minnesota power
AN ALLETE COMPANY

30 west superior street / duluth, minnesota 55802-2093 / fax: 218-723-3955 /www.allete.com

David R. Moeller
Senior Attorney
218-723-3963
dmoeller@allete.com

March 20, 2015

VIA EMAIL: NDPSC@ND.GOV

Mr. Darrell Nitschke
Executive Secretary
North Dakota Public Service Commission
600 E. Boulevard Ave., Dept. 408
Bismarck, ND 58505-0480

RE: Bison 4 Wind Project
Oliver/Morton Counties
Siting Application
Case No. PU-13-127

Dear Mr. Nitschke:

Enclosed please find Minnesota Power's response to the sound issued raised by Mr. John Aasmundstad regarding one of the Bison 4 turbines. Please note that Minnesota Power is providing Mr. Aasmundstad a copy of the sound study completed by Barr Engineering which identifies that the turbine is in compliance with North Dakota Administrative Code 69-06-08-01(4).

Please do not hesitate to contact me with any questions or concerns that you have with regard to this matter. Minnesota Power will continue to update the PSC on any discussions with Mr. Aasmundstad.

Yours truly,

David R. Moeller

DRM:sr
Attach

96 PU-13-127 Filed 03/20/2015 Pages: 24
Response to John Aasmundstad re sound study
Allete, Inc.
David Moeller

minnesota power

AN ALLETE COMPANY

Bradley W. Oachs
Chief Operating Officer
Fax 218-723-3989
E-mail boachs@mnpower.com

VIA PERSONAL DELIVERY

March 23, 2015

John and Joyce Aasmundstad
5895 28th Street S.W.
Beulah, ND 58523

Re: Sound Study
Minnesota Power – Bison 4 Wind Farm

Dear Mr. and Mrs. Aasmundstad:

Your concerns with regard to Minnesota Power's recent installation and commissioning of a wind turbine located on property to the northwest of your property have been brought to my attention. We refer to the wind turbine as T463; for simplicity, I will use that same reference in this letter. We are sorry that you are unhappy with the sound level that you are experiencing at your home. We take this matter very seriously and appreciate the opportunity to address your concerns.

We understand that you initially shared your concerns with the North Dakota Public Services Commission (the "PSC") in late December. We have thoroughly reviewed this matter and appreciate the ongoing conversations that you have had with our land agent, Wade Isaacson, over the past few weeks. Thank you for your patience during our review.

Based on your complaint, we needed to gather and analyze sound data from T463 to understand the sound levels being generated in its operation. We engaged a testing firm, Barr Engineering, to gather and analyze the sound information. Given winter weather, it took them more time than we expected to gather the data.

The testing firm gathered sound data from a location south of your property and at a distance 100 feet closer to T463 than the distance between T463 and your home. Barr Engineering found that, on average, the sound from T463 at that distance is less than 50 decibels ("dBA"). A copy of their report is enclosed for your information.

We are also enclosing for your reference a copy of North Dakota Administrative Code Section 69-06-08-01, section 4, which states, in pertinent part:

> A wind energy conversion facility site must not include a geographic area where, due to operation of the facility, the sound levels within one hundred feet of an inhabited residence…will exceed fifty dBA.

We have found that the sound being generated by T463 is in compliance with the requirements of North Dakota administrative code.

We assure you that in locating the turbines for Minnesota Power's Bison 4 wind farm, we undertook a rigorous process of modeling sound levels and locating turbines so that they would be in compliance with all applicable laws and the site permit issued by the PSC. If you would like Minnesota Power to conduct another sound study on your property, we would be pleased to do so at our cost.

Please feel free to discuss and share this information with your attorney. After you have had time to review the report, if you have any questions or would like to discuss this matter further, please contact Todd Simmons. Todd is our General Manager of Wind Operations and is happy to work with you on this matter.

Minnesota Power strives to develop positive relationships with all landowners who are our neighbors, living and working in the areas in which we locate our energy developments. We understand that you have an option agreement with us and we are grateful for your participation with us in our development of this wind farm. Thank you, again, for bringing this matter to our attention and for your patience while we are working to address your concerns.

Sincerely,

Bradley W. Oachs
Chief Operating Officer

BWO:sr
Enc.

resourceful. naturally.
engineering and environmental consultants

BARR

Memorandum

To: Dan McCourtney
From: Andrew Skoglund
Subject: Bison Turbine Noise Compliance Monitoring Results Summary
Date: March 19, 2015
Project: 34301016
c: John Wachtler

Minnesota Power retained Barr Engineering to monitor and analyze noise levels at a wind turbine (Turbine 463) associated with its Bison 4 Wind Project. This memorandum summarizes the results of that monitoring which occurred from March 12, 2015 through March 14, 2015. Preliminary monitoring was also completed on February 28, 2015, March 6, 2015 and March 8, 2015. The monitoring was performed at a site located about 1300 feet southeast of Turbine 463 and approximately 730 feet to the southwest of a nearby residence. Figure 1 shows the location of the monitoring site, turbine and nearest residence.

The monitoring results, which are summarized in Table 1, indicate that monitored sound levels due to the operation of the wind turbine did not exceed the North Dakota Public Service Commission (PSC) regulatory limit of 50 dBA.[1]

Table 1 Monitoring Result Summary

Date	2/28/2015	2/28/2015	3/6/2015	3/8/2015	3/11-3/12/2015	3/12-3/13/2015	3/13-3/14/2015
Monitoring Period	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7
Start Time	10:34 am	11:48 am	3:25 pm	10:55 am	2:54 pm	4:09 pm	2:32 pm
End Time	11:33 am	2:20 pm	3:41 pm	11:08 am	4:08 pm	2:31 pm	2:55 pm
Leq (dBA)	46.0	46.4	41.5	41.5	46.5	46.8	49.9
Leq (dBA) non-representative conditions removed	-	-	-	-	45.6	46.7	42.5
Dominant Wind Direction	NW	NW	NW	NW	NW	NW	NW

[1] North Dakota Administrative Code Chapter 69-06-08-01(4): *"A wind energy conversion facility site must not include a geographic area where, due to operation of the facility, the sound levels within one hundred feet of an inhabited residence or a community building will exceed fifty dBA. The sound level avoidance area criteria may be waived in writing by the owner of the occupied residence or the community building."*

Monitoring Protocol and Qualifications

Monitoring was performed with standard outdoor noise monitoring equipment, maintained and calibrated per standard industry practice. Field calibration of the monitor was checked at 114.0 dB prior to run start, and was 114.4 dB upon completion of the monitoring (using standard calibrator, 1000Hz @ 114.0 dB). Attachment A provides monitoring survey sheets. Attachment B provides the equipment calibration documentation.

