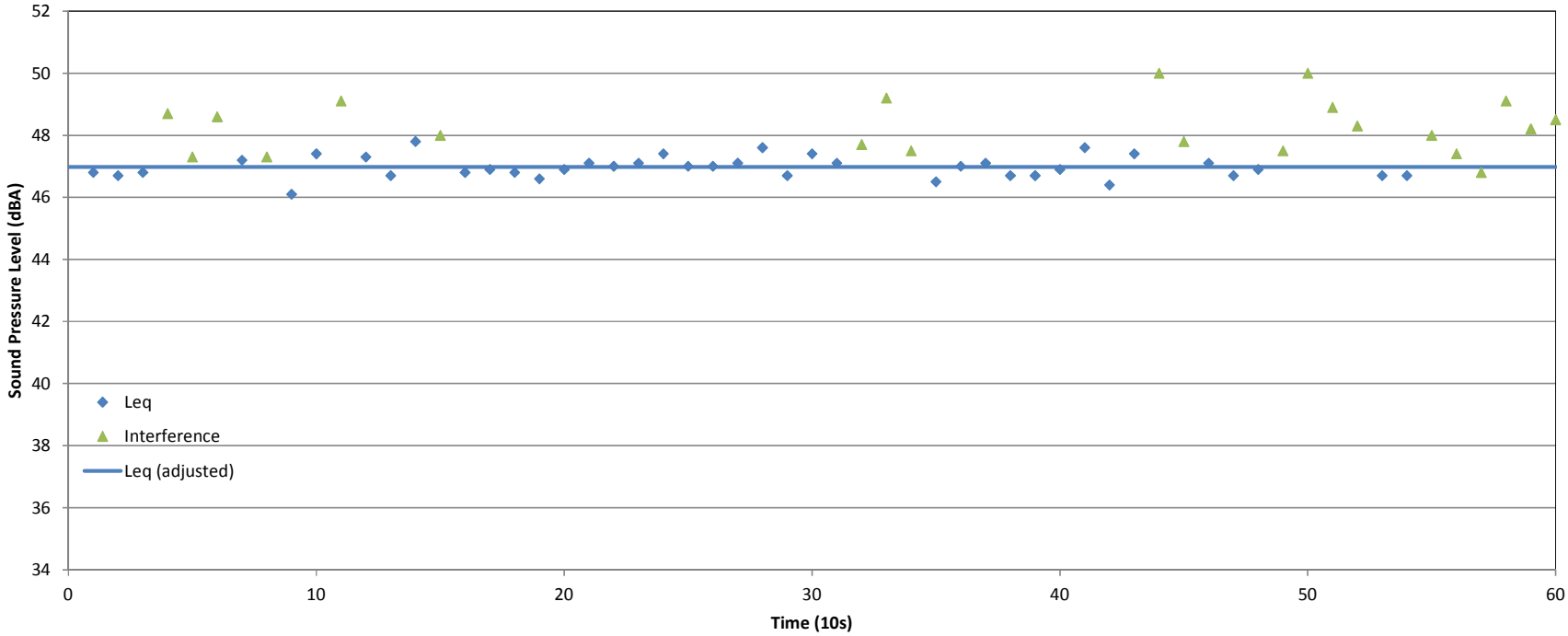
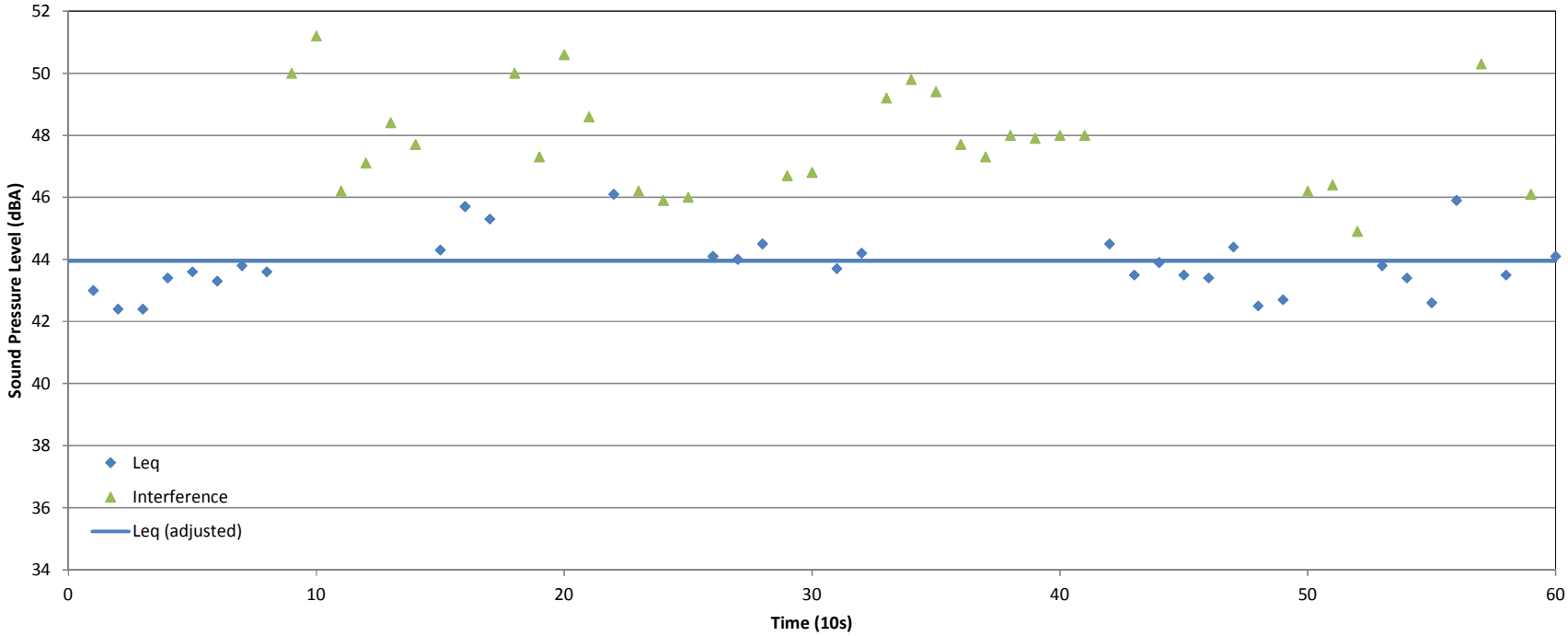


Figure 18: Sound Level Measurements at Location 7, Turbines OFF
LWEP, Mason County, April 7, 2015



Appendix A

Detailed Results

Sound Level Measurements, Lake Winds Energy Park, Detail H
Location 1, April 12, 2015, Turbines ON

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	12-Apr-15	0:48:00	0:00:00	44.9		Y	
1	12-Apr-15	0:48:10	0:00:10	45.1		Y	
2	12-Apr-15	0:48:20	0:00:20	44.6		Y	
3	12-Apr-15	0:48:30	0:00:30	45.5		Y	
4	12-Apr-15	0:48:40	0:00:40	44.9		Y	
5	12-Apr-15	0:48:50	0:00:50	45.1		Y	
6	12-Apr-15	0:49:00	0:01:00	45.1		Y	
7	12-Apr-15	0:49:10	0:01:10	45.1		Y	
8	12-Apr-15	0:49:20	0:01:20	45.2		Y	
9	12-Apr-15	0:49:30	0:01:30	45.0		Y	
10	12-Apr-15	0:49:40	0:01:40	45.2		Y	
11	12-Apr-15	0:49:50	0:01:50	45.0		Y	
12	12-Apr-15	0:50:00	0:02:00	44.7		Y	
13	12-Apr-15	0:50:10	0:02:10	45.0		Y	
14	12-Apr-15	0:50:20	0:02:20	45.3		Y	
15	12-Apr-15	0:50:30	0:02:30	45.1		Y	
16	12-Apr-15	0:50:40	0:02:40	44.7		Y	
17	12-Apr-15	0:50:50	0:02:50	45.1		Y	
18	12-Apr-15	0:51:00	0:03:00	45.2		Y	
19	12-Apr-15	0:51:10	0:03:10	44.9		Y	
20	12-Apr-15	0:51:20	0:03:20	45.0		Y	
21	12-Apr-15	0:51:30	0:03:30	45.3		Y	
22	12-Apr-15	0:51:40	0:03:40	44.5		Y	
23	12-Apr-15	0:51:50	0:03:50	45.3		Y	
24	12-Apr-15	0:52:00	0:04:00	44.7		Y	
25	12-Apr-15	0:52:10	0:04:10	45.9		Y	
26	12-Apr-15	0:52:20	0:04:20	45.4		Y	
27	12-Apr-15	0:52:30	0:04:30	45.4		Y	
28	12-Apr-15	0:52:40	0:04:40	44.9		Y	
29	12-Apr-15	0:52:50	0:04:50	45.0		Y	
30	12-Apr-15	0:53:00	0:05:00	45.9		Y	
31	12-Apr-15	0:53:10	0:05:10	44.8		Y	
32	12-Apr-15	0:53:20	0:05:20	45.0		Y	
33	12-Apr-15	0:53:30	0:05:30	45.0		Y	
34	12-Apr-15	0:53:40	0:05:40	45.3		Y	
35	12-Apr-15	0:53:50	0:05:50	44.8		Y	
36	12-Apr-15	0:54:00	0:06:00	44.8		Y	
37	12-Apr-15	0:54:10	0:06:10	44.9		Y	
38	12-Apr-15	0:54:20	0:06:20	45.3		Y	
39	12-Apr-15	0:54:30	0:06:30	44.8		Y	
40	12-Apr-15	0:54:40	0:06:40	45.5		Y	
41	12-Apr-15	0:54:50	0:06:50	44.7		Y	
42	12-Apr-15	0:55:00	0:07:00	44.7		Y	
43	12-Apr-15	0:55:10	0:07:10	45.0		Y	
44	12-Apr-15	0:55:20	0:07:20	44.7		Y	
45	12-Apr-15	0:55:30	0:07:30	45.6		Y	
46	12-Apr-15	0:55:40	0:07:40	44.9		Y	
47	12-Apr-15	0:55:50	0:07:50	44.5		Y	
48	12-Apr-15	0:56:00	0:08:00	44.8		Y	
49	12-Apr-15	0:56:10	0:08:10	44.6		Y	
50	12-Apr-15	0:56:20	0:08:20	45.2		Y	
51	12-Apr-15	0:56:30	0:08:30	45.0		Y	
52	12-Apr-15	0:56:40	0:08:40	44.6		Y	
53	12-Apr-15	0:56:50	0:08:50	45.5		Y	
54	12-Apr-15	0:57:00	0:09:00	44.8		Y	
55	12-Apr-15	0:57:10	0:09:10	45.1		Y	
56	12-Apr-15	0:57:20	0:09:20	45.4		Y	
57	12-Apr-15	0:57:30	0:09:30	44.9		Y	
58	12-Apr-15	0:57:40	0:09:40	44.6		Y	
59	12-Apr-15	0:57:50	0:09:50	45.2		Y	

10 minute Leq [dBA]	**45.0**
# of Valid Data Points	**60**

Sound Level Measurements, Lake Winds Energy Park, Detail H
Location 1, April 12, 2015, Turbines OFF

