APPENDIX K NOISE ANALYSIS

Noise Assessment Study

for a

660 MW Electric Generating Facility
Norborne, Missouri

for

Associated Electric Cooperative, Inc.

October 2006

Burns & McDonnell
SINCE 1898

Noise Assessment Study
660 MW Electric Generating Facility
Norborne, Missouri

prepared for

Associated Electric Cooperative, Inc.
Springfield, Missouri

October 2006

Project No. 38370

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

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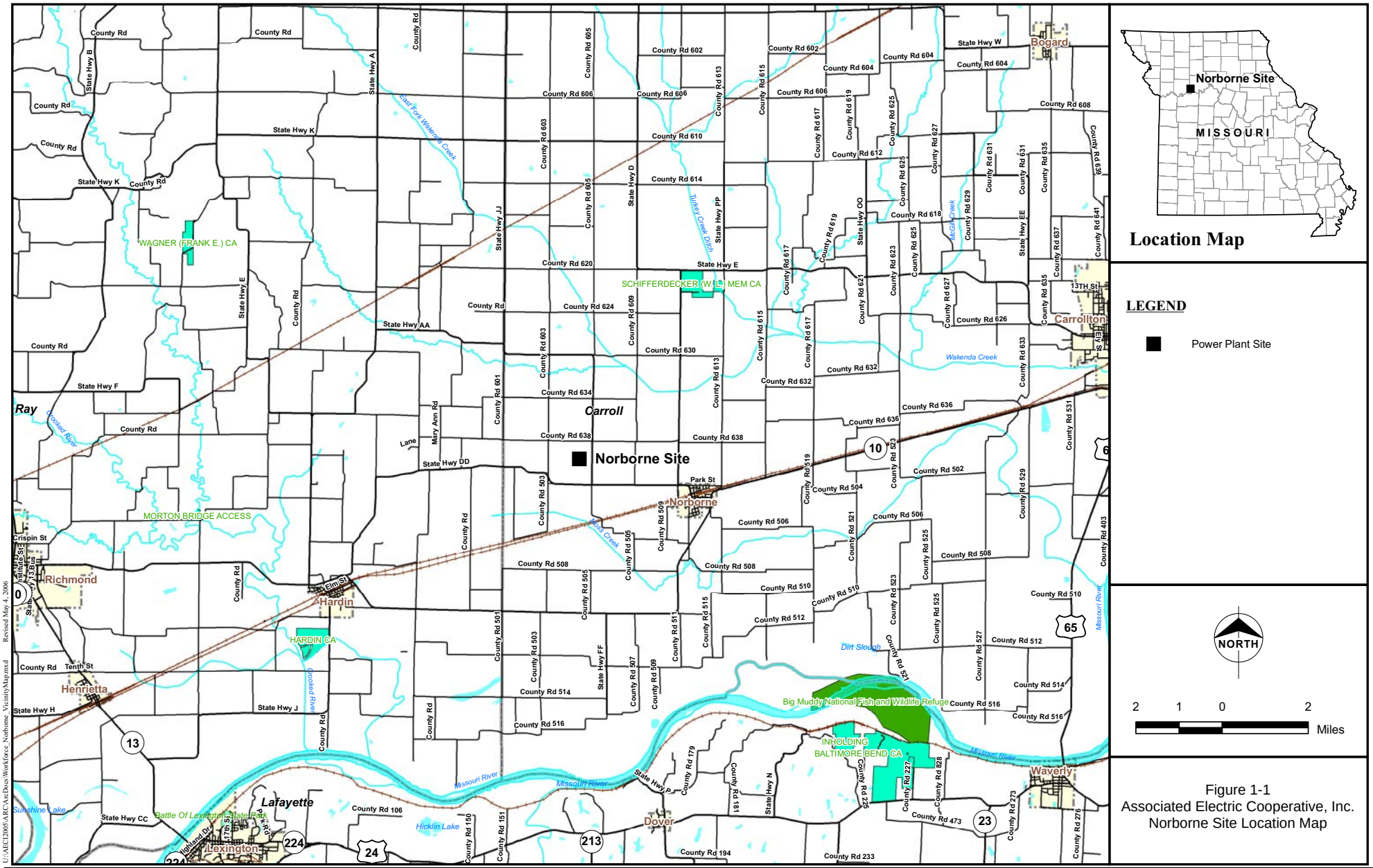
1.0 Introduction

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) has been contracted by Associated Electric Cooperative, Incorporated (AECI) to conduct an environmental sound assessment study for the proposed Norborne power plant (facility). The facility is proposed to be located approximately 2 ½ miles northwest of Norborne, Missouri in Carroll County, Missouri. AECI is proposing to construct a 660-MW (net) pulverized coal-fired boiler, a steam turbine generator, associated pollution control equipment, auxiliary equipment, cooling tower, and materials handling equipment.

The objectives of this study are to identify local noise ordinances, measure ambient existing noise levels in the area surrounding the proposed Norborne facility, project operational noise levels from the new facility, and examine the potential effects of the projected noise levels on the closest sound receptors in the surrounding community due to operation and construction of the new facility. Figure 1-1 shows the proposed location of the Norborne power plant.


Norborne Site
MISSOURI
Location Map
LEGEND
Power Plant Site
NORTH
2 1 0 2
Miles
Figure 1-1
Associated Electric Cooperative, Inc.
Norborne Site Location Map
Ray
Carroll
Norborne
Richmond
Hardin
Henrietta
Lexington
Lafayette
Carrollton
Bogard
Waverly
Dover
WAGNER (FRANK E.) CA
SCHIFFERDECKER (W. L.) MEM CA
HARDIN CA
INHOLDING BALTIMORE BEND CA
Big Muddy National Fish and Wildlife Refuge
MORTON BRIDGE ACCESS
Battle Of Lexington State Park
Missouri River
Wakenda Creek
Dirt Slough
Hicklin Lake
Sunshine Lake

2.0 Acoustical Terminology

Noise is often considered unwanted sound. However, human response to sound is complex and is influenced by a variety of acoustic and non-acoustic factors. Acoustic factors generally include the sound's amplitude, duration, frequency content, and fluctuations. Non-acoustic factors typically include the listener's ability to become accustomed to the sound, the listener's attitude towards the noise and the noise source, the listener's view of the necessity of the noise, and the predictability of the noise. As such, response to noise is highly individualized.

Amplitude and frequency physically characterize sound energy. Sound amplitude is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPascals (microPa)). The reference sound pressure corresponds to the typical threshold of human hearing. A 3 dB change in a continuous broadband noise is generally considered "just barely perceptible" to the average listener. Similarly, a 6 dB change is generally considered "clearly noticeable" and a 10 dB change is generally considered a doubling (or halving) of the apparent loudness.

Frequency is measured in hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the low and high frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels or dBA. For reference, the A-weighted sound pressure level and subjective loudness associated with some common noise sources are listed in Table 2-1.

Another weighting scale is the C-weighting scale. The C-weighting scale simulates the human ear's response to relatively low frequency sound levels. At low frequency sound levels, the response of the human ear to different frequencies is relatively constant. The C-weighting scale generally applies to sound levels that are much higher than typical environmental sound levels. Nonetheless, the C-weighting scale can be useful in evaluating low-frequency sound levels. Excessive levels of low frequency noise, while not being readily perceptible to the human ear, can be sensed as airborne vibrations. These vibrations can be felt as much as they can be heard. In extreme cases, these vibrations may cause light frame structures to vibrate causing a noticeable vibration within residences. In general, low-frequency impacts to residences in the way of perceptible vibrations are minimized when the C-weighted sound pressure levels are at or below 75 to 80 dBC.

Table 2-1
Typical Sound Pressure Levels Associated with Common Noise Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 ft	
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 ft	
120	Threshold of feeling	Elevated train	Hard rock band
110		Jet flyover at 1000 ft	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 ft, auto horn at 10 ft, crowd noise at football game	
90		Propeller plane flyover at 1000 ft, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 ft	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner
60	Moderate	Air-conditioner condenser at 15 ft, near highway traffic	General office
50	Quiet		Private office
40		Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without t.v. and stereo)
20		Rustling leaves	Quiet theater, whisper
10	Just audible		Human breathing
0	Threshold of hearing		

Source: Adapted from Architectural Acoustics, M. David Egan, 1988 and Architectural Graphic Standards, Ramsey and Sleeper, 1994.

There are also objective factors to consider when determining the sound and how people may be affected by the sound. A noise spectrum that contains audible pure tones is typically more annoying than a spectrum with the same overall level but without the tones. It has been shown that, when noise complaints were received from a power plant when registering sound levels under 45 dBA, the noise had some tonal components. Low frequency sound may also affect people subject to the noise. Pulsation may occur when the sound level is 75 to 80 dBC in the 31.5 Hz octave band at residential locations.

Noise in the environment is constantly fluctuating; examples could be when a car drives by, a dog barks, or a plane passes overhead. Therefore, sound metrics have been developed to quantify fluctuating environmental sound levels. These metrics include the exceedance sound levels. The exceedance sound

level, L_x, is the sound level exceeded "x" percent of the sampling period and is referred to as a statistical sound level. The most common L_x values are L_{ave}, L_{90}, L_{50}, and L_{10}. L_{eq} is the equivalent level of a constant sound over a specific time period that has the same sound energy as the actual sound over the same period. L_{90} is the sound level exceeded 90 percent of the sampling period. L_{90} represents the sound level without the influence of loud, transient noise sources and is often referred to as the residual or background sound level. L_{50} is the sound level exceeded 50 percent of the sampling period. L_{10} represents the occasional louder sounds and is often referred to as the intrusive sound level. The variation between the L_{90}, L_{50}, and L_{10} sound levels can provide an indication of the variability of the acoustical environment. If the acoustical environment is perfectly steady, all values are identical. A large variation between the values indicates highly fluctuating sound levels. For instance, measurements near a roadway with frequent passing vehicles may cause a large variation in the statistical sound levels. For this report, L_{eq} is used. L_{eq} represents the time-weighted average noise level during the measurement period. For example, an $L_{eq(h)}$ noise level represent the average sound pressure level experienced in one hour.

3.0 Applicable Regulations

Burns & McDonnell reviewed applicable noise regulations for the town of Norborne, Carroll County, and the Township of Egypt. No known noise ordinances exist for industrial facilities in these areas.

Since applicable noise standards are not available at the local level, noise levels will be compared to an acceptable noise level increase. The acoustic community generally accepts that an increase of 3 dBA and up to 5 dBA over an existing noise level is just audible to an observer paying attention to the noise level. Therefore, future predicted noise levels will be compared to the existing noise levels to determine if an acceptable increase in noise will be achieved.

In addition to the acceptable increase, the noise levels at the nearby residences will be compared to the U.S. Department of Housing and Urban Development (HUD) standards. HUD has adopted environmental standards, criteria, and guidelines for determining acceptability of federally assisted projects and proposed mitigation measures that achieve the goal of a suitable living environment. Table 3-1 summarizes HUD site acceptability standards based on external sound levels.

Table 3-1
HUD Site Acceptability Standards

Rating	Outdoor (dBA)
Acceptable	Not exceeding 65
Normally Unacceptable	65 to 75
Unacceptable	Above 75

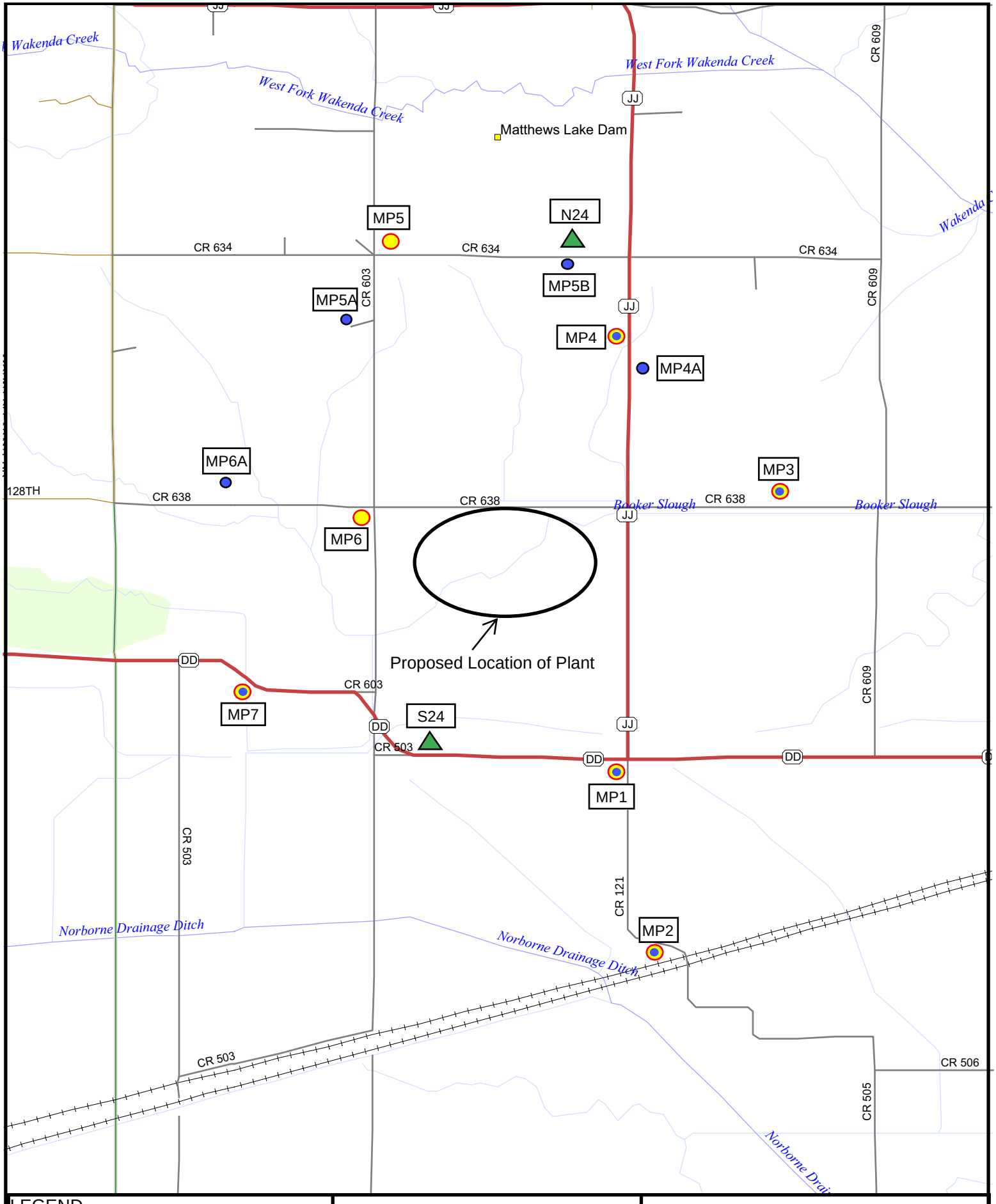
Source: Title 24, Code of Federal Regulations, Part 51.103©, Exterior Standards.