Field staff were trained and assisted in the operation of the monitoring equipment by Andrew Skoglund of Barr Engineering, who also completed the data analysis. Mr. Skoglund has a B.S. in Engineering Science with focus area of Acoustics, and is a registered professional engineer in Minnesota. He has over ten years of experience assessing noise impacts and compliance for various facility types, including modeling power generation facilities ranging in size from 2 to 600 MW.

Monitoring Details

As shown in Figure 1, the nearest turbine from the residence is located upwind of the monitoring location when winds are out of the northwest. During all periods winds were primarily from the northwest however, the wind direction did shift to the south and increase in speed on March 14, 2015. During monitoring, temperatures remained within the manufacturers operating specification for all monitoring periods.

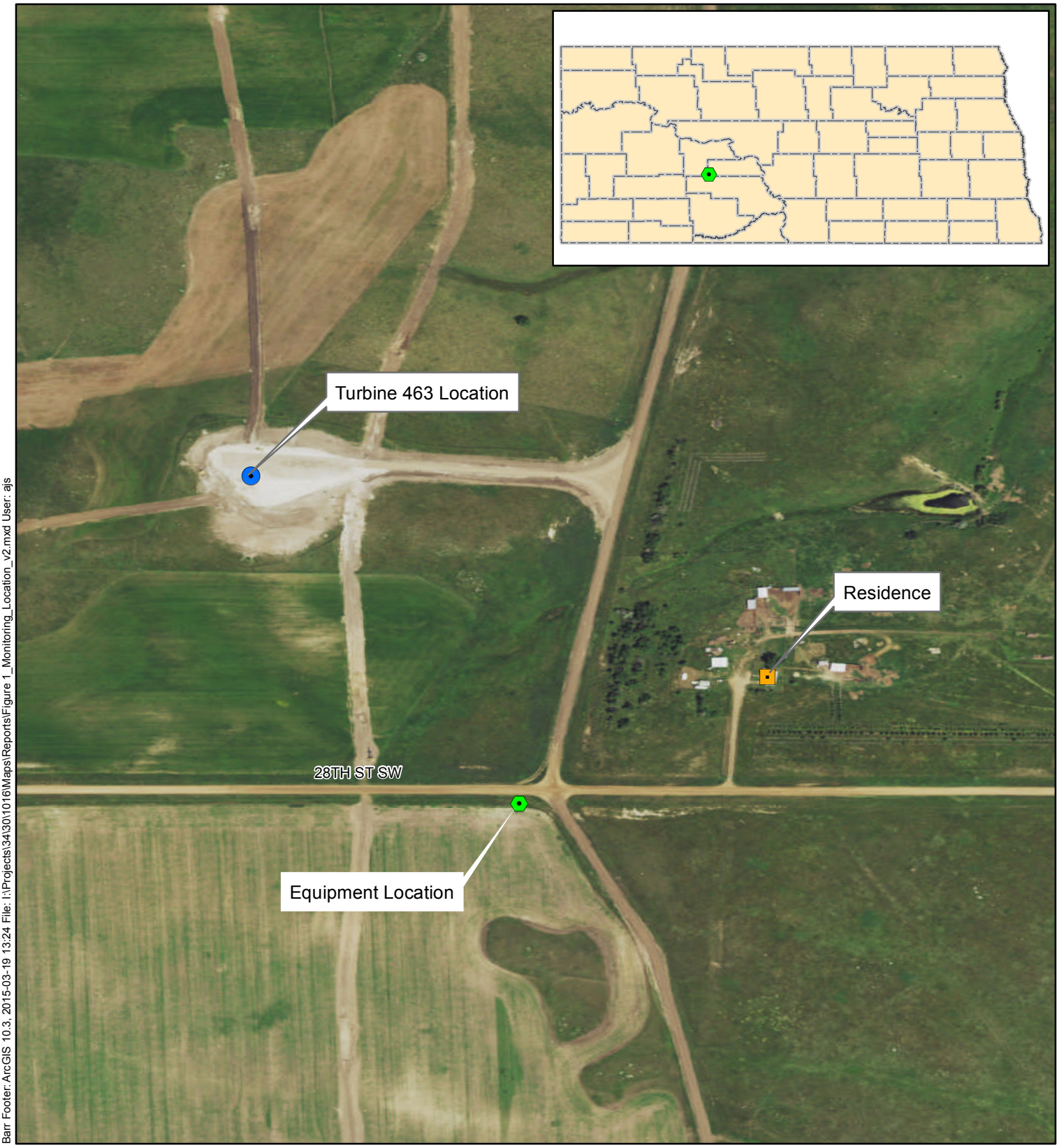
Initial monitoring was performed on February 28, 2015, March 6, 2015, and March 8, 2015. A summary of these preliminary monitoring periods is included in Table 1. The monitored sound levels (Leq) for these periods generally ranged from 41-46 dBA. These preliminary results indicate compliance with PSC requirements.