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	12-Apr-15	1:42:00	0:00:00	36.8		Y	
1	12-Apr-15	1:42:10	0:00:10	38.4		Y	
2	12-Apr-15	1:42:20	0:00:20	38.7		Y	
3	12-Apr-15	1:42:30	0:00:30		39.6	N	Truck
4	12-Apr-15	1:42:40	0:00:40		39.7	N	Truck
5	12-Apr-15	1:42:50	0:00:50		39.7	N	Truck
6	12-Apr-15	1:43:00	0:01:00	39.4		Y	
7	12-Apr-15	1:43:10	0:01:10	39.7		Y	
8	12-Apr-15	1:43:20	0:01:20	39.4		Y	
9	12-Apr-15	1:43:30	0:01:30	37.6		Y	
10	12-Apr-15	1:43:40	0:01:40	38.1		Y	
11	12-Apr-15	1:43:50	0:01:50	38.3		Y	
12	12-Apr-15	1:44:00	0:02:00	38.1		Y	
13	12-Apr-15	1:44:10	0:02:10	38.2		Y	
14	12-Apr-15	1:44:20	0:02:20	39.5		Y	
15	12-Apr-15	1:44:30	0:02:30	37.7		Y	
16	12-Apr-15	1:44:40	0:02:40	39.1		Y	
17	12-Apr-15	1:44:50	0:02:50	37.8		Y	
18	12-Apr-15	1:45:00	0:03:00	38.2		Y	
19	12-Apr-15	1:45:10	0:03:10	38.9		Y	
20	12-Apr-15	1:45:20	0:03:20	38.9		Y	
21	12-Apr-15	1:45:30	0:03:30	39.3		Y	
22	12-Apr-15	1:45:40	0:03:40	38.7		Y	
23	12-Apr-15	1:45:50	0:03:50	39.4		Y	
24	12-Apr-15	1:46:00	0:04:00	37.3		Y	
25	12-Apr-15	1:46:10	0:04:10	37.5		Y	
26	12-Apr-15	1:46:20	0:04:20	38.2		Y	
27	12-Apr-15	1:46:30	0:04:30	38.0		Y	
28	12-Apr-15	1:46:40	0:04:40	38.7		Y	
29	12-Apr-15	1:46:50	0:04:50	38.0		Y	
30	12-Apr-15	1:47:00	0:05:00	38.2		Y	
31	12-Apr-15	1:47:10	0:05:10	37.6		Y	
32	12-Apr-15	1:47:20	0:05:20	38.6		Y	
33	12-Apr-15	1:47:30	0:05:30	37.7		Y	
34	12-Apr-15	1:47:40	0:05:40	39.4		Y	
35	12-Apr-15	1:47:50	0:05:50	38.9		Y	
36	12-Apr-15	1:48:00	0:06:00	38.9		Y	
37	12-Apr-15	1:48:10	0:06:10	38.7		Y	
38	12-Apr-15	1:48:20	0:06:20	39.1		Y	
39	12-Apr-15	1:48:30	0:06:30	38.1		Y	
40	12-Apr-15	1:48:40	0:06:40	37.0		Y	
41	12-Apr-15	1:48:50	0:06:50	38.5		Y	
42	12-Apr-15	1:49:00	0:07:00	38.4		Y	
43	12-Apr-15	1:49:10	0:07:10	38.6		Y	
44	12-Apr-15	1:49:20	0:07:20	39.4		Y	
45	12-Apr-15	1:49:30	0:07:30	38.4		Y	
46	12-Apr-15	1:49:40	0:07:40	37.5		Y	
47	12-Apr-15	1:49:50	0:07:50		39.5	N	Truck
48	12-Apr-15	1:50:00	0:08:00		43.8	N	Truck
49	12-Apr-15	1:50:10	0:08:10		51.4	N	Truck
50	12-Apr-15	1:50:20	0:08:20		66.2	N	Truck
51	12-Apr-15	1:50:30	0:08:30		50.3	N	Truck
52	12-Apr-15	1:50:40	0:08:40		40.6	N	Truck
53	12-Apr-15	1:50:50	0:08:50		38.0	N	Truck
54	12-Apr-15	1:51:00	0:09:00		38.0	N	Truck
55	12-Apr-15	1:51:10	0:09:10	38.1		Y	
56	12-Apr-15	1:51:20	0:09:20	38.1		Y	
57	12-Apr-15	1:51:30	0:09:30	38.1		Y	
58	12-Apr-15	1:51:40	0:09:40	39.6		Y	
59	12-Apr-15	1:51:50	0:09:50	38.2		Y	

10 minute Leq [dBA]	**38.5**
# of Valid Data Points	**49**

Sound Level Measurements, Lake Winds Energy Park, Detail A
Location 2, March 25, 2015, Turbines ON

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	25-Mar-15	20:09:40	0:00:00	45.0		Y	
1	25-Mar-15	20:09:50	0:00:10	44.8		Y	
2	25-Mar-15	20:10:00	0:00:20	44.8		Y	
3	25-Mar-15	20:10:10	0:00:30	44.7		Y	
4	25-Mar-15	20:10:20	0:00:40	45.0		Y	
5	25-Mar-15	20:10:30	0:00:50	45.1		Y	
6	25-Mar-15	20:10:40	0:01:00	45.1		Y	
7	25-Mar-15	20:10:50	0:01:10	44.8		Y	
8	25-Mar-15	20:11:00	0:01:20	45.4		Y	
9	25-Mar-15	20:11:10	0:01:30	45.2		Y	
10	25-Mar-15	20:11:20	0:01:40	45.9		Y	
11	25-Mar-15	20:11:30	0:01:50	45.7		Y	
12	25-Mar-15	20:11:40	0:02:00	45.4		Y	
13	25-Mar-15	20:11:50	0:02:10	45.1		Y	
14	25-Mar-15	20:12:00	0:02:20	45.4		Y	
15	25-Mar-15	20:12:10	0:02:30	45.1		Y	
16	25-Mar-15	20:12:20	0:02:40	45.6		Y	
17	25-Mar-15	20:12:30	0:02:50	45.8		Y	
18	25-Mar-15	20:12:40	0:03:00	44.6		Y	
19	25-Mar-15	20:12:50	0:03:10	45.0		Y	
20	25-Mar-15	20:13:00	0:03:20	44.7		Y	
21	25-Mar-15	20:13:10	0:03:30	45.1		Y	
22	25-Mar-15	20:13:20	0:03:40	45.4		Y	
23	25-Mar-15	20:13:30	0:03:50	45.0		Y	
24	25-Mar-15	20:13:40	0:04:00	44.5		Y	
25	25-Mar-15	20:13:50	0:04:10	44.5		Y	
26	25-Mar-15	20:14:00	0:04:20	44.2		Y	
27	25-Mar-15	20:14:10	0:04:30	44.2		Y	
28	25-Mar-15	20:14:20	0:04:40	44.5		Y	
29	25-Mar-15	20:14:30	0:04:50	44.9		Y	
30	25-Mar-15	20:14:40	0:05:00	45.3		Y	
31	25-Mar-15	20:14:50	0:05:10	45.0		Y	
32	25-Mar-15	20:15:00	0:05:20	45.1		Y	
33	25-Mar-15	20:15:10	0:05:30	46.1		Y	
34	25-Mar-15	20:15:20	0:05:40	45.2		Y	
35	25-Mar-15	20:15:30	0:05:50	45.3		Y	
36	25-Mar-15	20:15:40	0:06:00	45.0		Y	
37	25-Mar-15	20:15:50	0:06:10	45.4		Y	
38	25-Mar-15	20:16:00	0:06:20	44.9		Y	
39	25-Mar-15	20:16:10	0:06:30	45.9		Y	
40	25-Mar-15	20:16:20	0:06:40	45.0		Y	
41	25-Mar-15	20:16:30	0:06:50	45.4		Y	
42	25-Mar-15	20:16:40	0:07:00	45.2		Y	
43	25-Mar-15	20:16:50	0:07:10	45.4		Y	
44	25-Mar-15	20:17:00	0:07:20	45.2		Y	
45	25-Mar-15	20:17:10	0:07:30	45.3		Y	
46	25-Mar-15	20:17:20	0:07:40	45.5		Y	
47	25-Mar-15	20:17:30	0:07:50	45.1		Y	
48	25-Mar-15	20:17:40	0:08:00	45.4		Y	
49	25-Mar-15	20:17:50	0:08:10	44.8		Y	
50	25-Mar-15	20:18:00	0:08:20	44.5		Y	
51	25-Mar-15	20:18:10	0:08:30	45.0		Y	
52	25-Mar-15	20:18:20	0:08:40	45.8		Y	
53	25-Mar-15	20:18:30	0:08:50	45.5		Y	
54	25-Mar-15	20:18:40	0:09:00	45.4		Y	
55	25-Mar-15	20:18:50	0:09:10	45.7		Y	
56	25-Mar-15	20:19:00	0:09:20	45.6		Y	
57	25-Mar-15	20:19:10	0:09:30	46.2		Y	
58	25-Mar-15	20:19:20	0:09:40	46.1		Y	
59	25-Mar-15	20:19:30	0:09:50	44.9		Y	

10 minute Leq [dBA]	**45.2**
# of Valid Data Points	**60**

Sound Level Measurements, Lake Winds Energy Park, Detail A
Location 2, March 25, 2015, Turbines OFF

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	25-Mar-15	20:44:50	0:00:00	36.0		Y	
1	25-Mar-15	20:45:00	0:00:10	36.6		Y	
2	25-Mar-15	20:45:10	0:00:20	36.0		Y	
3	25-Mar-15	20:45:20	0:00:30	36.9		Y	
4	25-Mar-15	20:45:30	0:00:40	35.9		Y	
5	25-Mar-15	20:45:40	0:00:50	37.4		Y	
6	25-Mar-15	20:45:50	0:01:00	38.2		Y	
7	25-Mar-15	20:46:00	0:01:10	36.6		Y	
8	25-Mar-15	20:46:10	0:01:20	36.8		Y	
9	25-Mar-15	20:46:20	0:01:30	37.0		Y	
10	25-Mar-15	20:46:30	0:01:40	36.8		Y	
11	25-Mar-15	20:46:40	0:01:50	37.0		Y	
12	25-Mar-15	20:46:50	0:02:00	36.7		Y	
13	25-Mar-15	20:47:00	0:02:10	37.1		Y	
14	25-Mar-15	20:47:10	0:02:20	37.2		Y	
15	25-Mar-15	20:47:20	0:02:30	36.4		Y	
16	25-Mar-15	20:47:30	0:02:40	36.3		Y	
17	25-Mar-15	20:47:40	0:02:50	36.9		Y	
18	25-Mar-15	20:47:50	0:03:00	37.6		Y	
19	25-Mar-15	20:48:00	0:03:10	36.9		Y	
20	25-Mar-15	20:48:10	0:03:20	36.2		Y	
21	25-Mar-15	20:48:20	0:03:30	36.6		Y	
22	25-Mar-15	20:48:30	0:03:40	36.9		Y	
23	25-Mar-15	20:48:40	0:03:50	37.8		Y	
24	25-Mar-15	20:48:50	0:04:00	37.4		Y	
25	25-Mar-15	20:49:00	0:04:10	38.0		Y	
26	25-Mar-15	20:49:10	0:04:20	37.1		Y	
27	25-Mar-15	20:49:20	0:04:30	37.4		Y	
28	25-Mar-15	20:49:30	0:04:40	37.2		Y	
29	25-Mar-15	20:49:40	0:04:50	36.4		Y	
30	25-Mar-15	20:49:50	0:05:00	36.9		Y	
31	25-Mar-15	20:50:00	0:05:10	37.3		Y	
32	25-Mar-15	20:50:10	0:05:20	37.3		Y	
33	25-Mar-15	20:50:20	0:05:30	37.7		Y	
34	25-Mar-15	20:50:30	0:05:40	38.1		Y	
35	25-Mar-15	20:50:40	0:05:50	37.2		Y	
36	25-Mar-15	20:50:50	0:06:00	36.4		Y	
37	25-Mar-15	20:51:00	0:06:10	37.7		Y	
38	25-Mar-15	20:51:10	0:06:20	37.5		Y	
39	25-Mar-15	20:51:20	0:06:30	38.0		Y	
40	25-Mar-15	20:51:30	0:06:40	37.3		Y	
41	25-Mar-15	20:51:40	0:06:50		39.5	N	Car
42	25-Mar-15	20:51:50	0:07:00		40.7	N	Car
43	25-Mar-15	20:52:00	0:07:10	37.7		Y	
44	25-Mar-15	20:52:10	0:07:20	37.4		Y	
45	25-Mar-15	20:52:20	0:07:30	38.0		Y	
46	25-Mar-15	20:52:30	0:07:40	38.3		Y	
47	25-Mar-15	20:52:40	0:07:50	36.7		Y	
48	25-Mar-15	20:52:50	0:08:00	36.6		Y	
49	25-Mar-15	20:53:00	0:08:10	35.4		Y	
50	25-Mar-15	20:53:10	0:08:20	36.8		Y	
51	25-Mar-15	20:53:20	0:08:30	37.6		Y	
52	25-Mar-15	20:53:30	0:08:40	36.6		Y	
53	25-Mar-15	20:53:40	0:08:50	36.0		Y	
54	25-Mar-15	20:53:50	0:09:00	36.8		Y	
55	25-Mar-15	20:54:00	0:09:10	36.7		Y	
56	25-Mar-15	20:54:10	0:09:20	36.6		Y	
57	25-Mar-15	20:54:20	0:09:30	36.6		Y	
58	25-Mar-15	20:54:30	0:09:40	36.4		Y	
59	25-Mar-15	20:54:40	0:09:50	36.9		Y	

10 minute Leq [dBA]	**37.0**
# of Valid Data Points	**58**

Sound Level Measurements, Lake Winds Energy Park, Detail C
Location 5, March 29, 2015, Turbines ON