4.0 Existing Noise Environment

An ambient noise survey was conducted for the surrounding community of the proposed facility. Measurements were taken during several time periods near the closest sensitive noise receivers (residences) to determine the existing sound levels in the area. In addition, two 24-hour measurements were taken north and south of the site to continuously monitor the noise levels in the area. On August 14 and 15, 2006, between the hours of 6 and 8 a.m., 11 a.m. and 12:30 p.m., 5 p.m. and 6:30 p.m., and 10 and 11:30 p.m., Burns & McDonnell personnel made background sound level measurements to capture the ambient sound levels near the proposed site. Weather conditions were favorable for conducting ambient sound measurements during all survey periods. On August 14, 2006, skies were clear to partly cloudy and winds varied between four and eight miles per hour (mph) in the afternoon (5 to 6:30 p.m.) and zero and two mph in the nighttime (10 to 11:30 p.m.). Temperatures were between 72 and 80 degrees Fahrenheit during the evening and nighttime. On August 15, 2006, winds were low in the morning (6 a.m. to 8 a.m.), varying between zero and two mph and increased at the afternoon measurements (6 to 8 mph). Temperatures were approximately 63 degrees Fahrenheit in the morning and increased to approximately 80 degrees Fahrenheit in the afternoon. Relative humidity varied from 45 percent to 70 percent on both days.

Sound level measurements were made at seven locations around the proposed property boundary of the facility (Figure 4-1). These locations were selected because they were deemed to be representative of existing environmental conditions, they are near sensitive sound receptors, and they were accessible. Measurements were made in decibels (dB) at 16, 31.5, 63, 125, 250, 500, 1,000, 2,000, 4,000, and 8,000 Hertz (Hz) using a Larson-Davis Model 824 Type I sound level meter. The sound level meter was calibrated before each set of measurements. None of the calibration level changes exceeded ± 0.3 dB. A windscreen was used at all times on the meter, and the meter was mounted on a tripod, 5 feet above ground with the microphone directed toward the proposed boiler locations. The meter measured A-weighted L_{eq} sound levels along with A-weighted octave band frequency sound levels for the operational noise levels. A listing of general noise meter certifications is provided in Table 4-1.

In addition to these measurement point locations, several of the closest residences in the area were identified. These residences are also shown on Figure 4-1 and are identified as a blue dot. All of the closest residences identified were analyzed in this report in addition to the measurement points.



LEGEND

- Measurement Point Location
- Sensitive Noise Receiver
- 24-Hour Measurement Point Location

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Figure 4-1
Measurement Point Locations and Sensitive Noise Receivers

Table 4-1
General Noise Meter Certifications

Instrument Name	Serial Number	Calibration Date	Recalibration Date	Procedures For Calibration
Larson Davis Monitor Model 824	1331	06/05/2006	06/05/2008	D0001.8046, ANSI S1.4-1983, IEC 651-1979 Type 1, IEC 804-1985 Type 1, IEC 1260-1995 Class 1, and ANSI S1.11-1986 Type 1D
Larson Davis Instrument Model 902	1853	06/05/2006	06/05/2008	D0001.8167
Larson Davis Microphone Model 2560	2560	06/05/2006	06/05/2008	D0001.8167
Larson Davis Calibrator Model CAL200	3009	06/05/2006	06/05/2008	D0001.8190

The proposed location for the facility is located about 2 miles west of Norborne, Missouri in a primarily agricultural area with some sparse residences. The nearest residence to the proposed site is located to the southeast of the plant at Measurement Point 1 (MP1). MP1 is approximately 3,510 feet from the proposed site, as measured from the closest edge of the major sound emitting equipment. A description of each measurement point and documentation of extraneous sounds that occurred during the measurement periods are described below. Measurement points are representative of all sensitive noise receivers in the area of the measurement point.

Measurement Point 1 (MP1) is located to the southeast of the site just south of the intersection of State Highway (SH) DD and SH JJ. The measurement point is located south of SH DD, however the sensitive noise receiver is located to the north of Highway DD. The ambient noise levels are expected to be the same for each side of the highway. The actual location of the residence was put into the model. It is approximately 3,510 feet from the major sound emitting equipment and is approximately the same elevation as the proposed site. During the measurement periods, insects and vehicles passing by on SH DD may have contributed to the overall sound level at this measurement point. During the 10 to 11:30 p.m. period, a train passed by to the south and the train whistle was audible during the measurement.

MP2 is located southeast of the site near the railroad track on County Road (CR) 505. It is approximately 7,650 feet from the noise emitting equipment proposed for the site at the same elevation. A train passed by during the 6 and 8 a.m. and 11 a.m. to 12:30 p.m. measurements for part of the measurement period. When the train passed by, the measurement increased to 86 dBA instantaneously; however, the overall noise measurement with train and without the train averaged to around 71 dBA. Other extraneous noises include a truck idling 300 feet away during the 5 to 6:30 p.m. measurement and a dog barking during the 10 to 11:30 p.m. period. Insect noise was audible during all measurements at this point.

MP3 is located to the east of the proposed site on CR 638 and is approximately 8,520 feet from the major sound emitting equipment. There are two residences near this measurement point and the elevation of these residences is approximately 65 feet higher than the elevation at the site. During the 5 to 6:30 p.m. measurement period, insect noise dominated the noise measurement. The insects contributed greatly to the overall noise during this period. Distant trains could be heard during all other measurement periods. The 11 a.m. to 12:30 p.m. measurement includes the sound level of a passing car during the period.

MP4 is approximately 5,320 feet from the proposed facility and is located to the northeast of the site on SH JJ, close to the AECI property boundary. The elevation of this measurement point is about 65 feet higher than the site. MP4A is 4,960 feet from the site near MP4 and is the location of two residences. It is assumed that the sound levels measured at MP4 are the same for MP4A. One vehicle passed by this point during the 6 to 8 a.m. and 11 a.m. to 12:30 p.m. measurements. This contributed to the overall sound levels measured during these periods. Insect noise was observed during all measurement periods.

MP5 is located to the north/northwest of the proposed site on CR 634, approximately 7,380 feet from the sound emitting equipment. It is approximately 105 feet higher in elevation than the proposed site. Two residences are located at MP5A, which is approximately 6,590 feet away from the site with an elevation difference of 85 feet higher than the site, and one residence is located at MP5B, which is approximately 6,690 feet away from the site, with an elevation difference of 95 feet higher than the site. Both of these residences are assumed to have similar noise levels as MP5. Insect noise was prevalent during all measurement periods. During the 11 a.m. to 12:30 p.m. period, three vehicles passed by. Dog barking was heard during the 10 to 11:30 p.m. measurement. These extraneous sounds may have contributed to the overall noise reading at this measurement point.

MP6 is located near the intersection of CR 638 and CR 603 on the western property boundary of the site. It is approximately 15 feet higher in elevation than the proposed site, and approximately 3,420 feet from the noise emitting equipment. MP6A is at a residence that is almost double the distance (5,720 feet) from the noise emitting equipment along CR 638, but is assumed to have the same existing noise level as MP6. It is at a slightly higher elevation of 35 feet higher than the site. Insect noise was heard during all of the measurement periods. During the 5 to 6:30 p.m. period, a vehicle passed by the noise meter that increased the overall L_{eq} during this period.

MP7 is located to the southwest of the proposed site on Highway DD. It is approximately 6,660 feet from the proposed noise emitting equipment on site. During the 11 a.m. to 12:30 p.m. measurement, three vehicles passed by. In addition to one vehicle passing by, during the 10 to 11:30 p.m. period, two trains were also heard. Insect noise was heard at all measurement periods; however, it was minimal at the 6 to 8

a.m. measurement period. All of these sources of noise may have contributed to the overall sound levels measured at during each period.

At each location, sound levels at each frequency band were measured and logged by the analyzer. Three-minute measurement samples were recorded during each of the four time periods. The measured dBA-weighted L_{eq} sound levels are presented in Table 4-2. Ambient A-weighted sound levels varied from a low of 43 dBA at MP7 to a high of 71 dBA at MP2. The sound levels varied at each measurement point depending on the proximity to roads, train tracks, and insects.

Table 4-2
Existing Ambient Sound Levels (dBA)

Time Period	Location	Location Description	L_{eq}, dBA
6 a.m. to 8 a.m	MP1*	Southeast of site at SH DD and SH JJ	51.0
	MP2*	Southeast of site on CR 505; near train track	71.0
	MP3*	East of site on CR 638, east of SH JJ	46.9
	MP4*	Northeast of site on SH JJ	55.2
	MP5	Northwest of site on CR 634	45.5
	MP6	West of site at CR 603 and CR 638	46.0
	MP7*	West of site at 10581 DD Hwy	42.7
11 a.m. to 12:30 p.m.	MP1*	Southeast of site at SH DD and SH JJ	55.0
	MP2*	Southeast of site on CR 505; near train track	71.4
	MP3*	East of site on CR 638, east of SH JJ	58.1
	MP4*	Northeast of site on SH JJ	51.7
	MP5	Northwest of site on CR 634	60.7
	MP6	West of site at CR 603 and CR 638	49.2
	MP7*	West of site at 10581 DD Hwy	59.4
5 p.m. to 6:30 p.m.	MP1*	Southeast of site at SH DD and SH JJ	55.5
	MP2*	Southeast of site on CR 505; near train track	58.8
	MP3*	East of site on CR 638, east of SH JJ	63.7
	MP4*	Northeast of site on SH JJ	59.1
	MP5	Northwest of site on CR 634	45.2
	MP6	West of site at CR 603 and CR 638	54.8
	MP7*	West of site at 10581 DD Hwy	47.1
10 p.m. to 11:30 p.m.	MP1*	Southeast of site at SH DD and SH JJ	54.7
	MP2*	Southeast of site on CR 505; near train track	60.6
	MP3*	East of site on CR 638, east of SH JJ	49.1
	MP4*	Northeast of site on SH JJ	44.7
	MP5	Northwest of site on CR 634	53.6
	MP6	West of site at CR 603 and CR 638	46.5
	MP7*	West of site at 10581 DD Hwy	61.3

*Measurement point is close to a sensitive noise receiver.

In addition to the four-period measurements at the previously described locations, two sites were selected for 24-hour continuous measurements. A-weighted L_{eq} measurements were recorded every minute for a 24-hour period. These measurement points are depicted on Figure 4-1 as N24 and S24. Measurement point N24 is the north site selected along CR 634 at an elevation of 100 feet above the proposed site. Measurement point S24 is located near the southern portion of the site along Highway DD, approximately 150 feet from the road at approximately the same elevation as the proposed site. During both 24-hour measurements, insects were observed and audible. Vehicles passed by both sites sporadically which contributed to the measurements. Figures A-1 and A-2, in Appendix A, are a graphical depiction of the sound captured by the noise meter for the 24-hour periods. The black line in the figure depicts 1-hour averages and the red line depicts the overall 24-hour average L_{eq} value.

The south point (S24) has extreme peaks and valleys due to traffic on SH DD, trains on the railroad approximately one mile away, and very loud insect noise (cicadas) in the trees overhead of the meter. The cicadas were numerous in the trees overhead and could not be avoided. This insect noise, when occurring, dominated the noise level at this point. As can be seen in Figure A-1, the cicadas sound decreased at about dusk (approximately 8:00 p.m.). The noise level was decreased further due to the normal decrease in overall noise levels due to human activity decreasing after dark. The overall average is 53 dBA for the entire 24-hour period, with highs near 75 dBA during the day and lows near 40 dBA during the night.

The north point (N24) experienced less traffic than S24 and the trains were barely audible. Insect noise was audible at this point most of the time; however, the noise appeared to be usually from crickets, with an occasional cicada sound. The numbers of insects appeared to be greater at the south point. The same drop in overall noise levels as seen in Figure A-1 is seen in Figure A-2 for the north point (N24). This is due to the diurnal fluctuations caused by human activities and decreased insect noise. The overall average noise level for this measurement point was 53 dBA with highs near 65 dBA during the day and lows near 45 dBA during the night.