The preliminary monitoring was followed up with three days of continuous monitoring from March 11 through March 14, 2015. The Leq from all noise sources for the three days ranged from 46.5 to 49.9 dBA. A time series showing the detailed results is found in Figure 2. Figure 2 compares Turbine 463 rotation per minute (rpm, in red) with the 1-minute sound level data (Leq, in blue). These data show a significant correlation between turbine rpm and noise level. For example, when the turbine rpm reaches its maximum rotation speed (15 rpm), noise levels plateau at approximately 47 dBA. Brief spikes above 50 dBA only occur in the daytime hours, and are likely associated with non-continuous noise events (e.g. vehicles, vegetation, birds, brief wind gusts), and are not reflective of a more constant source such as a turbine. Portions of the dataset on March 12 and 14, 2015 with high sound levels were due to wind gusts that caused windscreen-derived sound. As a result, this data was removed from the plotted dataset in

Figure 2 as non-representative of actual noise conditions. Exclusion of the non-representative data results in Leq values ranging from 42.5 to 46.7 dBA for the three day period.

In summary, Barr Engineering monitored consistent sound levels during operation of turbine 463 at four separate testing intervals and a three day-long continuous testing interval. The sound results of all monitoring activities are below the PSC 50 dBA standard, indicating that the turbine is in compliance with PSC noise standards.

Attachments



Barr Footer: ArcGIS 10.3, 2015-03-19 13:24 File: I:\Projects\34\30\1016\Maps\Reports\Figure 1_Monitoring_Location_v2.mxd User: ajs