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	29-Mar-15	4:27:40	0:00:00	38.5		Y	
1	29-Mar-15	4:27:50	0:00:10	43.6		Y	
2	29-Mar-15	4:28:00	0:00:20	44.7		Y	
3	29-Mar-15	4:28:10	0:00:30	44.3		Y	
4	29-Mar-15	4:28:20	0:00:40	44.3		Y	
5	29-Mar-15	4:28:30	0:00:50	44.8		Y	
6	29-Mar-15	4:28:40	0:01:00	44.5		Y	
7	29-Mar-15	4:28:50	0:01:10	45.5		Y	
8	29-Mar-15	4:29:00	0:01:20	46.3		Y	
9	29-Mar-15	4:29:10	0:01:30	45.3		Y	
10	29-Mar-15	4:29:20	0:01:40	44.9		Y	
11	29-Mar-15	4:29:30	0:01:50	45.7		Y	
12	29-Mar-15	4:29:40	0:02:00	44.9		Y	
13	29-Mar-15	4:29:50	0:02:10	46.0		Y	
14	29-Mar-15	4:30:00	0:02:20	45.5		Y	
15	29-Mar-15	4:30:10	0:02:30	45.1		Y	
16	29-Mar-15	4:30:20	0:02:40	44.9		Y	
17	29-Mar-15	4:30:30	0:02:50	45.2		Y	
18	29-Mar-15	4:30:40	0:03:00	44.3		Y	
19	29-Mar-15	4:30:50	0:03:10	46.8		Y	
20	29-Mar-15	4:31:00	0:03:20	44.4		Y	
21	29-Mar-15	4:31:10	0:03:30	46.3		Y	
22	29-Mar-15	4:31:20	0:03:40	45.3		Y	
23	29-Mar-15	4:31:30	0:03:50	44.7		Y	
24	29-Mar-15	4:31:40	0:04:00	44.8		Y	
25	29-Mar-15	4:31:50	0:04:10	45.4		Y	
26	29-Mar-15	4:32:00	0:04:20	45.5		Y	
27	29-Mar-15	4:32:10	0:04:30	44.6		Y	
28	29-Mar-15	4:32:20	0:04:40	44.9		Y	
29	29-Mar-15	4:32:30	0:04:50	43.6		Y	
30	29-Mar-15	4:32:40	0:05:00	44.1		Y	
31	29-Mar-15	4:32:50	0:05:10	44.6		Y	
32	29-Mar-15	4:33:00	0:05:20	44.3		Y	
33	29-Mar-15	4:33:10	0:05:30	44.0		Y	
34	29-Mar-15	4:33:20	0:05:40	45.4		Y	
35	29-Mar-15	4:33:30	0:05:50	43.6		Y	
36	29-Mar-15	4:33:40	0:06:00	44.4		Y	
37	29-Mar-15	4:33:50	0:06:10	44.4		Y	
38	29-Mar-15	4:34:00	0:06:20	44.7		Y	
39	29-Mar-15	4:34:10	0:06:30	44.7		Y	
40	29-Mar-15	4:34:20	0:06:40	44.2		Y	
41	29-Mar-15	4:34:30	0:06:50	43.4		Y	
42	29-Mar-15	4:34:40	0:07:00	43.4		Y	
43	29-Mar-15	4:34:50	0:07:10	44.4		Y	
44	29-Mar-15	4:35:00	0:07:20	44.4		Y	
45	29-Mar-15	4:35:10	0:07:30	44.8		Y	
46	29-Mar-15	4:35:20	0:07:40	44.3		Y	
47	29-Mar-15	4:35:30	0:07:50	44.7		Y	
48	29-Mar-15	4:35:40	0:08:00	45.3		Y	
49	29-Mar-15	4:35:50	0:08:10	44.9		Y	
50	29-Mar-15	4:36:00	0:08:20	45.9		Y	
51	29-Mar-15	4:36:10	0:08:30	44.5		Y	
52	29-Mar-15	4:36:20	0:08:40	44.2		Y	
53	29-Mar-15	4:36:30	0:08:50	45.9		Y	
54	29-Mar-15	4:36:40	0:09:00	44.9		Y	
55	29-Mar-15	4:36:50	0:09:10	45.5		Y	
56	29-Mar-15	4:37:00	0:09:20	44.5		Y	
57	29-Mar-15	4:37:10	0:09:30	44.9		Y	
58	29-Mar-15	4:37:20	0:09:40	45.7		Y	
59	29-Mar-15	4:37:30	0:09:50	45.0		Y	

10 minute Leq [dBA]	**44.8**
# of Valid Data Points	**60**

Sound Level Measurements, Lake Winds Energy Park, Detail C
Location 5, March 29, 2015, Turbines OFF

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	29-Mar-15	5:03:10	0:00:00	32.0		Y	
1	29-Mar-15	5:03:20	0:00:10	32.5		Y	
2	29-Mar-15	5:03:30	0:00:20	32.8		Y	
3	29-Mar-15	5:03:40	0:00:30	31.6		Y	
4	29-Mar-15	5:03:50	0:00:40	31.5		Y	
5	29-Mar-15	5:04:00	0:00:50	31.4		Y	
6	29-Mar-15	5:04:10	0:01:00	31.0		Y	
7	29-Mar-15	5:04:20	0:01:10	32.0		Y	
8	29-Mar-15	5:04:30	0:01:20	31.7		Y	
9	29-Mar-15	5:04:40	0:01:30	32.0		Y	
10	29-Mar-15	5:04:50	0:01:40	31.9		Y	
11	29-Mar-15	5:05:00	0:01:50	32.0		Y	
12	29-Mar-15	5:05:10	0:02:00	32.4		Y	
13	29-Mar-15	5:05:20	0:02:10	31.6		Y	
14	29-Mar-15	5:05:30	0:02:20	31.3		Y	
15	29-Mar-15	5:05:40	0:02:30	31.3		Y	
16	29-Mar-15	5:05:50	0:02:40		34.9	N	WTG yaw
17	29-Mar-15	5:06:00	0:02:50	31.7		Y	
18	29-Mar-15	5:06:10	0:03:00	31.4		Y	
19	29-Mar-15	5:06:20	0:03:10	32.5		Y	
20	29-Mar-15	5:06:30	0:03:20	31.6		Y	
21	29-Mar-15	5:06:40	0:03:30	31.7		Y	
22	29-Mar-15	5:06:50	0:03:40	32.0		Y	
23	29-Mar-15	5:07:00	0:03:50	33.4		Y	
24	29-Mar-15	5:07:10	0:04:00	31.6		Y	
25	29-Mar-15	5:07:20	0:04:10	32.0		Y	
26	29-Mar-15	5:07:30	0:04:20	32.3		Y	
27	29-Mar-15	5:07:40	0:04:30	32.0		Y	
28	29-Mar-15	5:07:50	0:04:40	31.7		Y	
29	29-Mar-15	5:08:00	0:04:50	32.3		Y	
30	29-Mar-15	5:08:10	0:05:00	33.4		Y	
31	29-Mar-15	5:08:20	0:05:10	33.1		Y	
32	29-Mar-15	5:08:30	0:05:20	33.3		Y	
33	29-Mar-15	5:08:40	0:05:30	32.5		Y	
34	29-Mar-15	5:08:50	0:05:40	33.1		Y	
35	29-Mar-15	5:09:00	0:05:50	31.6		Y	
36	29-Mar-15	5:09:10	0:06:00	31.6		Y	
37	29-Mar-15	5:09:20	0:06:10	32.0		Y	
38	29-Mar-15	5:09:30	0:06:20	31.9		Y	
39	29-Mar-15	5:09:40	0:06:30	32.0		Y	
40	29-Mar-15	5:09:50	0:06:40	31.6		Y	
41	29-Mar-15	5:10:00	0:06:50	32.3		Y	
42	29-Mar-15	5:10:10	0:07:00	32.6		Y	
43	29-Mar-15	5:10:20	0:07:10		36.1	N	WTG yaw
44	29-Mar-15	5:10:30	0:07:20		39.6	N	WTG yaw
45	29-Mar-15	5:10:40	0:07:30		36.9	N	vehicle
46	29-Mar-15	5:10:50	0:07:40		33.0	N	vehicle
47	29-Mar-15	5:11:00	0:07:50	33.1		Y	
48	29-Mar-15	5:11:10	0:08:00	32.7		Y	
49	29-Mar-15	5:11:20	0:08:10	32.0		Y	
50	29-Mar-15	5:11:30	0:08:20	31.9		Y	
51	29-Mar-15	5:11:40	0:08:30	32.1		Y	
52	29-Mar-15	5:11:50	0:08:40	32.6		Y	
53	29-Mar-15	5:12:00	0:08:50	32.2		Y	
54	29-Mar-15	5:12:10	0:09:00	32.7		Y	
55	29-Mar-15	5:12:20	0:09:10	32.2		Y	
56	29-Mar-15	5:12:30	0:09:20	32.8		Y	
57	29-Mar-15	5:12:40	0:09:30	33.1		Y	
58	29-Mar-15	5:12:50	0:09:40	32.9		Y	
59	29-Mar-15	5:13:00	0:09:50	31.8		Y	

10 minute Leq [dBA]	**32.2**
# of Valid Data Points	**55**

Sound Level Measurements, Lake Winds Energy Park, Detail F
Location 5, April 7, 2015, Turbines ON

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	07-Apr-15	21:48:00	0:00:00		48.9	N	gust
1	07-Apr-15	21:48:10	0:00:10		47.7	N	gust
2	07-Apr-15	21:48:20	0:00:20	45.9		Y	
3	07-Apr-15	21:48:30	0:00:30	46.0		Y	
4	07-Apr-15	21:48:40	0:00:40		45.5	N	car
5	07-Apr-15	21:48:50	0:00:50		48.1	N	car
6	07-Apr-15	21:49:00	0:01:00	45.6		Y	
7	07-Apr-15	21:49:10	0:01:10	45.6		Y	
8	07-Apr-15	21:49:20	0:01:20	45.6		Y	
9	07-Apr-15	21:49:30	0:01:30	45.1		Y	
10	07-Apr-15	21:49:40	0:01:40	45.3		Y	
11	07-Apr-15	21:49:50	0:01:50	45.5		Y	
12	07-Apr-15	21:50:00	0:02:00	45.9		Y	
13	07-Apr-15	21:50:10	0:02:10	45.7		Y	
14	07-Apr-15	21:50:20	0:02:20	46.3		Y	
15	07-Apr-15	21:50:30	0:02:30		46.5	N	gust
16	07-Apr-15	21:50:40	0:02:40	45.6		Y	
17	07-Apr-15	21:50:50	0:02:50	46.3		Y	
18	07-Apr-15	21:51:00	0:03:00	46.6		Y	
19	07-Apr-15	21:51:10	0:03:10	48.5		Y	
20	07-Apr-15	21:51:20	0:03:20	46.4		Y	
21	07-Apr-15	21:51:30	0:03:30	46.1		Y	
22	07-Apr-15	21:51:40	0:03:40	46.9		Y	
23	07-Apr-15	21:51:50	0:03:50	47.1		Y	
24	07-Apr-15	21:52:00	0:04:00	46.0		Y	
25	07-Apr-15	21:52:10	0:04:10		49.7	N	gust
26	07-Apr-15	21:52:20	0:04:20		47.0	N	gust
27	07-Apr-15	21:52:30	0:04:30		47.2	N	gust
28	07-Apr-15	21:52:40	0:04:40	45.8		Y	
29	07-Apr-15	21:52:50	0:04:50	45.6		Y	
30	07-Apr-15	21:53:00	0:05:00		49.8	N	gust
31	07-Apr-15	21:53:10	0:05:10		45.9	N	gust
32	07-Apr-15	21:53:20	0:05:20	45.7		Y	
33	07-Apr-15	21:53:30	0:05:30	46.3		Y	
34	07-Apr-15	21:53:40	0:05:40	45.9		Y	
35	07-Apr-15	21:53:50	0:05:50	45.2		Y	
36	07-Apr-15	21:54:00	0:06:00	46.2		Y	
37	07-Apr-15	21:54:10	0:06:10	45.4		Y	
38	07-Apr-15	21:54:20	0:06:20	45.3		Y	
39	07-Apr-15	21:54:30	0:06:30	45.3		Y	
40	07-Apr-15	21:54:40	0:06:40		45.5	N	gust
41	07-Apr-15	21:54:50	0:06:50		46.1	N	gust
42	07-Apr-15	21:55:00	0:07:00	45.5		Y	
43	07-Apr-15	21:55:10	0:07:10	44.9		Y	
44	07-Apr-15	21:55:20	0:07:20	46.1		Y	
45	07-Apr-15	21:55:30	0:07:30	45.5		Y	
46	07-Apr-15	21:55:40	0:07:40		45.9	N	gust
47	07-Apr-15	21:55:50	0:07:50		45.4	N	gust
48	07-Apr-15	21:56:00	0:08:00	44.8		Y	
49	07-Apr-15	21:56:10	0:08:10	45.3		Y	
50	07-Apr-15	21:56:20	0:08:20	45.5		Y	
51	07-Apr-15	21:56:30	0:08:30	44.8		Y	
52	07-Apr-15	21:56:40	0:08:40	45.0		Y	
53	07-Apr-15	21:56:50	0:08:50	44.6		Y	
54	07-Apr-15	21:57:00	0:09:00	45.1		Y	
55	07-Apr-15	21:57:10	0:09:10		46.1	N	gust
56	07-Apr-15	21:57:20	0:09:20		48.7	N	gust
57	07-Apr-15	21:57:30	0:09:30		48.2	N	gust
58	07-Apr-15	21:57:40	0:09:40	45.6		Y	
59	07-Apr-15	21:57:50	0:09:50	46.5		Y	