Existing sound levels in the area were approximated from the noise measurements. Figure 4-2 displays the existing noise levels in 5-dB contours. The noise levels in the area decrease with distance from the major highways (SH DD and SH JJ) and the railroad.

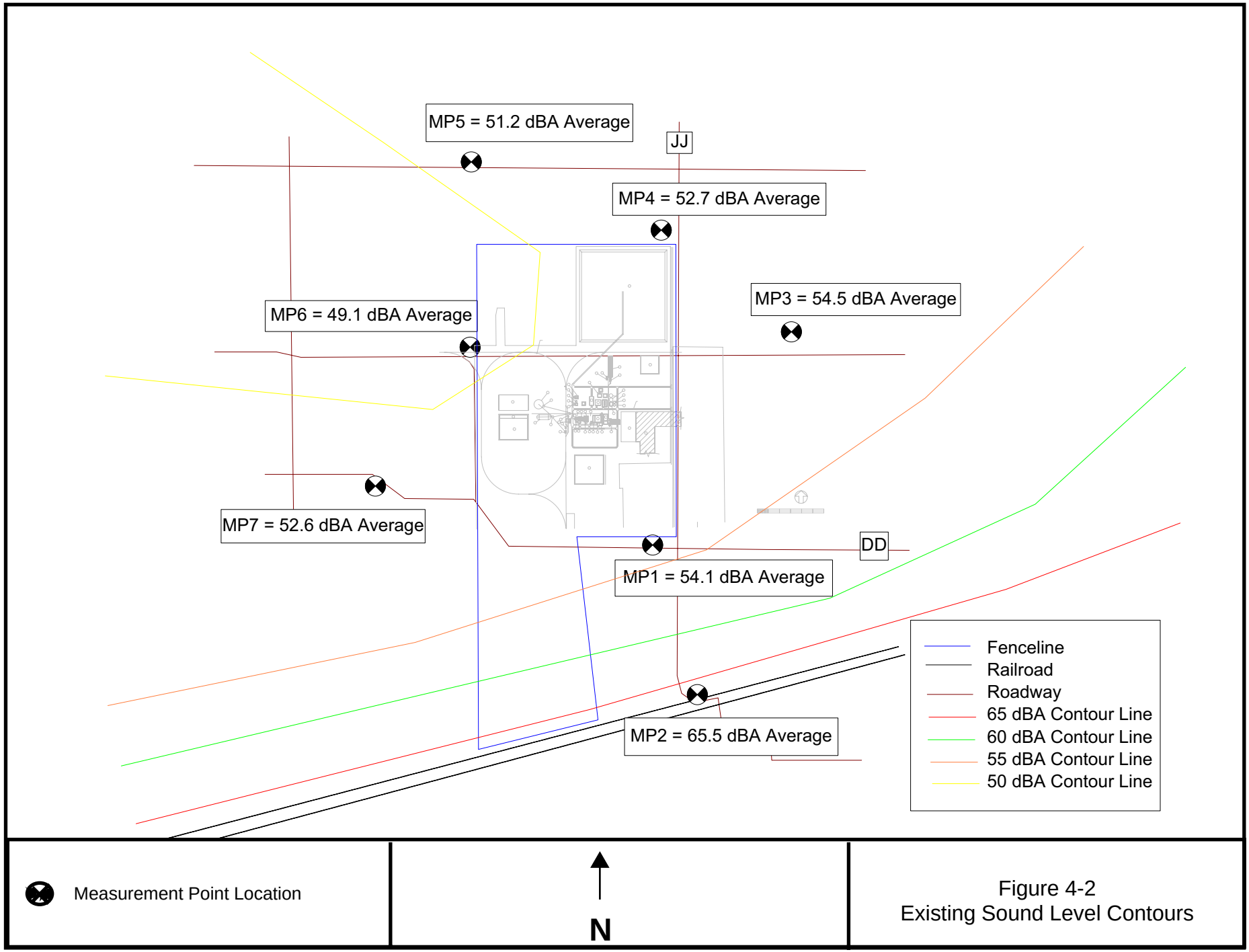


Figure 4-2
Existing Sound Level Contours

5.0 Operational Noise Levels

In order to evaluate the sound predicted from the proposed facility, all noise sources proposed for the new facility were modeled, based on a site layout provided by AECI. Using industry-accepted sound modeling software, the expected project sound levels at the identified sensitive receptors were calculated. The program used for this project was the Computer Aided Design for Noise Abatement (CadnaA), Version 3.5.115, published by DataKustik, Ltd., Munich, Germany. The CadnaA program is a scaled, three-dimensional program which takes into account each piece of noise-emitting equipment on the project site and predicts sound levels in circular contours of equal sound pressure. Appropriate sound generation sources are applied for all sound radiating surfaces and points. Attenuation was included for sound propagation over vegetation, barriers, and shielding. The model calculates sound propagation based on ISO 9613-2:1996, General Method of Calculation. ISO 9613 and CadnaA assess the sound levels based on the Octave Band Center Frequency range from 31.5 to 8,000 Hz. The atmospheric conditions were assumed to be calm and the temperature and relative humidity were set to 50º F and 70 percent respectively (based on program defaults). Since temperature and humidity can vary significantly during the course of year in the vicinity of this site, the program defaults were used as an "average" for weather in this area.

The sound from each noise-emitting unit proposed as part of the project was predicted based on information in the book, Electric Power Plant Environmental Noise Guide[1] and the Burns & McDonnell coal-fired power plant noise source inventory. Table 5-1 presents the sound power levels, as estimated in the Noise Guide and inventory referenced above, for each major noise-emitting piece of new equipment proposed for the Norborne project. The inventory equipment was used for applicable equipment since it was information that was readily available and the final engineering for the proposed facility has not been completed. Since some of the equipment may be oversized in the model as compared to what will actually be constructed on-site, predicted noise emissions are expected to be conservative. In addition, many pieces of the equipment will be located indoors. The acoustic community generally accepts that a 15 to 20 dB decrease in sound power levels is observed when a noise-emitting unit is placed indoors. For those units that are located indoors, a 15 dB decrease due to transmission loss was applied to the overall sound level, where appropriate. Sound power levels at each of the octave bands for each piece of equipment are displayed in Table 5-2.

[1] Electric Power Plant Environmental Noise Guide, Volume I 2nd Edition, Edison Electric Institute.

Table 5-1
NED 3 New Equipment Sound Power Levels (dB, dBA)

	Indoor	Distance (Feet)	Total Sound Power Level (dB)	Total Sound Power Level (dBA)
Steam Turbine Generator	√	3	124.4	112.5
Main Steam Boiler	√	3	125.5	113.4
Baghouse (Pulse Jet)		3	115.3	114.1
Baghouse Air Compressor	√	3	115.5	114.4
Fly Ash Handling System	√	3	115.5	106.5
ID Fans (Centrifugal)		3	135.7	131.1
ID Fans (Centrifugal)		3	135.7	131.1
FD Fan (Axial)	√	3	135.6	131.0
FD Fan (Axial)	√	3	135.6	131.0
Cooling Tower Fans (24)	√	3	129.2	120
Condenser Unit	√	3	122	114.1
Ventilating Fans- Turbine Building		3	80.5	75.9
Air Compressors (rotory screw)	√	3	113.8	112.9
Boiler Feed Pump - Turbine Driven	√	3	115.1	113.8
Deaerator Vent		3	105.1	105.1
Ventilation Fans - Boiler Building		3	85.5	80.9
Primary Air Fans (Centrifugal)	√	3	129.5	124.9
Auxiliary Boiler	√	3	110.3	101.2
Auxiliary Boiler FD Fan	√	3	88.4	83.8
Rail Unloading	√	3	121.2	111.6
Crusher House	√	3	126.9	117.8
Main Auxiliary Transformer		3	101	92.4
Main Auxiliary Transformer		3	101	92.4
Generator Step Up Transformer		3	119	110.4
Circulating Water Pump*	√	3	109.2	106.6
Circulating Water Pump*	√	3	109.2	106.6
Circulating Water Pump*	√	3	109.2	106.6
Circulating Water Pump*	√	3	109.2	106.6
Coal Yard Stockout and Reclaim		3	115.5	106.5
Bulldozer		3	126.2	120.9
Stack	√	3	124.5	105.8
Spray Dryer Pumps	√	3	107.5	105
Lime Feed Pumps	√	3	87.5	85

Source: Electric Power Plant Environmental Noise Guide (Edison Electric Institute) and Burns & McDonnell Noise Source Inventory
*It is expected that two circulating water pumps will be installed, however up to four may be installed, so four were included in the model to be conservative.

Table 5-2
New Equipment Sound Power Levels at Each Octave Band Frequency

	Indoor	dB at Octave Band Frequency (Hz)									Total Sound Power Level (dB)	Total Sound Power Level (dBA)
		32	63	125	250	500	1000	2000	4000	8000		
Steam Turbine Generator	√	115	121	119	114	110	106	103	95	89	124.4	112.5
Main Steam Boiler	√	122	121	116	110	109	107	105	105	105	125.5	113.4
Baghouse (Pulse Jet)		105	101	106	105	103	106	110	107	101	115.3	114.1
Baghouse Air Compressor	√	105	101	106	105	103	106	110	108	101	115.5	114.4
Fly Ash Handling System	√	110	111	107	104	105	101	97	96	87	115.5	106.5
ID Fans (Centrifugal)		125.2	127.2	129.2	128.2	127.2	127.2	123.2	119.2	112.2	135.7	131.1
ID Fans (Centrifugal)		125.2	127.2	129.2	128.2	127.2	127.2	123.2	119.2	112.2	135.7	131.1
FD Fan (Axial)	√	125	127	129	128	127	127	123	119	112	135.6	131.0
FD Fan (Axial)	√	125	127	129	128	127	127	123	119	112	135.6	131.0
Cooling Tower Fans (24)	√	120.8	123.8	123.8	120.8	117.8	113.8	110.8	107.8	99.8	129.2	120
Condenser Unit	√	115	116	115	113	114	108	103	98	94	122	114.1
Ventilating Fans- Turbine Building		70	72	74	73	72	72	68	64	57	80.5	75.9
Air Compressors (rotory screw)	√	103	99	104	103	101	104	109	106	99	113.8	112.9
Boiler Feed Pump - Turbine Driven	√	96	102	100	104	110	110	108	96	92	115.1	113.8
Deaerator Vent		0	0	0	90	92	95	98	99	101	105.1	105.1
Ventilation Fans - Boiler Building		75	77	79	78	77	77	73	69	62	85.5	80.9
Primary Air Fans (Centrifugal)	√	119	121	123	122	121	121	117	113	106	129.5	124.9
Auxiliary Boiler	√	104.5	104.5	103.5	101.5	98.5	95.5	92.5	89.5	86.5	110.3	101.2
Auxiliary Boiler FD Fan	√	77.9	79.9	81.9	80.9	79.9	79.9	75.9	71.9	64.9	88.4	83.8
Rail Unloading	√	118	116	110	107	107	107	103	102	102	121.2	111.6
Crusher House	√	121	121	121	117	115	112	110	106	97	126.9	117.8
Main Auxiliary Transformer		89	95	97	92	92	86	81	76	69	101	92.4
Main Auxiliary Transformer		89	95	97	92	92	86	81	76	69	101	92.4
Generator Step Up Transformer		107	113	115	110	110	104	99	94	87	119	110.4
Circulating Water Pump*	√	97	99	101	101	101	101	101	98	91	109.2	106.6
Circulating Water Pump*	√	97	99	101	101	101	101	101	98	91	109.2	106.6
Circulating Water Pump*	√	97	99	101	101	101	101	101	98	91	109.2	106.6
Circulating Water Pump*	√	97	99	101	101	101	101	101	98	91	109.2	106.6
Coal Yard Stockout and Reclaim		110	111	107	104	105	101	97	96	87	115.5	106.5
Bulldozer		0	114.6	119.6	122.6	117.6	115.6	112.6	106.6	100.6	126.2	120.9
Stack	√	122	117	118	110	101	92	80	73	62	124.5	105.8
Spray Dryer Pumps	√	98	98	98	98	98	98	98	98	98	107.5	105
Lime Feed Pumps	√	78	78	78	78	78	78	78	78	78	87.5	85

Source: Electric Power Plant Environmental Noise Guide (Edison Electric Institute) and Burns & McDonnell Noise Source Inventory
*It is expected that two circulating water pumps will be installed, however up to four may be installed, so four were included in the model to be conservative.

The primary noise sources on-site that are part of the project are the fans associated with the operation of the facility. The induced draft (ID) fans (centrifugal), forced draft (FD) fans (axial), and cooling tower fans are all major contributors to the overall sound levels expected as a result of the AECI facility. The main steam boiler and steam turbine generator will also contribute significantly to the overall sound level from the project. Road traffic associated with the facility will be limited to operating personnel and supply or maintenance trucks that will enter the site on an infrequent basis. Therefore, the increase in traffic and associated sound is expected to be minimal.

Some of the equipment will produce tonal sound. Fans producing blade pass frequency tones, which are characteristics of paddle, blade fans working at high speeds, generate tonal sound. The pieces of equipment that will most likely produce some tonal sounds are the fans, transformers, and the auxiliary boiler. It has been shown that people are affected more by tonal sounds than other pure sounds, especially at lower overall sound levels. The most prominent tonal sounds will be from the ID fans. They produce fundamental and first harmonic tones of the blade-passage frequency when the system is operated with inlet dampers less than about half open. Distance will help attenuate the tonal sounds from the fans. Further, the tonal sounds may be reduced and or eliminated by attenuating the ID fans, which is an option for this facility if it is deemed necessary.

Sound pressure levels were predicted for all measurement points and the nearby residences, using the CadnaA noise modeling software. Existing background measurements were combined with expected sound levels from the proposed plant equipment for the project to determine total sound levels at each measurement location when power plant is operational.

An overall sound level increase at each measurement point up to 5 dB increase is normally considered acceptable. Table 5-3 displays the existing noise levels in the area, a 5-dB increase in existing noise levels, the modeled noise levels at each receiver from the new plant and the overall noise level (existing noise logarithmically added to the new plant noise). With the predicted sound levels calculated for each piece of noise-emitting equipment on the site, it is predicted that a couple of nearby sensitive noise receivers (homes) will experience more than a 5 dB increase due to the operation of the new power plant (Table 5-3), with the maximum increase being 7 dB at MP4A at night. An analysis was completed to determine the main contributor to the overall noise at each sensitive noise receiver that exceeded a 5 dB increase in sound. It was found that when a partial level noise analysis was conducted, the ID fans dominated the overall sound level at MP1, MP4, MP4A, and MP6A.

Table 5-3
Un-attenuated Sound Pressure Level Evaluation – dBA

Measurement Point Locations	Time Period	Existing Ambient Noise (dBA) L_{eq}	5-dB Increase L_{eq}	New Plant Noise Level All Units Operating (dBA) L_{eq}	Overall Noise Levels (Existing Ambient with New Plant Operating) (dBA) L_{eq}
MP1* (Southeast of site at SH DD and SH JJ)	6-8am	51.0	56.0	54.9	56
MP2* (Southeast of site on CR 505; near train track)	6-8am	71.0	76.0	0.0	71
MP3* (East of site on CR 638, east of SH JJ)	6-8am	46.9	51.9	46.6	50
MP4* (Northeast of site on SH JJ)	6-8am	55.2	60.2	50.2	56
MP4A* (Northeast of site on SH JJ)	6-8am	55.2	60.2	50.9	57
MP5 (Northwest of site on CR 634)	6-8am	45.5	50.5	37.5	46
MP5A* (North of site on CR 634)	6-8am	45.5	50.5	41.7	47
MP5B* (Northwest of site on CR 603)	6-8am	45.5	50.5	40.3	47
MP6 (West of site at CR 603 and CR 638)	6-8am	46.0	51.0	58.7	59
MP6A* (West of site at CR 603 and CR 638)	6-8am	46.0	51.0	50.7	52
MP7* (West of site on SH DD at 10581 SH DD)	6-8am	42.7	47.7	43.3	46
MP1* (Southeast of site at SH DD and SH JJ)	10-11:30am	55.0	60.0	54.9	58
MP2* (Southeast of site on CR 505; near train track)	10-11:30am	71.4	76.4	0	71
MP3* (East of site on CR 638, east of SH JJ)	10-11:30am	58.1	63.1	46.6	58
MP4* (Northeast of site on SH JJ)	10-11:30am	51.7	56.7	50.2	54
MP4A* (Northeast of site on SH JJ)	10-11:30am	51.7	56.7	50.9	54
MP5 (Northwest of site on CR 634)	10-11:30am	60.7	65.7	37.5	61
MP5A* (North of site on CR 634)	10-11:30am	60.7	65.7	41.7	61
MP5B* (Northwest of site on CR 603)	10-11:30am	60.7	65.7	40.3	61
MP6 (West of site at CR 603 and CR 638)	10-11:30am	49.2	54.2	58.7	59
MP6A* (West of site at CR 603 and CR 638)	10-11:30am	49.2	54.2	50.7	53
MP7* (West of site on SH DD at 10581 SH DD)	10-11:30am	59.4	64.4	43.3	60
MP1* (Southeast of site at SH DD and SH JJ)	6-7:30pm	55.5	60.5	54.9	58
MP2* (Southeast of site on CR 505; near train track)	6-7:30pm	58.8	63.8	0	59
MP3* (East of site on CR 638, east of SH JJ)	6-7:30pm	63.7	68.7	46.6	64
MP4* (Northeast of site on SH JJ)	6-7:30pm	59.1	64.1	50.2	60
MP4A* (Northeast of site on SH JJ)	6-7:30pm	59.1	64.1	50.9	60
MP5 (Northwest of site on CR 634)	6-7:30pm	45.2	50.2	37.5	46
MP5A* (North of site on CR 634)	6-7:30pm	45.2	50.2	41.7	47
MP5B* (Northwest of site on CR 603)	6-7:30pm	45.2	50.2	40.3	46
MP6 (West of site at CR 603 and CR 638)	6-7:30pm	54.8	59.8	58.7	60
MP6A* (West of site at CR 603 and CR 638)	6-7:30pm	54.8	59.8	50.7	56
MP7* (West of site on SH DD at 10581 SH DD)	6-7:30pm	47.1	52.1	43.3	49
MP1* (Southeast of site at SH DD and SH JJ)	10-11:30pm	54.7	59.7	54.9	58
MP2* (Southeast of site on CR 505; near train track)	10-11:30pm	60.6	65.6	0	61
MP3* (East of site on CR 638, east of SH JJ)	10-11:30pm	49.1	54.1	46.6	51
MP4* (Northeast of site on SH JJ)	10-11:30pm	44.7	49.7	50.2	51
MP4A* (Northeast of site on SH JJ)	10-11:30pm	44.7	49.7	50.9	52
MP5 (Northwest of site on CR 634)	10-11:30pm	53.6	58.6	37.5	54
MP5A* (North of site on CR 634)	10-11:30pm	53.6	58.6	41.7	54
MP5B* (Northwest of site on CR 603)	10-11:30pm	53.6	58.6	40.3	54
MP6 (West of site at CR 603 and CR 638)	10-11:30pm	46.5	51.5	58.7	59
MP6A* (West of site at CR 603 and CR 638)	10-11:30pm	46.5	51.5	50.7	52
MP7* (West of site on SH DD at 10581 SH DD)	10-11:30pm	61.3	66.3	43.3	61

*Near a sensitive noise receiver.

The CadnaA model was also run with a different operating scenario. It was found that to reduce sound levels at all sensitive noise receivers to less than a 5 dB increase at any time period, the ID fans would have to be attenuated by 10 dB. This may be accomplished by enclosing the ID fans to achieve a 10 dB reduction or possibly by installing low sound fans. In addition, noise walls may be used to reduce the sound level. Table 5-4 displays the overall sound levels with 10 dB attenuation on the ID fans.

The results of the attenuated model, assuming a 10 dB reduction on the ID fans, are shown in Table 5-4. The results show that none of the sensitive noise receivers are expected to increase from ambient sound levels by 5 dB or more. Therefore, during normal operation, none of the sensitive noise receivers are considered impacted.

Table 5-4
Attenuated Sound Pressure Level Evaluation – dBA
10 dB Reduction on ID Fans

Measurement Point Locations	Time Period	Existing Ambient Noise (dBA) L_{eq}	5-dB Increase L_{eq}	New Plant Noise Level All Units Operating (dBA) L_{eq}	Overall Noise Levels (Existing Ambient with New Plant Operating) (dBA) L_{eq}
MP1* (Southeast of site at SH DD and SH JJ)	6-8am	51.0	48.2	53	51
MP2* (Southeast of site on CR 505; near train track)	6-8am	71.0	0	71	71
MP3* (East of site on CR 638, east of SH JJ)	6-8am	46.9	44.1	49	46.9
MP4* (Northeast of site on SH JJ)	6-8am	55.2	46.9	56	55.2
MP4A* (Northeast of site on SH JJ)	6-8am	55.2	47.8	56	55.2
MP5 (Northwest of site on CR 634)	6-8am	45.5	37.5	46	45.5
MP5A* (North of site on CR 634)	6-8am	45.5	41.7	47	45.5
MP5B* (Northwest of site on CR 603)	6-8am	45.5	40.3	47	45.5
MP6 (West of site at CR 603 and CR 638)	6-8am	46.0	53.8	54	46
MP6A* (West of site at CR 603 and CR 638)	6-8am	46.0	47.9	50	46
MP7* (West of site on SH DD at 10581 SH DD)	6-8am	42.7	43.2	46	42.7
MP1* (Southeast of site at SH DD and SH JJ)	10-11:30am	55.0	48.2	56	55
MP2* (Southeast of site on CR 505; near train track)	10-11:30am	71.4	0	71	71.4
MP3* (East of site on CR 638, east of SH JJ)	10-11:30am	58.1	44.1	58	58.1
MP4* (Northeast of site on SH JJ)	10-11:30am	51.7	46.9	53	51.7
MP4A* (Northeast of site on SH JJ)	10-11:30am	51.7	47.8	53	51.7
MP5 (Northwest of site on CR 634)	10-11:30am	60.7	37.5	61	60.7
MP5A* (North of site on CR 634)	10-11:30am	60.7	41.7	61	60.7
MP5B* (Northwest of site on CR 603)	10-11:30am	60.7	40.3	61	60.7
MP6 (West of site at CR 603 and CR 638)	10-11:30am	49.2	53.8	55	49.2
MP6A* (West of site at CR 603 and CR 638)	10-11:30am	49.2	47.9	52	49.2
MP7* (West of site on SH DD at 10581 SH DD)	10-11:30am	59.4	43.2	60	59.4
MP1* (Southeast of site at SH DD and SH JJ)	6-7:30pm	55.5	48.2	56	55.5
MP2* (Southeast of site on CR 505; near train track)	6-7:30pm	58.8	0	59	58.8
MP3* (East of site on CR 638, east of SH JJ)	6-7:30pm	63.7	44.1	64	63.7
MP4* (Northeast of site on SH JJ)	6-7:30pm	59.1	46.9	59	59.1
MP4A* (Northeast of site on SH JJ)	6-7:30pm	59.1	47.8	59	59.1
MP5 (Northwest of site on CR 634)	6-7:30pm	45.2	37.5	46	45.2
MP5A* (North of site on CR 634)	6-7:30pm	45.2	41.7	47	45.2
MP5B* (Northwest of site on CR 603)	6-7:30pm	45.2	40.3	46	45.2
MP6 (West of site at CR 603 and CR 638)	6-7:30pm	54.8	53.8	57	54.8
MP6A* (West of site at CR 603 and CR 638)	6-7:30pm	54.8	47.9	56	54.8
MP7* (West of site on SH DD at 10581 SH DD)	6-7:30pm	47.1	43.2	49	47.1
MP1* (Southeast of site at SH DD and SH JJ)	10-11:30pm	54.7	48.2	56	54.7
MP2* (Southeast of site on CR 505; near train track)	10-11:30pm	60.6	0	61	60.6
MP3* (East of site on CR 638, east of SH JJ)	10-11:30pm	49.1	44.1	50	49.1
MP4* (Northeast of site on SH JJ)	10-11:30pm	44.7	46.9	49	44.7
MP4A* (Northeast of site on SH JJ)	10-11:30pm	44.7	47.8	50	44.7
MP5 (Northwest of site on CR 634)	10-11:30pm	53.6	37.5	54	53.6
MP5A* (North of site on CR 634)	10-11:30pm	53.6	41.7	54	53.6
MP5B* (Northwest of site on CR 603)	10-11:30pm	53.6	40.3	54	53.6
MP6 (West of site at CR 603 and CR 638)	10-11:30pm	46.5	53.8	55	46.5
MP6A* (West of site at CR 603 and CR 638)	10-11:30pm	46.5	47.9	50	46.5
MP7* (West of site on SH DD at 10581 SH DD)	10-11:30pm	61.3	43.2	61	61.3

*Measurement point is near a sensitive noise receiver.

As listed in Table 5-5, the future sound levels during normal operation of the AECI project with attenuation on the ID fans are expected to range between approximately 43 dBA at MP7 and 71 dBA at MP2 (existing noise level – contribution from the new facility is zero). The contribution from the AECI project at the lowest measurement points is projected to be 38 – 43 dBA, indicating that the contribution at these points due to the facility is very low, considering existing background noise levels. The highest noise level has no contribution from the proposed plant. The maximum increase in sound at any of the sensitive noise receivers is predicted to be 4.8 dB. Therefore, no significant impact is expected.

Part of the proposed project includes a new rail spur that will deliver coal to the site. Although the trains will not be delivering coal at all times of plant operation, the noise from the new rail spur was analyzed as part of this project. It has been assumed that the train whistle (oftentimes the most disturbing sound from a train) will not be operating. Two possible routes are currently being reviewed for coal delivery. Alternative 1 would connect the new power plant to the NS or BNSF railroads located to the south of the proposed facility, approximately 1 mile away. Alternative 2 would connect the new power plant to the BNSF main line near the Ray/Carroll County Line, approximately 5 miles to the north. The new rail spur is expected to travel over SH DD or SH JJ. AECI is considering that a ramp over the train track will be constructed, thereby eliminating the need for the train whistle. It is also expected that train car decoupling will not be occurring since there is enough room in the proposed rail loop that no turn-around would be required. AECI expects about 3 to 4 trains per week will deliver coal to the site.

Trains on-site were modeled using CadnaA and sound levels were estimated for each alternative. To estimate typical overall L_{eq} values that present average noise levels which include trains, the following assumptions were used:

- a train is moving on-site at 25 miles per hour, an overestimate while unloading and arriving on-site
- a locomotive is idling near the coal unloader
- 2 trains deliver coal in one day
- 1 train delivers coal at night in one day
- trains are 150 cars long
- rail cars are 54 feet long

The overall L_{eq} values from the operation of the plant and the operation of the train are presented in Table 5-5A and 5-5B for Alternative 1 and Alternative 2, respectively. The effect of the trains on the overall average noise levels at the nearby residences is minimal. The maximum increase over normal operation of the facility for either alternative is only 0.2 dB. However, these are average noise levels assuming two trains per day and one train per night in any one day.

Table 5-5A
Average Daily Sound Pressure Level Evaluation with Trains, Alternative 1 – dBA

Measurement Point Locations	Time Period	Existing Ambient Noise (dBA) L_{eq}	5-dB Increase L_{eq}	New Plant Noise Level All Units Operating (dBA) L_{eq}	Overall Noise Levels (Existing Ambient with New Plant Operating) (dBA) L_{eq}
MP1* (Southeast of site at SH DD and SH JJ)	6-8am	51.0	56.0	48.4	53
MP2* (Southeast of site on CR 505; near train track)	6-8am	71.0	76.0	29.6	71
MP3* (East of site on CR 638, east of SH JJ)	6-8am	46.9	51.9	44.1	49
MP4* (Northeast of site on SH JJ)	6-8am	55.2	60.2	47.0	56
MP4A* (Northeast of site on SH JJ)	6-8am	55.2	60.2	47.8	56
MP5 (Northwest of site on CR 634)	6-8am	45.5	50.5	37.6	46
MP5A* (North of site on CR 634)	6-8am	45.5	50.5	41.7	47
MP5B* (Northwest of site on CR 603)	6-8am	45.5	50.5	40.3	47
MP6 (West of site at CR 603 and CR 638)	6-8am	46.0	51.0	54.0	55
MP6A* (West of site at CR 603 and CR 638)	6-8am	46.0	51.0	48.0	50
MP7* (West of site on SH DD at 10581 SH DD)	6-8am	42.7	47.7	43.4	46
MP1* (Southeast of site at SH DD and SH JJ)	11am-12:30pm	55.0	60	48.4	56
MP2* (Southeast of site on CR 505; near train track)	11am-12:30pm	71.4	76.4	29.6	71
MP3* (East of site on CR 638, east of SH JJ)	11am-12:30pm	58.1	63.1	44.1	58
MP4* (Northeast of site on SH JJ)	11am-12:30pm	51.7	56.7	47.0	53
MP4A* (Northeast of site on SH JJ)	11am-12:30pm	51.7	56.7	47.8	53
MP5 (Northwest of site on CR 634)	11am-12:30pm	60.7	65.7	37.6	61
MP5A* (North of site on CR 634)	11am-12:30pm	60.7	65.7	41.7	61
MP5B* (Northwest of site on CR 603)	11am-12:30pm	60.7	65.7	40.3	61
MP6 (West of site at CR 603 and CR 638)	11am-12:30pm	49.2	54.2	54.0	55
MP6A* (West of site at CR 603 and CR 638)	11am-12:30pm	49.2	54.2	48.0	52
MP7* (West of site on SH DD at 10581 SH DD)	11am-12:30pm	59.4	64.4	43.4	60
MP1* (Southeast of site at SH DD and SH JJ)	5-6:30pm	55.5	60.5	48.4	56
MP2* (Southeast of site on CR 505; near train track)	5-6:30pm	58.8	63.8	29.6	59
MP3* (East of site on CR 638, east of SH JJ)	5-6:30pm	63.7	68.7	44.1	64
MP4* (Northeast of site on SH JJ)	5-6:30pm	59.1	64.1	47.0	59
MP4A* (Northeast of site on SH JJ)	5-6:30pm	59.1	64.1	47.8	59
MP5 (Northwest of site on CR 634)	5-6:30pm	45.2	50.2	37.6	46
MP5A* (North of site on CR 634)	5-6:30pm	45.2	50.2	41.7	47
MP5B* (Northwest of site on CR 603)	5-6:30pm	45.2	50.2	40.3	46
MP6 (West of site at CR 603 and CR 638)	5-6:30pm	54.8	59.8	54.0	57
MP6A* (West of site at CR 603 and CR 638)	5-6:30pm	54.8	59.8	48.0	56
MP7* (West of site on SH DD at 10581 SH DD)	5-6:30pm	47.1	52.1	43.4	49
MP1* (Southeast of site at SH DD and SH JJ)	10-11:30pm	54.7	59.7	48.4	56
MP2* (Southeast of site on CR 505; near train track)	10-11:30pm	60.6	65.6	29.6	61
MP3* (East of site on CR 638, east of SH JJ)	10-11:30pm	49.1	54.1	44.1	50
MP4* (Northeast of site on SH JJ)	10-11:30pm	44.7	49.7	47.0	49
MP4A* (Northeast of site on SH JJ)	10-11:30pm	44.7	49.7	47.8	50
MP5 (Northwest of site on CR 634)	10-11:30pm	53.6	58.6	37.6	54
MP5A* (North of site on CR 634)	10-11:30pm	53.6	58.6	41.7	54
MP5B* (Northwest of site on CR 603)	10-11:30pm	53.6	58.6	40.3	54
MP6 (West of site at CR 603 and CR 638)	10-11:30pm	46.5	51.5	54.0	55
MP6A* (West of site at CR 603 and CR 638)	10-11:30pm	46.5	51.5	48.0	50
MP7* (West of site on SH DD at 10581 SH DD)	10-11:30pm	61.3	66.3	43.4	61

*Measurement point is near a sensitive noise receiver.

Table 5-5B
Average Daily Sound Pressure Level Evaluation with Trains, Alternative 2 – dBA

Measurement Point Locations	Time Period	Existing Ambient Noise (dBA) L_{eq}	5-dB Increase L_{eq}	New Plant Noise Level All Units Operating (dBA) L_{eq}	Overall Noise Levels (Existing Ambient with New Plant Operating) (dBA) L_{eq}
MP1* (Southeast of site at SH DD and SH JJ)	6-8am	51.0	56.0	48.3	53
MP2* (Southeast of site on CR 505; near train track)	6-8am	71.0	76.0	0.0	71
MP3* (East of site on CR 638, east of SH JJ)	6-8am	46.9	51.9	44.6	49
MP4* (Northeast of site on SH JJ)	6-8am	55.2	60.2	47.1	56
MP4A* (Northeast of site on SH JJ)	6-8am	55.2	60.2	48.0	56
MP5 (Northwest of site on CR 634)	6-8am	45.5	50.5	37.6	46
MP5A* (North of site on CR 634)	6-8am	45.5	50.5	41.8	47
MP5B* (Northwest of site on CR 603)	6-8am	45.5	50.5	40.5	47
MP6 (West of site at CR 603 and CR 638)	6-8am	46.0	51.0	54.0	55
MP6A* (West of site at CR 603 and CR 638)	6-8am	46.0	51.0	48.0	50
MP7* (West of site on SH DD at 10581 SH DD)	6-8am	42.7	47.7	43.3	46
MP1* (Southeast of site at SH DD and SH JJ)	11am-12:30pm	55.0	60.0	48.3	56
MP2* (Southeast of site on CR 505; near train track)	11am-12:30pm	71.4	76.4	0.0	71
MP3* (East of site on CR 638, east of SH JJ)	11am-12:30pm	58.1	63.1	44.6	58
MP4* (Northeast of site on SH JJ)	11am-12:30pm	51.7	56.7	47.1	53
MP4A* (Northeast of site on SH JJ)	11am-12:30pm	51.7	56.7	48.0	53
MP5 (Northwest of site on CR 634)	11am-12:30pm	60.7	65.7	37.6	61
MP5A* (North of site on CR 634)	11am-12:30pm	60.7	65.7	41.8	61
MP5B* (Northwest of site on CR 603)	11am-12:30pm	60.7	65.7	40.5	61
MP6 (West of site at CR 603 and CR 638)	11am-12:30pm	49.2	54.2	54.0	55
MP6A* (West of site at CR 603 and CR 638)	11am-12:30pm	49.2	54.2	48.0	52
MP7* (West of site on SH DD at 10581 SH DD)	11am-12:30pm	59.4	64.4	43.3	60
MP1* (Southeast of site at SH DD and SH JJ)	5-6:30pm	55.5	60.5	48.3	56
MP2* (Southeast of site on CR 505; near train track)	5-6:30pm	58.8	63.8	0.0	59
MP3* (East of site on CR 638, east of SH JJ)	5-6:30pm	63.7	68.7	44.6	64
MP4* (Northeast of site on SH JJ)	5-6:30pm	59.1	64.1	47.1	59
MP4A* (Northeast of site on SH JJ)	5-6:30pm	59.1	64.1	48.0	59
MP5 (Northwest of site on CR 634)	5-6:30pm	45.2	50.2	37.6	46
MP5A* (North of site on CR 634)	5-6:30pm	45.2	50.2	41.8	47
MP5B* (Northwest of site on CR 603)	5-6:30pm	45.2	50.2	40.5	46
MP6 (West of site at CR 603 and CR 638)	5-6:30pm	54.8	59.8	54.0	57
MP6A* (West of site at CR 603 and CR 638)	5-6:30pm	54.8	59.8	48.0	56
MP7* (West of site on SH DD at 10581 SH DD)	5-6:30pm	47.1	52.1	43.3	49
MP1* (Southeast of site at SH DD and SH JJ)	10-11:30pm	54.7	59.7	48.3	56
MP2* (Southeast of site on CR 505; near train track)	10-11:30pm	60.6	65.6	0.0	61
MP3* (East of site on CR 638, east of SH JJ)	10-11:30pm	49.1	54.1	44.6	50
MP4* (Northeast of site on SH JJ)	10-11:30pm	44.7	49.7	47.1	49
MP4A* (Northeast of site on SH JJ)	10-11:30pm	44.7	49.7	48.0	50
MP5 (Northwest of site on CR 634)	10-11:30pm	53.6	58.6	37.6	54
MP5A* (North of site on CR 634)	10-11:30pm	53.6	58.6	41.8	54
MP5B* (Northwest of site on CR 603)	10-11:30pm	53.6	58.6	40.5	54
MP6 (West of site at CR 603 and CR 638)	10-11:30pm	46.5	51.5	54.0	55
MP6A* (West of site at CR 603 and CR 638)	10-11:30pm	46.5	51.5	48.0	50
MP7* (West of site on SH DD at 10581 SH DD)	10-11:30pm	61.3	66.3	43.3	61

*Measurement point is near a sensitive noise receiver.

To determine the maximum noise due to trains on-site, an instantaneous maximum noise level was determined using the CadnaA model for both alternatives. Instantaneous noise levels will be louder at the moment that the train is arriving on-site and delivering coal. To determine the instantaneous noise level when the train is moving (and to be conservative, while the locomotive is also idling), the instantaneous noise levels are determined assuming that trains are arriving non-stop and traveling at a higher speed (30 miles per hour).

The overall instantaneous maximum expected noise levels at the nearby residences when trains are delivering coal are expected to be approximately the values shown in Table 5-6 for Alternative 1. Noise levels expected from the train when delivering coal to the site will increase the instantaneous noise from the existing measured levels by up to 7 dB at MP7 and by slightly more than 5 dB at MP6A. This increase will be barely noticeable during this process, as trains already exist to the south of the site. MP2, while close to the new rail spur, already experiences frequent trains on the railroad that is within 300 feet of the residence.

Alternative 2 is expected to increase at MP4A by up to 10 dB over nighttime measured noise levels. MP3, MP4, MP6A, and MP7 are also expected to experience increased noise levels when a train passes by from 5 to 8 dB over existing noise levels. Since the trains will only be delivering coal 3 to 4 times per week, total, the increase in noise will be sporadic. It is expected that the train may be traveling at even lower speeds once it leaves the main line and gets closer to the plant. Noise levels will drop considerably when the speed of the train is decreased below 30 miles per hour.

In addition to the receivers analyzed near the proposed facility, Alternative 2 may affect other sensitive noise receivers between the BNSF main rail line and the facility. It is estimated that there are approximately five residences within 1,200 feet of the proposed route. The CadnaA model predicted that the maximum instantaneous noise level at 1,200 feet from the railroad track when a train is passing by would be 55 dBA. The overall L_{eq} given that two trains pass during the day and one train at night, in one 24-hour period, is estimated to be 37 dBA. Therefore, it is expected that within 1,200 feet of the proposed railroad track, the residences may experience an increase in noise levels when the train passes by. At 3,000 feet from the track, the instantaneous noise expected from the train diminishes from 55 dBA to 37 dBA at a time when a train is traveling on the rail spur, which is a level below all of the existing noise levels that were measured in the area. In addition, the main line BNSF trains travel at much higher speeds, therefore the noise from this existing track is louder than expected from the rail spur proposed for Alternative 1.

Table 5-6A
Instantaneous (L_{max}) Train Sound Pressure Level Evaluation, Alternative 1 - dBA

Measurement Point Locations	Time Period	Existing Ambient Noise (dBA) L_{eq}	5-dB Increase L_{eq}	Instantaneous New Plant Noise Level Including Trains Inx(dBA) L_{max}	Overall Noise Levels (Existing Ambient with New Plant Operating) (dBA) L_{eq}
MP1* (Southeast of site at SH DD and SH JJ)	6-8am	51	56	54.3	56
MP2* (Southeast of site on CR 505; near train track)	6-8am	71	76	47.4	71
MP3* (East of site on CR 638, east of SH JJ)	6-8am	46.9	51.9	44.6	49
MP4* (Northeast of site on SH JJ)	6-8am	55.2	60.2	47.6	56
MP4A* (Northeast of site on SH JJ)	6-8am	55.2	60.2	48.4	56
MP5 (Northwest of site on CR 634)	6-8am	45.5	50.5	40.1	47
MP5A* (North of site on CR 634)	6-8am	45.5	50.5	43.9	48
MP5B* (Northwest of site on CR 603)	6-8am	45.5	50.5	41.4	47
MP6 (West of site at CR 603 and CR 638)	6-8am	46	51	58.5	59
MP6A* (West of site at CR 603 and CR 638)	6-8am	46	51	50	51
MP7* (West of site on SH DD at 10581 SH DD)	6-8am	42.7	47.7	48.6	50
MP1* (Southeast of site at SH DD and SH JJ)	11am-12:30pm	55	60	54.3	58
MP2* (Southeast of site on CR 505; near train track)	11am-12:30pm	71.4	76.4	47.4	71
MP3* (East of site on CR 638, east of SH JJ)	11am-12:30pm	58.1	63.1	44.6	58
MP4* (Northeast of site on SH JJ)	11am-12:30pm	51.7	56.7	47.6	53
MP4A* (Northeast of site on SH JJ)	11am-12:30pm	51.7	56.7	48.4	53
MP5 (Northwest of site on CR 634)	11am-12:30pm	60.7	65.7	40.1	61
MP5A* (North of site on CR 634)	11am-12:30pm	60.7	65.7	43.9	61
MP5B* (Northwest of site on CR 603)	11am-12:30pm	60.7	65.7	41.4	61
MP6 (West of site at CR 603 and CR 638)	11am-12:30pm	49.2	54.2	58.5	59
MP6A* (West of site at CR 603 and CR 638)	11am-12:30pm	49.2	54.2	50	53
MP7* (West of site on SH DD at 10581 SH DD)	11am-12:30pm	59.4	64.4	48.6	60
MP1* (Southeast of site at SH DD and SH JJ)	5-6:30pm	55.5	60.5	54.3	58
MP2* (Southeast of site on CR 505; near train track)	5-6:30pm	58.8	63.8	47.4	59
MP3* (East of site on CR 638, east of SH JJ)	5-6:30pm	63.7	68.7	44.6	64
MP4* (Northeast of site on SH JJ)	5-6:30pm	59.1	64.1	47.6	59
MP4A* (Northeast of site on SH JJ)	5-6:30pm	59.1	64.1	48.4	59
MP5 (Northwest of site on CR 634)	5-6:30pm	45.2	50.2	40.1	46
MP5A* (North of site on CR 634)	5-6:30pm	45.2	50.2	43.9	48
MP5B* (Northwest of site on CR 603)	5-6:30pm	45.2	50.2	41.4	47
MP6 (West of site at CR 603 and CR 638)	5-6:30pm	54.8	59.8	58.5	60
MP6A* (West of site at CR 603 and CR 638)	5-6:30pm	54.8	59.8	50	56
MP7* (West of site on SH DD at 10581 SH DD)	5-6:30pm	47.1	52.1	48.6	51
MP1* (Southeast of site at SH DD and SH JJ)	10-11:30pm	54.7	59.7	54.3	58
MP2* (Southeast of site on CR 505; near train track)	10-11:30pm	60.6	65.6	47.4	61
MP3* (East of site on CR 638, east of SH JJ)	10-11:30pm	49.1	54.1	44.6	50
MP4* (Northeast of site on SH JJ)	10-11:30pm	44.7	49.7	47.6	49
MP4A* (Northeast of site on SH JJ)	10-11:30pm	44.7	49.7	48.4	50
MP5 (Northwest of site on CR 634)	10-11:30pm	53.6	58.6	40.1	54
MP5A* (North of site on CR 634)	10-11:30pm	53.6	58.6	43.9	54
MP5B* (Northwest of site on CR 603)	10-11:30pm	53.6	58.6	41.4	54
MP6 (West of site at CR 603 and CR 638)	10-11:30pm	46.5	51.5	58.5	59
MP6A* (West of site at CR 603 and CR 638)	10-11:30pm	46.5	51.5	50	52
MP7* (West of site on SH DD at 10581 SH DD)	10-11:30pm	61.3	66.3	48.6	62

*Measurement point near a sensitive noise receiver.

Table 5-6B
Instantaneous (L_{max}) Train Sound Pressure Level Evaluation, Alternative 2 - dBA

Measurement Point Locations	Time Period	Existing Ambient Noise (dBA) L_{eq}	5-dB Increase L_{eq}	New Plant Noise Level All Units Operating (dBA) L_{eq}	Overall Noise Levels (Existing Ambient with New Plant Operating) (dBA) L_{eq}
MP1* (Southeast of site at SH DD and SH JJ)	6-8am	51.0	56.0	50.1	54
MP2* (Southeast of site on CR 505; near train track)	6-8am	71.0	76.0	0.0	71
MP3* (East of site on CR 638, east of SH JJ)	6-8am	46.9	51.9	53.5	54
MP4* (Northeast of site on SH JJ)	6-8am	55.2	60.2	52.4	57
MP4A* (Northeast of site on SH JJ)	6-8am	55.2	60.2	54.5	58
MP5 (Northwest of site on CR 634)	6-8am	45.5	50.5	41.0	47
MP5A* (North of site on CR 634)	6-8am	45.5	50.5	44.4	48
MP5B* (Northwest of site on CR 603)	6-8am	45.5	50.5	46.4	49
MP6 (West of site at CR 603 and CR 638)	6-8am	46.0	51.0	58.9	59
MP6A* (West of site at CR 603 and CR 638)	6-8am	46.0	51.0	50.1	52
MP7* (West of site on SH DD at 10581 SH DD)	6-8am	42.7	47.7	47.9	49
MP1* (Southeast of site at SH DD and SH JJ)	11am-12:30pm	55.0	60.0	50.1	56
MP2* (Southeast of site on CR 505; near train track)	11am-12:30pm	71.4	76.4	0.0	71
MP3* (East of site on CR 638, east of SH JJ)	11am-12:30pm	58.1	63.1	53.5	59
MP4* (Northeast of site on SH JJ)	11am-12:30pm	51.7	56.7	52.4	55
MP4A* (Northeast of site on SH JJ)	11am-12:30pm	51.7	56.7	54.5	56
MP5 (Northwest of site on CR 634)	11am-12:30pm	60.7	65.7	41.0	61
MP5A* (North of site on CR 634)	11am-12:30pm	60.7	65.7	44.4	61
MP5B* (Northwest of site on CR 603)	11am-12:30pm	60.7	65.7	46.4	61
MP6 (West of site at CR 603 and CR 638)	11am-12:30pm	49.2	54.2	58.9	59
MP6A* (West of site at CR 603 and CR 638)	11am-12:30pm	49.2	54.2	50.1	53
MP7* (West of site on SH DD at 10581 SH DD)	11am-12:30pm	59.4	64.4	47.9	60
MP1* (Southeast of site at SH DD and SH JJ)	5-6:30pm	55.5	60.5	50.1	57
MP2* (Southeast of site on CR 505; near train track)	5-6:30pm	58.8	63.8	0.0	59
MP3* (East of site on CR 638, east of SH JJ)	5-6:30pm	63.7	68.7	53.5	64
MP4* (Northeast of site on SH JJ)	5-6:30pm	59.1	64.1	52.4	60
MP4A* (Northeast of site on SH JJ)	5-6:30pm	59.1	64.1	54.5	60
MP5 (Northwest of site on CR 634)	5-6:30pm	45.2	50.2	41.0	47
MP5A* (North of site on CR 634)	5-6:30pm	45.2	50.2	44.4	48
MP5B* (Northwest of site on CR 603)	5-6:30pm	45.2	50.2	46.4	49
MP6 (West of site at CR 603 and CR 638)	5-6:30pm	54.8	59.8	58.9	60
MP6A* (West of site at CR 603 and CR 638)	5-6:30pm	54.8	59.8	50.1	56
MP7* (West of site on SH DD at 10581 SH DD)	5-6:30pm	47.1	52.1	47.9	51
MP1* (Southeast of site at SH DD and SH JJ)	10-11:30pm	54.7	59.7	50.1	56
MP2* (Southeast of site on CR 505; near train track)	10-11:30pm	60.6	65.6	0.0	61
MP3* (East of site on CR 638, east of SH JJ)	10-11:30pm	49.1	54.1	53.5	55
MP4* (Northeast of site on SH JJ)	10-11:30pm	44.7	49.7	52.4	53
MP4A* (Northeast of site on SH JJ)	10-11:30pm	44.7	49.7	54.5	55
MP5 (Northwest of site on CR 634)	10-11:30pm	53.6	58.6	41.0	54
MP5A* (North of site on CR 634)	10-11:30pm	53.6	58.6	44.4	54
MP5B* (Northwest of site on CR 603)	10-11:30pm	53.6	58.6	46.4	54
MP6 (West of site at CR 603 and CR 638)	10-11:30pm	46.5	51.5	58.9	59
MP6A* (West of site at CR 603 and CR 638)	10-11:30pm	46.5	51.5	50.1	52
MP7* (West of site on SH DD at 10581 SH DD)	10-11:30pm	61.3	66.3	47.9	61

*Measurement point is near a sensitive noise receiver.

6.0 Impacts to Sensitive Noise Receptors

Noise predicted from the AECI facility equipment is expected to be barely audible to the sensitive noise receptors in the area of the site. During normal operation without train activity, three receivers (MP4, MP4A, and MP1) are expected to possibly experience a greater than 5 dB increase; however, the greatest increase in noise level will only be up to 7 dB. With ID fan enclosures that attenuate the fans by 10 dB, none of the sensitive noise receivers will experience an increase in noise levels over 5 dB.

No schools, hospitals, or other community facilities, which would be considered sensitive noise receptors, are located within one mile of the site. The closest sensitive noise receiver to the proposed facility is located at MP1. Sound levels at the MP1 residence are expected to be up to 51dBA from the facility (without attenuation of the ID Fans) or 48 dBA with attenuation. Existing sound levels at this measurement point vary from 51 to 56 dBA which is near or exceeding the project sound from the operation of the new facility. Therefore, no significant increase (around 5 dBA) in sound levels at this residence is expected. The second closest residence is MP4A. Without attenuation on the ID fans, it is expected that the sound levels will increase up to 7 dB during normal operation. (Existing levels range from 45 to 59 dBA with the new facility contributing 51 dBA to the overall measurement.) With sound level enclosures on the ID fans, no increase over 5 dB is expected at any of the nearby sensitive noise receivers.

With train operation, the overall daily L_{eq} sound level is not expected to increase significantly from normal daily operation of the facility. Rail deliveries are only expected 3 to 4 times per week and the speed of the train will be low, with actual speeds around 10 to 15 miles per hour, which will greatly reduce the noise expected due to the trains. Existing trains already operate at high speeds along the NS and BNSF rails to the south approximately 1 mile away, which contribute to the existing noise levels significantly to the south of the site. Noise from the train activities will not increase noise above the operational noise levels that are averaged over the day and night assuming only two trains per day and one train per night in any one day for either alternative. During the period that a train may be traveling at slightly higher speeds (30 mph) to the facility from the main line(s), instantaneous noise levels are not expected to increase over the normal operation noise at any of the receptors by more than about 4 dB near the facility. As such, it is not expected that the train activities will significantly increase noise levels at the nearby residences. A few more residences may be impacted if Alternative 2 is chosen for the rail spur as it is a longer distance to the main line. Since the trains will be very sporadic at only 3 to 4 trains per week, impact from noise should be minimal.

As discussed in Section 3, HUD guideline noise levels for outside activity are 65 dBA. Only MP2 will experience noise levels above this level, and it already experiencing noise levels above this limit due to its proximity to the existing rail line. All sensitive noise receivers will remain below this threshold, so no impact is expected due to operation of the facility or operation of the rail spur.

Sound from new equipment proposed for the facility will propagate in approximately circular contours of equal sound pressure. Figure 6-1 is a contour map of the expected sound levels from the facility with ID fan attenuation of 10 dB, with 5-dBA increments extended out to cover all receivers. Figure 6-2A and 6-2B display the worst-case sound levels as a result of the train traveling to the site for coal unloading for Alternative 1 and Alternative 2, respectively.

Figure 6-1
Noise Level Contours from Operation of the Proposed Facility, dBA

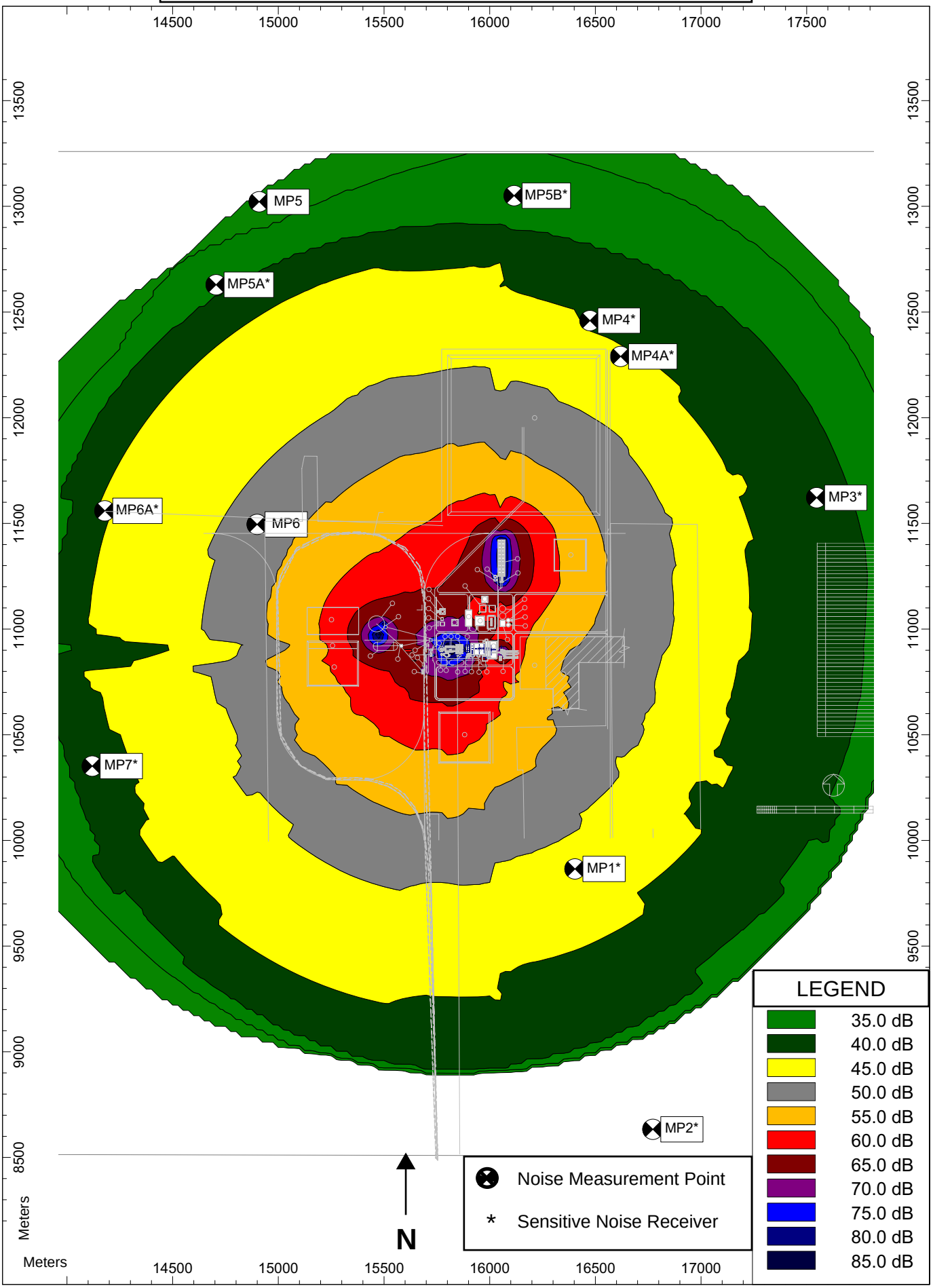


Figure 6-2A
Noise Level Contours for Maximum Train and Facility Operation, Alternative 1, dBA

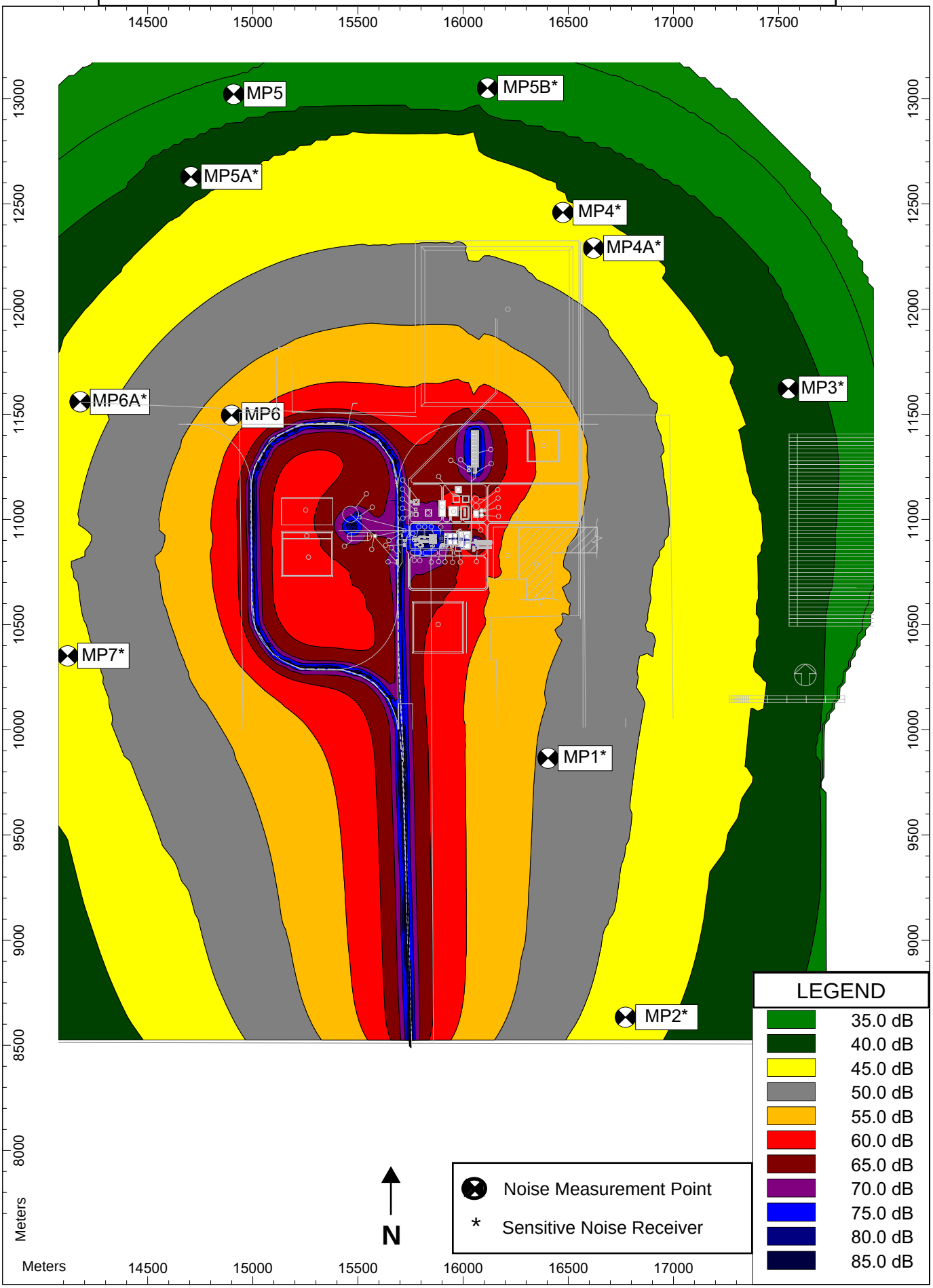
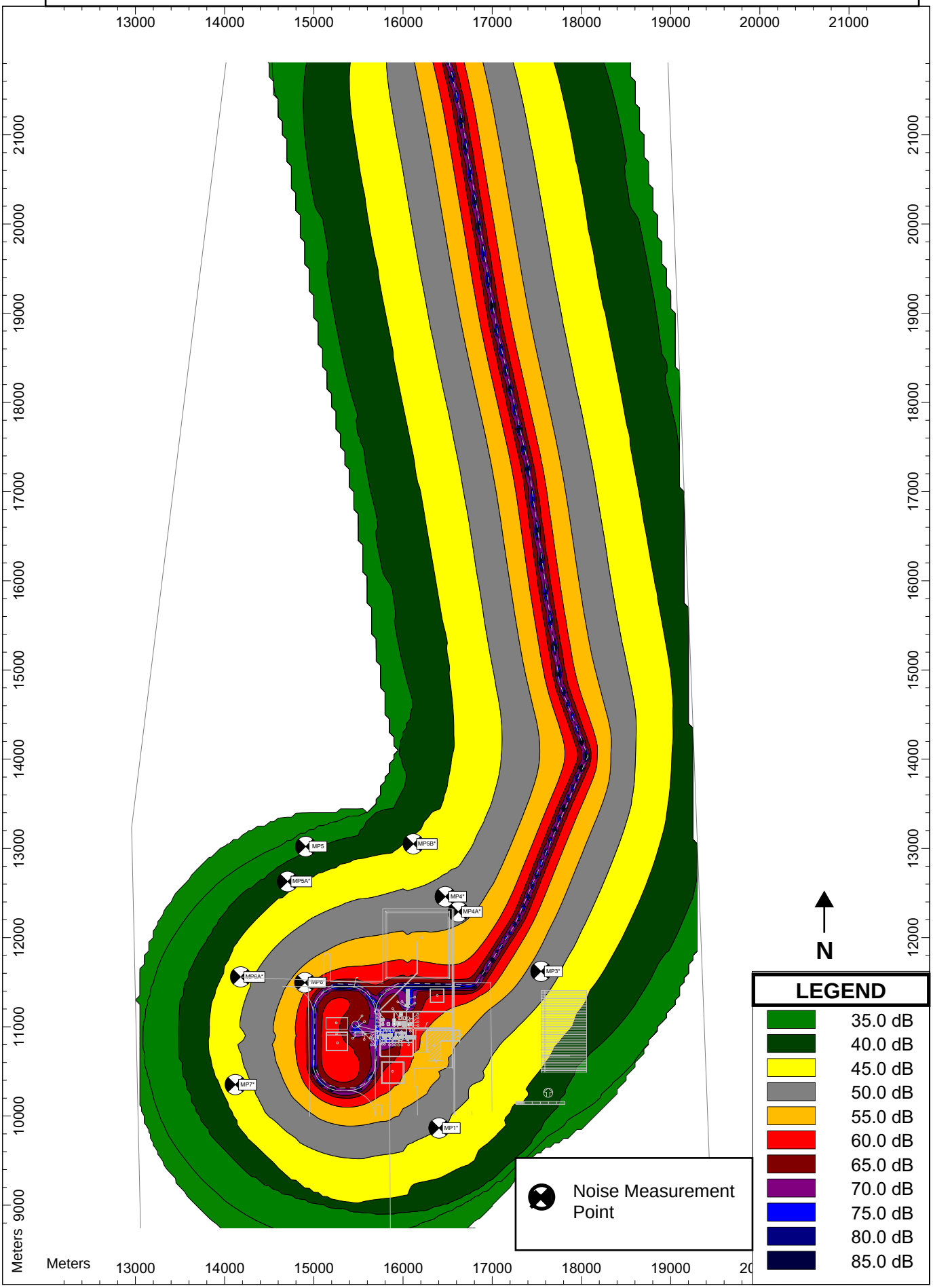


Figure 6-2B
Noise Level Contours for Maximum Train and Facility Operation, Alternative 2, dBA



7.0 Construction Noise

Construction of the proposed AECI facility will take several years. During this time, several noise emitting sources will be on-site. To estimate the sound produced during the construction of the facility, a program developed by the Federal Highway Administration (FHWA) and the Department of Transportation (DOT) for highway road construction projects was used: Roadway Construction Noise Model (RCNM), Version 1.0. Since highway road construction uses a lot of the same equipment as power plant construction, and because this is one of the few tools available to estimate noise from construction activities, this program is appropriate for modeling noise from construction of the AECI facility.

The closest receivers to the site in each direction were modeled. Equipment assumed to be on-site during construction was selected from the RCNM model. The equipment included in the model and the percent of operation during the day is shown in Table 7-1.

Table 7-1
Construction Equipment, Noise Levels and Percent Usage for Construction of Facility

Description	Usage (%)	Equipment Noise Level L_{max} (dBA)
Vibratory Pile Driver	20	100.8
Backhoe	40	77.6
Compactor (ground)	20	83.2
Concrete Mixer Truck	40	78.8
Crane	16	80.6
Grader	40	85
Dump Truck	40	76.5
Flat Bed Truck	40	74.3
Front End Loader	40	79.1
Pneumatic Tools	50	85.2
Rivet Buster/chipping gun	20	79.1
Welder / Torch	40	74
Man Lift	20	74.7

The output of the model displays the L_{max} and L_{eq} values for construction noise at each of the receivers. Table 7-2 displays the sound levels expected during construction compared to the existing noise levels in the area during the day, as outside sound-emitting construction activities will occur during the daytime hours only.

Overall, construction noise impacts at the nearby residences will not exceed 7 dB for a daily average except at one receiver during one time period. Instantaneous noise levels are expected to increase for

sporadic short periods above 10 dB over the existing noise levels. The average (L_{eq}) noise level and the L_{max} noise levels at each residence to the construction activities will be below the HUD standard for outside areas in a residential area (65 dBA). Every precaution will be taken to minimize noise impacts to the surrounding community during the construction of the facility. Some of these options are discussed in Section 8 of this report.

Table 7-2
Estimated Construction Noise Levels, Maximum (L_{max}) and Average (L_{eq})

		Existing Ambient Noise (dBA)	Instantaneous Maximum Construction Noise Level (dBA)	Daily Average Construction Noise Level (dBA)
Measurement Point Locations	**Time Period**	**L_{eq}**	**L_{max}**	**L_{eq}**
MP1* (Southeast of site at SH DD and SH JJ)	6-8am	51	63.9	58
MP2* (Southeast of site on CR 505; near train track)	6-8am	71	57.1	51
MP3* (East of site on CR 638, east of SH JJ)	6-8am	46.9	56.2	50
MP4* (Northeast of site on SH JJ)	6-8am	55.2	61.4	55
MP4A* (Northeast of site on SH JJ)	6-8am	55.2	61.4	55
MP5 (Northwest of site on CR 634)	6-8am	45.5	58.4	52
MP5A* (North of site on CR 634)	6-8am	45.5	58.4	52
MP5B* (Northwest of site on CR 603)	6-8am	45.5	58.4	52
MP6 (West of site at CR 603 and CR 638)	6-8am	46	59.7	54
MP6A* (West of site at CR 603 and CR 638)	6-8am	46	59.7	54
MP7* (West of site on SH DD at 10581 SH DD)	6-8am	42.7	58.4	52
MP1* (Southeast of site at SH DD and SH JJ)	11am-12:30pm	55	63.9	58
MP2* (Southeast of site on CR 505; near train track)	11am-12:30pm	71.4	57.1	51
MP3* (East of site on CR 638, east of SH JJ)	11am-12:30pm	58.1	56.2	50
MP4* (Northeast of site on SH JJ)	11am-12:30pm	51.7	61.4	55
MP4A* (Northeast of site on SH JJ)	11am-12:30pm	51.7	61.4	55
MP5 (Northwest of site on CR 634)	11am-12:30pm	60.7	58.4	52
MP5A* (North of site on CR 634)	11am-12:30pm	60.7	58.4	52
MP5B* (Northwest of site on CR 603)	11am-12:30pm	60.7	58.4	52
MP6 (West of site at CR 603 and CR 638)	11am-12:30pm	49.2	59.7	54
MP6A* (West of site at CR 603 and CR 638)	11am-12:30pm	49.2	59.7	54
MP7* (West of site on SH DD at 10581 SH DD)	11am-12:30pm	59.4	58.4	52
MP1* (Southeast of site at SH DD and SH JJ)	5-6:30pm	55.5	63.9	58
MP2* (Southeast of site on CR 505; near train track)	5-6:30pm	58.8	57.1	51
MP3* (East of site on CR 638, east of SH JJ)	5-6:30pm	63.7	56.2	50
MP4* (Northeast of site on SH JJ)	5-6:30pm	59.1	61.4	55
MP4A* (Northeast of site on SH JJ)	5-6:30pm	59.1	61.4	55
MP5 (Northwest of site on CR 634)	5-6:30pm	45.2	58.4	52
MP5A* (North of site on CR 634)	5-6:30pm	45.2	58.4	52
MP5B* (Northwest of site on CR 603)	5-6:30pm	45.2	58.4	52
MP6 (West of site at CR 603 and CR 638)	5-6:30pm	54.8	59.7	54
MP6A* (West of site at CR 603 and CR 638)	5-6:30pm	54.8	59.7	54
MP7* (West of site on SH DD at 10581 SH DD)	5-6:30pm	47.1	58.4	52

*Measurement point is near a sensitive noise receiver.

8.0 Equipment and Procedures to Mitigate the Effects of Noise Emissions During Construction and Operation

The following procedures could be used to mitigate sound during construction and operation of the Project.

Construction – The construction of the proposed facility will be similar to that of any other medium to large-scale construction project and will generally employ the same types of construction equipment engaged at other construction sites. Pile driving, typically one of the noisiest construction activities, will be required; however, this activity will be limited to daytime operation and will be sporadic during the initial construction phase only. Overall, site work is expected to take approximately 48 months, during which a number of different construction phases will be completed.

Each phase will employ a different mix of equipment and will have different noise emissions. To reduce noise impacts on nearby residences, most on-site project construction work will be scheduled to occur during daylight hours when people are generally less sensitive to noise. Construction work at night could be limited to relatively quiet activities, such as interior work. Engine-powered construction equipment used on-site should be equipped with exhaust mufflers.

Operation – Building materials can be selected for their sound attenuating properties. Standard silencing features of stacks and their sound attenuating properties should be considered when specific equipment is selected. The use of acoustic/weather enclosures around major outdoor equipment would help to mitigate the overall sound from the site.

8.0 Conclusion

A facility noise evaluation has been performed for the AECI coal-fired power plant facility proposed near Norborne, Missouri. The noise evaluation included an ambient noise survey to quantify the existing acoustical environment and noise modeling to predict sound levels in the community resulting from operation of the facility, including a new rail spur proposed for the facility.

No noise regulations were identified that are applicable to the AECI facility for the State of Missouri, Carroll County, Egypt Township, or the city of Norborne, where the proposed site is located.

Overall background readings were fairly low with the higher sound measurement readings being due to traffic noise (trains and road vehicles) and insects. Predicted operational sound levels will be only slightly higher than ambient levels. In some cases, the existing sound level is louder than the predicted noise emanating from the proposed facility. Noise attenuating equipment and materials could be

incorporated into the equipment design to minimize sound impacts of the facility on the surrounding area. Given the site layout, noise emissions used in the model, and potentially attenuating the ID fans by 10 dB, it is predicted that the measurement points will observe no more than a 5 dB increase over background sound levels. Without noise attenuation, the maximum expected increase is 7 dB which is not far above the 5 dB goal. The noise model also assumed conservative noise emissions for each piece of equipment. Therefore, the anticipated proposed project noise impacts on surrounding areas are minimal. Railroad noise is also considered to be minimal, given the location and speed of the proposed spur and the existing rails already emitting noise in the area.

Noise attenuation measures will be evaluated during the design of the proposed project that will limit sound level increases to 3 to 5 dB at residences near the plant. Other attenuation options may be available if actual design of the plant is modeled to show more than a 5 dB increase over existing levels at receptors. Other options include attenuation of other equipment, acquisition of the sensitive noise receptor properties, acoustic walls, low-sound fans and enclosures.

Construction noise may increase noise levels in the area for brief sporadic periods during the construction phase of the project. An increase in noise will be intermittent, and all appropriate actions will be taken to minimize noise impacts on the surrounding community.

APPENDIX A

Figure A-1
August 15-16, 2006 24-Hour Noise Survey - South Point (S24)

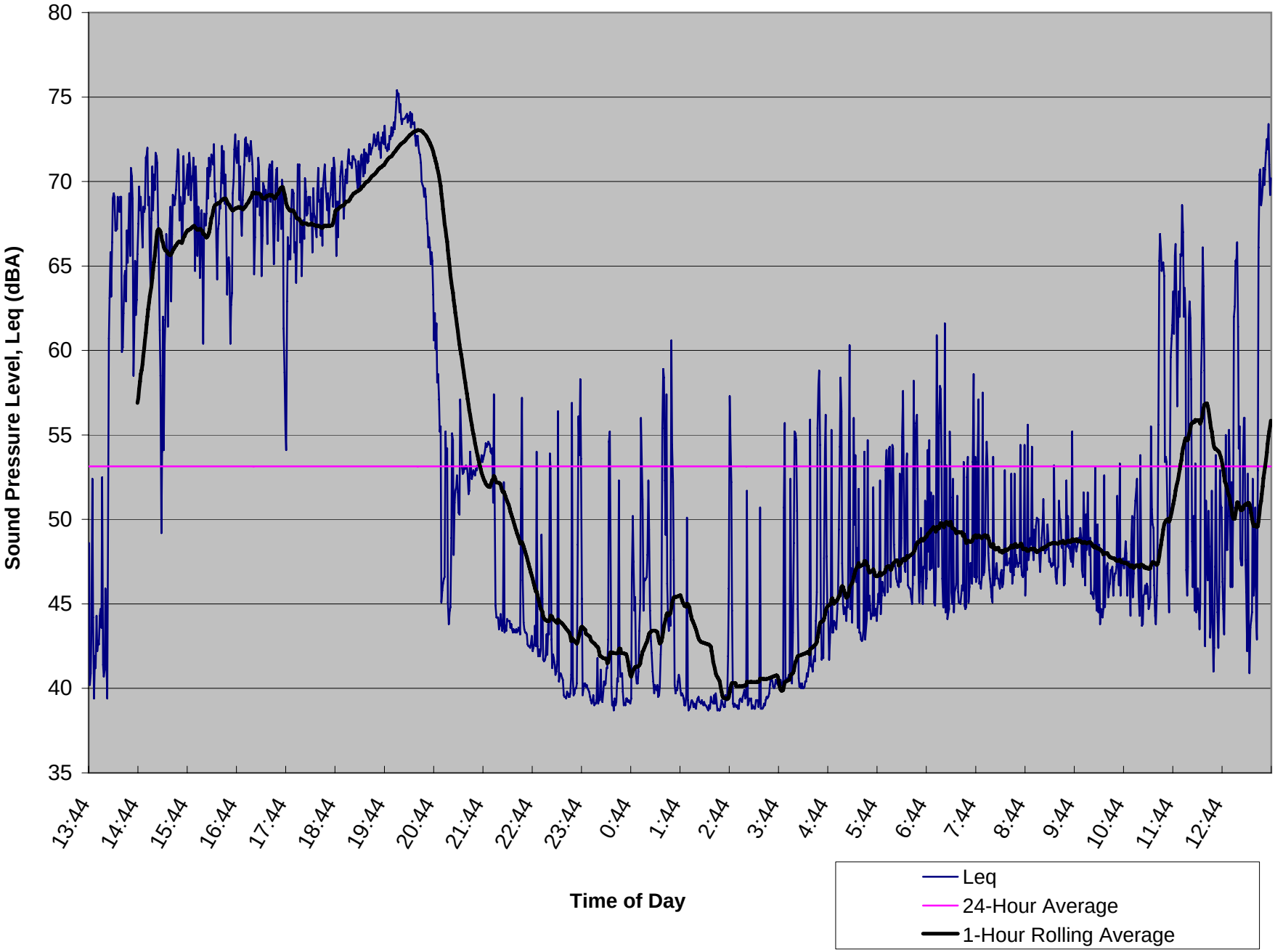


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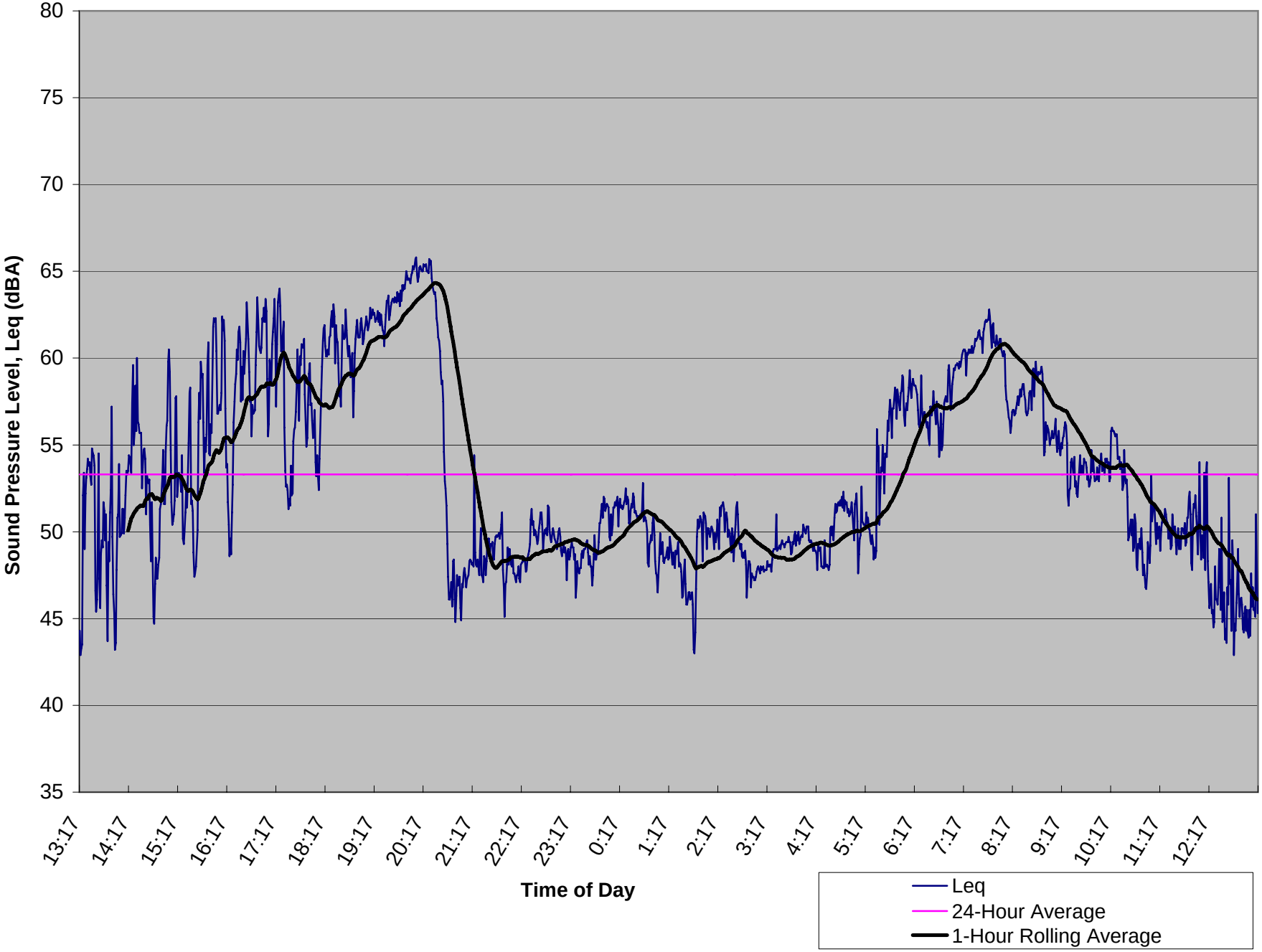
Figure A-2
August 15-16, 2006 24-Hour Noise Survey - North Point (N24)



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