- Turbine 463 Location
- Noise Monitoring Point
- Residence

N

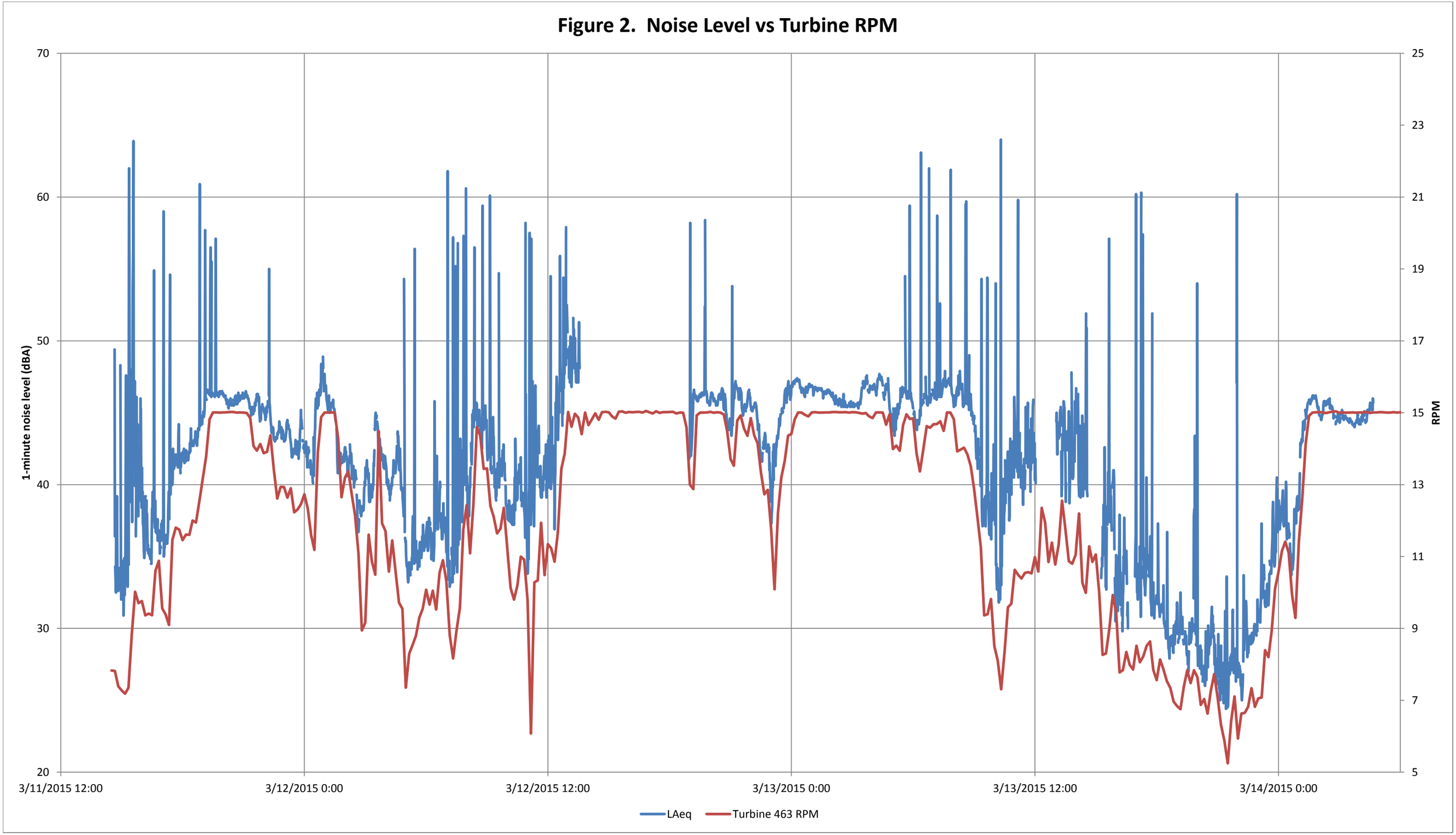
Feet

250 0 250 500

Figure 1

MONITORING LOCATION
Bison Turbine Monitoring
ALLETE/Minnesota Power
Beulah, ND

Figure 2. Noise Level vs Turbine RPM



Attachment A

Monitoring Survey Sheets

3/11/2015 - 3/12/2015

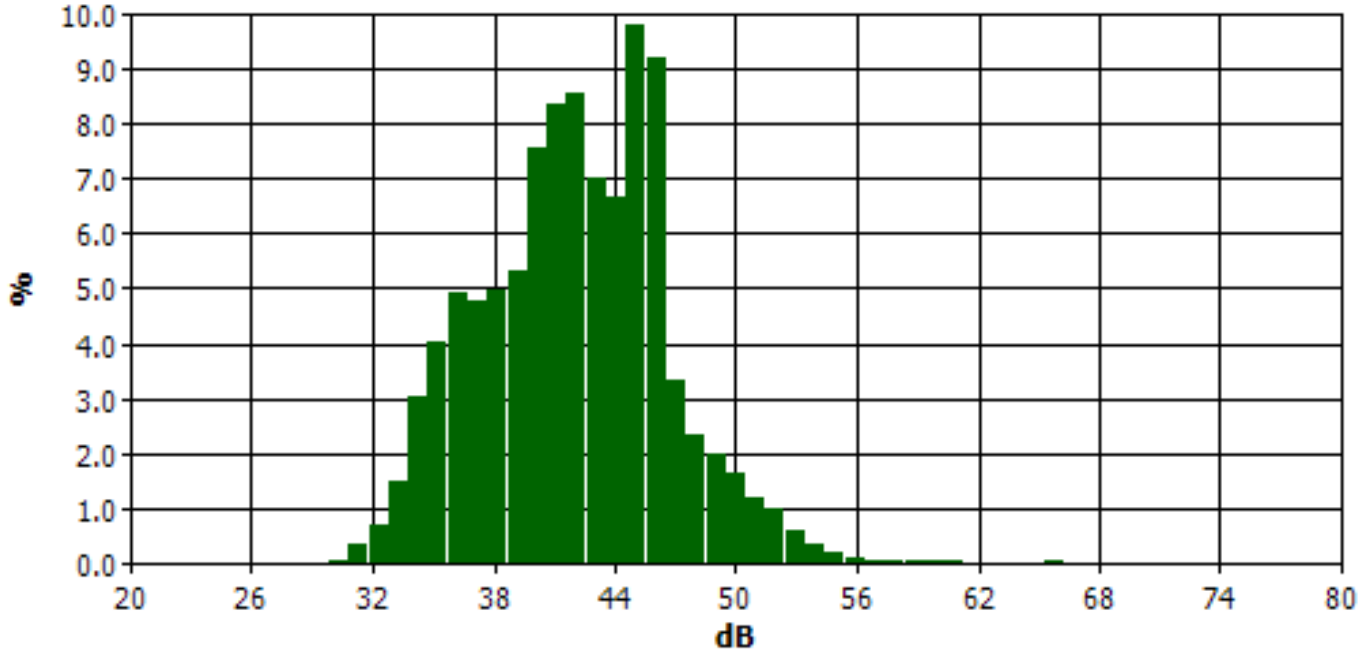
Information Panel

Name	S005_BJH030020_14032015_170504
Start Time	Wednesday, March 11, 2015 14:54:01
Stop Time	Thursday, March 12, 2015 16:08:34
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	46.5 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	5 dB
Weighting	2	C	Response	2	FAST

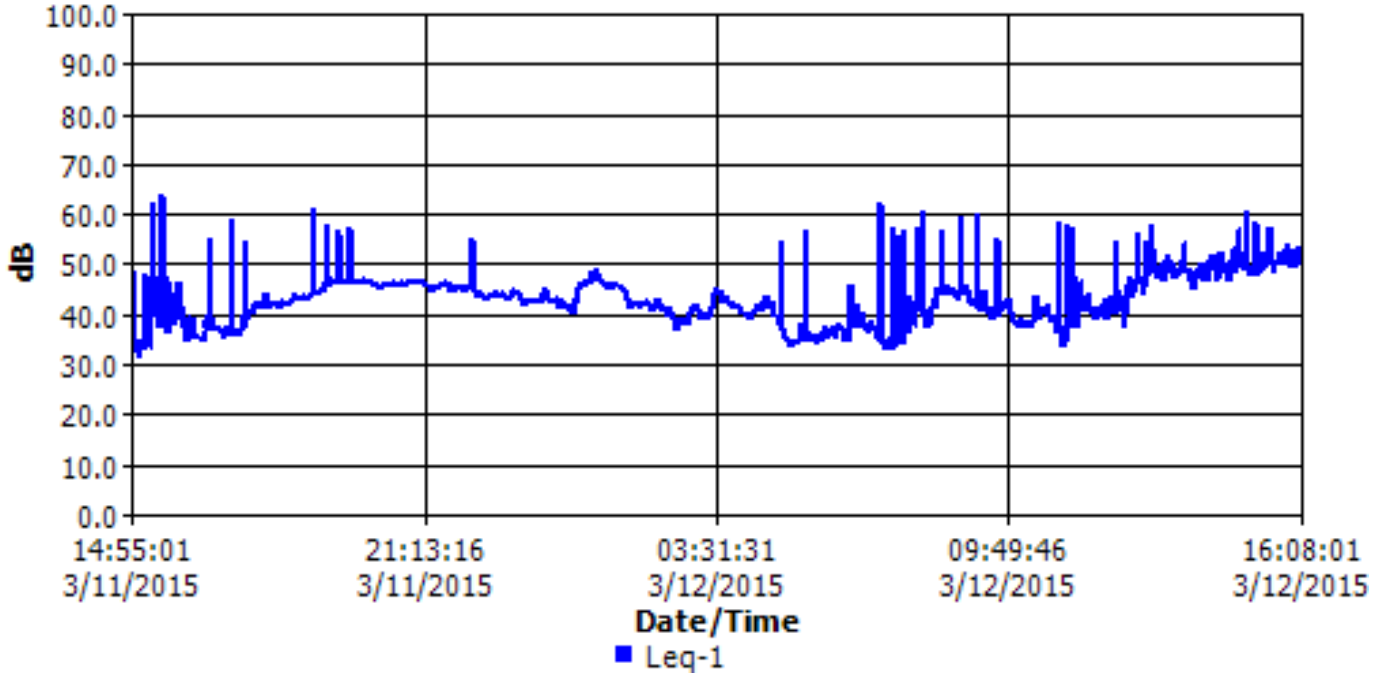
Statistics Chart



Calibration History

Date	Action	Level	Serial Number	Certification Date
3/11/2015 2:35:52 PM	Calibration	114.0		