10 minute Leq [dBA]	**45.8**
# of Valid Data Points	**43**

Sound Level Measurements, Lake Winds Energy Park, Detail F

Location 5, April 7, 2015, Turbines OFF

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	07-Apr-15	20:53:10	0:00:00	37.3		Y	
1	07-Apr-15	20:53:20	0:00:10	38.2		Y	
2	07-Apr-15	20:53:30	0:00:20	37.4		Y	
3	07-Apr-15	20:53:40	0:00:30	36.8		Y	
4	07-Apr-15	20:53:50	0:00:40	37.4		Y	
5	07-Apr-15	20:54:00	0:00:50	37.2		Y	
6	07-Apr-15	20:54:10	0:01:00	37.9		Y	
7	07-Apr-15	20:54:20	0:01:10	38.4		Y	
8	07-Apr-15	20:54:30	0:01:20	38.9		Y	
9	07-Apr-15	20:54:40	0:01:30	39.1		Y	
10	07-Apr-15	20:54:50	0:01:40	39.1		Y	
11	07-Apr-15	20:55:00	0:01:50	36.6		Y	
12	07-Apr-15	20:55:10	0:02:00	37.1		Y	
13	07-Apr-15	20:55:20	0:02:10	37.4		Y	
14	07-Apr-15	20:55:30	0:02:20		42.1	N	yaw
15	07-Apr-15	20:55:40	0:02:30	39.7		Y	
16	07-Apr-15	20:55:50	0:02:40	39.0		Y	
17	07-Apr-15	20:56:00	0:02:50	37.5		Y	
18	07-Apr-15	20:56:10	0:03:00	37.7		Y	
19	07-Apr-15	20:56:20	0:03:10	37.9		Y	
20	07-Apr-15	20:56:30	0:03:20	36.5		Y	
21	07-Apr-15	20:56:40	0:03:30	36.3		Y	
22	07-Apr-15	20:56:50	0:03:40	36.0		Y	
23	07-Apr-15	20:57:00	0:03:50	36.6		Y	
24	07-Apr-15	20:57:10	0:04:00	36.6		Y	
25	07-Apr-15	20:57:20	0:04:10	39.8		Y	
26	07-Apr-15	20:57:30	0:04:20		42.5	N	gust
27	07-Apr-15	20:57:40	0:04:30		41.0	N	gust
28	07-Apr-15	20:57:50	0:04:40	39.3		Y	
29	07-Apr-15	20:58:00	0:04:50	39.1		Y	
30	07-Apr-15	20:58:10	0:05:00	38.3		Y	
31	07-Apr-15	20:58:20	0:05:10	36.7		Y	
32	07-Apr-15	20:58:30	0:05:20	37.4		Y	
33	07-Apr-15	20:58:40	0:05:30	36.6		Y	
34	07-Apr-15	20:58:50	0:05:40	36.0		Y	
35	07-Apr-15	20:59:00	0:05:50	36.5		Y	
36	07-Apr-15	20:59:10	0:06:00	35.6		Y	
37	07-Apr-15	20:59:20	0:06:10	35.6		Y	
38	07-Apr-15	20:59:30	0:06:20	35.8		Y	
39	07-Apr-15	20:59:40	0:06:30	35.8		Y	
40	07-Apr-15	20:59:50	0:06:40	35.7		Y	
41	07-Apr-15	21:00:00	0:06:50	34.8		Y	
42	07-Apr-15	21:00:10	0:07:00	35.8		Y	
43	07-Apr-15	21:00:20	0:07:10	35.3		Y	
44	07-Apr-15	21:00:30	0:07:20		36.5	N	yaw
45	07-Apr-15	21:00:40	0:07:30	33.8		Y	
46	07-Apr-15	21:00:50	0:07:40	35.1		Y	
47	07-Apr-15	21:01:00	0:07:50	35.0		Y	
48	07-Apr-15	21:01:10	0:08:00	34.6		Y	
49	07-Apr-15	21:01:20	0:08:10	34.4		Y	
50	07-Apr-15	21:01:30	0:08:20	34.6		Y	
51	07-Apr-15	21:01:40	0:08:30	35.8		Y	
52	07-Apr-15	21:01:50	0:08:40	35.1		Y	
53	07-Apr-15	21:02:00	0:08:50	34.8		Y	
54	07-Apr-15	21:02:10	0:09:00	35.1		Y	
55	07-Apr-15	21:02:20	0:09:10	34.8		Y	
56	07-Apr-15	21:02:30	0:09:20	34.5		Y	
57	07-Apr-15	21:02:40	0:09:30	34.4		Y	
58	07-Apr-15	21:02:50	0:09:40	35.3		Y	
59	07-Apr-15	21:03:00	0:09:50	35.3		Y	

10 minute Leq [dBA] **36.9**

# of Valid Data Points **56**

Sound Level Measurements, Lake Winds Energy Park, Detail D
Location 6, April 6, 2015, Turbines ON

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	06-Apr-15	22:00:00	0:00:00	44.2		Y	
1	06-Apr-15	22:00:10	0:00:10	45.1		Y	
2	06-Apr-15	22:00:20	0:00:20	45.2		Y	
3	06-Apr-15	22:00:30	0:00:30	45.0		Y	
4	06-Apr-15	22:00:40	0:00:40	45.9		Y	
5	06-Apr-15	22:00:50	0:00:50	46.6		Y	
6	06-Apr-15	22:01:00	0:01:00	46.4		Y	
7	06-Apr-15	22:01:10	0:01:10	46.1		Y	
8	06-Apr-15	22:01:20	0:01:20		48.3	N	wind gust
9	06-Apr-15	22:01:30	0:01:30	46.9		Y	
10	06-Apr-15	22:01:40	0:01:40	46.5		Y	
11	06-Apr-15	22:01:50	0:01:50	46.1		Y	
12	06-Apr-15	22:02:00	0:02:00	46.0		Y	
13	06-Apr-15	22:02:10	0:02:10	45.6		Y	
14	06-Apr-15	22:02:20	0:02:20	46.2		Y	
15	06-Apr-15	22:02:30	0:02:30	45.5		Y	
16	06-Apr-15	22:02:40	0:02:40	44.8		Y	
17	06-Apr-15	22:02:50	0:02:50	46.4		Y	
18	06-Apr-15	22:03:00	0:03:00	45.7		Y	
19	06-Apr-15	22:03:10	0:03:10	44.9		Y	
20	06-Apr-15	22:03:20	0:03:20	45.0		Y	
21	06-Apr-15	22:03:30	0:03:30	46.5		Y	
22	06-Apr-15	22:03:40	0:03:40	45.4		Y	
23	06-Apr-15	22:03:50	0:03:50	43.6		Y	
24	06-Apr-15	22:04:00	0:04:00	44.9		Y	
25	06-Apr-15	22:04:10	0:04:10	44.8		Y	
26	06-Apr-15	22:04:20	0:04:20	45.7		Y	
27	06-Apr-15	22:04:30	0:04:30		47.0	N	wind gust
28	06-Apr-15	22:04:40	0:04:40	46.0		Y	
29	06-Apr-15	22:04:50	0:04:50	46.3		Y	
30	06-Apr-15	22:05:00	0:05:00	45.0		Y	
31	06-Apr-15	22:05:10	0:05:10		45.9	N	wind gust
32	06-Apr-15	22:05:20	0:05:20		46.7	N	wind gust
33	06-Apr-15	22:05:30	0:05:30	45.0		Y	
34	06-Apr-15	22:05:40	0:05:40	45.3		Y	
35	06-Apr-15	22:05:50	0:05:50		46.8	N	wind gust
36	06-Apr-15	22:06:00	0:06:00	46.5		Y	
37	06-Apr-15	22:06:10	0:06:10	45.7		Y	
38	06-Apr-15	22:06:20	0:06:20	45.3		Y	
39	06-Apr-15	22:06:30	0:06:30	44.7		Y	
40	06-Apr-15	22:06:40	0:06:40	46.7		Y	
41	06-Apr-15	22:06:50	0:06:50	47.4		Y	
42	06-Apr-15	22:07:00	0:07:00	46.7		Y	
43	06-Apr-15	22:07:10	0:07:10	45.0		Y	
44	06-Apr-15	22:07:20	0:07:20	44.6		Y	
45	06-Apr-15	22:07:30	0:07:30	47.2		Y	
46	06-Apr-15	22:07:40	0:07:40	47.6		Y	
47	06-Apr-15	22:07:50	0:07:50	47.2		Y	
48	06-Apr-15	22:08:00	0:08:00	44.7		Y	
49	06-Apr-15	22:08:10	0:08:10	45.6		Y	
50	06-Apr-15	22:08:20	0:08:20	45.2		Y	
51	06-Apr-15	22:08:30	0:08:30	43.3		Y	
52	06-Apr-15	22:08:40	0:08:40	42.4		Y	
53	06-Apr-15	22:08:50	0:08:50	44.0		Y	
54	06-Apr-15	22:09:00	0:09:00	44.8		Y	
55	06-Apr-15	22:09:10	0:09:10	44.8		Y	
56	06-Apr-15	22:09:20	0:09:20	44.1		Y	
57	06-Apr-15	22:09:30	0:09:30	43.7		Y	
58	06-Apr-15	22:09:40	0:09:40	43.8		Y	
59	06-Apr-15	22:09:50	0:09:50	44.2		Y	

10 minute Leq [dBA]	**45.5**
# of Valid Data Points	**55**

Sound Level Measurements, Lake Winds Energy Park, Detail D

Location 6, April 6, 2015, Turbines OFF_A

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	06-Apr-15	23:10:00	0:00:00	41.8		Y	
1	06-Apr-15	23:10:10	0:00:10	44.8		Y	
2	06-Apr-15	23:10:20	0:00:20	43.9		Y	
3	06-Apr-15	23:10:30	0:00:30	41.7		Y	
4	06-Apr-15	23:10:40	0:00:40	42.6		Y	
5	06-Apr-15	23:10:50	0:00:50	39.6		Y	
6	06-Apr-15	23:11:00	0:01:00	41.7		Y	
7	06-Apr-15	23:11:10	0:01:10	44.2		Y	
8	06-Apr-15	23:11:20	0:01:20		44.8	N	yaw
9	06-Apr-15	23:11:30	0:01:30		43.9	N	yaw
10	06-Apr-15	23:11:40	0:01:40	42.1		Y	
11	06-Apr-15	23:11:50	0:01:50	41.8		Y	
12	06-Apr-15	23:12:00	0:02:00	40.6		Y	
13	06-Apr-15	23:12:10	0:02:10	41.9		Y	
14	06-Apr-15	23:12:20	0:02:20	41.5		Y	
15	06-Apr-15	23:12:30	0:02:30	40.9		Y	
16	06-Apr-15	23:12:40	0:02:40	40.7		Y	
17	06-Apr-15	23:12:50	0:02:50	42.9		Y	
18	06-Apr-15	23:13:00	0:03:00	42.6		Y	
19	06-Apr-15	23:13:10	0:03:10	43.1		Y	
20	06-Apr-15	23:13:20	0:03:20	43.2		Y	
21	06-Apr-15	23:13:30	0:03:30	44.4		Y	
22	06-Apr-15	23:13:40	0:03:40	43.0		Y	
23	06-Apr-15	23:13:50	0:03:50	44.5		Y	
24	06-Apr-15	23:14:00	0:04:00		46.1	N	gust
25	06-Apr-15	23:14:10	0:04:10	45.1		Y	
26	06-Apr-15	23:14:20	0:04:20	45.4		Y	
27	06-Apr-15	23:14:30	0:04:30	42.9		Y	
28	06-Apr-15	23:14:40	0:04:40	41.6		Y	
29	06-Apr-15	23:14:50	0:04:50	41.7		Y	
30	06-Apr-15	23:15:00	0:05:00	43.6		Y	
31	06-Apr-15	23:15:10	0:05:10	44.8		Y	
32	06-Apr-15	23:15:20	0:05:20	44.5		Y	
33	06-Apr-15	23:15:30	0:05:30		46.0	N	gust
34	06-Apr-15	23:15:40	0:05:40		44.3	N	gust
35	06-Apr-15	23:15:50	0:05:50	42.7		Y	
36	06-Apr-15	23:16:00	0:06:00	41.5		Y	
37	06-Apr-15	23:16:10	0:06:10	42.8		Y	
38	06-Apr-15	23:16:20	0:06:20	43.3		Y	
39	06-Apr-15	23:16:30	0:06:30	42.7		Y	
40	06-Apr-15	23:16:40	0:06:40	45.2		Y	
41	06-Apr-15	23:16:50	0:06:50	42.7		Y	
42	06-Apr-15	23:17:00	0:07:00	43.4		Y	
43	06-Apr-15	23:17:10	0:07:10	43.4		Y	
44	06-Apr-15	23:17:20	0:07:20	44.5		Y	
45	06-Apr-15	23:17:30	0:07:30		44.3	N	yaw
46	06-Apr-15	23:17:40	0:07:40	45.2		Y	
47	06-Apr-15	23:17:50	0:07:50	43.2		Y	
48	06-Apr-15	23:18:00	0:08:00		45.0	Y	trees
49	06-Apr-15	23:18:10	0:08:10	44.7		Y	
50	06-Apr-15	23:18:20	0:08:20	42.6		Y	
51	06-Apr-15	23:18:30	0:08:30	42.9		Y	
52	06-Apr-15	23:18:40	0:08:40	43.7		Y	
53	06-Apr-15	23:18:50	0:08:50	42.6		Y	
54	06-Apr-15	23:19:00	0:09:00	43.7		Y	
55	06-Apr-15	23:19:10	0:09:10	42.5		Y	
56	06-Apr-15	23:19:20	0:09:20	43.4		Y	
57	06-Apr-15	23:19:30	0:09:30	43.9		Y	
58	06-Apr-15	23:19:40	0:09:40	43.4		Y	
59	06-Apr-15	23:19:50	0:09:50	42.2		Y	

10 minute Leq [dBA]	**43.2**
# of Valid Data Points	**53**

Sound Level Measurements, Lake Winds Energy Park, Detail D

Location 6, April 7, 2015, Turbines OFF_B

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	07-Apr-15	0:02:00	0:00:00	39.1		Y	
1	07-Apr-15	0:02:10	0:00:10	39.2		Y	
2	07-Apr-15	0:02:20	0:00:20	38.5		Y	
3	07-Apr-15	0:02:30	0:00:30	39.1		Y	
4	07-Apr-15	0:02:40	0:00:40	40.5		Y	
5	07-Apr-15	0:02:50	0:00:50	39.2		Y	
6	07-Apr-15	0:03:00	0:01:00	37.8		Y	
7	07-Apr-15	0:03:10	0:01:10	37.1		Y	
8	07-Apr-15	0:03:20	0:01:20	37.8		Y	
9	07-Apr-15	0:03:30	0:01:30	38.6		Y	
10	07-Apr-15	0:03:40	0:01:40	39.5		Y	
11	07-Apr-15	0:03:50	0:01:50	38.1		Y	
12	07-Apr-15	0:04:00	0:02:00	38.4		Y	
13	07-Apr-15	0:04:10	0:02:10	38.3		Y	
14	07-Apr-15	0:04:20	0:02:20	40.1		Y	
15	07-Apr-15	0:04:30	0:02:30	39.8		Y	
16	07-Apr-15	0:04:40	0:02:40	39.1		Y	
17	07-Apr-15	0:04:50	0:02:50	39.0		Y	
18	07-Apr-15	0:05:00	0:03:00	37.4		Y	
19	07-Apr-15	0:05:10	0:03:10	36.7		Y	
20	07-Apr-15	0:05:20	0:03:20	36.2		Y	
21	07-Apr-15	0:05:30	0:03:30	36.6		Y	
22	07-Apr-15	0:05:40	0:03:40	37.9		Y	
23	07-Apr-15	0:05:50	0:03:50	39.0		Y	
24	07-Apr-15	0:06:00	0:04:00		38.2	N	yaw
25	07-Apr-15	0:06:10	0:04:10	37.2		Y	
26	07-Apr-15	0:06:20	0:04:20	37.5		Y	
27	07-Apr-15	0:06:30	0:04:30	37.7		Y	
28	07-Apr-15	0:06:40	0:04:40	38.2		Y	
29	07-Apr-15	0:06:50	0:04:50	37.8		Y	
30	07-Apr-15	0:07:00	0:05:00	37.6		Y	
31	07-Apr-15	0:07:10	0:05:10	37.8		Y	
32	07-Apr-15	0:07:20	0:05:20	37.6		Y	
33	07-Apr-15	0:07:30	0:05:30	36.8		Y	
34	07-Apr-15	0:07:40	0:05:40	39.1		Y	
35	07-Apr-15	0:07:50	0:05:50	39.9		Y	
36	07-Apr-15	0:08:00	0:06:00	42.6		Y	
37	07-Apr-15	0:08:10	0:06:10	41.0		Y	
38	07-Apr-15	0:08:20	0:06:20	40.3		Y	
39	07-Apr-15	0:08:30	0:06:30	40.1		Y	
40	07-Apr-15	0:08:40	0:06:40	38.3		Y	
41	07-Apr-15	0:08:50	0:06:50	39.4		Y	
42	07-Apr-15	0:09:00	0:07:00	40.8		Y	
43	07-Apr-15	0:09:10	0:07:10	39.9		Y	
44	07-Apr-15	0:09:20	0:07:20	39.1		Y	
45	07-Apr-15	0:09:30	0:07:30	41.1		Y	
46	07-Apr-15	0:09:40	0:07:40	39.7		Y	
47	07-Apr-15	0:09:50	0:07:50	41.9		Y	
48	07-Apr-15	0:10:00	0:08:00	40.7		Y	
49	07-Apr-15	0:10:10	0:08:10	41.5		Y	
50	07-Apr-15	0:10:20	0:08:20	41.6		Y	
51	07-Apr-15	0:10:30	0:08:30	40.8		Y	
52	07-Apr-15	0:10:40	0:08:40	42.1		Y	
53	07-Apr-15	0:10:50	0:08:50		41.5	N	yaw
54	07-Apr-15	0:11:00	0:09:00		39.5	N	yaw
55	07-Apr-15	0:11:10	0:09:10	39.2		Y	
56	07-Apr-15	0:11:20	0:09:20	39.3		Y	
57	07-Apr-15	0:11:30	0:09:30	39.6		Y	
58	07-Apr-15	0:11:40	0:09:40	40.0		Y	
59	07-Apr-15	0:11:50	0:09:50	39.0		Y	

10 minute Leq [dBA]	**39.3**
# of Valid Data Points	**57**

Sound Level Measurements, Lake Winds Energy Park, Detail B
Location 7, March 26, 2015, Turbines ON

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	26-Mar-15	20:30:30	0:00:00		46.5	N	gust
1	26-Mar-15	20:30:40	0:00:10	45.6		Y	
2	26-Mar-15	20:30:50	0:00:20		47.0	N	trees
3	26-Mar-15	20:31:00	0:00:30		48.0	N	gust
4	26-Mar-15	20:31:10	0:00:40		47.2	N	gust
5	26-Mar-15	20:31:20	0:00:50		47.1	N	trees
6	26-Mar-15	20:31:30	0:01:00	46.3		Y	
7	26-Mar-15	20:31:40	0:01:10	46.6		Y	
8	26-Mar-15	20:31:50	0:01:20		47.7	N	trees
9	26-Mar-15	20:32:00	0:01:30		47.0	N	gust
10	26-Mar-15	20:32:10	0:01:40	45.9		Y	
11	26-Mar-15	20:32:20	0:01:50	45.8		Y	
12	26-Mar-15	20:32:30	0:02:00	45.3		Y	
13	26-Mar-15	20:32:40	0:02:10	46.2		Y	
14	26-Mar-15	20:32:50	0:02:20	45.7		Y	
15	26-Mar-15	20:33:00	0:02:30	45.8		Y	
16	26-Mar-15	20:33:10	0:02:40	45.2		Y	
17	26-Mar-15	20:33:20	0:02:50	45.5		Y	
18	26-Mar-15	20:33:30	0:03:00	45.9		Y	
19	26-Mar-15	20:33:40	0:03:10	44.7		Y	
20	26-Mar-15	20:33:50	0:03:20	45.5		Y	
21	26-Mar-15	20:34:00	0:03:30	44.9		Y	
22	26-Mar-15	20:34:10	0:03:40	45.6		Y	
23	26-Mar-15	20:34:20	0:03:50	45.2		Y	
24	26-Mar-15	20:34:30	0:04:00	45.5		Y	
25	26-Mar-15	20:34:40	0:04:10	45.6		Y	
26	26-Mar-15	20:34:50	0:04:20	45.0		Y	
27	26-Mar-15	20:35:00	0:04:30	45.3		Y	
28	26-Mar-15	20:35:10	0:04:40		45.7	N	trees
29	26-Mar-15	20:35:20	0:04:50	45.6		Y	
30	26-Mar-15	20:35:30	0:05:00		46.4	N	trees
31	26-Mar-15	20:35:40	0:05:10		48.7	N	trees
32	26-Mar-15	20:35:50	0:05:20		50.3	N	gust
33	26-Mar-15	20:36:00	0:05:30		48.0	N	trees
34	26-Mar-15	20:36:10	0:05:40	46.7		Y	
35	26-Mar-15	20:36:20	0:05:50		48.1	N	trees
36	26-Mar-15	20:36:30	0:06:00	46.7		Y	
37	26-Mar-15	20:36:40	0:06:10		47.5	N	trees
38	26-Mar-15	20:36:50	0:06:20		48.4	N	trees
39	26-Mar-15	20:37:00	0:06:30		48.2	N	trees
40	26-Mar-15	20:37:10	0:06:40		47.8	N	trees
41	26-Mar-15	20:37:20	0:06:50	47.3		Y	
42	26-Mar-15	20:37:30	0:07:00	46.5		Y	
43	26-Mar-15	20:37:40	0:07:10	46.8		Y	
44	26-Mar-15	20:37:50	0:07:20	46.1		Y	
45	26-Mar-15	20:38:00	0:07:30	45.7		Y	
46	26-Mar-15	20:38:10	0:07:40	45.8		Y	
47	26-Mar-15	20:38:20	0:07:50	45.5		Y	
48	26-Mar-15	20:38:30	0:08:00	46.1		Y	
49	26-Mar-15	20:38:40	0:08:10	46.1		Y	
50	26-Mar-15	20:38:50	0:08:20	46.8		Y	
51	26-Mar-15	20:39:00	0:08:30	47.0		Y	
52	26-Mar-15	20:39:10	0:08:40	46.8		Y	
53	26-Mar-15	20:39:20	0:08:50		48.7	N	trees
54	26-Mar-15	20:39:30	0:09:00		49.6	N	trees
55	26-Mar-15	20:39:40	0:09:10		48.2	N	trees
56	26-Mar-15	20:39:50	0:09:20		47.3	N	trees
57	26-Mar-15	20:40:00	0:09:30	46.0		Y	
58	26-Mar-15	20:40:10	0:09:40		47.2	N	gust
59	26-Mar-15	20:40:20	0:09:50		47.3	N	trees

10 minute Leq [dBA]	**46.0**
# of Valid Data Points	**37**

Sound Level Measurements, Lake Winds Energy Park, Detail B
Location 7, March 26, 2015, Turbines OFF

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	26-Mar-15	21:02:00	0:00:00	44.2		Y	
1	26-Mar-15	21:02:10	0:00:10		45.8	N	trees
2	26-Mar-15	21:02:20	0:00:20		46.3	N	gust
3	26-Mar-15	21:02:30	0:00:30	42.6		Y	
4	26-Mar-15	21:02:40	0:00:40		42.7	N	plane
5	26-Mar-15	21:02:50	0:00:50		42.7	N	plane
6	26-Mar-15	21:03:00	0:01:00		43.3	N	plane
7	26-Mar-15	21:03:10	0:01:10	41.2		Y	
8	26-Mar-15	21:03:20	0:01:20	41.2		Y	
9	26-Mar-15	21:03:30	0:01:30		43.8	N	trees
10	26-Mar-15	21:03:40	0:01:40		44.9	N	trees/gust
11	26-Mar-15	21:03:50	0:01:50	40.4		Y	
12	26-Mar-15	21:04:00	0:02:00	41.7		Y	
13	26-Mar-15	21:04:10	0:02:10		41.7	N	yaw
14	26-Mar-15	21:04:20	0:02:20	40.8		Y	
15	26-Mar-15	21:04:30	0:02:30	39.5		Y	
16	26-Mar-15	21:04:40	0:02:40	38.2		Y	
17	26-Mar-15	21:04:50	0:02:50	38.5		Y	
18	26-Mar-15	21:05:00	0:03:00		43.3	N	car
19	26-Mar-15	21:05:10	0:03:10		44.2	N	car
20	26-Mar-15	21:05:20	0:03:20		38.9	N	car
21	26-Mar-15	21:05:30	0:03:30	36.6		Y	
22	26-Mar-15	21:05:40	0:03:40	35.3		Y	
23	26-Mar-15	21:05:50	0:03:50	37.1		Y	
24	26-Mar-15	21:06:00	0:04:00	37.0		Y	
25	26-Mar-15	21:06:10	0:04:10	37.3		Y	
26	26-Mar-15	21:06:20	0:04:20	39.9		Y	
27	26-Mar-15	21:06:30	0:04:30	39.1		Y	
28	26-Mar-15	21:06:40	0:04:40	41.1		Y	
29	26-Mar-15	21:06:50	0:04:50		40.4	N	plane / birds
30	26-Mar-15	21:07:00	0:05:00		42.4	N	plane / birds
31	26-Mar-15	21:07:10	0:05:10		43.6	N	plane / birds
32	26-Mar-15	21:07:20	0:05:20		45.5	N	trees
33	26-Mar-15	21:07:30	0:05:30		46.3	N	trees
34	26-Mar-15	21:07:40	0:05:40		45.4	N	trees
35	26-Mar-15	21:07:50	0:05:50		43.9	N	gust
36	26-Mar-15	21:08:00	0:06:00		45.4	N	gust
37	26-Mar-15	21:08:10	0:06:10	43.0		Y	
38	26-Mar-15	21:08:20	0:06:20	43.1		Y	
39	26-Mar-15	21:08:30	0:06:30		43.1	N	yaw
40	26-Mar-15	21:08:40	0:06:40	40.0		Y	
41	26-Mar-15	21:08:50	0:06:50	42.5		Y	
42	26-Mar-15	21:09:00	0:07:00		42.6	N	trees
43	26-Mar-15	21:09:10	0:07:10	41.9		Y	
44	26-Mar-15	21:09:20	0:07:20	42.1		Y	
45	26-Mar-15	21:09:30	0:07:30	40.0		Y	
46	26-Mar-15	21:09:40	0:07:40	39.7		Y	
47	26-Mar-15	21:09:50	0:07:50	39.6		Y	
48	26-Mar-15	21:10:00	0:08:00	39.9		Y	
49	26-Mar-15	21:10:10	0:08:10	41.3		Y	
50	26-Mar-15	21:10:20	0:08:20		43.4	N	trees
51	26-Mar-15	21:10:30	0:08:30	39.6		Y	
52	26-Mar-15	21:10:40	0:08:40	38.1		Y	
53	26-Mar-15	21:10:50	0:08:50	37.3		Y	
54	26-Mar-15	21:11:00	0:09:00	38.2		Y	
55	26-Mar-15	21:11:10	0:09:10	39.1		Y	
56	26-Mar-15	21:11:20	0:09:20	40.6		Y	
57	26-Mar-15	21:11:30	0:09:30	38.7		Y	
58	26-Mar-15	21:11:40	0:09:40	39.6		Y	
59	26-Mar-15	21:11:50	0:09:50	40.4		Y	

10 minute Leq [dBA]	**40.3**
# of Valid Data Points	**38**

Sound Level Measurements, Lake Winds Energy Park, Detail E
Location 7, April 6, 2015, Turbines ON

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	06-Apr-15	21:53:00	0:00:00	45.2		Y	
1	06-Apr-15	21:53:10	0:00:10	45.6		Y	
2	06-Apr-15	21:53:20	0:00:20	46.1		Y	
3	06-Apr-15	21:53:30	0:00:30	45.7		Y	
4	06-Apr-15	21:53:40	0:00:40	45.2		Y	
5	06-Apr-15	21:53:50	0:00:50	45.6		Y	
6	06-Apr-15	21:54:00	0:01:00	45.5		Y	
7	06-Apr-15	21:54:10	0:01:10	46.2		Y	
8	06-Apr-15	21:54:20	0:01:20	46.1		Y	
9	06-Apr-15	21:54:30	0:01:30	46.5		Y	
10	06-Apr-15	21:54:40	0:01:40	46.1		Y	
11	06-Apr-15	21:54:50	0:01:50	45.3		Y	
12	06-Apr-15	21:55:00	0:02:00	44.9		Y	
13	06-Apr-15	21:55:10	0:02:10	45.4		Y	
14	06-Apr-15	21:55:20	0:02:20	44.9		Y	
15	06-Apr-15	21:55:30	0:02:30	45.6		Y	
16	06-Apr-15	21:55:40	0:02:40	45.5		Y	
17	06-Apr-15	21:55:50	0:02:50	45.9		Y	
18	06-Apr-15	21:56:00	0:03:00	46.3		Y	
19	06-Apr-15	21:56:10	0:03:10	45.6		Y	
20	06-Apr-15	21:56:20	0:03:20	45.8		Y	
21	06-Apr-15	21:56:30	0:03:30	45.5		Y	
22	06-Apr-15	21:56:40	0:03:40	45.8		Y	
23	06-Apr-15	21:56:50	0:03:50	46.7		Y	
24	06-Apr-15	21:57:00	0:04:00	46.4		Y	
25	06-Apr-15	21:57:10	0:04:10	46.4		Y	
26	06-Apr-15	21:57:20	0:04:20	46.7		Y	
27	06-Apr-15	21:57:30	0:04:30	46.1		Y	
28	06-Apr-15	21:57:40	0:04:40	46.3		Y	
29	06-Apr-15	21:57:50	0:04:50	46.2		Y	
30	06-Apr-15	21:58:00	0:05:00	46.5		Y	
31	06-Apr-15	21:58:10	0:05:10	45.8		Y	
32	06-Apr-15	21:58:20	0:05:20	46.5		Y	
33	06-Apr-15	21:58:30	0:05:30	46.5		Y	
34	06-Apr-15	21:58:40	0:05:40	46.0		Y	
35	06-Apr-15	21:58:50	0:05:50	45.8		Y	
36	06-Apr-15	21:59:00	0:06:00	46.4		Y	
37	06-Apr-15	21:59:10	0:06:10		46.7	N	wind in trees
38	06-Apr-15	21:59:20	0:06:20		49.2	N	wind in trees
39	06-Apr-15	21:59:30	0:06:30		50.0	N	wind in trees
40	06-Apr-15	21:59:40	0:06:40		46.5	N	wind in trees
41	06-Apr-15	21:59:50	0:06:50	45.9		Y	
42	06-Apr-15	22:00:00	0:07:00	47.1		Y	
43	06-Apr-15	22:00:10	0:07:10		46.9	N	Wind
44	06-Apr-15	22:00:20	0:07:20	46.5		Y	
45	06-Apr-15	22:00:30	0:07:30	47.1		Y	
46	06-Apr-15	22:00:40	0:07:40	46.3		Y	
47	06-Apr-15	22:00:50	0:07:50	45.9		Y	
48	06-Apr-15	22:01:00	0:08:00	46.1		Y	
49	06-Apr-15	22:01:10	0:08:10	46.0		Y	
50	06-Apr-15	22:01:20	0:08:20	46.4		Y	
51	06-Apr-15	22:01:30	0:08:30	45.6		Y	
52	06-Apr-15	22:01:40	0:08:40	46.1		Y	
53	06-Apr-15	22:01:50	0:08:50	45.7		Y	
54	06-Apr-15	22:02:00	0:09:00	45.9		Y	
55	06-Apr-15	22:02:10	0:09:10	46.1		Y	
56	06-Apr-15	22:02:20	0:09:20	46.0		Y	
57	06-Apr-15	22:02:30	0:09:30	45.8		Y	
58	06-Apr-15	22:02:40	0:09:40	45.7		Y	
59	06-Apr-15	22:02:50	0:09:50	44.9		Y	

10 minute Leq [dBA]	**46.0**
# of Valid Data Points	**55**

Sound Level Measurements, Lake Winds Energy Park, Detail E
Location 7, April 6, 2015, Turbines OFF

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	06-Apr-15	22:57:00	0:00:00	40.9		Y	
1	06-Apr-15	22:57:10	0:00:10	40.7		Y	
2	06-Apr-15	22:57:20	0:00:20	40.4		Y	
3	06-Apr-15	22:57:30	0:00:30	40.9		Y	
4	06-Apr-15	22:57:40	0:00:40	40.4		Y	
5	06-Apr-15	22:57:50	0:00:50	40.4		Y	
6	06-Apr-15	22:58:00	0:01:00	40.7		Y	
7	06-Apr-15	22:58:10	0:01:10	40.8		Y	
8	06-Apr-15	22:58:20	0:01:20	40.9		Y	
9	06-Apr-15	22:58:30	0:01:30	40.0		Y	
10	06-Apr-15	22:58:40	0:01:40	41.6		Y	
11	06-Apr-15	22:58:50	0:01:50	41.0		Y	
12	06-Apr-15	22:59:00	0:02:00	40.5		Y	
13	06-Apr-15	22:59:10	0:02:10	40.1		Y	
14	06-Apr-15	22:59:20	0:02:20	40.7		Y	
15	06-Apr-15	22:59:30	0:02:30	41.0		Y	
16	06-Apr-15	22:59:40	0:02:40	40.0		Y	
17	06-Apr-15	22:59:50	0:02:50	40.8		Y	
18	06-Apr-15	23:00:00	0:03:00	40.7		Y	
19	06-Apr-15	23:00:10	0:03:10	40.5		Y	
20	06-Apr-15	23:00:20	0:03:20	40.7		Y	
21	06-Apr-15	23:00:30	0:03:30	40.1		Y	
22	06-Apr-15	23:00:40	0:03:40	40.1		Y	
23	06-Apr-15	23:00:50	0:03:50	41.3		Y	
24	06-Apr-15	23:01:00	0:04:00	40.3		Y	
25	06-Apr-15	23:01:10	0:04:10	39.8		Y	
26	06-Apr-15	23:01:20	0:04:20	39.9		Y	
27	06-Apr-15	23:01:30	0:04:30	40.7		Y	
28	06-Apr-15	23:01:40	0:04:40	40.8		Y	
29	06-Apr-15	23:01:50	0:04:50	40.5		Y	
30	06-Apr-15	23:02:00	0:05:00	40.0		Y	
31	06-Apr-15	23:02:10	0:05:10	40.7		Y	
32	06-Apr-15	23:02:20	0:05:20	39.9		Y	
33	06-Apr-15	23:02:30	0:05:30	41.2		Y	
34	06-Apr-15	23:02:40	0:05:40	41.4		Y	
35	06-Apr-15	23:02:50	0:05:50	39.8		Y	
36	06-Apr-15	23:03:00	0:06:00	39.8		Y	
37	06-Apr-15	23:03:10	0:06:10	40.3		Y	
38	06-Apr-15	23:03:20	0:06:20	40.9		Y	
39	06-Apr-15	23:03:30	0:06:30	40.9		Y	
40	06-Apr-15	23:03:40	0:06:40	40.1		Y	
41	06-Apr-15	23:03:50	0:06:50	40.8		Y	
42	06-Apr-15	23:04:00	0:07:00	40.7		Y	
43	06-Apr-15	23:04:10	0:07:10	40.8		Y	
44	06-Apr-15	23:04:20	0:07:20	40.4		Y	
45	06-Apr-15	23:04:30	0:07:30	40.7		Y	
46	06-Apr-15	23:04:40	0:07:40	41.0		Y	
47	06-Apr-15	23:04:50	0:07:50		42.9	N	wind
48	06-Apr-15	23:05:00	0:08:00	39.8		Y	
49	06-Apr-15	23:05:10	0:08:10	41.2		Y	
50	06-Apr-15	23:05:20	0:08:20		42.2	N	airplane
51	06-Apr-15	23:05:30	0:08:30		42.6	N	airplane
52	06-Apr-15	23:05:40	0:08:40		43.3	N	airplane
53	06-Apr-15	23:05:50	0:08:50		43.9	N	airplane
54	06-Apr-15	23:06:00	0:09:00		41.3	N	airplane
55	06-Apr-15	23:06:10	0:09:10		40.7	N	airplane
56	06-Apr-15	23:06:20	0:09:20		40.3	N	airplane
57	06-Apr-15	23:06:30	0:09:30		42.8	N	airplane
58	06-Apr-15	23:06:40	0:09:40		43.0	N	airplane
59	06-Apr-15	23:06:50	0:09:50	41.4		Y	

10 minute Leq [dBA]	**40.6**
# of Valid Data Points	**50**

Sound Level Measurements, Lake Winds Energy Park, Detail G
Location 7, April 7, 2015, Turbines ON

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	07-Apr-15	21:48:00	0:00:00	46.8		Y	
1	07-Apr-15	21:48:10	0:00:10	46.7		Y	
2	07-Apr-15	21:48:20	0:00:20	46.8		Y	
3	07-Apr-15	21:48:30	0:00:30		48.7	N	wind in trees
4	07-Apr-15	21:48:40	0:00:40		47.3	N	wind in trees
5	07-Apr-15	21:48:50	0:00:50		48.6	N	wind in trees
6	07-Apr-15	21:49:00	0:01:00	47.2		Y	
7	07-Apr-15	21:49:10	0:01:10		47.3	N	wind in trees
8	07-Apr-15	21:49:20	0:01:20	46.1		Y	
9	07-Apr-15	21:49:30	0:01:30	47.4		Y	
10	07-Apr-15	21:49:40	0:01:40		49.1	N	wind in trees
11	07-Apr-15	21:49:50	0:01:50	47.3		Y	
12	07-Apr-15	21:50:00	0:02:00	46.7		Y	
13	07-Apr-15	21:50:10	0:02:10	47.8		Y	
14	07-Apr-15	21:50:20	0:02:20		48.0	N	wind in trees
15	07-Apr-15	21:50:30	0:02:30	46.8		Y	
16	07-Apr-15	21:50:40	0:02:40	46.9		Y	
17	07-Apr-15	21:50:50	0:02:50	46.8		Y	
18	07-Apr-15	21:51:00	0:03:00	46.6		Y	
19	07-Apr-15	21:51:10	0:03:10	46.9		Y	
20	07-Apr-15	21:51:20	0:03:20	47.1		Y	
21	07-Apr-15	21:51:30	0:03:30	47.0		Y	
22	07-Apr-15	21:51:40	0:03:40	47.1		Y	
23	07-Apr-15	21:51:50	0:03:50	47.4		Y	
24	07-Apr-15	21:52:00	0:04:00	47.0		Y	
25	07-Apr-15	21:52:10	0:04:10	47.0		Y	
26	07-Apr-15	21:52:20	0:04:20	47.1		Y	
27	07-Apr-15	21:52:30	0:04:30	47.6		Y	
28	07-Apr-15	21:52:40	0:04:40	46.7		Y	
29	07-Apr-15	21:52:50	0:04:50	47.4		Y	
30	07-Apr-15	21:53:00	0:05:00	47.1		Y	
31	07-Apr-15	21:53:10	0:05:10		47.7	N	wind in trees
32	07-Apr-15	21:53:20	0:05:20		49.2	N	wind in trees
33	07-Apr-15	21:53:30	0:05:30		47.5	N	wind in trees
34	07-Apr-15	21:53:40	0:05:40	46.5		Y	
35	07-Apr-15	21:53:50	0:05:50	47.0		Y	
36	07-Apr-15	21:54:00	0:06:00	47.1		Y	
37	07-Apr-15	21:54:10	0:06:10	46.7		Y	
38	07-Apr-15	21:54:20	0:06:20	46.7		Y	
39	07-Apr-15	21:54:30	0:06:30	46.9		Y	
40	07-Apr-15	21:54:40	0:06:40	47.6		Y	
41	07-Apr-15	21:54:50	0:06:50	46.4		Y	
42	07-Apr-15	21:55:00	0:07:00	47.4		Y	
43	07-Apr-15	21:55:10	0:07:10		50.0	N	wind in trees
44	07-Apr-15	21:55:20	0:07:20		47.8	N	wind in trees
45	07-Apr-15	21:55:30	0:07:30	47.1		Y	
46	07-Apr-15	21:55:40	0:07:40	46.7		Y	
47	07-Apr-15	21:55:50	0:07:50	46.9		Y	
48	07-Apr-15	21:56:00	0:08:00		47.5	N	wind in trees
49	07-Apr-15	21:56:10	0:08:10		50.0	N	wind in trees
50	07-Apr-15	21:56:20	0:08:20		48.9	N	wind in trees
51	07-Apr-15	21:56:30	0:08:30		48.3	N	wind in trees
52	07-Apr-15	21:56:40	0:08:40	46.7		Y	
53	07-Apr-15	21:56:50	0:08:50	46.7		Y	
54	07-Apr-15	21:57:00	0:09:00		48.0	N	rain
55	07-Apr-15	21:57:10	0:09:10		47.4	N	rain
56	07-Apr-15	21:57:20	0:09:20		46.8	N	rain
57	07-Apr-15	21:57:30	0:09:30		49.1	N	rain
58	07-Apr-15	21:57:40	0:09:40		48.2	N	rain
59	07-Apr-15	21:57:50	0:09:50		48.5	N	rain

10 minute Leq [dBA]	**47.0**
# of Valid Data Points	**39**

Sound Level Measurements, Lake Winds Energy Park, Detail G
Location 7, April 7, 2015, Turbines OFF

Period	Date	Time	Duration	LAeq	Invalid	Valid	Comment
0	07-Apr-15	20:51:20	0:00:00	43.0		Y	
1	07-Apr-15	20:51:30	0:00:10	42.4		Y	
2	07-Apr-15	20:51:40	0:00:20	42.4		Y	
3	07-Apr-15	20:51:50	0:00:30	43.4		Y	
4	07-Apr-15	20:52:00	0:00:40	43.6		Y	
5	07-Apr-15	20:52:10	0:00:50	43.3		Y	
6	07-Apr-15	20:52:20	0:01:00	43.8		Y	
7	07-Apr-15	20:52:30	0:01:10	43.6		Y	
8	07-Apr-15	20:52:40	0:01:20		50.0	N	wind gusts
9	07-Apr-15	20:52:50	0:01:30		51.2	N	wind gusts
10	07-Apr-15	20:53:00	0:01:40		46.2	N	wind gusts
11	07-Apr-15	20:53:10	0:01:50		47.1	N	wind gusts
12	07-Apr-15	20:53:20	0:02:00		48.4	N	wind gusts
13	07-Apr-15	20:53:30	0:02:10		47.7	N	wind gusts
14	07-Apr-15	20:53:40	0:02:20	44.3		Y	
15	07-Apr-15	20:53:50	0:02:30	45.7		Y	
16	07-Apr-15	20:54:00	0:02:40	45.3		Y	
17	07-Apr-15	20:54:10	0:02:50		50.0	N	wind gusts
18	07-Apr-15	20:54:20	0:03:00		47.3	N	wind gusts
19	07-Apr-15	20:54:30	0:03:10		50.6	N	wind gusts
20	07-Apr-15	20:54:40	0:03:20		48.6	N	wind gusts
21	07-Apr-15	20:54:50	0:03:30	46.1		Y	
22	07-Apr-15	20:55:00	0:03:40		46.2	N	wind gusts
23	07-Apr-15	20:55:10	0:03:50		45.9	N	wind gusts
24	07-Apr-15	20:55:20	0:04:00		46.0	N	wind gusts
25	07-Apr-15	20:55:30	0:04:10	44.1		Y	
26	07-Apr-15	20:55:40	0:04:20	44.0		Y	
27	07-Apr-15	20:55:50	0:04:30	44.5		Y	
28	07-Apr-15	20:56:00	0:04:40		46.7	N	wind gusts
29	07-Apr-15	20:56:10	0:04:50		46.8	N	wind gusts
30	07-Apr-15	20:56:20	0:05:00	43.7		Y	
31	07-Apr-15	20:56:30	0:05:10	44.2		Y	
32	07-Apr-15	20:56:40	0:05:20		49.2	N	wind gusts
33	07-Apr-15	20:56:50	0:05:30		49.8	N	wind gusts
34	07-Apr-15	20:57:00	0:05:40		49.4	N	wind gusts
35	07-Apr-15	20:57:10	0:05:50		47.7	N	wind gusts
36	07-Apr-15	20:57:20	0:06:00		47.3	N	wind gusts
37	07-Apr-15	20:57:30	0:06:10		48.0	N	wind gusts
38	07-Apr-15	20:57:40	0:06:20		47.9	N	wind gusts
39	07-Apr-15	20:57:50	0:06:30		48.0	N	wind gusts
40	07-Apr-15	20:58:00	0:06:40		48.0	N	wind gusts
41	07-Apr-15	20:58:10	0:06:50	44.5		Y	
42	07-Apr-15	20:58:20	0:07:00	43.5		Y	
43	07-Apr-15	20:58:30	0:07:10	43.9		Y	
44	07-Apr-15	20:58:40	0:07:20	43.5		Y	
45	07-Apr-15	20:58:50	0:07:30	43.4		Y	
46	07-Apr-15	20:59:00	0:07:40	44.4		Y	
47	07-Apr-15	20:59:10	0:07:50	42.5		Y	
48	07-Apr-15	20:59:20	0:08:00	42.7		Y	
49	07-Apr-15	20:59:30	0:08:10		46.2	N	wind gusts
50	07-Apr-15	20:59:40	0:08:20		46.4	N	wind gusts
51	07-Apr-15	20:59:50	0:08:30		44.9	N	yaw
52	07-Apr-15	21:00:00	0:08:40	43.8		Y	
53	07-Apr-15	21:00:10	0:08:50	43.4		Y	
54	07-Apr-15	21:00:20	0:09:00	42.6		Y	
55	07-Apr-15	21:00:30	0:09:10	45.9		Y	
56	07-Apr-15	21:00:40	0:09:20		50.3	N	wind gusts
57	07-Apr-15	21:00:50	0:09:30	43.5		Y	
58	07-Apr-15	21:01:00	0:09:40		46.1	N	trees
59	07-Apr-15	21:01:10	0:09:50	44.1		Y	

10 minute Leq [dBA] **43.9**
# of Valid Data Points **31**

Appendix B

Test Protocol

Appendix 2

Mitigation Plan Sound Testing Protocol

Item 3 of the Consumers Energy Mitigation Plan states that Consumers Energy will "Conduct follow-up acoustic testing to determine the new sound effects after the mitigation plan implementation, as well as with the turbines operating without restrictions imposed by the mitigation plan." Details for the testing can be found below.

Testing Methodology

The testing will be conducted in full compliance with the Mason County Zoning Ordinance ("Zoning Ordinance") and will follow the procedures of ANSI Standard S12.9/Part 3 with an observer present and Standard S12.18. The compliance test procedure will use alternating series of turbine-on and turbine-off 10-minute L_{eq} measurements. These tests will involve three operating conditions shown below in Table 3.

Table 3 [1]**:** Shows the mode of operation, sound power level reduction for mitigated turbines and hub height winds speed for max sound power.

Test	Turbines	Turbine Operation Mode	Sound Level Reduction[2]	Hub Height wind speed at Max Sound Power
Mitigated Test	6,15,20,23,28,32, and 35	Mode 2	2dB reduction	8.6 m/s
Turbines Off	8000 ft. radius from test locations	N/A	N/A	N/A

1. *All other turbines not listed for mitigated testing will remain in mode 0. The design wind speed is the lowest hub height wind speed at which maximum sound power is generated by the Vestas V100 under normal operations (Mode 0). The seven turbines operating under modified operations (Mode 2) will reach their maximum sound power level at a lower wind speed of 8.6 m/s. Modified Operations will be for all wind speeds and directions during the Mitigated Test.*
2. *Data from Vestas General Specifications, § 12.1.3 and §12.3.3 .*

The testing protocol will be as follows:

1. The 10 minute average A-weighted turbine-only L_{eq} sound level will be determined by logarithmically subtracting the 10 minute average A-weighted sound level measured during an applicable off period from the 10 minute average A-weighted sound level measured during a related on period in accordance with ANSI S12.9 Part 3, Clauses 6.7.2, 6.8, 6.9, 7.2, 7.3.2 and 7.3.3. The testing will not be conducted under either of the simplified procedures contained in ANSI S12.9 Part 3, Clauses 6.5 and 6.6. With regards to corrections for uncertainty of the background sound (Clauses 7.3.2 and 7.3.3 of ANSI S12.9), Consumers Energy will report the turbine-only L_{eq} sound level calculated for each valid measurement period with the uncertainty factor subtracted from background sound. Consumers Energy understands that HGC will report the turbine-only L_{eq} sound level calculated for each valid measurement period based upon the uncertainty factor subtracted from background sound.
2. The background sound level will be determined without the contribution of the turbine's cooling fans. Intermittent sound caused by the turbines during off testing due to the "hydraulic pump", "yaw", or other intermittent mechanical sounds produced by the turbines will be noted and subtracted from the data in the 10-second interval in which it occurred. If the cooling fans run continuously through the testing period, the measurement period will be extended (if practicable) until the fans shut down.
3. Turbines within an 8,000 foot radius of a testing site will be on with the prescribed noise mitigation plan implemented and then turned off during each on-off testing sequence.
4. Preventative maintenance and scheduled shutdowns within 8,000 feet of a test site during testing (8 pm to 6 am on the chosen nights) shall be rescheduled. Schedule shutdowns for regular or preventative maintenance will not occur for all of LWEP for the testing time periods (8 pm to 6 am on the chosen nights).
5. Consumers Energy will notify the Zoning Administrator and HGC as soon as reasonably practicable under the circumstances (and within two hours if at all possible) of an unscheduled shut down of any LWEP turbine(s) during the testing time periods.
6. The Planning Commission, through its Sound Consultant, and Consumers Energy, through its Sound Consultant, will complete sound measurements and cooperate with each other regarding logistics of coming on and off the site to minimize disturbance and noise such as dogs barking or cars entering or leaving the site. Such cooperation will include Consumers Energy's Sound Consultant having the same access routes as the Planning Commission's Sound Consultant to the test locations so that both teams can enter and leave together as much as possible.
7. The Planning Commission's Sound Consultant will develop a detailed test plan (dates, shut down times, test instrumentation, test procedures, calibration, etc.), following the procedures in ANSI S12.9 Part 3, ANSI S12.18, and this document, in consultation with Consumers Energy's acoustical consultant for the tests.
8. Consumers Energy will cooperate with the County on follow up acoustic testing as per the appended Mitigation Test Procedure to determine new turbine-only L_{eq} sound levels at HGC Engineering's 2013 test locations 1, 2, 5^3, 6, and 7 under maximum electrical power (as defined below) after the defined mitigation has been implemented. If the maximum 10 minute average A-weighted turbine-only L_{eq} sound level exceeds 45 dBA, the mitigation plan shall be adjusted

and retested at any of those locations that do not comply with the 45 dBA limit with a similar protocol as outlined in this appendix.