Logged Data Chart



3/12/2015 - 3/13/2015

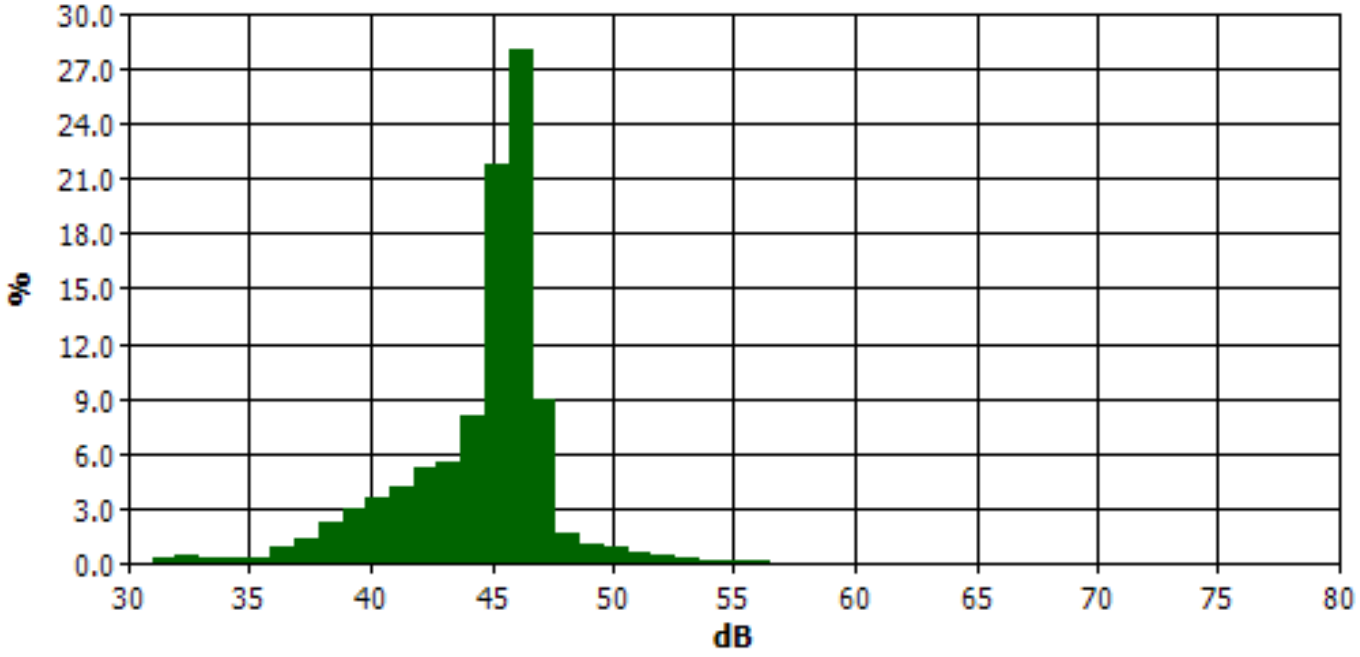
Information Panel

Name	S006_BJH030020_14032015_170505
Start Time	Thursday, March 12, 2015 16:08:55
Stop Time	Friday, March 13, 2015 14:31:42
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	46.8 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	5 dB
Weighting	2	C	Response	2	FAST

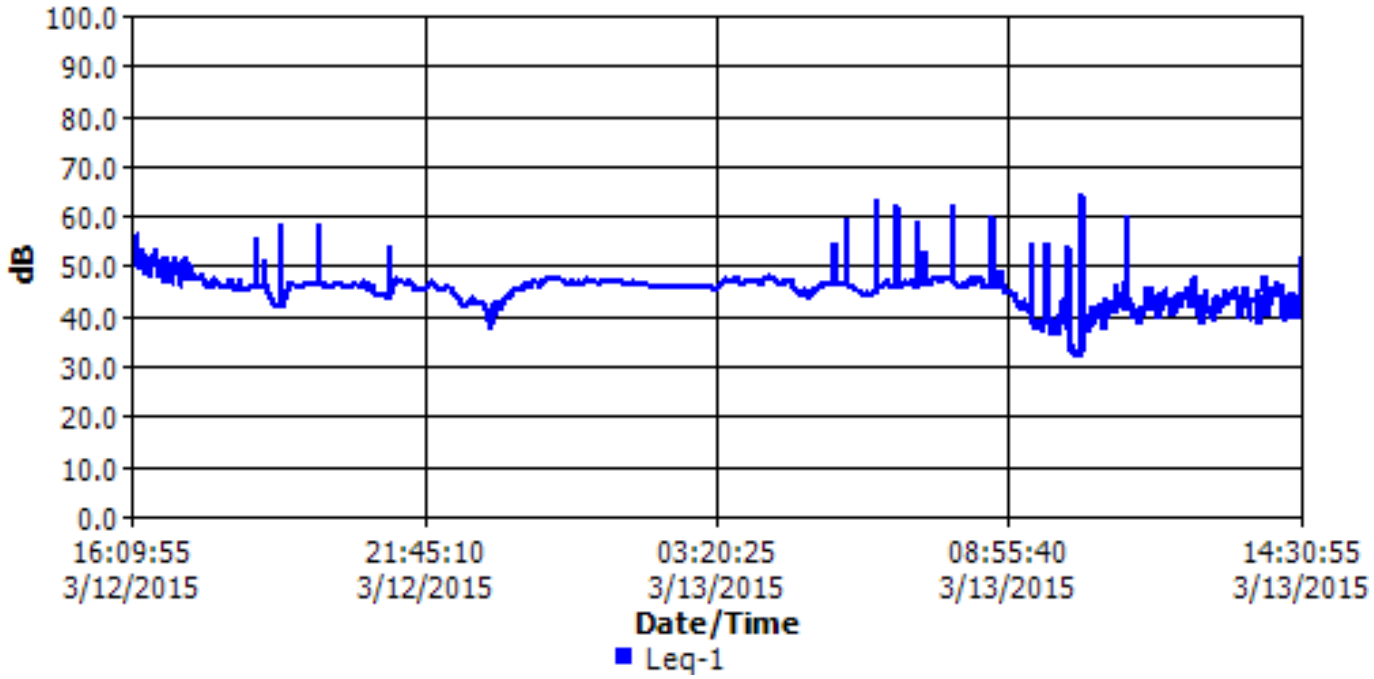
Statistics Chart



Calibration History

Date	Action	Level	Serial Number	Certification Date
3/11/2015 2:35:52 PM	Calibration	114.0		

Logged Data Chart



3/13/2015 - 3/14/2015

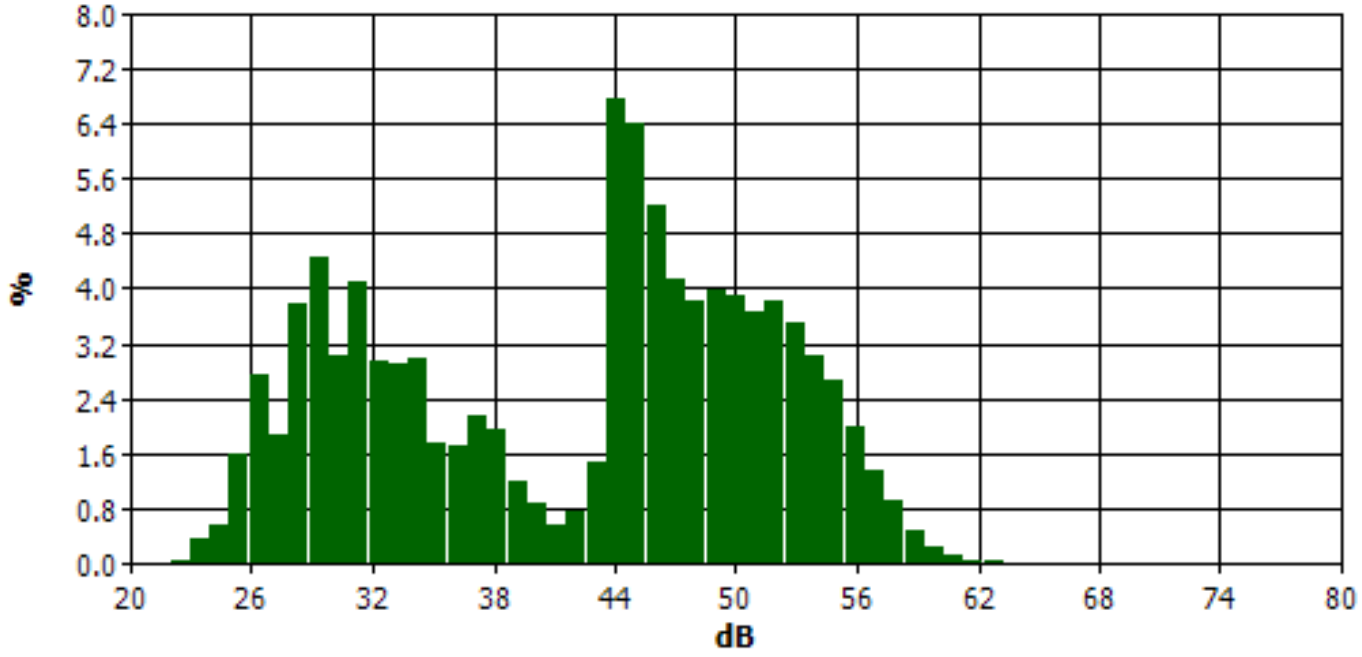
Information Panel

Name	S007_BJH030020_14032015_170505
Start Time	Friday, March 13, 2015 14:31:52
Stop Time	Saturday, March 14, 2015 14:55:17
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	49.9 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	5 dB
Weighting	2	C	Response	2	FAST