Monitoring Locations and Schedule

Attended on-off testing will primarily be performed during nighttime hours (between 8 pm and 6 am). Six nights of testing (two periods of three consecutive nights each) will be completed with the turbines near a test location shut down for a period of at least one hour at a predetermined time each night. Measurements at two test locations will be conducted at the same time.

Full electrical power shall be defined as the nearest mitigated turbine(s) to a test location producing at least 80% of rated electric power in the applicable Mode 2, or 90% for the nearest turbine operating in NRO Mode 0 (test site 5 only). If testing under full electrical power, and suitable weather/ambient-sound conditions, is not achieved in six nights, the testing shall be extended at the expense of Consumers Energy.

Test Equipment and Field Procedures

Type 1/Class 1 (precision grade) real-time sound analyzers (Bruel & Kjaer Model 2250 or equivalent) will be setup to record sound pressure levels at the monitoring locations 1, 2, 5, 6 and 7. Testing at locations 1 and 2 will be done simultaneously as they share a common turbine shutdown list. All equipment will have been laboratory-calibrated to NIST standards within the previous 12 months and will be field calibrated with an ANSI Type 1 calibrator, both before and after the measurements. Microphones will be tripod mounted approximately 1.5 m above the ground and 7-inch ACO-Pacific wind screens (or equivalent) will be used to screen out contaminating wind noise. Surface wind speeds will be measured continuously with a 2-meter anemometer (HOBO H21-002 micro-weather station anemometer or equivalent) setup near the sound analyzer.

The analyzers will log 10 second equivalent-continuous (L_{eq}) and maximum (L_{max}) sound pressure levels in A-weighted decibels (dBA). The sound analyzers will be time-synchronized to the clock of the LWEP SCADA system. The acoustic engineers will use hub-height wind speed and direction data from the LWEP Control Center to guide the field program. During the testing, the acoustic engineer attending each sound analyzer will listen for any loud background noise that would bias the measurements, such as a motor vehicle passing by, aircraft flying overhead, dogs barking, farm machinery, or impulse noise from wind gusts, and the engineer will record his observations in a field log.

Data Analysis

Under the same conditions as the previous compliance testing performed in 2013, Consumers Energy will provide HGC Engineering with the following data in ten-minute intervals: hub height wind speed, hub height wind direction and electrical power generation data, for the entire test period (8 pm to 6 am on the chosen nights). Consumers Energy will certify, in writing, that the subject wind turbines were operating in NRO mode 2 during the entire duration of the mitigation testing.

Consumers Energy's Sound Consultant will organize 10 second measurements and field observations into a master spreadsheet with data on surface and hub-height wind speeds and turbine power production (kW). For each monitoring location, the 10 second L_{eq} and L_{max} data will be reviewed using field engineer notes, and segments with unusual or loud background noise will be excluded from the 10-minute L_{eq} measurements, following ANSI S12.9/Part 3 data screening procedures. Then, the turbine-off L_{eq} measurements will be subtracted from the turbine-on L_{eq} measurements on an energy basis to remove long-term background sound per ANSI S12.9/Part 3 procedures. The resulting turbine-only L_{eq} sound levels, for both modified and normal operations if applicable, will be compared to the 45-dBA limit in the Mason County Zoning Ordinance for an Unpooled Parcel property line. A report will be prepared that summarizes all data, results and conclusions.

Further Analysis

Once a suitable mitigation plan is determined through testing to be successful, Consumers Energy shall further develop the plan to take into consideration the need to demonstrate compliant sound levels at all other unpooled properties in the project area. Details concerning any need for operating additional turbines in selected NRO modes shall be provided to the County as well as the expected sound levels at each unpooled property in a similar format to the June 2011 acoustic-modeling study that Consumers Energy submitted during the permitting process. The County and/or its acoustic consultant will review the plan. The Planning Commission shall approve the plan prior to implementation. Additional testing may be required to confirm the mitigation plan.

Appendix 2

Mitigation Plan Sound Testing Protocol (revised April 2015)

Item 3 of the Consumers Energy Mitigation Plan states that Consumers Energy will "Conduct follow-up acoustic testing to determine the new sound effects after the mitigation plan implementation, as well as with the turbines operating without restrictions imposed by the mitigation plan." Details for further testing that is scheduled to begin in Spring 2015 can be found below.

Testing Methodology

The testing will be conducted in full compliance with the Mason County Zoning Ordinance ("Zoning Ordinance") and will follow the procedures of ANSI Standard S12.9/Part 3 with an observer present and Standard S12.18. The compliance test procedure will use alternating series of turbine-on and turbine-off 10-minute L_{eq} measurements. These tests will involve three operating conditions shown below in Table 3.

Table 3 [1]**:** Shows the mode of operation, sound power level reduction for mitigated turbines and hub height winds speed for max sound power.

Test	Turbines	Turbine Operation Mode	Sound Level Reduction[2]	Hub Height wind speed at Max Sound Power
Mitigated Test	6,15,20,23,28,32, and 35	Mode 2	2dB reduction	8.6 m/s
Turbines Off	8000 ft. radius from test locations	N/A	N/A	N/A

1. *All other turbines not listed for mitigated testing will remain in mode 0. The design wind speed is the lowest hub height wind speed at which maximum sound power is generated by the Vestas V100 under normal operations (Mode 0). The seven turbines operating under modified operations (Mode 2) will reach their maximum sound power level at a lower wind speed of 8.6 m/s. Modified Operations will be for all wind speeds and directions during the Mitigated Test.*
2. *Data from Vestas General Specifications, § 12.1.3 and §12.3.3 .*

The testing protocol will be as follows:

1. The 10 minute average A-weighted turbine-only L_{eq} sound level will be determined by logarithmically subtracting the 10 minute average A-weighted sound level measured during an applicable off period from the 10 minute average A-weighted sound level measured during a related on period in accordance with ANSI S12.9 Part 3, Clauses 6.7.2, 6.8, 6.9, 7.2, 7.3.2 and 7.3.3. The testing will not be conducted under either of the simplified procedures contained in ANSI S12.9 Part 3, Clauses 6.5 and 6.6. With regards to corrections for uncertainty of the background sound (Clauses 7.3.2 and 7.3.3 of ANSI S12.9), Consumers Energy will report the turbine-only L_{eq} sound level calculated for each valid measurement period with the uncertainty factor subtracted from background sound. Consumers Energy understands that HGC will report the turbine-only L_{eq} sound level calculated for each valid measurement period based upon the uncertainty factor subtracted from background sound.
2. The background sound level will be determined without the contribution of the turbine's cooling fans. Intermittent sound caused by the turbines during off testing due to the "hydraulic pump", "yaw", or other intermittent mechanical sounds produced by the turbines will be noted and subtracted from the data in the 10-second interval in which it occurred. If the cooling fans run continuously through the testing period, the measurement period will be extended (if practicable) until the fans shut down.
3. Turbines within an 8,000 foot radius of a testing site will be on with the prescribed noise mitigation plan implemented and then turned off during each on-off testing sequence.
4. Preventative maintenance and scheduled shutdowns within 8,000 feet of a test site during testing (8 pm to 6 am on the chosen nights) shall be rescheduled. Schedule shutdowns for regular or preventative maintenance will not occur for all of LWEP for the testing time periods (8 pm to 6 am on the chosen nights).
5. Consumers Energy will notify the Zoning Administrator and HGC as soon as reasonably practicable under the circumstances (and within two hours if at all possible) of an unscheduled shut down of any LWEP turbine(s) during the testing time periods.
6. The Planning Commission, through its Sound Consultant, and Consumers Energy, through its Sound Consultant, will complete sound measurements and cooperate with each other regarding logistics of coming on and off the site to minimize disturbance and noise such as dogs barking or cars entering or leaving the site. Such cooperation will include Consumers Energy's Sound Consultant having the same access routes as the Planning Commission's Sound Consultant to the test locations so that both teams can enter and leave together as much as possible.
7. The Planning Commission's Sound Consultant will develop a detailed test plan (dates, shut down times, test instrumentation, test procedures, calibration, etc.), following the procedures in ANSI S12.9 Part 3, ANSI S12.18, and this document, in consultation with Consumers Energy's acoustical consultant for the tests.
8. Consumers Energy will cooperate with the County on follow up acoustic testing as per the appended Mitigation Test Procedure to determine new turbine-only L_{eq} sound levels at HGC Engineering's 2013 test locations 1, 2, 5[4], 6, and 7 under maximum electrical power (as defined

4. Location 5 is included in these tests due to HGC's equipment failure during the initial post-construction sound test.

below) after the defined mitigation has been implemented. If the maximum 10 minute average A-weighted turbine-only L_{eq} sound level exceeds 45 dBA, the mitigation plan shall be adjusted and retested at any of those locations that do not comply with the 45 dBA limit with a similar protocol as outlined in this appendix.

9. In determination of the Turbine only sound, wind speeds must be similar in order for the turbine only calculated value to be valid. *Similar* shall be defined as a 1.5 m/s, or lower, difference between the applicable Turbine-ON and Turbine-OFF test cycle hub height wind speed values. Where two multiple turbine-OFF periods shoulder a turbine-ON period, the one with the hub-height wind speed closest to that of the turbine-ON period shall be used.

Monitoring Locations and Schedule

Attended on/off testing will primarily be performed during nighttime hours (between 8 pm and 6 am) for an ongoing period of up to several weeks as necessary to obtain sufficient valid data. Testing will be completed at up to two locations at the same time with the turbines near each test location shut-down for periods of at least 40 min at a predetermined time each night. Two successive on/off cycles for each particular location being tested will be required prior to moving to another site, unless conditions require moving to another site, such as a turbine maintenance shutdown. Not more than four locations shall be tested during a given test night, however concurrent manned testing at more than two locations is allowable (up to four (4) concurrent locations).

Full electrical power shall be defined as the nearest mitigated turbine(s) to a test location producing at least 80% of rated electric power in the applicable Mode 2, or 90% for the nearest turbine operating in NRO Mode 0 (test site 5 only). If testing under full electrical power, and suitable weather/ambient-sound conditions, is not achieved in six nights, the testing shall be extended at the expense of Consumers Energy.

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as a motor vehicle passing by, aircraft flying overhead, dogs barking, farm machinery, or impulse noise from wind gusts, and the engineer will record his observations in a field log.

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Consumers Energy's Sound Consultant will organize 10 second measurements and field observations into a master spreadsheet with data on surface and hub-height wind speeds and turbine power production (kW). For each monitoring location, the 10 second L_{eq} and L_{max} data will be reviewed using field engineer notes, and segments with unusual or loud background noise will be excluded from the 10-minute L_{eq} measurements, following ANSI S12.9/Part 3 data screening procedures. Then, the turbine-off L_{eq} measurements will be subtracted from the turbine-on L_{eq} measurements on an energy basis to remove long-term background sound per ANSI S12.9/Part 3 procedures. The resulting turbine-only L_{eq} sound levels, for both modified and normal operations if applicable, will be compared to the 45-dBA limit in the Mason County Zoning Ordinance for an Unpooled Parcel property line. A report will be prepared that summarizes all data, results and conclusions.

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