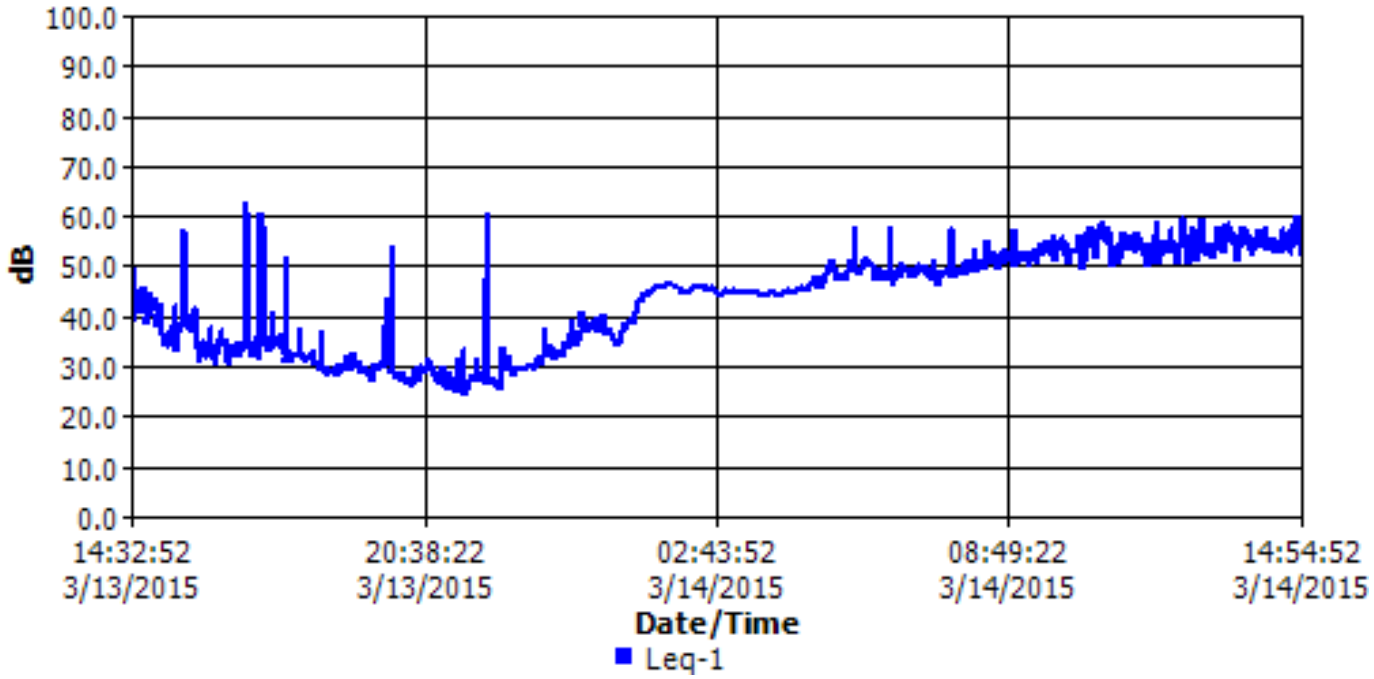
Statistics Chart



Calibration History

Date	Action	Level	Serial Number	Certification Date
3/11/2015 2:35:52 PM	Calibration	114.0		

Logged Data Chart



Attachment B

Calibration Documents

INSTRUMENT CALIBRATION REPORT

Advanced Labs, Inc.

Pine Environmental Services, Inc

Instrument ID 14608
Description Quest SoundPro DL-1-1/3
Calibrated 12/30/2014

Manufacturer Quest
Model Number SoundPro DL-1-1/3
Serial Number BLI050002
Location New Jersey
Temp 73

Classification
Status pass
Frequency Yearly EOM
Department Lab
Humidity 29

Calibration Specifications

Group # 1
Group Name Acoustic Tests Performed
Test Performed: Yes **As Found Result: Fail** **As Left Result: Pass**

Test Instruments Used During the Calibration

Test Instrument ID	Description	Manufacturer	Serial Number	(As Of Cal Entry Date) Last Cal Date	Next Cal Date
B&K 4226	Brüel & Kjær 4226	Brüel & Kjær	2590968	1/24/2014	1/24/2015
B&K 4228	Brüel & Kjær 4228	Brüel & Kjær	2667476	1/27/2014	1/27/2015
FLUKE 114	Fluke 114 NIST Traceable Multimeter	Fluke	15310288	2/25/2014	2/25/2015

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Kevin Cole

Advanced Labs, Inc. hereby certifies that this instrument is calibrated and functions to meet the manufacture's specifications using NIST traceable standards, or is derived from accepted values of physical constants.

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services, LLC.

8413 Sterling Street Suite B
Dallas TX 75063
800-242-3910

Pine Environmental Services, Inc.

Instrument ID 12307
Description Quest SoundPro DL
Calibrated 3/5/2015 4:03:40PM

Manufacturer	Quest	**State Certified**	
Model Number	SoundPro DL-1	**Status**	Pass
Serial Number/ Lot Number	BJH030020	**Temp °C**	21
Location	Dallas	**Humidity %**	42
Department			

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes **As Found Result: Pass** **As Left Result: Pass**

Test Instruments Used During the Calibration **(As Of Cal Entry Date)**

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Next Cal Date / Last Cal Date/ Expiration Date Opened Date

Notes about this calibration
Calibration Verified with AC-300 S/N: AC300003143

Calibration Result Calibration Successful
Who Calibrated Josh Reeves

All instruments are calibrated by Pine Environmental Services, LLC. according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services, LLC. of any defect within 24 hours of receipt of equipment
Please call 866-960-7463 for Technical Assistance

INSTRUMENT CALIBRATION REPORT

Advanced Labs, Inc.

Pine Environmental Services, Inc

Instrument ID 12307
Description Quest SoundPro DL-1
Calibrated 8/8/2014

Manufacturer Quest
Model Number SoundPro DL-1
Serial Number BJH030020
Location New Jersey
Temp 73

Classification
Status pass
Frequency Yearly EOM
Department Lab
Humidity 35

Calibration Specifications

Group # 1
Group Name Acoustic Tests Performed
Test Performed: Yes **As Found Result: Fail** **As Left Result: Pass**

Test Instruments Used During the Calibration

				(As Of Cal Entry Date)	
Test Instrument ID	**Description**	**Manufacturer**	**Serial Number**	**Last Cal Date**	**Next Cal Date**
B&K 4226	Brüel & Kjær 4226	Brüel & Kjær	2590968	1/24/2014	1/24/2015
B&K 4228	Brüel & Kjær 4228	Brüel & Kjær	2667476	1/27/2014	1/27/2015
FLUKE 114	Fluke 114 NIST Traceable Multimeter	Fluke	15310288	2/25/2014	2/25/2015

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Jeff Frady

Advanced Labs, Inc. hereby certifies that this instrument is calibrated and functions to meet the manufacture's specifications using NIST traceable standards, or is derived from accepted values of physical constants.

CHAPTER 69-06-08
CRITERIA

69-06-08-01. Energy conversion facility siting criteria. The following criteria must guide and govern the preparation of the inventory of exclusion and avoidance areas, and the site suitability evaluation process.

1. **Exclusion areas.** The following geographical areas must be excluded in the consideration of a site for an energy conversion facility.

   a. Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; historic districts; monuments; wilderness areas; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.

   b. Designated or registered state: parks; forests; forest management lands; historic sites; monuments; historical markers; archaeological sites; grasslands; wild, scenic, or recreational rivers; game refuges; game management areas; management areas; and nature preserves.

   c. County parks and recreational areas; municipal parks; parks owned or administered by other governmental subdivisions; hardwood draws; and enrolled woodlands.

   d. Prime farmland and unique farmland, as defined by the land inventory and monitoring division of the soil conservation service, United States department of agriculture, in 7 C.F.R. part 657; provided, however, that if the commission finds that the prime farmland and unique farmland that will be removed from use for the life of the facility is of such small acreage as to be of negligible impact on agricultural productions, this exclusion does not apply.

   e. Irrigated land.

   f. Areas critical to the life stages of threatened or endangered animal or plant species.

   g. Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged.

   h. Areas within one thousand two hundred feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility.

2. **Additional exclusion areas for wind energy conversion facilities.** The following geographical areas must be excluded in the consideration of a site for a wind energy conversion facility:

   a. Areas less than:

      (1) One and one-tenth times the height of the turbine from interstate or state roadway right of way;

      (2) One and one-tenth times the height of the turbine plus seventy-five feet from the centerline of any county or maintained township roadway;

      (3) One and one-tenth times the height of the turbine from any railroad right of way;

      (4) One and one-tenth times the height of the turbine from a one hundred fifteen kilovolt or higher transmission line; and

      (5) One and one-tenth times the height of the turbine from the property line of a nonparticipating landowner, unless a variance is granted. A variance may be granted if an authorized representative or agent of the permittee and affected parties with associated wind rights file a written agreement expressing all parties' support for a variance to reduce the setback requirement in this subsection. A nonparticipating landowner is a landowner that has not signed a wind option or an easement agreement with the permittee of the wind energy conversion facility as defined in North Dakota Century Code chapter 17-04.

3. **Avoidance areas.** The following geographical areas may not be approved as a site for an energy conversion facility unless the applicant shows that under the circumstances there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility the commission may consider, among other things, the proposed management of adverse impacts; the orderly siting of facilities; system reliability and integrity; the efficient use of resources; and alternative sites. Economic considerations alone will not justify approval of these areas. A buffer zone of a reasonable width to protect the integrity of the area must be included. Natural screening may be considered in determining the width of the buffer zone.

   a. Historical resources which are not designated as exclusion areas.

   b. Areas within the city limits of a city or the boundaries of a military installation.

c. Areas within known floodplains as defined by the geographical boundaries of the hundred-year flood.

d. Areas that are geologically unstable.

e. Woodlands and wetlands.

f. Areas of recreational significance which are not designated as exclusion areas.

4. **Additional avoidance areas for wind energy conversion facilities.** A wind energy conversion facility site must not include a geographic area where, due to operation of the facility, the sound levels within one hundred feet of an inhabited residence or a community building will exceed fifty dBA. The sound level avoidance area criteria may be waived in writing by the owner of the occupied residence or the community building.

5. **Selection criteria.** A site may be approved in an area only when it is demonstrated to the commission by the applicant that any significant adverse effects resulting from the location, construction, and operation of the facility in that area as they relate to the following, will be at an acceptable minimum, or that those effects will be managed and maintained at an acceptable minimum. The effects to be considered include:

a. The impact upon agriculture:

(1) Agricultural production.

(2) Family farms and ranches.

(3) Land which the owner demonstrates has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation.

(4) Surface drainage patterns and ground water flow patterns.

(5) The agricultural quality of the cropland.

b. The impact upon the availability and adequacy of:

(1) Law enforcement.

(2) School systems and education programs.

(3) Governmental services and facilities.

(4) General and mental health care facilities.

(5) Recreational programs and facilities.

(6) Transportation facilities and networks.

(7) Retail service facilities.

(8) Utility services.

c. The impact upon:

(1) Local institutions.

(2) Noise-sensitive land uses.

(3) Rural residences and businesses.

(4) Aquifers.

(5) Human health and safety.

(6) Animal health and safety.

(7) Plant life.

(8) Temporary and permanent housing.

(9) Temporary and permanent skilled and unskilled labor.

d. The cumulative effects of the location of the facility in relation to existing and planned facilities and other industrial development.

6. **Policy criteria.** The commission may give preference to an applicant that will maximize benefits that result from the adoption of the following policies and practices, and in a proper case may require the adoption of such policies and practices. The commission may also give preference to an applicant that will maximize interstate benefits. The benefits to be considered include:

a. Recycling of the conversion byproducts and effluents.

b. Energy conservation through location, process, and design.

c. Training and utilization of available labor in this state for the general and specialized skills required.

d. Use of a primary energy source or raw material located within the state.

e. Not relocating residents.

f. The dedication of an area adjacent to the facility to land uses such as recreation, agriculture, or wildlife management.

g. Economies of construction and operation.

h. Secondary uses of appropriate associated facilities for recreation and the enhancement of wildlife.

i. Use of citizen coordinating committees.

j. A commitment of a portion of the energy produced for use in this state.

k. Labor relations.

l. The coordination of facilities.

m. Monitoring of impacts.

History: Amended effective August 1, 1979; July 1, 2006; April 1, 2013.
General Authority: NDCC 49-22-18
Law Implemented: NDCC 49-22-05.1

69-06-08-02. Transmission facility corridor and route criteria. The following criteria must guide and govern the preparation of the inventory of exclusion and avoidance areas, and the corridor and route suitability evaluation process. Exclusion and avoidance areas may be located within a corridor, but at no given point may such an area or areas encompass more than fifty percent of the corridor width unless there is no reasonable alternative.

1. **Exclusion areas.** The following geographical areas must be excluded in the consideration of a route for a transmission facility. A buffer zone of a reasonable width to protect the integrity of the area must be included. Natural screening may be considered in determining the width of the buffer zone.

   a. Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas.

   b. Designated or registered state: parks; historic sites; monuments; historical markers; archaeological sites; and nature preserves.

   c. County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions.