PART 3 of Petition

Appendix N
Noise Level Study

APPENDIX N NOISE IMPACT ASSESSMENT

Noise Impact Evaluation for the Wawayanda Energy Center

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Prepared for:

Calpine Corporation
The Pilot House, 2nd Floor
Lewis Wharf
Boston, Massachusetts 02110
(617) 723-7200
(617) 723-7635 Fax

Prepared by:

Michael Theriault Acoustics, Inc.
15 Worcester Square, Suite 4
Boston, MA 02118
(617) 437-9887
(617) 437-9343 Fax

Table of Contents

Appendix:

- Stipulation No. 6 – Noise & Noise Impact Assessment Protocol
- Winter Long Term Monitor Data
- Winter Short Term Spectrum Data
- Winter Weather Monitor Data
- Summer Long Term Monitor Data
- Summer Short Term Spectrum Data
- Instrumentation
- Calibration Certificates
- Construction Noise Modeling
- Project Noise Modeling
    - MCNR Analysis
    - L_{DN} Analysis
    - C-Weighted Analysis
    - Cumulative Facility Noise Modeling
    - Local Activities Analysis
- Acoustical Terminology

1.0 Executive Summary [1]

Wawayanda Energy Center, LLC, a wholly-owned subsidiary of Calpine Corporation, (Calpine) is proposing to construct and operate the Wawayanda Energy Center (Project), a nominal 540-megawatt, natural gas-fired combustion turbine power plant located in the Town of Wawayanda, New York. As required by Article X of the Public Service Law, Calpine prepared a comprehensive noise impact evaluation in accordance with Stipulation 6 and the Noise Impact Assessment Protocol developed for the Project. As part of the study, ambient noise level surveys were conducted in June and December 2000, to establish baseline (L_{90}) levels prior to Project operation. Results showed that average ambient noise levels (L_{90}) ranged from the low 40s to low 50s (A-weighted) at the nearest residences to the Project site, largely affected by traffic noise from Interstate I-84.

A three-dimensional acoustical model of construction operations was developed to predict noise levels at the nearest receiver areas for five separate construction phases. Results showed that construction activities would range in level (L_{EQ}) from the low-50s to high 60s (A-weighted) at nearby homes. Given that normal speech intelligibility will be preserved both indoors and outdoors and that sleep disturbance risk is low during daytime periods, the potential for community complaint is considered small. Moreover, the Project will employ numerous

[1] **Stipulation 6: NOISE**

The Application to be submitted will include a study of the noise impacts of the construction and operation of the Project, as described and detailed in Attachment 1, the Noise Impact Assessment Protocol, which is a part of this Stipulation.

administrative techniques and source noise controls in order to limit construction noise levels at nearby receivers.

The Modified Composite Noise Rating method (MCNR) was used to establish noise level limits for the Project. This methodology takes into account many factors including: expected Project noise level; existing background noise level within the community; character of Project noise (*e.g.*, tonal, impulsive); duration, time of day and season of Project operation, as well as subjective factors such as community attitude and history of previous exposure. Conceptual noise controls were determined based on achieving a Composite Noise Rating of C, corresponding to "*no reaction, although noise is noticeable*" and to D, corresponding to "*sporadic complaint*."

Results showed that for MCNR C, Project noise levels would range from 31 to 46 dBA at nearby homes, requiring extensive mitigation of the air-cooled condenser and heat recovery steam generator (HRSG) stacks, a low-noise wet surface air cooler, high transmission loss power block building and substantial treatment of ventilation systems. The incremental capital expenditure for these controls would be approximately $ 1.8 million dollars.

Results further showed that for MCNR D, Project noise levels at the nearest homes would range from 35 to 50 dBA, requiring extensive mitigation of the air cooled condenser, and treatment of HRSG exhaust stacks and building ventilation systems. The incremental capital expenditure for these controls would be approximately $ 900,000 dollars. Given these results, Calpine is committed to establishing a noise level design goal of MCNR C for the Project.

In addition to assessing potential noise impacts using the MCNR analysis, further evaluations showed that: 1) risk of hearing damage risk is negligible; 2) interference with sleep, and indoor/outdoor speech is not expected; 3) annoyance due to low-frequency noise is not anticipated; and 4) there is no potential for structural damage due to infrasound. Also, results showed that noise levels during operation of the Project are consistent with guidelines for acceptable levels of community noise established by federal bureaus such as the Department of Housing and Urban Development (HUD) and the Environmental Protection Agency (EPA). Given these findings, the potential for community complaint is low. Finally, noise levels during operation of the Project will comply with Wawayanda's "General and Commercial Industrial Standards" as proposed in recent zoning code amendments.

A noise level compliance test will be performed when the Project becomes operational, in order to demonstrate conformance to noise control design goals established by the New York State Public Service Commission (NYSPSC) for the Project.

In accordance with the Noise Impact Assessment Protocol established for the Project, an analysis of cumulative noise impacts associated with construction and operation of the Orange Recycling Project (Masada Project) and the Wawayanda Energy Center (WEC) was conducted. Results showed that changes in noise level at receivers, relative to noise produced by only the WEC, would range from one (1) to nine (9) decibels for construction and one (1) to four (4) decibels for operation. Similarly, an analysis of cumulative noise impacts associated with construction and operation of the Torne Valley Station/Ramapo Energy Project and the Wawayanda Energy Center was conducted. The analysis showed that no change in community noise levels, relative to the contribution of noise from construction and operation of the Wawayanda Energy Center, would result from simultaneous construction and operation of these facilities.

Finally, noise levels generated during construction and operation of the Project were compared to noise produced by local activities, such as fireworks displays, aircraft flyovers and operation of the Orange County Speedway. In general, emissions produced by the Project will be at or significantly below noise levels produced by these activities.

2.0 Area Description

As shown in Figure 1, the Project will be located on a 38-acre parcel of land south of the City of Middletown, and adjacent to the southeast corner of Dolsontown Road and McVeigh Road in the Town of Wawayanda, Orange County, New York. Land use in the immediate area is mainly agricultural or commercial with low population density. The nearest noise receiver areas to the

Project (i.e., residences, schools, public open space, etc.) are identified in Figure 2.[2]

3.0 Noise Metric Descriptions

Noise can be described using various scales, similar to measuring temperature in terms of Fahrenheit or Celsius degrees, or weight in terms of pounds and kilograms. Moreover, noise can be described using a variety of statistical metrics. The following section briefly reviews the most commonly used metrics for reporting environmental noise levels.

3.1 A-Weighted Levels and Frequency Analysis

The human ear responds to a frequency range from about 20 Hertz to 20,000 Hertz. Since our hearing is not equally sensitive to low and high frequency sound or pitch, sound level meters are equipped with "A-Weighting" filters to approximate this irregular response. These measurements are called A-weighted levels (reported in units of decibels, dBA) and are a customary indicator of perceived loudness. Figure 3 illustrates some typical A-weighted levels produced by familiar noise sources.

[2] Stipulation 6.1

A map showing the location of the nearest sound receptors in relation to the Project site, including the nearest residential, school, and public open space receptor locations;

To further approximate the response of human hearing, sound level meters are often equipped with octave band filters. Octave band filters divide the audible range into nine separate "frequency-bins" much like a prism separates white-light into bands of different color or wavelengths. Sound levels are sometimes measured using one-third (1/3rd) octave band filters. As the name implies, one-third octave band filters divide octaves into three additional "bins" for greater resolution.

Octave Band Filter Frequency Ranges

Octave Band Center Frequency	Frequency Range
31.5 Hz	22 Hz - 44 Hz
63 Hz	44 Hz - 88 Hz
125 Hz	88 Hz - 177 Hz
250 Hz	177 Hz - 355 Hz
500 Hz	355 Hz - 710 Hz
1000 Hz	710 Hz - 1420 Hz
2000 Hz	1420 Hz - 2840 Hz
4000 Hz	2840 Hz - 5680 Hz
8000 Hz	5680 Hz - 11360 Hz

3.2 Percentile Levels

Environmental sound levels typically fluctuate, and as a result, percentile or "exceedance" measurements are often used to quantify them. These metrics take into account the amount of time an environment is at a given loudness, and allow us to separate loud, intrusive noises, from steady state or background sounds. For example, as shown in Figure 4:

L_{10} ("L-Ten") is the level exceeded 10% of the time, that is, levels are higher than this value only 10% of the measurement time. The L_{10} typically represents the loudest noise events, such as car and truck passes and aircraft flyovers.

L_{50} ("L-Fifty") is the sound level exceeded 50% of the time. Levels will be above and below this value exactly one-half of the measurement time, and therefore the L_{50} is sometimes referred to as the "median" sound level.

L_{90} ("L-Ninety") is the sound level exceeded 90% of the time and is often called the "background" sound level. Ninety percent of the time, measured levels are higher than this value, and therefore the L_{90} represents the environment at its quietest periods.

3.3 Equivalent Energy Level

Sound level measurements may also be reported in terms of "equivalent energy levels" or L_{EQ}. An L_{EQ} is a single number that is "equivalent" to the actual fluctuating noise level, for any given measurement period. Typically, the L_{EQ} falls between the L_{10} and L_{50}.

3.4 *Day-Night Level*

Another metric used to assess community noise is called the *Day-Night Level*, or L_{DN}. The L_{DN} represents a 24-hour measurement of sound within a community, and is calculated by adding a 10-decibel "penalty" to noises that occur between 10 p.m. and 7 a.m. This approach considers the potential for increased annoyance when people are resting, relaxing and sleeping. The *Day-Night Level* is the preferred metric of federal bureaus such as the Department of Housing and Urban Development (HUD) and the Environmental Protection Agency (EPA).

3.5 *Modified Composite Noise Rating*

Although not specifically a noise level metric, the Modified Composite Noise Rating (MCNR) procedure is a widely published method for rating the annoyance of outdoor noise. Octave band sound pressure levels of the noise expected near a residential site are plotted over a family of 'noise level rank curves' (*see Appendix*). These curves are labeled "a" through "m" and are spaced at about 5-decibel intervals. The highest area into which the predicted noise spectrum protrudes in any octave band gives the 'noise level rank' of the source. Corrections are then applied to the 'noise level rank' to obtain the Composite Noise Rating (CNR) for the source. These corrections include: existing background noise level within the community; spectral character of noise (*e.g.*, tonal, impulsive); temporal character of noise, (duration, time of day, season), and subjective factors such as community attitude and history of previous exposure. In conjunction with a figure of 'Estimated

Community Responses' (*see Appendix*) the CNR provides the 'average expected response from a normal community.' The responses are 1) *no reaction, although noise is generally noticeable;* 2) *sporadic complaints;* 3) *widespread complaints or single threat of legal action;* 4) *several threats of legal action or strong appeals to local officials to stop noise;* and 5) *vigorous action* [Ref. 4]. This procedure is the preferred analysis method of the NYSPSC.

4.0 Ambient Sound Level Surveys [3]

Two (2) ambient sound level surveys were conducted to quantify and characterize existing community noise levels in the vicinity of the Project site. Specifically, sound level measurements were collected to establish baseline levels (L_{90}) at nearby noise receptors, prior to construction and operation of the Project. Baseline (L_{90}) levels were used in the MCNR procedure for assessing potential noise impact. Measurements were performed during both warm weather ("leaf-on and insect noise") and cold weather ("leaf-off and no insect noise") months. The warm weather measurement survey was conducted in June 2000 [4] and the cold weather

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[3] ***Stipulation 6.2***

An evaluation of ambient pre-construction baseline noise conditions, including pure tones, at the nearest noise receptors, using actual measurement data recorded for 20 minute durations as a function of time and frequency using a Type 1 precision sound level meter (SLM) and octave band frequency spectrum analyzer;

[4] Warm weather results were previously reported in the Preliminary Scoping Statement for the Project – July 15, 2000.

measurement survey in December 2000. (Warm weather results were previously reported in the Preliminary Scoping Statement for the Project).

4.1 Selection of Noise Monitoring Locations

On 20 June 2000 and 13 December 2000, the site and surrounding area was surveyed to identify nearby noise receptors (residences, churches, hospitals). As shown in Figure 2, and described below, six (6) locations were selected as spatially appropriate for obtaining ambient noise readings:

- Dolsontown Road East – The nearest residences east (1300 feet) of the Project site. (Monitoring was conducted at the E-Z Loader facility).

- Dolsontown Road West – This area is located on a bluff approximately 1300 feet west of the Project site, and represents the nearest western residences.

- Dolsontown Road South – The nearest residence south (600 feet) of the Project site. (Cold weather monitoring only).

- Genung Street – This area is located approximately 4,300 feet northeast of the Project.

- Country View Manor Apartments – This large apartment complex is located approximately 3300 feet north of the site.

- Ruth Court – A residential area located approximately 4,400 feet north of the proposed Project site. (Warm weather monitoring only).

4.2 Procedures

Measurements included both attended, short-term (i.e., 20-minute samples performed during daytime/evening and early morning hours) and unattended, long term monitoring (i.e., one-hour periods for a minimum of 24 consecutive hours). Warm-weather, long-term monitoring was conducted in the vicinity of residences located north and east of the Project site. Cold weather, long-term monitoring was conducted adjacent to the nearest southern residence, as well as near Country View Manor.

All warm and cold-weather measurements included percentile sound levels (L_{MAX}, L_1, L_5, L_{10}, L_{50}, L_{90}, and L_{MIN}) as well as energy average levels (L_{EQ}). One-third (1/3rd) octave band readings were also collected during attended measurements to identify existing pure tones. Pure tones occur when sound is concentrated in a narrow band of frequencies, typically perceived as hum, buzz or whistle-like, in character.

4.3 *Instrumentation*

All attended, short-term sound level measurements were collected with a Brüel & Kjær Model 2260 Sound Level Meter. All warm weather, unattended measurements were collected with a Brüel & Kjær Model 2236 Sound Level Meter. These meters comply with Type 1 precision requirements of the American National Standards Institute (ANSI) and were field calibrated before and after each measurement set with a Brüel & Kjær Model 4231 Acoustic Calibrator.

All cold weather, unattended sound level measurements were collected with a Brüel & Kjær Model 2238 Sound Level Meter. This meter complies with Type 2 tolerance requirements of ANSI, (when fitted with the Model 4198 Outdoor Microphone Probe) and was also field calibrated with a Brüel & Kjær Model 4231 Acoustic Calibrator before and after the long-term deployment. Either the manufacturer or an accredited calibration laboratory qualified the equipment within the preceding 12-month period using references traceable to the National Institute of Standards and Technology. Complete instrument specifications and calibration certificates are provided in the Appendix.

4.4 *Monitoring Results*

Early morning background sound levels (L_{90}) near the site were generally controlled by distant traffic noise on Route I-84 and local traffic along Dolsontown Road and Genung Street. At residences located further from the Project site, such as near the Country View Manor Apartments, background sound levels (L_{90}) were controlled by mechanical noise from the adjacent sewage treatment facility. As summarized in Table 1, early morning ambient noise levels (L_{90}) collected during attended measurements ranged from the high 30s to high 40s (A-weighted) at the nearest residences to the site. As shown in Table 2, ambient noise levels (L_{90}) collected during long-term monitoring ranged from the low 40s to low 50s (A-weighted) at nearby residences.[5] In general, no measurement exhibited unusually strong tonal components, although subjective observations at Country View Manor indicated the presence of mechanical noise, tonal in nature, produced by the water treatment facility.

Table 1

Summary of Short-Term Early Morning L_{90} Measurements

Location	Description	Winter	Summer
Dolsontown Road East	Nearest Eastern Residences	43 dBA	48 dBA
Dolsontown Road West	Nearest Western Residences	40 dBA	49 dBA
Dolsontown Road South	Nearest Residence	42 dBA	---
Genung Street	Northeastern Residences	39 dBA	41 dBA
Country View Manor	Northern Residences	42 dBA	47 dBA
Ruth Court	Northern Residences	---	43 dBA

[5] Arithmetic average from 10 p.m. to 7 a.m.

Table 2

Summary of Long-Term L_{90} Measurements

Location	**Description**	**Winter**	**Summer**
Dolsontown Road East	Nearest Eastern Residences	---	51 dBA
Dolsontown Road South	Nearest Residence	46 dBA	---
Country View Manor	Northern Residences	42 dBA	47 dBA

5.0 Applicable Noise Level Regulations [6]

Noise produced during operation of the Project is required to conform to local noise control laws, ordinances and regulations, as well as to limits established by the NYSPSC, as described in the following section.

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[6] **Stipulation 6.3**

A description of the noise standards applicable to the Project and the noise design goals for the Project at the nearest noise receptors, including the nearest residential, school, and public open space receptor locations. The noise design goals shall include dBA levels;

5.1 Local Noise Laws

The Town of Wawayanda has established noise limits in their Performance Standards for Nonresidential Districts. Specifically,

> *" Noise shall not exceed an intensity, as measured 100 feet from the boundaries of the lot where such use is situated, of the average intensity, occurrence and duration of the noise of street traffic at adjoining streets."*

The Town of Wawayanda Building Inspections Department indicated that this Performance Standard was ambiguous and difficult to enforce.[7]

Under Wawayanda's *proposed* Zoning Code amendment, a new chapter 195-19 will be adopted, entitled "General Commercial and Industrial Standards." Section 195-19D states that noise may not exceed an intensity of 65 decibels [dBA] as measured 100 feet from the boundaries of the lot where such use is situated.

5.2 New York State Public Service Commission

In accordance with NYSPSC requirements, the Modified Composite Noise Rating (MCNR) procedure was used to establish noise level limits for the Project. This methodology takes into account many factors including: expected noise level of the Project; existing background noise level within the community; character of

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[7] Communications between Calpine and the Town of Wawayanda Building Inspections Department.

Project noise (*e.g.*, tonal, impulsive); duration, time of day and season of Project operation, as well as subjective factors such as community attitude and history of previous exposure. Noise controls for the Project were determined based on achieving both a Composite Noise Rating of C, corresponding to a community reaction of "*no reaction, although noise is noticeable*" and to D, corresponding to "*sporadic complaint*."

Although the MCNR method is applied in terms of octave bands, an equivalent A-weighted noise level can be derived for Composite Noise Rating. Assuming a neutral adjustment (i.e., zero) for all factors, Project noise levels are limited to 46 dBA and to 51 dBA at the nearest residence, school or public open space, in order to achieve community reactions of "*no reaction . . .*" and "*sporadic complaint,*" respectively.

In addition to NYSPSC standards, Project noise levels were compared to guidelines established by federal bureaus such as the Department of Housing and Urban Development (HUD) and the Environmental Protection Agency (EPA). This comparison is presented in Section 10.0, *Project Sound Level Assessment.*

6.0 Construction Noise Impact Assessment [8]

As required by the NYSPSC, the potential for construction noise impact was evaluated. In accordance with the Noise Impact Assessment Protocol, *(see Appendix)* equivalent energy levels (L_{EQ}) measured during ambient surveys were compared to construction noise level estimates at nearby receptors. Where ambient noise measurements were not collected, estimates of community sound levels have been provided. For periods when construction noise levels were predicted to exceed existing L_{EQ} levels by more than 10 decibels, an evaluation of the potential for indoor and outdoor speech interference, and for sleep interference was conducted.

6.1 Existing Ambient Conditions (L_{EQ})

Construction of the Project will take place largely during daytime hours and therefore; construction noise levels were compared to measured/estimated existing "daytime" equivalent levels (L_{EQ}). For purposes of this section only, daytime is defined from 7 a.m. to 4 p.m. (i.e., typical construction hours). As shown in Table 3, measured/estimated existing equivalent noise levels (L_{EQ}) ranged from the low-50s to high-60s (A-weighted) at the nearest receptors.

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[8] **Stipulation 6.4**

An evaluation of the impact of construction noise, at the nearest residential, school, and public open space receptor locations;

Table 3

Measured/Estimated Existing Daytime (7 a.m. to 4 p.m.)

Energy Average Levels (L_{EQ})

Location	Description	Measured/Estimated Existing L_{EQ}
Dolsontown Road East	Nearest Eastern Residences	69 dBA
Dolsontown Road West	Nearest Western Residences	61 dBA
Dolsontown Road South	Nearest Residence	54 dBA
Monhagen River	Nearest Public Space	54 dBA (est.)
Moon School	Nearest Public School	53 dBA (est.)
Genung Street	Northeastern Residences	68 dBA
Country View Manor	Northern Residences	53 dBA
Ruth Court	Northern Residences	66 dBA

6.2 Construction Noise Level Modeling

An acoustical model of construction operations and equipment was developed using SoundPLAN® Version 5.0 [Ref. 1] and industry standard algorithms [Ref. 2] to predict noise levels at the nearest receptors. Energy equivalent sound levels (L_{EQ}) as well as maximum sound levels (L_{MAX}) were estimated for each of five major construction phases, including 1) grading and excavation, 2) concrete pouring, 3) steel erection, 4) equipment installation and 5) finishing.[9] Adjustments for geometrical spreading (hemispherical divergence); atmospheric absorption and ground effect were included. As shown in Tables 4 and 5, L_{EQ} levels are predicted to range from the mid-30s to high-60s (A-weighted) and maximum levels (L_{MAX}) from the low-50s to low-80s (A-weighted) at the nearest receptors.

Modeling results showed that during grading and excavation, and steel erection, construction noise levels may exceed existing equivalent sound levels by more than ten (10) decibels[10] at the nearest southern residence. For all other locations and construction phases, noise levels are expected to be less than 10-decibels above existing levels.

As shown in Table 4, construction noise levels (L_{EQ}) at the nearest southern residence are predicted to be no higher than 68 dBA, and therefore normal conversation (i.e., 95% sentence intelligibility) is expected outdoors as well as indoors [Ref. 5].

Although construction noise levels may be higher than typically recommended to avoid sleep disturbance at the nearest southern residence, most construction activities will take place during daytime hours when acceptance towards noise is higher, and the risk of sleep disturbance and interference with relaxation activities is lower. Given that normal speech intelligibility will be maintained both indoors and outdoors; and that the risk of sleep disturbance is low during daytime periods; and that average individuals are usually tolerant of construction noise given its temporary nature, the potential for community complaint is small.

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[9] Assumes use of blow-down silencing during plant clean out.
[10] Assessment threshold identified in the Protocol, above which further analysis was required.

6.3 Nighttime Construction Noise Levels

Nighttime activities will likely be similar to the "finishing phase" of construction, which is typically 10 decibels quieter than for other phases. Also, the size of the nighttime work force may be only $1/3^{rd}$ that during daytime hours, further reducing sound levels. Finally, since the majority of work (e.g., electrical, piping, craft work etc.) will probably take place within the generation building, noise due to construction operations and activities should be significantly attenuated before reaching the community.

Table 4

Daytime Ambient Levels (L_{EQ}) versus Estimated Construction Noise Levels (L_{EQ})

Location	Measured or Estimated Existing L_{EQ}	L_{EQ} Threshold Increase	Construction L_{EQ} Threshold	Construction Phase Grading/ Excavation	Construction Phase Concrete Pouring	Construction Phase Steel Erection	Construction Phase Equipment Installation	Construction Phase Finishing
Nearest Eastern Residences	69	10	79	61	57	61	56	51
Nearest Western Residences	61	10	71	61	57	61	56	51
Nearest Southern Residence	54	10	64	68	64	68	63	58
Nearest Public Space	54 (Estimated)	10	64	60	56	60	55	50
Nearest School	53 (Estimated)	10	63	45	41	45	40	35
Genung Street	68	10	78	48	44	48	43	38
Country View Manor	53	10	63	51	47	51	46	41
Ruth Court	66	10	76	47	43	47	42	37

All table values A-Weighted (dBA)

Table 5

Estimated Maximum Construction Noise Levels (L_{MAX})

Location	Grading & Excavation	Concrete Pouring	Steel Erection	Equipment Installation	Finishing
Nearest Eastern Residences	76	72	76	71	66
Nearest Western Residences	76	72	76	71	66
Nearest Southern Residences	83	79	83	78	73
Nearest Public Space	75	71	75	70	65
Nearest School	60	56	60	55	50
Genung Street	63	59	63	58	53
Country View Manor	66	62	66	61	56
Ruth Court	62	58	62	57	52

All table values A-Weighted (dBA)

7.0 Construction Noise Controls [11]

The Project will implement all reasonable noise abatement measures for normal as well as significant noise-producing construction activities. This may include the following strategies [Ref 3]:

[11] **Stipulation 6.5**

An identification and evaluation of reasonable noise abatement measures for normal as well as significant noise-producing construction activities;

- Where practical and feasible, the site will be configured to minimize backup alarm noise. For example, construction site access will be designed such that delivery trucks move through the site in a circular manner without the need to backup.

- To the extent possible, truck loading, unloading, and hauling operations will be scheduled to minimize noise impact, especially during nighttime hours.

- Wherever feasible, local power will be used to limit portable generator noise. No generators larger than 25 KVA will be used, and where a generator is necessary, it will employ maximum noise attenuation performance.

- Wherever feasible, pre-auguring equipment will be used to reduce the duration of any impact or vibratory pile driving that may be required.

- Pre-cast decking or plates on road surfaces will be routinely inspected for creating unnecessary noise. If required, barrels or signs will be used to detour traffic away from plated trenches. As needed, transit routes will be graded to prevent the generation of impact noise by passing vehicles.

- Cargo will be secured to prevent rattling and banging.

- All equipment will be properly maintained.

- All equipment used on the construction site, including jackhammers and pavement breakers, will employ exhaust systems and mufflers recommended by the manufacturer as having the highest performance.

- To the extent feasible, loud equipment and activities will be stationed at the greatest distance from noise receivers.

- The use of public address systems will be limited, except for emergencies and other safety notifications.

8.0 Project Noise Levels [12]

The Project will utilize two (2) combined-cycle gas turbine power trains and one (1) steam turbine to generate a nominal electrical output of 540 megawatts. For purposes of this analysis, General Electric Frame 7Fs were modeled based on the general arrangements shown in Figures 5 and 6.

Two three-dimensional acoustical models of the Project were developed using SoundPLAN® Version 5.0, to determine conceptual noise controls required to achieve a Composite Noise Rating of C, (*"no reaction, although noise generally noticeable"*) and D (*"sporadic complaint"*) at nearby receivers. Specifically, octave band sound power level data from General Electric, in-house measurement data and

[12] **Stipulation 6.6**

An estimate of facility sound levels at the nearest receptors during operation of the Project;

industry-standard prediction algorithms [Ref. 4] were used to establish sound power levels (PWL) for the noise sources listed in Table 6. Sound power levels provide a convenient means to describe the total amount of noise produced by a piece of equipment or radiated by a structure.

Table 6

Project Noise Sources

Description	Sound Power Level MCNR C Design
Air Cooled Condenser	102 dBA
Gas Turbine Air Inlets	91 dBA/unit
Gas Turbine Exhausts (*through the HRSG stacks)*	94 dBA/unit
Gas Turbine Compartment Ventilation Fans	86 dBA/unit
Gas Turbine Exhaust Diffuser Fans	85 dBA/unit
Generation Building Walls & Roof *Containing Gas Turbines/HRSGs/Steam Turbine*	98 dBA
Generation Building Ventilation Fans	87 dBA/unit
Gas Pre-Heater Building Walls and Roof	80 dBA
Gas Turbine Step-Up Transformers	94 dBA/unit
Steam Turbine Step-Up Transformer	94 dBA/unit
HRSG Stacks (break-out noise)	85 dBA/unit
Gas Metering Station	89 dBA
Wet Surface Air Cooler	95 dBA

Source power levels were adjusted for: the reduction of sound with distance (*geometrical spreading*); the molecular absorption of sound by air (*air absorption*); the absorption and reflection of sound by the ground (*ground effect*); and the changes in source levels with direction (*source directivity*). Sound levels were further adjusted for the transmission loss of buildings, as appropriate; and for the shielding effects of buildings, tanks, and site topography to estimate far-field Project noise levels.

8.1 Results

As shown in Table 7, Project noise levels at the nearest homes are expected to range from about 31 to 46 dBA, when using equipment necessary to achieve a Composite Noise Rating of C. Similarly, A-weighted levels are predicted to range from about 35 to 50 dBA, when using equipment necessary to achieve a Composite Noise Rating of D. These results are also presented as a family of sound level contours in Figures 7 and 8, for MCNR Rating C and D, respectively, and a complete set of modeling calculations in tabular form can be found in the Appendix.

Table 7

Predicted (A-Weighted) Project Noise Levels at Nearest Receiver Areas

Location	Description	MCNR C	MCNR D
Dolsontown Road East	Nearest Eastern Residences	43 dBA	47 dBA
Dolsontown Road West	Nearest Western Residences	45 dBA	50 dBA
Dolsontown Road South	Nearest Residence	46 dBA	50 dBA
Monhagen River	Nearest Public Space	39 dBA	44 dBA
Moon School	Nearest Public School	30 dBA	35 dBA
Genung Street	Northeastern Residences	31 dBA	37 dBA
Country View Manor	Northern Residences	36 dBA	41 dBA
Ruth Court	Northern Residences	32 dBA	37 dBA

9.0 Conceptual Project Noise Controls [13]

The following section describes the conceptual noise controls necessary to achieve a modified Composite Noise Rating of C and D for the Project.

[13] **Stipulation 6.7**

An identification and evaluation of reasonable noise abatement measures, including the use of alternative technologies, for the final design and operation of the Project during all operating scenarios;

9.1 Air Cooled Condenser Levels

Modeling results indicate that the air-cooled condenser (ACC) will require up to eleven (11) decibels of noise reduction (A-weighted) to achieve a Composite Noise Rating of C at the nearest homes. For a Composite Noise Rating of D, approximately four (4) decibels less attenuation will be required. ACC noise reductions will be achieved with large-diameter, low-speed fans, low-noise gearboxes and drive motors, as well as by screen walls.

9.2 Combustion Turbine/HRSG Exhaust Stack Levels

Although the HRSGs provide a significant amount of noise attenuation, approximately thirteen (13) decibels (A-weighted) of additional reduction will be required to realize a Composite Noise Rating of C. This can be achieved with large, absorptive-type silencers placed either in the stack, or in the last module of the HRSG. For a Composite Noise Rating of D, approximately five (5) decibels less attenuation will be required.

9.3 Transmission Loss of Power Block Buildings

To achieve a Composite Noise Rating of C at nearby homes, the power block buildings must be constructed from a minimum of 22-gauge steel sheet plus 6 inches of insulation. For a Composite Noise Rating of D, construction equivalent to preengineered building design (i.e., 24 gauge steel corrugated sheet, 4" thick fiberglass insulation secured with vinyl scrim interior facing) will be sufficient.

9.4 CTG Compartment Ventilation System

For a MCNR of C, the gas turbine compartment and exhaust diffuser enclosure compartment ventilation fans will require 10 decibels of mitigation beyond that provided by General Electric's (GE) Level III Silencing option. For a Composite Noise Rating of D, GEs Level III silencing option is required.

9.5 Gas Metering Station

The gas metering station valves will require approximately twenty (20) decibels noise reduction for a MCNR of C and fifteen (15) decibels noise reduction for a MCNR of D. This can be achieved by enclosing the valves within acoustic insulated jackets.

9.6 Building Ventilation Systems

Approximately ten (10) decibels of mitigation will be required for the ventilation system design (MCNR C or D), assuming rooftop exhausters.

9.7 *Balance of Plant Equipment*

In order to achieve MCNR C or D, balance of plant equipment can utilize "standard designs" commercially available from vendors.

9.8 *Start-Up & Shutdown*

During startup of the Facility, minimal steam venting typically occurs. Nonetheless, all startup vents will be equipped with appropriately sized silencers. During planned shutdowns of the Facility, no steam venting to atmosphere typically occurs. Instead, steam produced by the HRSGs temporarily bypasses the steam turbine and dumps to the main duct of the air-cooled condenser. In order to minimize noise radiated by the ACC duct during this process, steam turbine bypass lines will be equipped with appropriately sized diffusers. These specially designed orifice plates significantly reduce noise emissions generated by turbulent flow and high-pressure drop.

For unplanned emergency shutdowns, steam may be temporarily vented to atmosphere. In order to minimize any potential community noise impact during these rare situations, all safety release vents will be equipped with appropriately sized steam vent silencers.

9.9 *Conceptual Noise Control Costs*

Table 8 provides incremental noise control costs to achieve Composite Noise

Ratings of C and D at nearby receivers. Specifically, Parsons Energy obtained costs for major equipment and structures (i.e., air cooled condenser, power generation building, transformers, etc.) from manufacturers and suppliers. Other costs were developed from in-house data for similarly designed projects.

Table 8

Conceptual Noise Control Costs

Equipment	Base Project Cost Increase To Achieve MCNR C	Base Project Cost Increase to Achieve MCNR D	Data Source
Air Cooled Condenser	$ 900,000	$ 750,000	GEA
HRSG Exhaust Silencer	$ 87,000	$ 38,000	Nooter-Eriksen
Step-Up Transformers	High Efficiency Design	High-Efficiency Design	Peebles Transformers, Ltd
Wet Surface Air-Cooler	$ 10,000	Standard Design	Niagara Blower Company
Power Block Buildings	$ 670,000	Standard Design	Parsons
CTG Compartment Fans	$ 35,000	$ 15,000	General Electric
Gas Metering Station	$ 15,000	$ 15,000	Shannon Enterprises
Building Ventilation	$ 59,000	$ 59,000	Moffit Corporation
Estimated Capital Expenditure	$ 1,776,000	$ 877,000	

As shown, conceptual noise control costs to achieve Composite Noise Ratings C and D are approximately $ 1.8 million and $ 900,000 dollars, respectively. Given these results, Calpine is committed to establishing a noise level design goal of MCNR C for the Project.

Acoustical modeling of the Project did not include noise level design margins for manufacturer's equipment. Design margins are incorporated during the detailed engineering phase, by purchasing equipment at least three (3) decibels quieter than would be dictated by modeling results, to account for 1) inherent modeling inaccuracies; 2) addition and/or changes to plant equipment; 3) supplied equipment is louder than specified; 4) meteorological changes in sound propagation, etc. Since the MCNR method uses octave band levels (versus only broadband levels) design margins would be applied in each of nine (9) octave bands. Modeling also did not include octave band tolerances used by equipment suppliers in stating noise level performance guarantees, (which are also accounted for during the detailed engineering phase). Given this, Calpine's commitment to achieve MCNR C is considered a design goal rather than a guaranteed noise level for the Project, since it may not be possible to purchase equipment sufficiently mitigated such that a three (3) decibel design margin is maintained in all octave bands, including tolerances, at all receiver locations, for the case of MCNR C.

10.0 Project Noise Impact Assessment [14]

This section provides an evaluation of the potential for hearing damage, sleep interference, indoor and outdoor speech interference, low frequency noise annoyance, community complaint and structural damage due to vibration or infrasound.

10.1 Hearing Damage

It is generally accepted that exposure to noise levels less than 75 dBA results in negligible risk for hearing damage. Since the highest predicted Project sound level is 50 dBA, (MCNR D – Nearest Southern Residence) or twenty-five (25) decibels lower than the damage threshold, the risk of hearing damage is negligible.

10.2 Sleep Interference

In order to avoid negative effects on sleep, indoor equivalent (L_{EQ}) sound levels should not exceed 30 to 35 dBA [Ref. 5]. Tables 9 and 10 provide the expected interior noise level of residences, based on outdoor levels of Project noise. As shown, noise reduction for typical northern climate homes is fifteen (15) decibels with partially open windows, [Ref. 6] and interior noise levels either for a Composite Noise Rating of C or D will conform to recommended criteria.

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[14] **Stipulation 6.8**

An evaluation of the following potential noise impacts: hearing damage; sleep interference; indoor and outdoor speech interference; use of public open space; low frequency noise annoyance, as well as community complaint potential; and the potential for structural damage due to vibration or infrasound;

Table 9

Analysis of Sleep Interference Potential for MCNR C Design Goal

Location	Description	Outdoor Level	Noise Reduction	Indoor Level
Dolsontown Road East	Nearest Eastern Residences	43 dBA	15 dBA	28 dBA
Dolsontown Road West	Nearest Western Residences	45 dBA	15 dBA	30 dBA
Dolsontown Road South	Nearest Residence	46 dBA	15 dBA	31 dBA
Genung Street	Northeastern Residences	31 dBA	15 dBA	16 dBA
Country View Manor	Northern Residences	36 dBA	15 dBA	21 dBA
Ruth Court	Northern Residences	32 dBA	15 dBA	17 dBA

Table 10

Analysis of Sleep Interference Potential for MCNR D Design Goal

Location	Description	Outdoor Level	Noise Reduction	Indoor Level
Dolsontown Road East	Nearest Eastern Residences	47 dBA	15 dBA	32 dBA
Dolsontown Road West	Nearest Western Residences	50 dBA	15 dBA	35 dBA
Dolsontown Road South	Nearest Residence	50 dBA	15 dBA	35 dBA
Genung Street	Northeastern Residences	37 dBA	15 dBA	22 dBA
Country View Manor	Northern Residences	41 dBA	15 dBA	26 dBA
Ruth Court	Northern Residences	37 dBA	15 dBA	22 dBA

10.3 Indoor and Outdoor Speech Interference

Speech spoken in relaxed conversation is intelligible when background (i.e., Project) sound levels are at or below 55 dBA (L_{EQ}) [Ref 5]. Since the highest predicted Project noise level is 50 dBA at the nearest residence, no interference with outdoor speech is anticipated.

To be able to hear and understand spoken messages indoors, it is recommended that sound levels do not exceed 35 dBA (L_{EQ}). As shown in Tables 9 and 10, noise levels within homes either for an MCNR Reaction Rating of C or D will conform to this recommended criterion, and therefore no interference with indoor speech is anticipated.

10.4 Use of Public Open Space

The effects of Project noise on public open space were evaluated in terms of outdoor speech interference. Speech spoken in relaxed conversation is considered intelligible when background (i.e., Project) sound levels are at or below 55 dBA (L_{EQ}). As shown in Table 7, the highest predicted Project noise level at the nearest open public space (Monhagen River) is 44 dBA, and therefore no interference with outdoor speech in public open space is anticipated.

10.5 Low Frequency Noise Annoyance

Low frequency airborne sound is sometimes characterized as "pulsating" when sound pressure levels are at least 70 to 75 dB in the 31.5 Hertz octave band [Ref. 4]. Since the maximum level of Project noise at the nearest residence is predicted to be about 69 dB in this band, low-frequency noise annoyance is not anticipated.

10.6 Community Complaint Potential

Community complaint potential was evaluated in terms of applying the Modified Composite Noise Ranking procedure, to achieve a community reaction of C (*"no reaction, although noise is generally noticeable"*) and D (*"sporadic complaint"*). It is useful to review the original authors' descriptions for these reactions [Ref 4].

"At the low end of the scale (i.e., Reaction C) is the region where no reaction is observed. The people in the community are not sufficiently disturbed to complain to those responsible for the noise or to municipal authorities. Many of the residents probably do not notice the noise, but others may be somewhat disturbed. Careful questioning or observation of an insider would bring the attitudes of these people into the open.

The next point on the scale, 'sporadic complaints,' (i.e., Reaction D) describes the situation in which some residents in the community are sufficiently disturbed to voice their opinions to those responsible for the noise, by means of telephone calls, letters, or the like. However, the complaints are not, for the most part, persistent. If a substantial number of residents in the community were to complain, and if some of the complaints were persistent, the point on the scale marked 'widespread complaints' (i.e., Reaction E) would be reached."

Project noise will be limited to a level such that a Composite Noise Rating of C or D will be achieved at the nearest receivers. As such, the potential for complaint is considered low.

10.7 Structural Damage due to Vibration or Infrasound

Structural damage potential was evaluated in terms of airblast criteria for surface mining activities, (i.e., air blasts often contain high levels of low-frequency noise). Airblast levels limited to 105 decibels (C-Weighted) are considered sufficiently low to eliminate any risk of damage to residential structures [Ref. 7].

Similar to A-weighting filters found in sound level meters, C-weighting filters account for the human ear's response at higher sound levels, and when sound contains greater low-frequency content. As shown in Table 11, Project noise levels (C-weighted) at the nearest receiver areas are predicted to range from 52 to 69 dBC, or significantly below the recommended criterion of 105 dBC.

Table 11

Predicted (C-Weighted) Project Noise Levels at Nearest Receiver Areas

Location	Description	MCNR C	MCNR D	Criterion
Dolsontown Road East	Nearest Eastern Residences	64 dBC	67 dBC	105 dBC
Dolsontown Road West	Nearest Western Residences	65 dBC	68 dBC	105 dBC
Dolsontown Road South	Nearest Residence	67 dBC	69 dBC	105 dBC
Monhagen River	Nearest Public Space	61 dBC	63 dBC	105 dBC
Moon School	Nearest Public School	52 dBC	55 dBC	105 dBC
Genung Street	Northeastern Residences	54 dBC	57 dBC	105 dBC
Country View Manor	Northern Residences	57 dBC	60 dBC	105 dBC
Ruth Court	Northern Residences	54 dBC	57 dBC	105 dBC

10.8 MCNR Analysis [15]

As stated in the Protocol, the potential for community noise impact was assessed using the Modified Composite Noise Rating procedure. This methodology takes into account many factors including: expected level of Project noise; existing background noise level within the community; character of Project noise (*e.g.*, tonal, impulsive); duration, time of day and season of Project operation, as well as subjective factors such

[15] Stipulation 6.9

A ranking for the operation phase, using the Modified Composite Noise Rating ("CNR") method, at the nearest residential, school, and public open space receptor locations. At a minimum, the application will include an assessment of achieving a CNR rating of "C";

as community attitude and history of previous exposure. In general, the most critical receivers for this evaluation were Dolsontown Road South and Dolsontown Road West. Table 12 summarizes the analysis results, and as shown, Composite Noise Ratings are predicted to range from A to D, corresponding to *"no reaction, although noise is generally noticeable"* to *"sporadic complaint."* [16]

Table 12

Predicted Composite Noise Ratings

Location	Description	MCNR C Design Goal	MCNR D Design Goal
Dolsontown Road East	Nearest Eastern Residences	B	C
Dolsontown Road West	Nearest Western Residences	C	D
Dolsontown Road South[17]	Nearest Residence	C	D
Monhagen River[18]	Nearest Public Space	B	C
Moon School	Nearest Public School	A	A
Genung Street	Northeastern Residences	A	B
Country View Manor	Northern Residences	A	C
Ruth Court	Northern Residences	A	B

[16] It has been suggested by one author [Ref. 8] that hundreds of individuals within a community may need to be exposed to the same level of noise before rating procedures such as the CNR method can be applied with reasonable statistical confidence.
[17] Predicted using background (L_{90}) sound levels obtained at Dolsontown Road South.
[18] Predicted using background (L_{90}) sound levels obtained at Ruth Court.

10.9 HUD Guidelines

Noise from the Project was also evaluated in terms of recommended guidelines established by federal agencies such as the Department of Housing and Urban Development (HUD) and the Federal Environmental Protection Agency (EPA).

HUD considers sites where Day-Night sound levels do not exceed 65 dBA, to be acceptable for housing. The Day-Night sound level, or L_{DN}, represents a 24-hour measurement of noise within a community. More specifically, the L_{DN} adds a ten (10) decibel penalty to all noises that occur from 10 p.m. to 7 a.m., to account for the potential of increased annoyance when people are relaxing, resting and sleeping. The highest predicted L_{DN} during operation of the Project is 56 dBA (MCNR D) or significantly below the recommended HUD criteria (65 dBA) for acceptable sound levels.

10.10 EPA Guidelines

The Federal Environmental Protection Agency (EPA) indicates that exposure to sound levels at or below L_{DN} = 55 dBA is satisfactory to "*protect the public health and welfare with an adequate margin of safety,*" since it will not produce significant speech interference either indoors or outdoors, and will lead to negligible community reaction, complaints or annoyance in average communities. Given a Project L_{DN} ranging from 52 dBA (MCNR C) to 56 dBA (MCNR D) Project emissions at nearby homes will be consistent with EPA guidelines for acceptable levels of noise.

10.11 Town of Wawayanda – Zoning Code Amendment

Under Wawayanda's proposed Zoning Code amendment, a new chapter 195-19 will be adopted, entitled "General Commercial and Industrial Standards." Section 195-19D states that noise may not exceed an intensity of 65 decibels [dBA] as measured 100 feet from the boundaries of the lot where such use is situated. Noise levels generated during operation of the Project will comply with this proposed amendment.

11.0 Post-Construction Noise Evaluation Studies [19]

A noise level compliance test will be performed to establish conformance with noise control design goals for the Project.

11.1 Field Testing - General

The test will be conducted largely in accordance with ANSI B133.8-1989, (Gas Turbine Installation Sound Emissions) ANSI/ASME PTC 36-1985, (Measurement of Industrial Sound) ANSI S1.13, (Methods for Measurement of Sound Pressure Levels). Readings will be obtained during periods of maximum noise from the Project and when non-Project related sounds are least intrusive, (such as noise from other industrial activities, vehicle passes, pedestrians, etc.).

[19] **Stipulation 6.10**

A description of post-construction noise evaluation studies that will be performed to establish conformance with operational noise design goals;

Measurements will be collected during compatible weather conditions, (wind velocity less than 10 mph, temperatures greater than 25°F, and no appreciable precipitation or presence of wet pavement in the test areas). Local meteorological data including temperature, humidity, wind speed, wind direction and cloud conditions will be reported. Also, observations of noise sources controlling the measured sound levels will be noted.

A microphone windscreen will be used for all tests. The microphone and/or sound level meter will be tripod or otherwise mounted to allow for a five-foot separation between the microphone and the operator, and between the microphone and the ground.

Prior to the test, the combustion turbines, steam turbine, air-cooled condenser and all auxiliary support equipment such as pumps, blowers, compressors, etc. will be confirmed to be operating at representative test conditions. In addition, an acoustical field calibration of instruments will be conducted prior to and following the measurement program.

11.2 Performance Test Instrumentation

All measurements will be made using precision real time sound analyzers and microphones conforming to Type 1 provisions of ANSI S1.4 (Specification for Sound Level Meters - Type 1). Sound level calibrators will have an accuracy of ± 0.3 dB and all measurement equipment will be qualified within the preceding 12-month period by a calibration laboratory and/or by the manufacturer using reference standards traceable to the National Institute of Standards and Technology (NIST).

11.3 Performance Test Sound Level Measurements

Project noise levels will be steady state to slowly fluctuating, and therefore, short-term (15-second to several minute) sound level measurements will be used to assess compliance. Numerous L_{EQ} broadband levels, (A-Weighted) or appropriate L_N levels using the slow time response of the meter will be manually collected at the nearest receiver areas. The measured sound levels will be corrected for the effect of pre-existing ambient levels at each location, as described in Section 11.4. The corrected far-field sound levels will be used to assess compliance with NYSPSC noise control guidelines.

11.4 Baseline Sound Level Measurements

Prior to, or following the Performance Test Measurements, at such time when the gas turbine and all associated equipment are inoperative, baseline L_{EQ} sound level measurements or appropriate L_N levels using the slow time response of the meter, will be manually collected at all selected test positions. For purposes of compliance assessment, the background or baseline sound levels, (i.e., ambient levels without the gas turbine and associated equipment operating) will be logarithmically subtracted from the Performance Test Sound Levels, to derive the sound level contribution of only new equipment.

11.5 Compliance Assessment

If background corrected Performance Test levels are within ± 3 dBA [Ref. 9] of NYSPSC requirements, noise emissions from the Project will be judged as conforming to regulatory guidelines.

11.6 Reporting

A comprehensive test report will be submitted to the NYSPSC within sixty-days of completing final field measurements. The report will include:

- A brief description of survey measurement procedures.
- A scaled plot plan indicating the Wawayanda Energy Center boundary lines and sound measurement locations, cross-referenced to data tables.
- Nomenclature and serial numbers of all test equipment.
- Calibration certificates for all sound level instruments.
- Tables and/or graphs listing measurement time of day, duration of measurements, Project operating conditions, and test meteorology.
- Tables and/or graphs reporting baseline and background broadband A-weighted levels.

- Data analysis.

- Assessment of Project compliance and summarized results.

11.7 Schedule

The Noise Performance Test will be conducted within sixty (60) days of commercial operation of the Project. Appropriate personnel at NYSPSC will be notified within one (1) week of the test date, for purposes of witnessing the measurements.

12.0 Cumulative Associated Noise Impacts [20]

As stated in the Protocol, an evaluation of the cumulative noise impact associated with the proposed Project and the Masada Project was conducted.

12.1 Masada and Wawayanda Cumulative Construction Noise Impact

No document reviewed, including the Masada Project FEIS and DEIS; Statement of Findings; Permit Conditions or Project regulatory approvals contained an analysis of construction noise for the Masada Project. Therefore, an estimate of cumulative construction noise (assuming both facilities were built simultaneously) was

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[20] **Stipulation 6.11**

The Application will include an evaluation of the cumulative associated multiple facility noise impacts of the proposed Project and the Masada Project.

conducted presuming construction noise produced by the Masada Project would be equivalent to construction noise for the Wawayanda Energy Center. Given this, changes in noise level at receiver locations (relative to the contribution expected from the Wawayanda Energy Center only) ranged from one (1) to nine (9) decibels (A-Weighted), as shown in Table 13.

Table 13

Masada and Wawayanda Cumulative Construction Noise Impact

(Highest L_{EQ} of any Construction Phase)

Location	Description	WEC	Masada	Total	Change[21]
Dolsontown Road East	Nearest Eastern Residences	61 dBA	50 dBA	61 dBA	--
Dolsontown Road West	Nearest Western Residences	61 dBA	55 dBA	62 dBA	1 dBA
Dolsontown Road South	Nearest Residence	68 dBA	51 dBA	68 dBA	--
Monhagen River	Nearest Public Space	60 dBA	48 dBA	60 dBA	--
Moon School	Nearest Public School	45 dBA	53 dBA	54 dBA	9 dBA
Genung Street	Northeastern Residences	48 dBA	47 dBA	51 dBA	3 dBA
Country View Manor	Northern Residences	51 dBA	56 dBA	57 dBA	6 dBA
Ruth Court	Northern Residences	47 dBA	54 dBA	55 dBA	8 dBA

[21] Increase relative to the noise contribution expected from the Wawayanda Energy Center (WEC).

12.2 Masada and Wawayanda Cumulative Operational Noise Impact

Operational sound power levels for the Masada Project were developed based on stationary and non-stationary equipment noise levels provided in the regulatory application for the project [Ref. 10]. Sound power levels were adjusted using only hemispherical divergence and atmospheric absorption, to conservatively estimate the noise contribution at the nearest receptors surrounding the Wawayanda Energy Center.

As shown in Tables 14 and 15, the change in noise level at receiver locations (relative to the contribution expected from the Wawayanda Energy Center only) ranged from one (1) to four (4) decibels (A-Weighted).

Table 14

Masada and Wawayanda Cumulative Operational Noise Impact

(Noise Level Design Goal = MCNR C)

Location	Description	WEC	Masada	Total	Change[22]
Dolsontown Road East	Nearest Eastern Residences	43 dBA	28 dBA	43 dBA	--
Dolsontown Road West	Nearest Western Residences	45 dBA	34 dBA	45 dBA	--
Dolsontown Road South	Nearest Residence	46 dBA	29 dBA	46 dBA	--
Monhagen River	Nearest Public Space	39 dBA	27 dBA	39 dBA	--
Moon School	Nearest Public School	30 dBA	32 dBA	34 dBA	4 dBA
Genung Street	Northeastern Residences	31 dBA	25 dBA	32 dBA	1 dBA
Country View Manor	Northern Residences	36 dBA	35 dBA	39 dBA	3 dBA
Ruth Court	Northern Residences	32 dBA	33 dBA	36 dBA	4 dBA

[22] Increase relative to the noise contribution expected from the Wawayanda Energy Center (WEC).

Table 15

Masada and Wawayanda Cumulative Operational Noise Impact

(Noise Level Design Goal = MCNR D)

Location	Description	WEC	Masada	Total	Change[23]
Dolsontown Road East	Nearest Eastern Residences	47 dBA	28 dBA	47 dBA	--
Dolsontown Road West	Nearest Western Residences	50 dBA	34 dBA	50 dBA	--
Dolsontown Road South	Nearest Residence	50 dBA	29 dBA	50 dBA	--
Monhagen River	Nearest Public Space	44 dBA	27 dBA	44 dBA	--
Moon School	Nearest Public School	35 dBA	32 dBA	37 dBA	2 dBA
Genung Street	Northeastern Residences	37 dBA	25 dBA	37 dBA	--
Country View Manor	Northern Residences	41 dBA	35 dBA	42 dBA	1 dBA
Ruth Court	Northern Residences	37 dBA	33 dBA	39 dBA	2 dBA

[23] Increase relative to the noise contribution from the Wawayanda Energy Center (WEC).

12.3 Cumulative Project Impact - Ramapo & Torne Valley Facilities [24]

As stated in the Protocol, an evaluation of the cumulative noise impact associated with the proposed Project and the Ramapo and Torne Valley Facilities, was conducted.

Sound power levels for the Ramapo Energy Facility and for the Torne Valley Station were developed based on noise levels provided in the Article X applications for each project, [Ref. 11 and Ref. 12, respectively]. Sound power levels were adjusted using only hemispherical divergence and atmospheric absorption, to conservatively estimate the contribution of noise at the nearest receivers surrounding the Wawayanda Energy Center. Since the Ramapo Facility and Torne Valley Station are located approximately twenty-two (22) miles from the Wawayanda Energy Center, the contribution of noise from the former facilities will be imperceptible. An analysis of construction noise produced similar results.

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[24] **Stipulation 15**

The Application will include (in addition to the study of cumulative effects of air emissions from the proposed Project and existing facilities and the potential for significant deterioration in local air quality in severe non-attainment areas, as described in Stipulation No.1 and in addition to the system production modeling, as described in Stipulation No. 14), a study of the cumulative associated multiple facility impacts of the proposed Project and Torne Valley LLC's Torne Valley Station (Case 98-F-1885) and Ramapo Energy LP's Ramapo Energy Project (Case 98-F-1968).

13.0 Noise Level Comparison to Local Activities

As stated in the Protocol, a comparison between noise produced by local activities and noise generated during construction and operation of the Project was prepared.

13.1 Orange County Speedway

Sound power levels for motor sport noise were developed from measurements collected at the Orange County Speedway on 14 June 2001. Sound power levels were adjusted using hemispherical divergence and atmospheric absorption, to estimate the contribution of noise at the nearest receivers surrounding the Wawayanda Energy Center. The results are summarized in Tables 16 and 17 for construction and operational noise, respectively.

Table 16

Orange County Speedway (OCS) Noise Levels versus Wawayanda Energy Center (WEC) Construction Noise Levels (Highest L_{EQ} of any Construction Phase)

Location	Description	WEC	OCS
Dolsontown Road East	Nearest Eastern Residences	61 dBA	49 dBA
Dolsontown Road West	Nearest Western Residences	61 dBA	48 dBA
Dolsontown Road South	Nearest Residence	68 dBA	48 dBA
Monhagen River	Nearest Public Space	60 dBA	47 dBA
Moon School	Nearest Public School	45 dBA	50 dBA
Genung Street	Northeastern Residences	48 dBA	54 dBA
Country View Manor	Northern Residences	51 dBA	52 dBA
Ruth Court	Northern Residences	47 dBA	53 dBA

Table 17

Orange County Speedway (OCS) Noise Levels versus Wawayanda Energy Center (WEC) Noise Levels for MCNR D Design

Location	Description	WEC	OCS
Dolsontown Road East	Nearest Eastern Residences	47 dBA	49 dBA
Dolsontown Road West	Nearest Western Residences	50 dBA	48 dBA
Dolsontown Road South	Nearest Residence	50 dBA	48 dBA
Monhagen River	Nearest Public Space	44 dBA	47 dBA
Moon School	Nearest Public School	35 dBA	50 dBA
Genung Street	Northeastern Residences	37 dBA	54 dBA
Country View Manor	Northern Residences	41 dBA	52 dBA
Ruth Court	Northern Residences	37 dBA	53 dBA

13.2 Fireworks Displays

No literature was identified regarding the noise level of fireworks displays. For purposes of this assessment, a conservative level of 105 dBC was used, equivalent to the recommended criteria for air blast noise with negligible likelihood to cause structural damage. As demonstrated in Section 10.7, the highest predicted Project noise level is 69 dBC at Dolsontown Road South for MCNR D or more than 35 decibels lower than conservative noise level estimates of fireworks displays.

Similarly, the highest predicted construction noise level was 81 dBC at Dolsontown Road South or approximately twenty-four (24) decibels lower than estimated fireworks noise levels.

13.3 National Guard C5A Aircraft Flyovers

There is a large variability associated with aircraft flyover noise, in part due to source-receiver distance, aircraft flight mode (takeoff, ramping, landing) aircraft type, meteorological conditions, etc. For purposes of this assessment, the sound level from jet flyovers at 3000 feet [Ref. 13] was compared to noise from Project construction and operation. As shown in Table 18, noise from aircraft flyovers (at 3000-foot altitudes) ranges from 14 to 33 decibels higher than noise produced by construction of the Project. Similarly, aircraft flyover noise ranges from 24 to 39 dB louder than noise generated during operation of the Project.

Table 18

Aircraft Flyover Noise Levels versus

Wawayanda Energy Center Construction Noise Levels

(Highest Linear L_{EQ} of any Construction Phase)

Location	Description	WEC	Aircraft Flyover	Difference
Dolsontown Road East	Nearest Eastern Residences	75 dB	95 dB	20 dB
Dolsontown Road West	Nearest Western Residences	76 dB	95 dB	19 dB
Dolsontown Road South	Nearest Residence	81 dB	95 dB	14 dB
Monhagen River	Nearest Public Space	75 dB	95 dB	20 dB
Moon School	Nearest Public School	62 dB	95 dB	33 dB
Genung Street	Northeastern Residences	64 dB	95 dB	31 dB
Country View Manor	Northern Residences	67 dB	95 dB	28 dB
Ruth Court	Northern Residences	64 dB	95 dB	31 dB

Table 19

Aircraft Flyover Noise Levels versus

Wawayanda Energy Center (WEC) Noise Levels for MCNR D Design

Location	Description	WEC	Aircraft Flyover	Difference
Dolsontown Road East	Nearest Eastern Residences	68 dB	95 dB	27 dB
Dolsontown Road West	Nearest Western Residences	69 dB	95 dB	26 dB
Dolsontown Road South	Nearest Residence	71 dB	95 dB	24 dB
Monhagen River	Nearest Public Space	65 dB	95 dB	30 dB
Moon School	Nearest Public School	56 dB	95 dB	39 dB
Genung Street	Northeastern Residences	59 dB	95 dB	36 dB
Country View Manor	Northern Residences	62 dB	95 dB	33 dB
Ruth Court	Northern Residences	58 dB	95 dB	37 dB

14.0 References

[1] *SoundPLAN® Version 5.0, Braunstein + Berndt, GmbH, Acoustical Modeling Software.*

[2] *Empire State Electric Energy Research Corporation, Power Plant Construction Noise Guide, Bolt, Beranek and Newman, Inc., Report No. 3321 (1977).*

[3] *Central Artery Tunnel (CA/T) Project Specification 721.60, CA/T Supplemental Specifications.*

[4] *Edison Electric Institute, Electric Power Plant Environmental Noise Guide, Volume 1, 2nd Edition (1984).*

[5] *Community Noise, Archives of the Center for Sensory Research, Berglund, B., & Lindvall, T (Eds.), 1995.*

[6] *United States Environmental Protection Agency, Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, USEPA Report 550/9-74-004 (March 1974).*

[7] *Structure Response and Damage Produced by Airblast from Surface Mining, Bureau of Mines Report of Investigations, RI 8485, Siskind, D., et al., 1980.*

[8] *Effect of Community Population on Applicability of Noise Rating Procedures, Noise Control Engineering Journal, Tatge, R.B., 1973.*

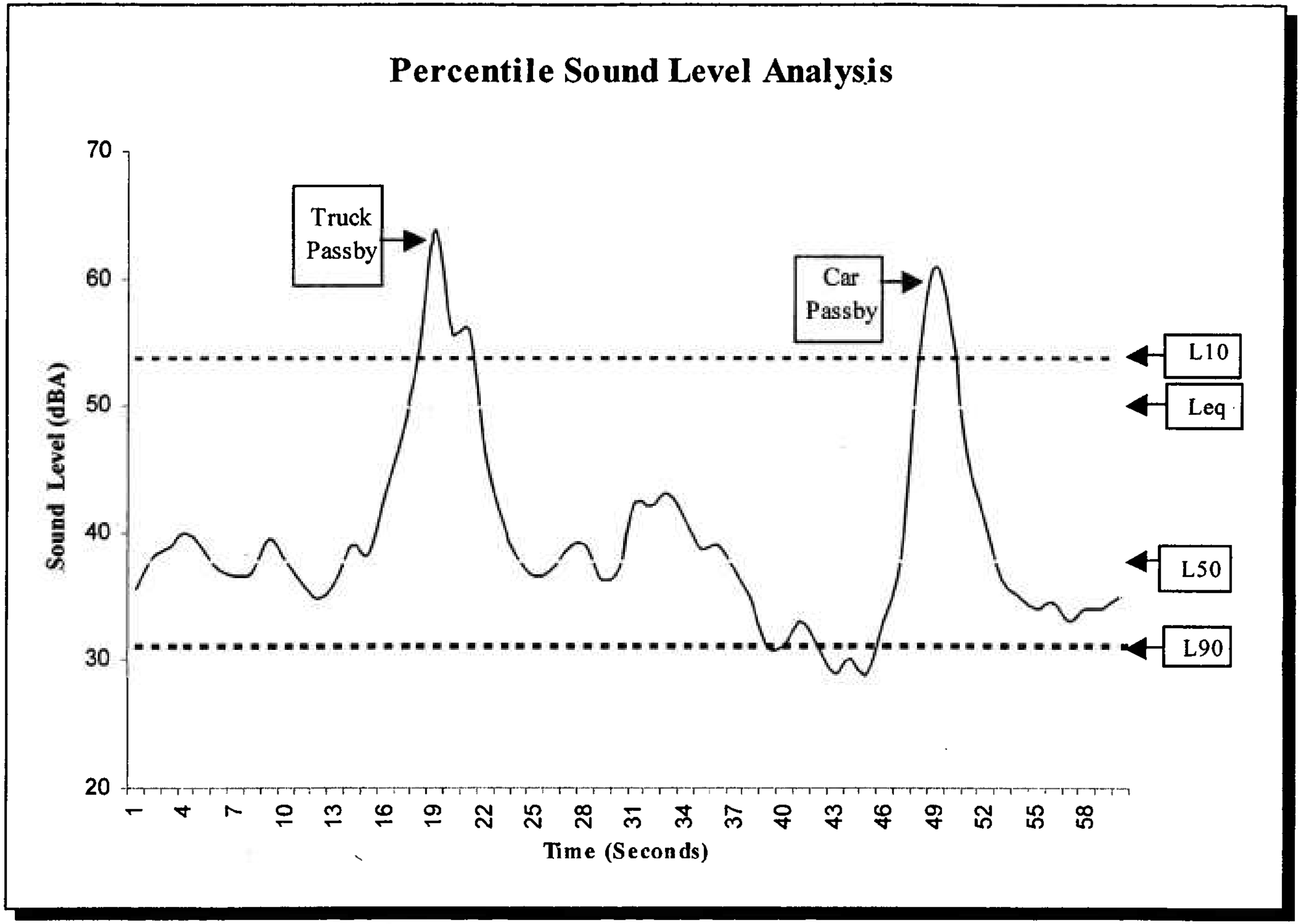


Figure 4 - Percentile Sound Level Analysis

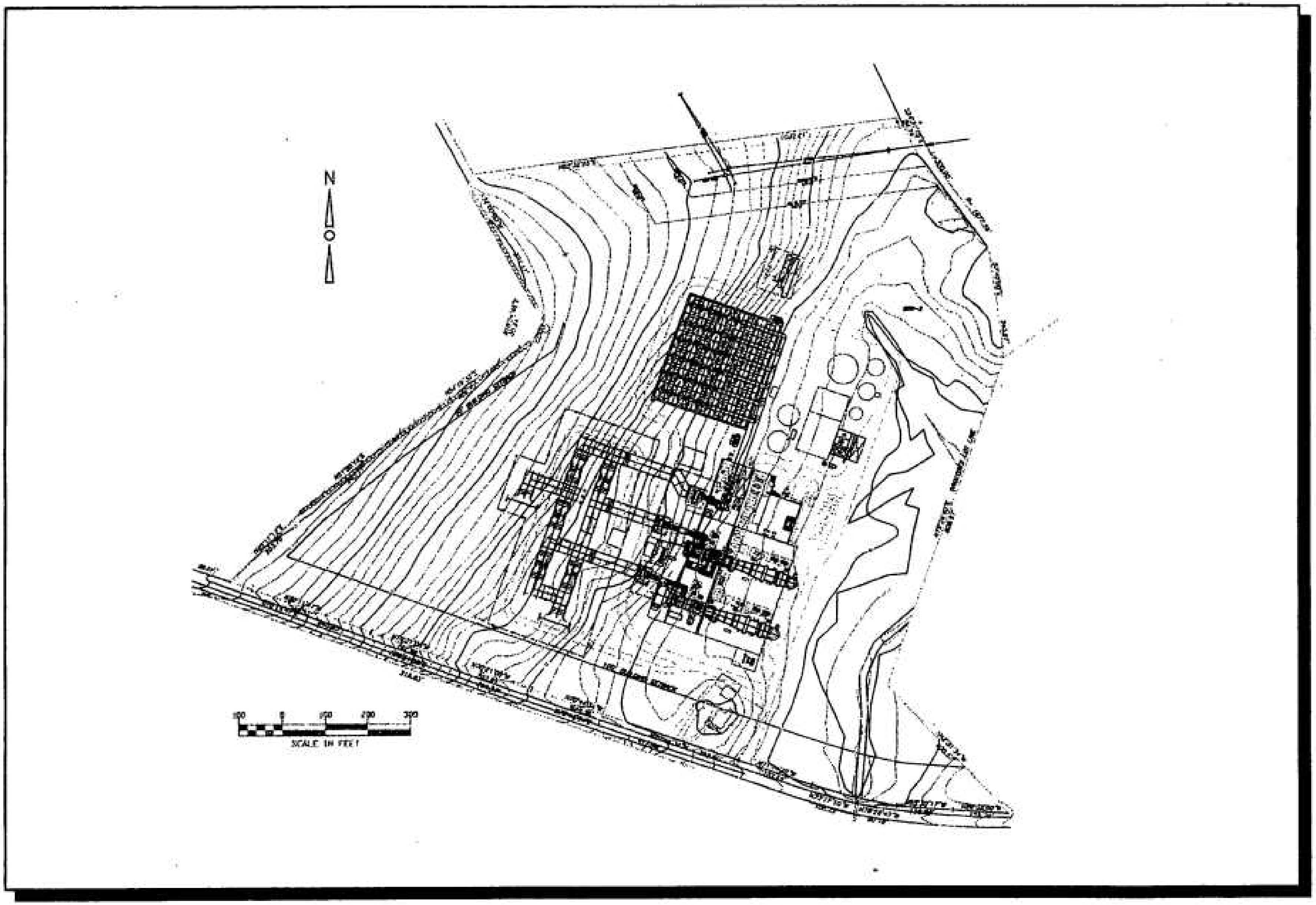


Figure 5 - General Arrangement Drawing I for the Wawayanda Energy Center

Stipulation No. 6: Noise
Noise Impact Assessment Protocol

STIPULATION NO. 6: NOISE

The Application to be submitted will include a study of the noise impacts of the construction and operation of the Project, as described and detailed in Attachment 1, the Noise Impact Assessment Protocol, which is a part of this Stipulation.

Regarding noise impacts, Calpine will provide:

1. A map showing the location of the nearest sound receptors in relation to the Project site, including the nearest residential, school, and public open space receptor locations;

2. An evaluation of ambient pre-construction baseline noise conditions, including pure tones, at the nearest noise receptors, using actual measurement data recorded for 20 minute durations as a function of time and frequency using a Type 1 precision sound level meter (SLM) and octave band frequency spectrum analyzer;

3. A description of the noise standards applicable to the Project and the noise design goals for the Project at the nearest noise receptors, including the nearest residential, school, and public open space receptor locations. The noise design goals shall include dBA levels;

4. An evaluation of the impact of construction noise, at the nearest residential, school, and public open space receptor locations;

5. An identification and evaluation of reasonable noise abatement measures for normal as well as significant noise-producing construction activities;

6. An estimate of facility sound levels at the nearest receptors during operation of the Project;

7. An identification and evaluation of reasonable noise abatement measures, including the use of alternative technologies, for the final design and operation of the Project during all operating scenarios;

8. An evaluation of the following potential noise impacts: hearing damage; sleep interference; indoor and outdoor speech interference; use of public open space; low frequency noise annoyance, as well as community complaint potential; and the potential for structural damage due to vibration or infrasound;

9. A ranking for the operation phase, using the Modified Composite Noise Rating ("CNR") method, at the nearest residential, school, and public open space receptor locations. At a minimum, the application will include an assessment of achieving a CNR rating of "C";

10. A description of post-construction noise evaluation studies that will be performed to establish conformance with operational noise design goals; and

11. The Application will include an evaluation of the cumulative associated multiple facility noise impacts of the proposed Project and the Masada Project.

Attachment 1 to Stipulation Number 6:
NOISE IMPACT ASSESSMENT PROTOCOL

1. Introduction

This protocol documents the procedures and methods being used to perform a noise impact assessment for the proposed Project. The assessment consists of determining the existing noise environment, through a community noise monitoring program, and computer noise modeling of the construction and operation of the facility noise sources.

2. Noise Sensitive Areas in the Community

Topographic and other maps/aerial photography were reviewed in order to identify representative noise receptors based on land uses in the area surrounding the proposed Project. Particular attention was given to identification of representative noise sensitive receptors (e.g., residences, public open spaces, and schools) in order to assure these locations are addressed in the noise assessment. A site reconnaissance of the area was performed on June 20, 2000 in order to verify the map/aerial photography survey. Based on these efforts, the following locations were identified as appropriate to obtain a spatial representation of the ambient noise environment at nearby noise sensitive receptors in the area:

- Dolsontown Road – The nearest residential locations to the southern boundary of the Project site. (Warm weather monitoring was conducted at the E-Z Loader facility).
- 1081 Dolsontown Road – This area is located on a bluff overlooking the proposed Project site, approximately 700 feet to the southwest.
- Ruth Court – This residential area is located approximately 3000 feet north of the proposed Project site.
- Country View Manor Apartments – This large apartment complex is located approximately 1600 feet north of the proposed Project site.
- 280 Genung Street – A few residences are located in this area, approximately 3000 feet to the northeast of the Project site.

3. Noise Monitoring Program

The noise monitoring program quantifies and characterizes pre-construction background environmental sound at the nearest noise sensitive receptors, as identified above. Measurements have been performed during both warm weather (leaf-on and insect noise) and cold weather (leaf-off and no insect noise) months. The warm weather measurement survey was conducted in June 2000. The cold weather measurement survey was conducted in December 2000. During that time, the measurement locations previously selected were reaffirmed as the best available for representing the acoustic environment of nearby noise-sensitive receptors.

Measurements include both attended interval measurements (20-minute samples performed during daytime, evening and early morning periods) and unattended, continuous long term monitoring (1-hour periods for a minimum of 24 consecutive hours). Warm-weather intermittent measurements were conducted at the five (5) receptor locations identified in Section 2 of this Protocol. Warm-weather continuous monitoring was performed in the vicinity of the nearest residences located north, east, and south of the Project site. The continuous, unattended measurements were collected to ensure that the attended measurements were taken at the quietest times. If the attended measurements were not taken at the quietest times, they will be adjusted based upon the unattended continuous data collected.

All warm- and cold-weather measurements included a statistical analysis of the A-weighted sound levels during the measurement periods. The measured A-weighted parameters included the energy average sound level (L_{eq}), and percentile sound levels (L_{max}, L_{min}, L_1, L_{10}, L_{50}, and L_{90}). Attended measurements also included octave band and one-third octave band analyses to identify existing pure tone components and to establish appropriate background sound spectra. Attended monitoring was conducted during meteorological conditions that included wind speeds of less than 15 miles per hour and no precipitation..

All attended sound level measurement equipment meets applicable standards for Type 1 precision instrumentation and was acoustically field-calibrated before and after each measurement period. In addition, the equipment has been qualified within the preceding 12-month period by a calibration laboratory or by the manufacturer, using reference standards traceable to the National Institute of Standards and Technology (NIST). All unattended sound level measurement equipment meets applicable standards for either Type I or Type II precision instrumentation.

4. Noise Standards

Calpine will evaluate the Project's compliance with local law, as applicable, and with DPS requirements, as set forth in paragraphs 4.1 and 4.2.

4.1 Local Noise Laws

The Code of the Town of Wawayanda, 195-55 Performance standards in nonresidential districts contains the following noise ordinance.

> *"No non-residential use shall be permitted in any district that does not conform to the following standards of use, occupancy and operation, which standards are hereby established as the minimum requirements to be maintained. A. Noise. Noise shall not exceed an intensity, as measured 100 feet from the boundaries of the lot where such use is situated, of the average intensity, occurrence and duration of the noise of street traffic at adjoining streets."*

4.2 New York State Department of Public Service

In accordance with NYSDPS requirements, the modified Composite Noise Rating Method (CNR) is used to assess potential noise impacts. This methodology takes into account many factors including the expected sound levels from the plant, the existing sound levels, character of the noise (*e.g.*, tonal, impulsive), duration, time of day and year, and subjective factors such as community attitude and history of previous exposure. The Application will contain an assessment of achieving a rating of "C", corresponding to "no reaction although noise is noticeable" and a rating of "D", corresponding to "sporadic complaint." An incremental cost analysis for achieving these ratings will also be included.

5. Computer Noise Modeling

5.1 Construction Noise Impact Assessment

The impact assessment will include an evaluation of environmental sound associated with facility construction at the nearest noise sensitive receptors. Estimates of the energy average sound levels (L_{eq}) and the maximum sound levels (L_{max}) for each major phase of the construction Project will be calculated, and the results will be summarized in tabular form. Receptor sound levels will be estimated using a computer model that accounts for noise produced by all significant construction equipment operating at the site. The model will calculate receptor sound levels based on the typical numbers of construction machines present at the site, the typical usage factor for each type of machine, and the A-weighted sound emissions for each type of machine. Adjustments for geometric spreading (hemispherical free field), acoustic shielding from barriers (natural, and man-made), atmospheric absorption and ground effect will be applied.

The evaluation will include a direct comparison of pre-construction sound levels (L_{eq}) with estimated construction sound levels (L_{eq}) for each major construction phase of the Project, and an assessment of the potential for community complaint. For areas where estimated construction sounds levels are expected to exceed the existing background sound level by more than 10 dBA, the report will also include an evaluation of the potential for indoor and outdoor speech interference, and sleep interference.

The assessment will also include an evaluation of reasonable noise abatement measures for normal as well as significant noise-producing construction activities. These will include the use of muffler systems on its construction equipment and construction schedules developed with an aim toward minimizing community noise impacts.

5.2 Operational Noise Impact Assessment

The impact assessment will include an evaluation of environmental sound associated with the operation of the facility at the nearest noise sensitive receptors. Estimates of facility operational sound levels (L_{eq}) in octave bands will be calculated using a computer model (*SoundPlan Version 5.0)*. The model will account for the noise emissions from each significant sound source located at the Project site. Adjustments for geometric spreading (hemispherical free field), source directivity, atmospheric absorption, ground effect, on-site structural barrier effects, and effects of prominent terrain features will be included in the model. The results of the calculations will be presented in tabular form and a graphical presentation of estimated isopleths of facility A-weighted sound levels in the surrounding community will be included in the report. The model will account for the noise emissions from each source in each octave band that propagates to specified receptor points, identifying the source and value of all data inputs used.

The basis for impact assessment will be the modified Composite Noise Rating (CNR) method. Calculated estimates of facility octave band sound levels at each noise sensitive receptor will be compared to the CNR Noise Level Rank Curves, and a noise level rank at each receptor will be derived. Noise level rankings will include adjustments for pre-existing background sound levels, temporal and seasonal factors, character of the sound, and previous community exposure.

The assessment will also include an evaluation of the following potential noise impacts: hearing damage; sleep interference; indoor and outdoor speech interference; use of public open space; low frequency noise annoyance; community complaint potential; and the potential for structural damage due to vibration or infrasound.

The assessment will also include an identification and evaluation of reasonable noise abatement measures, including the use of alternative technologies, for the final design and operation of the Project.

5.3 Comparison to Local Activities

The Application will include a noise level comparison between the plant and local activities. The following noise levels will be compared.

- Project construction (L_{eq} basis)
- Project operation (L_{eq} basis)
- Middletown Racetrack during summer months (if available; otherwise a comparable assessment based on available literature)
- Fireworks display (local display if available; otherwise a comparable assessment based on available literature).
- National Guard C5A Airplanes (local flyover if available; otherwise a comparable assessment based on available literature).

5.4 Multiple Facility Impact Assessment

The Application will include an evaluation of the cumulative associated multiple facility noise impacts of the proposed Project and the Masada Project. Calpine will rely on the SEQRA DEIS, FEIS, the Statement of Findings, permit conditions and regulatory approvals for the Masada Project in conducting the analysis.

a. Analysis of the cumulative construction noise impacts assuming the construction of both the Project and the Masada Project occur simultaneously; (unless demonstrated that the construction of both the Project and the Masada Project will not occur simultaneously).

b. Analysis of the cumulative operational noise impacts from the operational phase of both the Project and the Masada Project.

5.5 Post-Construction Noise Evaluation

The Application will include a description of post-construction noise evaluation studies that will be performed to establish conformance with operational noise design goals.

6. References

To the extent consistent with Stipulation No. 6: Noise, the methodology for assessing the potential impacts from noise will follow the procedures and use predictive data provided in the following documents:

Empire State Electric Energy Research Corporation, *Power Plant Construction Noise Guide*, Bolt, Beranek and Newman, Inc., Report No. 3321 (1977).

Edison Electric Institute, *Electric Power Plant Environmental Noise Guide*, Volume 1, 2nd Edition (1984).

United States Environmental Protection Agency, *Model Community Noise Control Ordinance*, USEPA Report EPA 550/9-76-003 (September 1975).

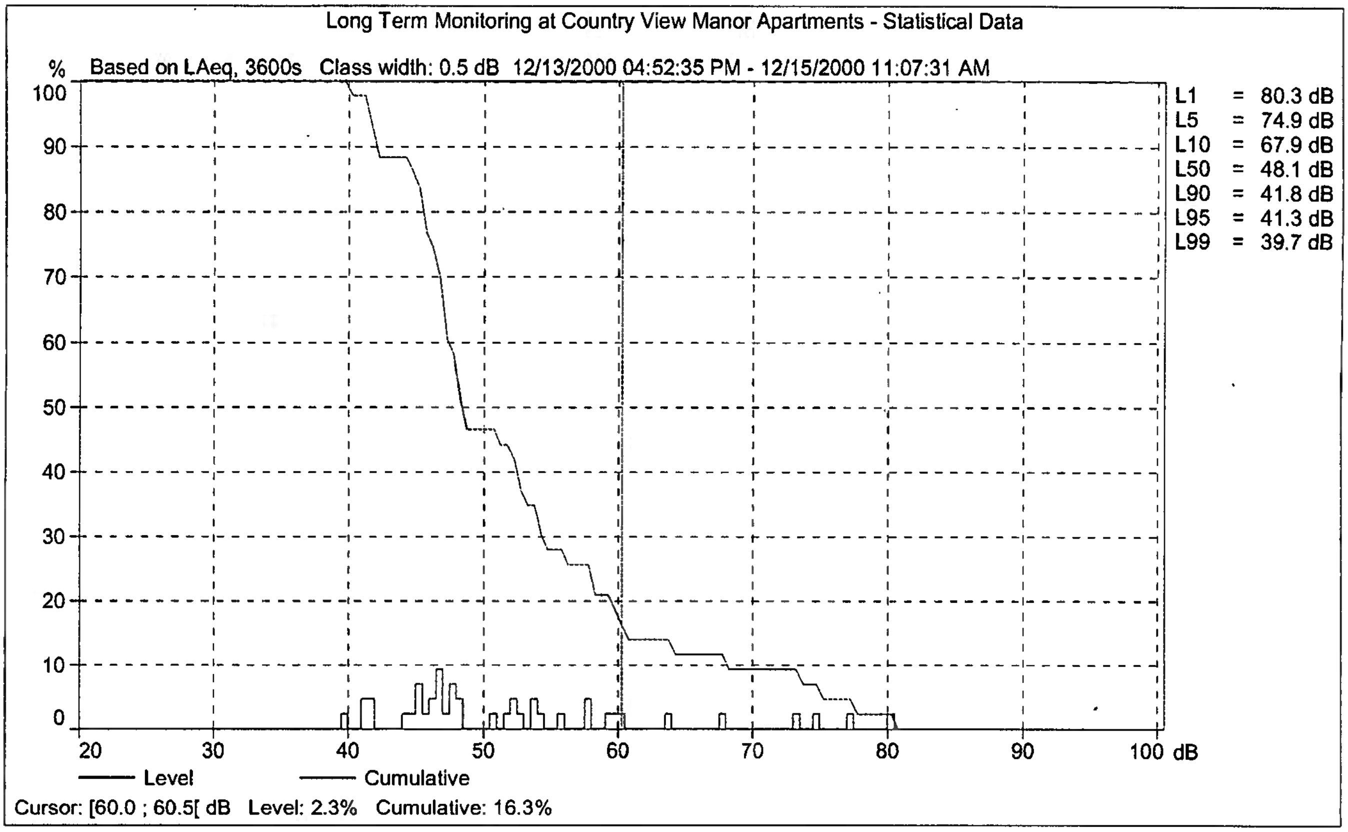
United States Environmental Protection Agency, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, EPA Document NTID300.1 (December 1971)

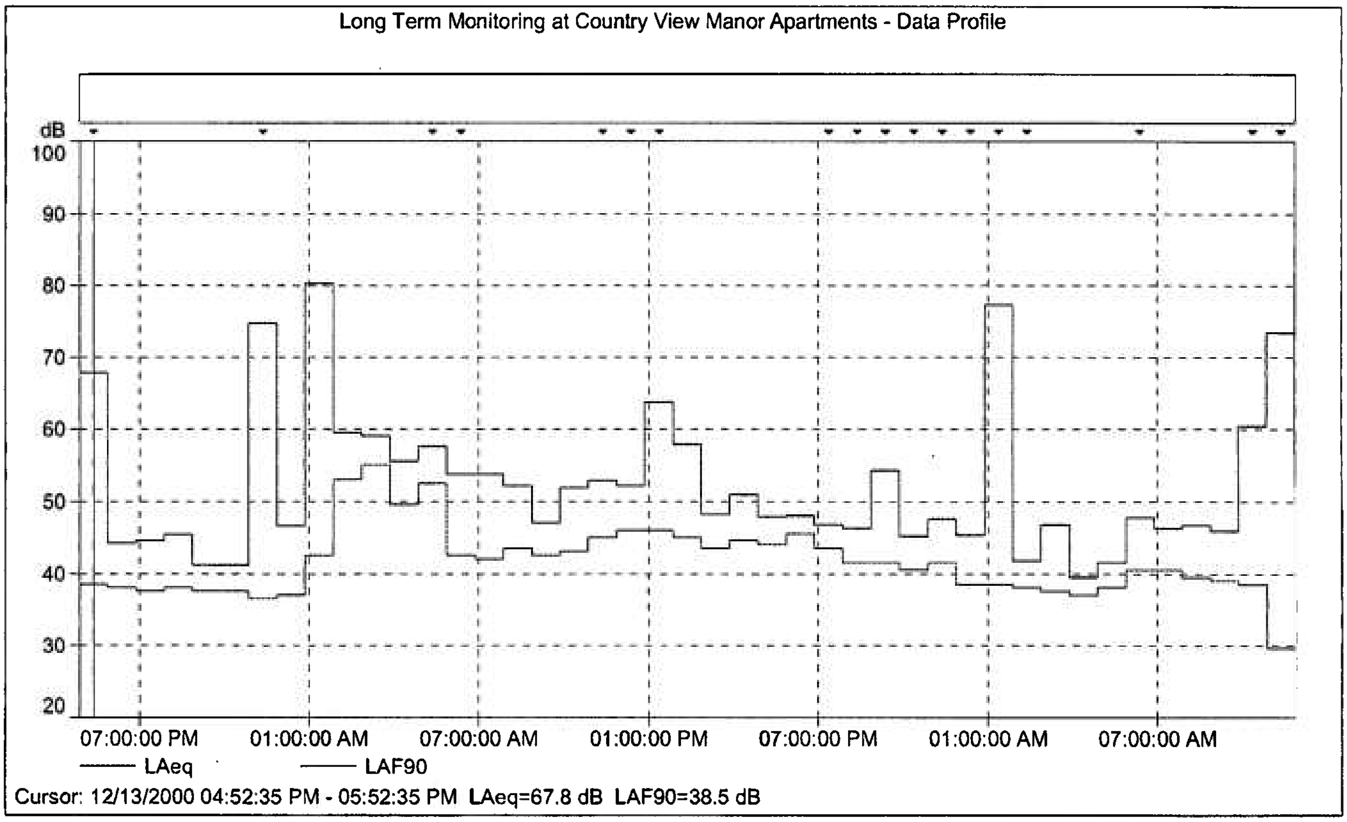
SoundPlan® Version 5.0, Baunstein + Berndt, GmbH, *Acoustical Modeling Software.*

Noise source input data for the computer models referenced herein will be a combination of data acquired from the equipment suppliers, data based on actual measurements of similar equipment at other facilities, and computations from published empirical equipment noise equations.

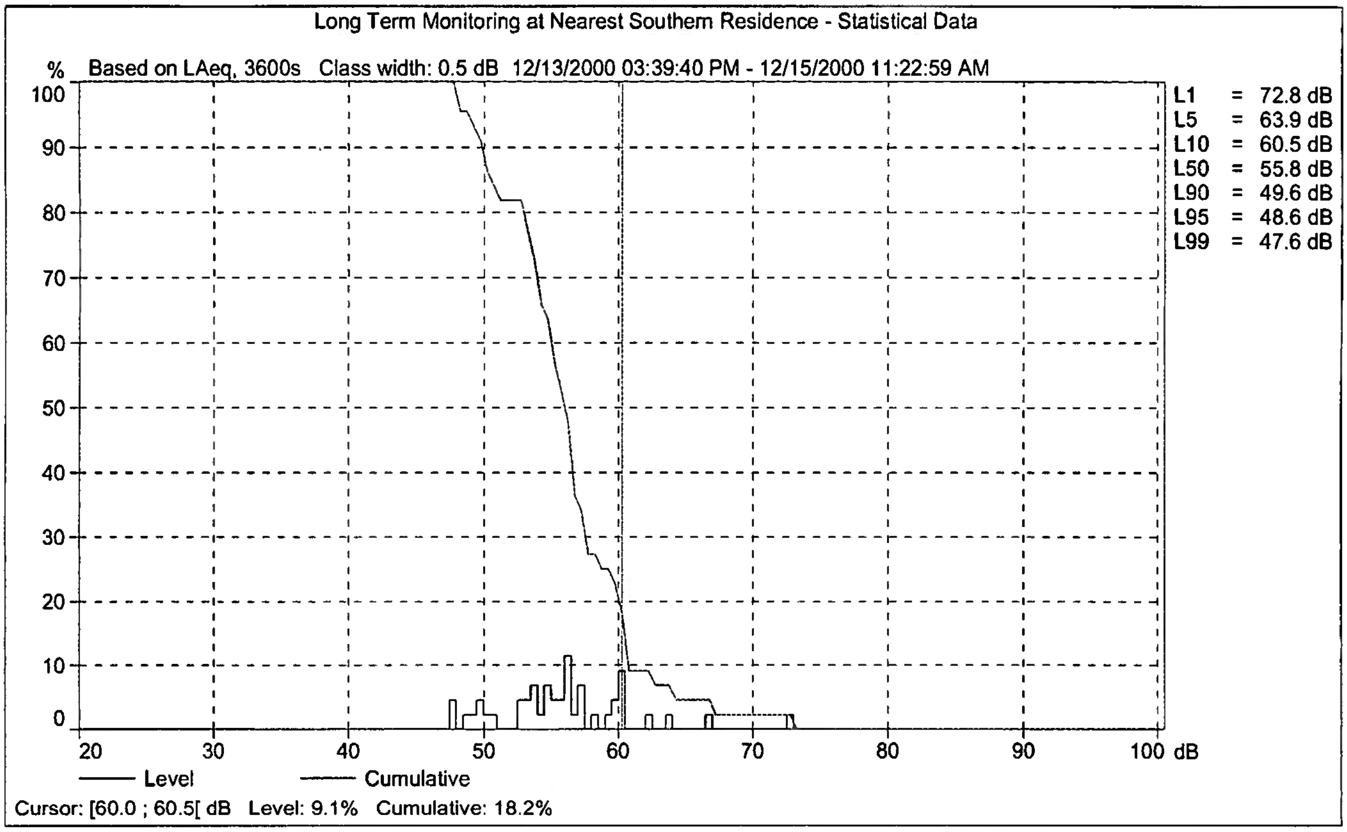
Winter Long Term Monitor Data

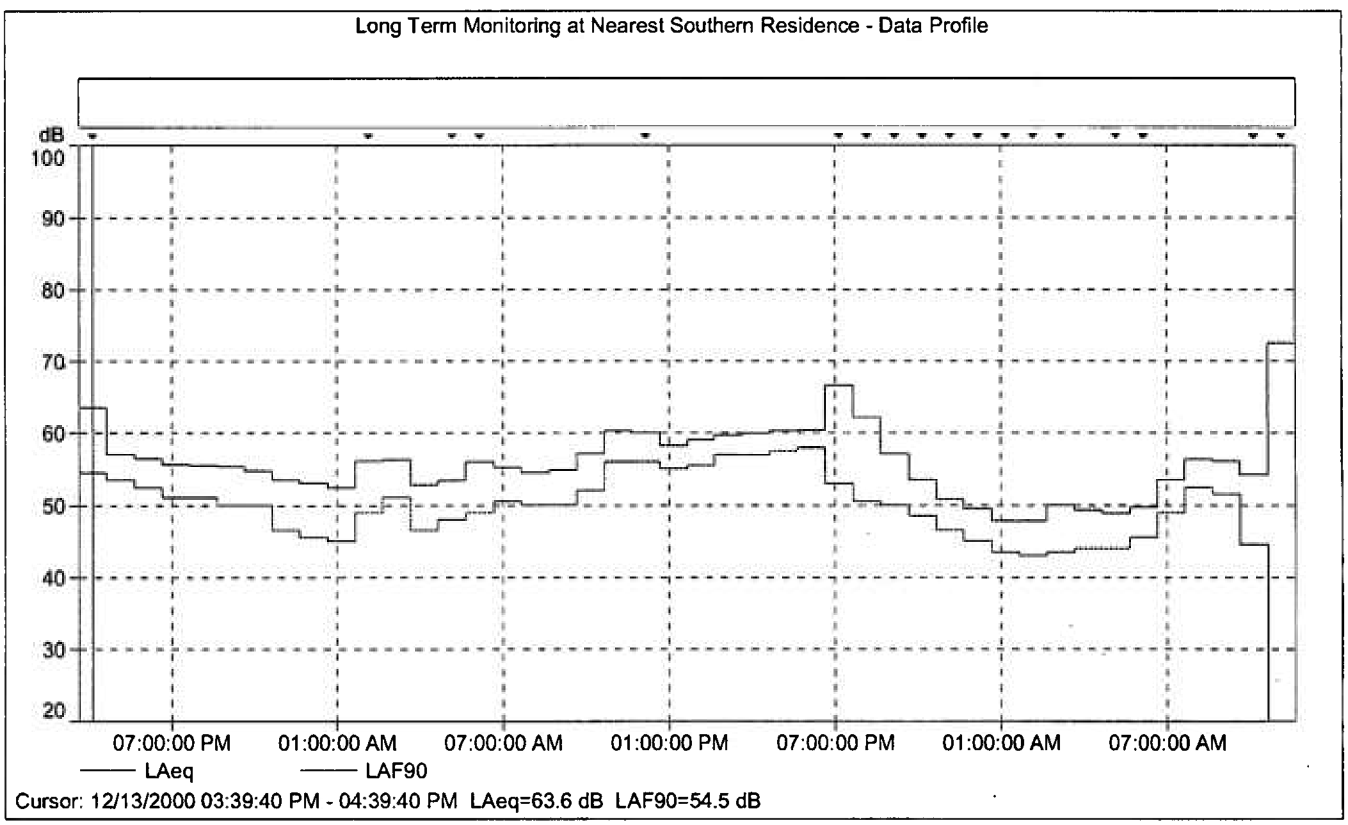
Wawayanda Energy Center



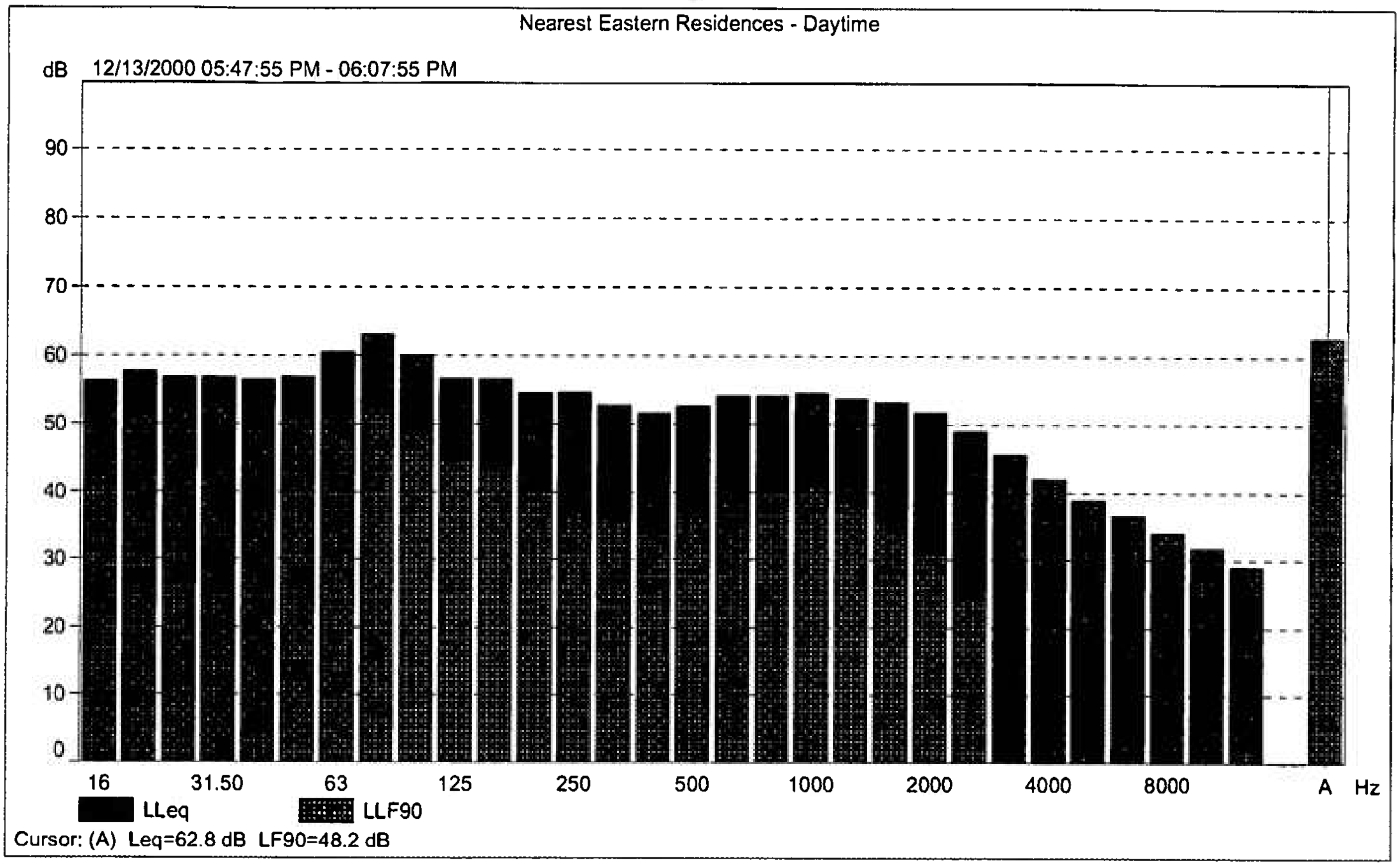


Wawayanda Energy Center





Winter Short Term Spectrum Data



Nearest Eastern Residences - Daytime
dB 12/13/2000 05:47:55 PM - 06:07:55 PM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
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2000
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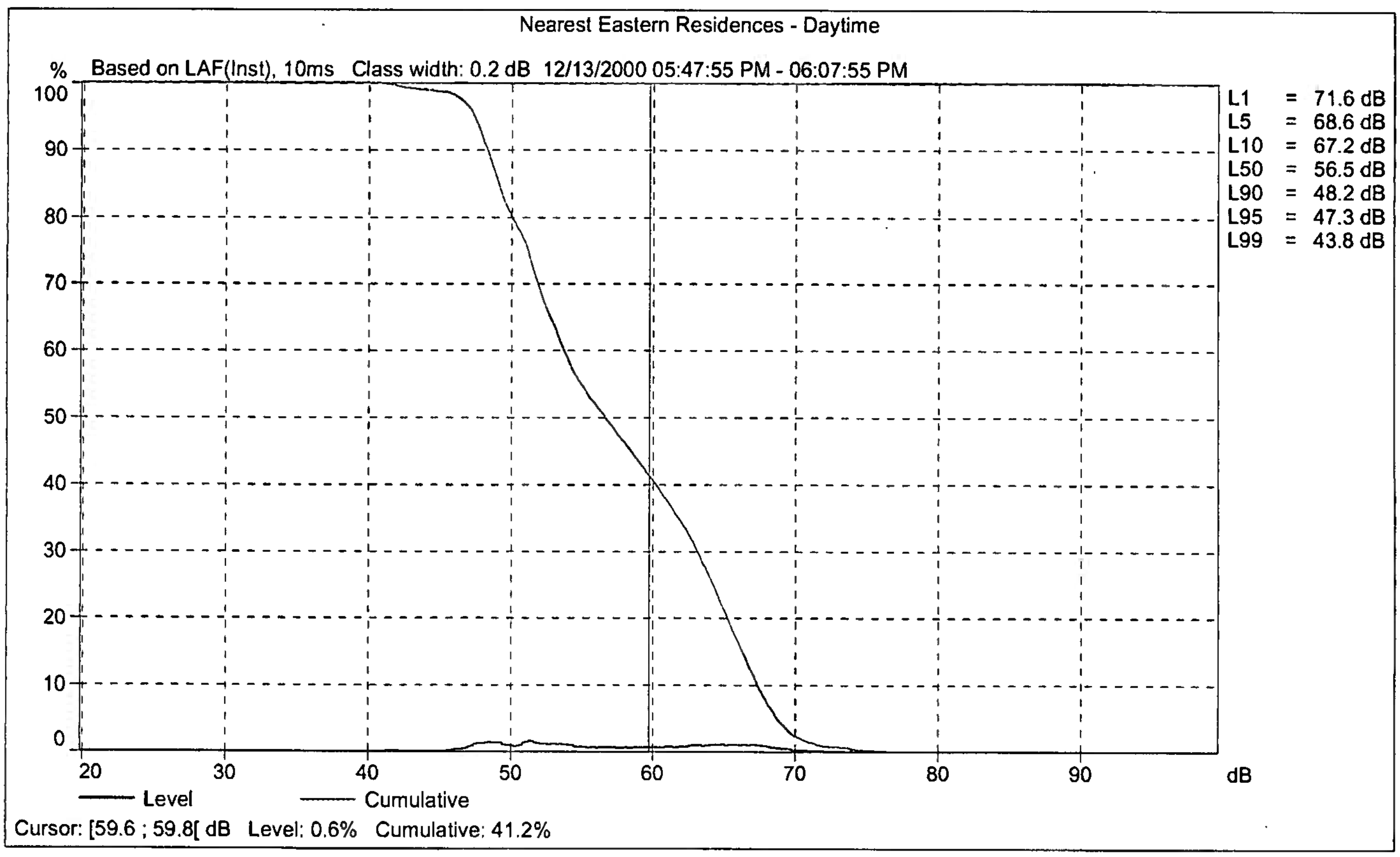
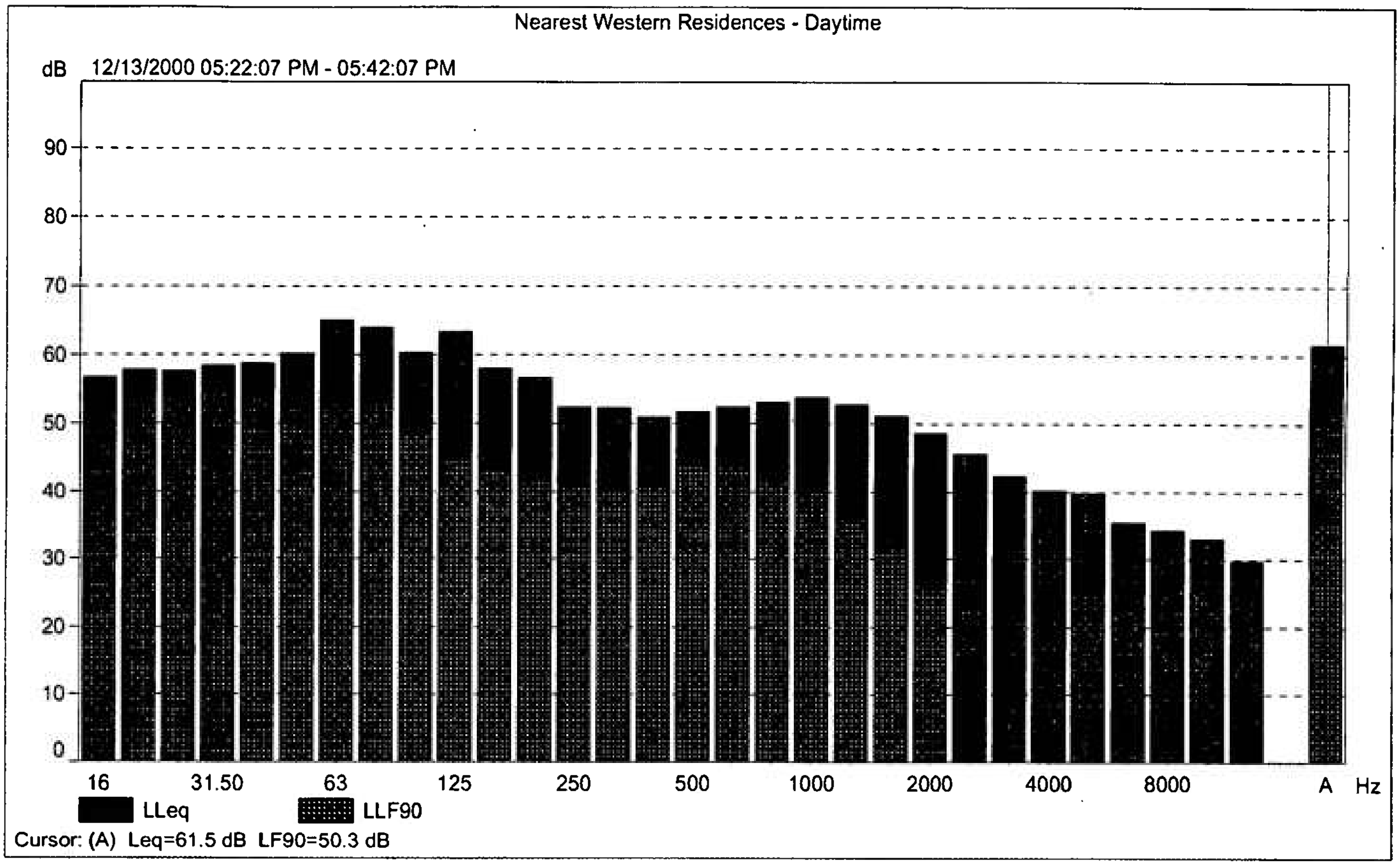
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=62.8 dB LF90=48.2 dB



Nearest Eastern Residences - Daytime
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/13/2000 05:47:55 PM - 06:07:55 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 71.6 dB
L5 = 68.6 dB
L10 = 67.2 dB
L50 = 56.5 dB
L90 = 48.2 dB
L95 = 47.3 dB
L99 = 43.8 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.6% Cumulative: 41.2%


Nearest Western Residences - Daytime
dB 12/13/2000 05:22:07 PM - 05:42:07 PM
90
80
70
60
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40
30
20
10
0
16
31.50
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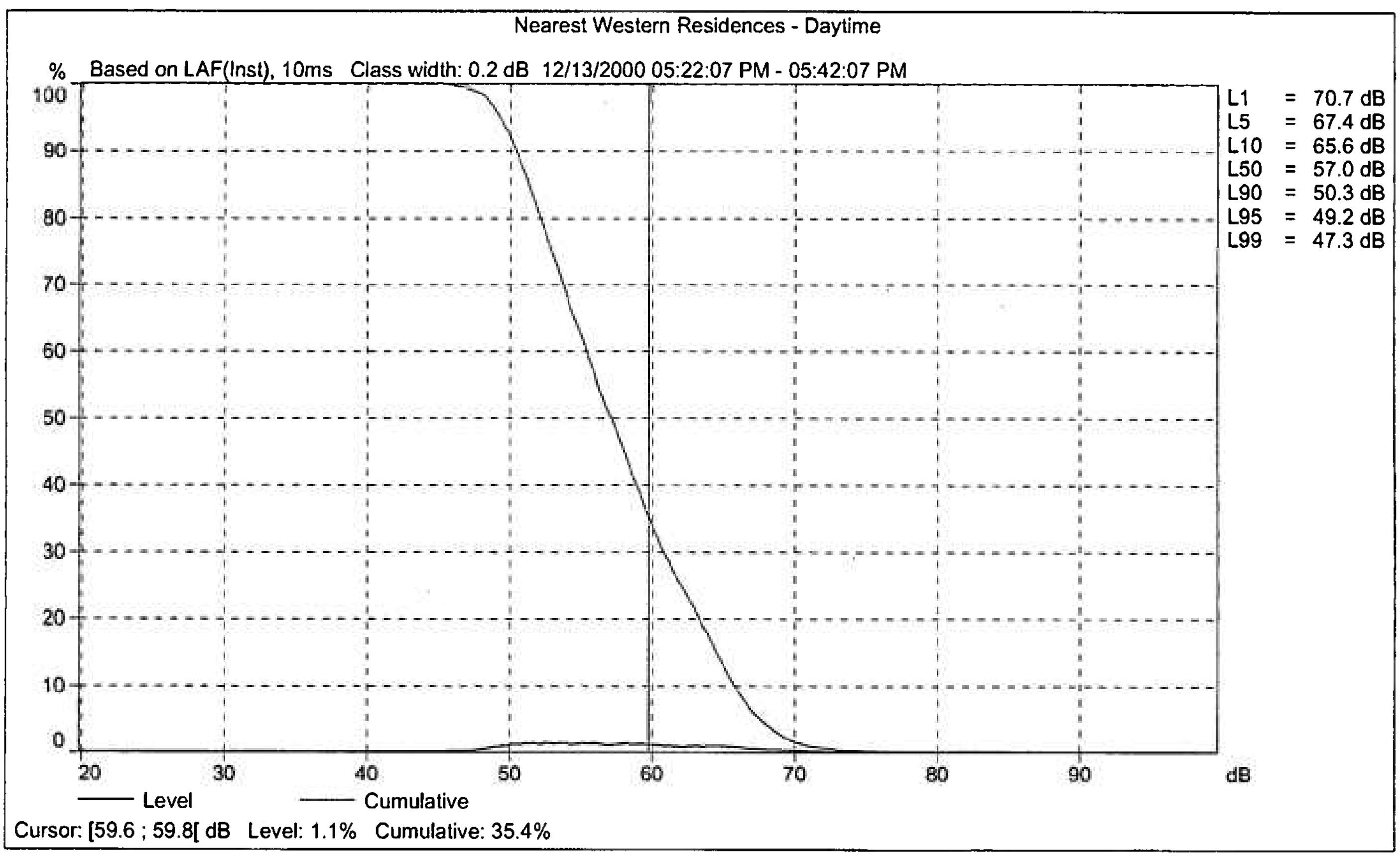
Hz
LLeq
LLF90
Cursor: (A) Leq=61.5 dB LF90=50.3 dB


Nearest Western Residences - Daytime
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/13/2000 05:22:07 PM - 05:42:07 PM
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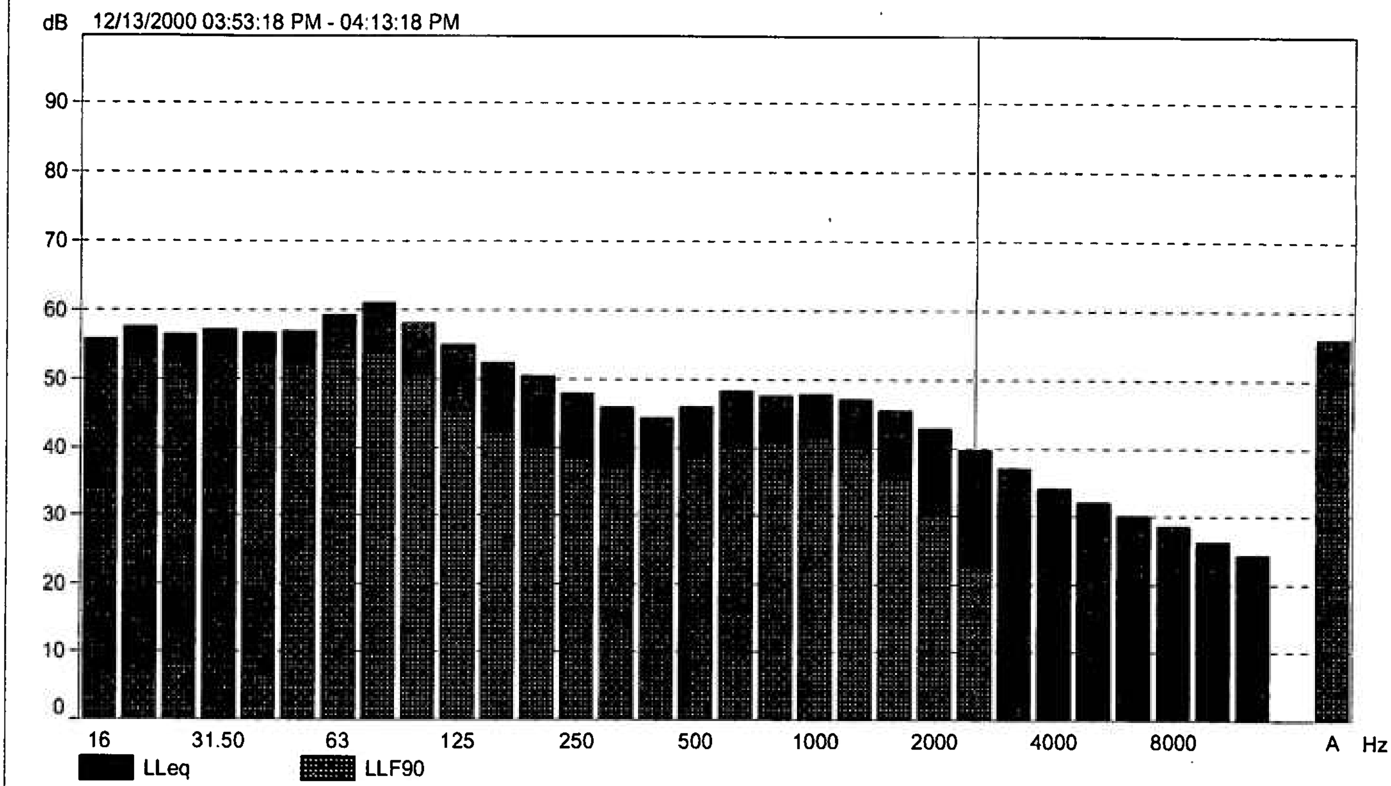
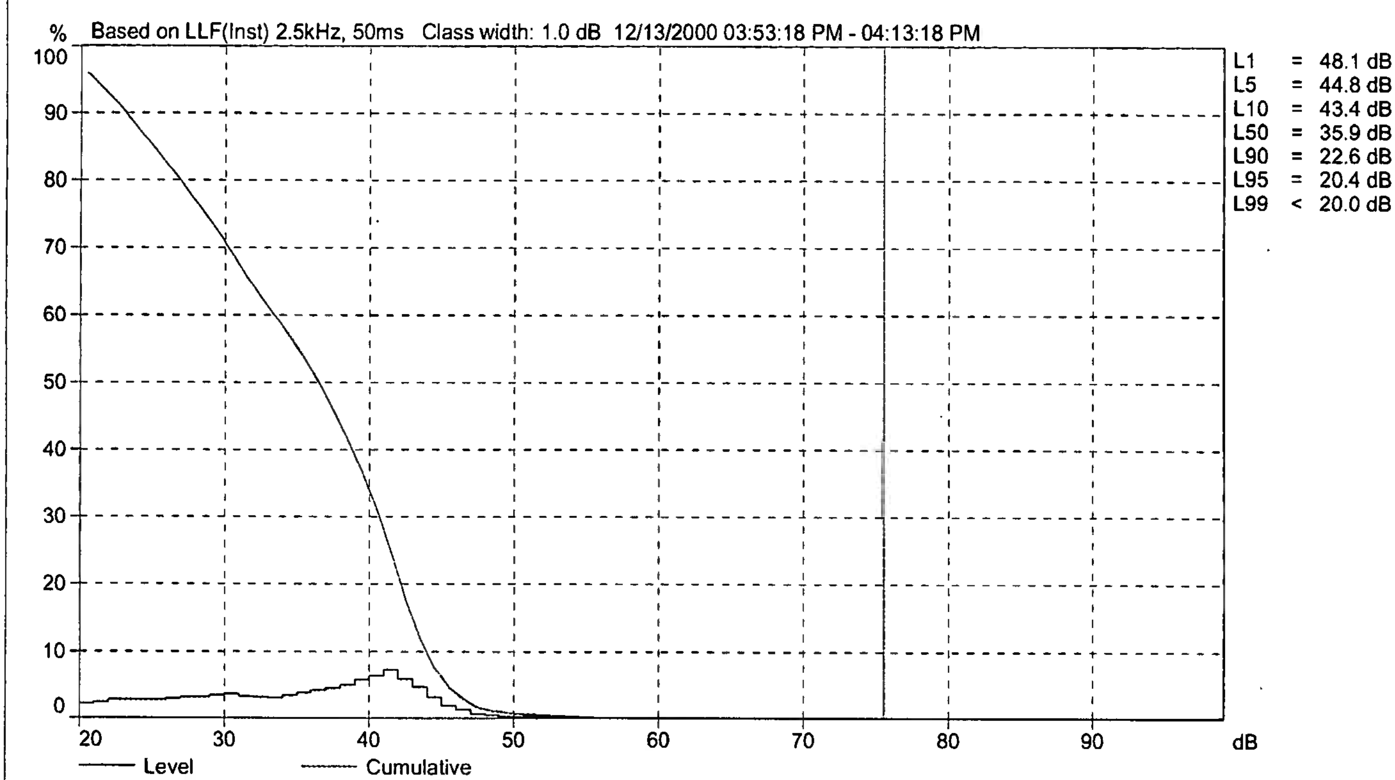
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 70.7 dB
L5 = 67.4 dB
L10 = 65.6 dB
L50 = 57.0 dB
L90 = 50.3 dB
L95 = 49.2 dB
L99 = 47.3 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 1.1% Cumulative: 35.4%

Nearest Southern Residence - Daytime

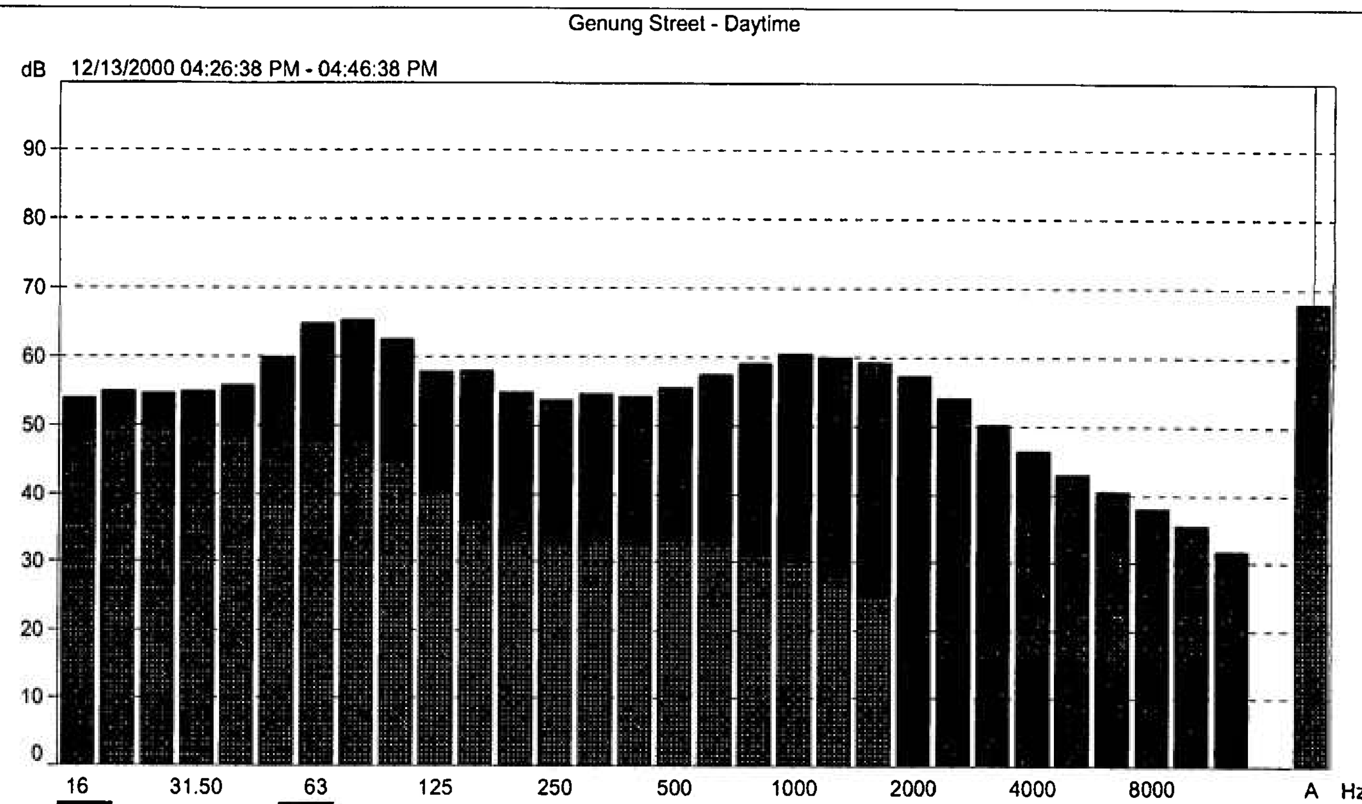


Cursor: 2500 Hz LLeq=39.8 dB LLF90=22.6 dB

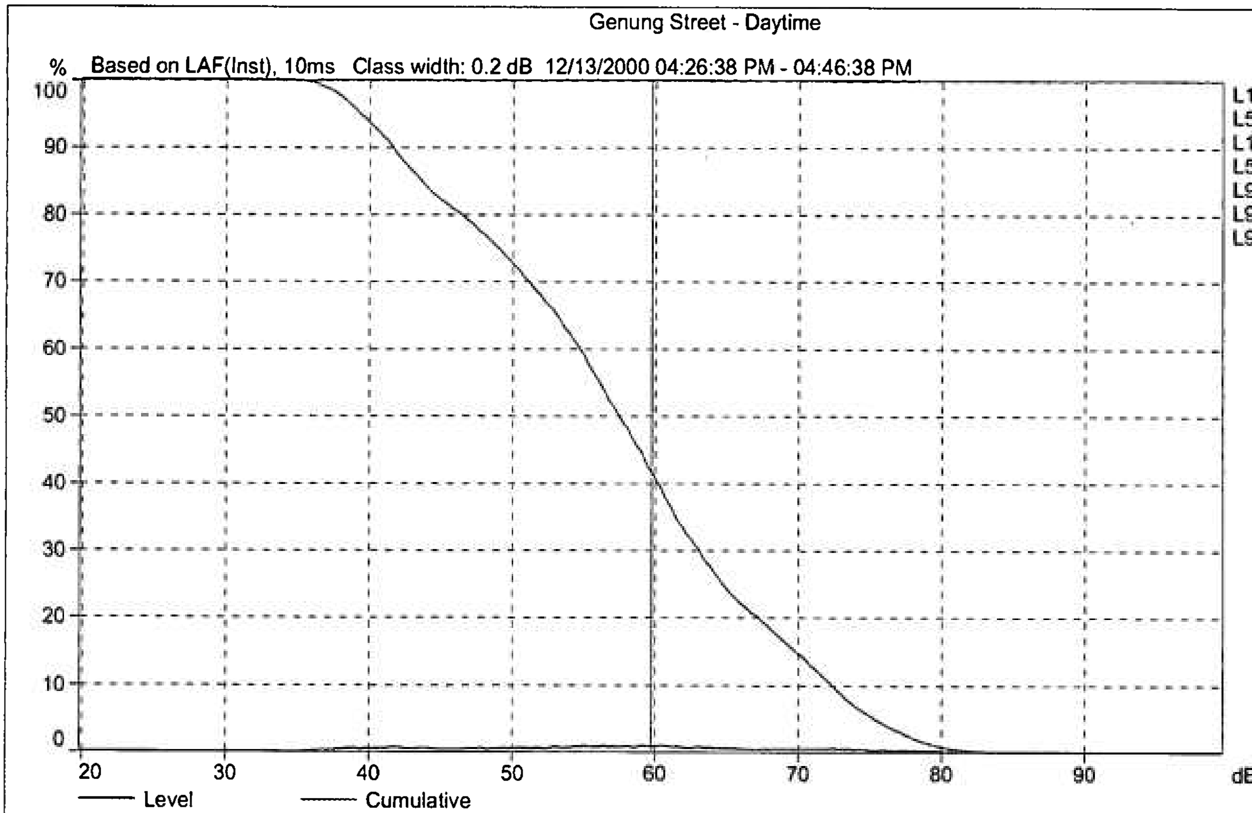
Nearest Southern Residence - Daytime



Cursor: [75.0 ; 76.0[dB Level: 0.0% Cumulative: 0.0%

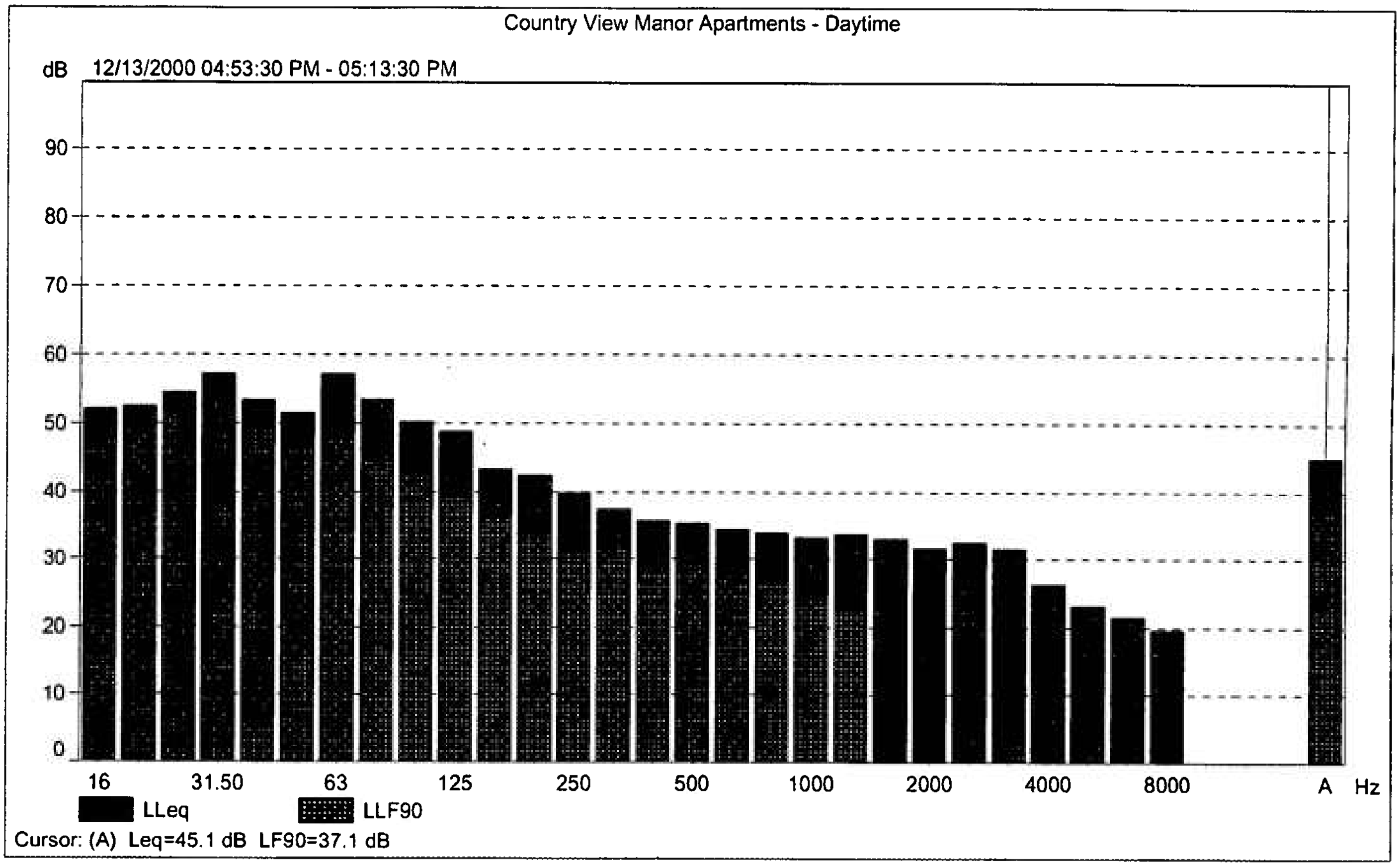


Cursor: (A) Leq=67.9 dB LF90=41.5 dB



L1	=	79.5 dB
L5	=	75.1 dB
L10	=	72.2 dB
L50	=	57.3 dB
L90	=	41.5 dB
L95	=	39.2 dB
L99	=	36.7 dB

Cursor: [59.6 ; 59.8[dB Level: 0.7% Cumulative: 41.6%


Country View Manor Apartments - Daytime
dB 12/13/2000 04:53:30 PM - 05:13:30 PM
90
80
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60
50
40
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16
31.50
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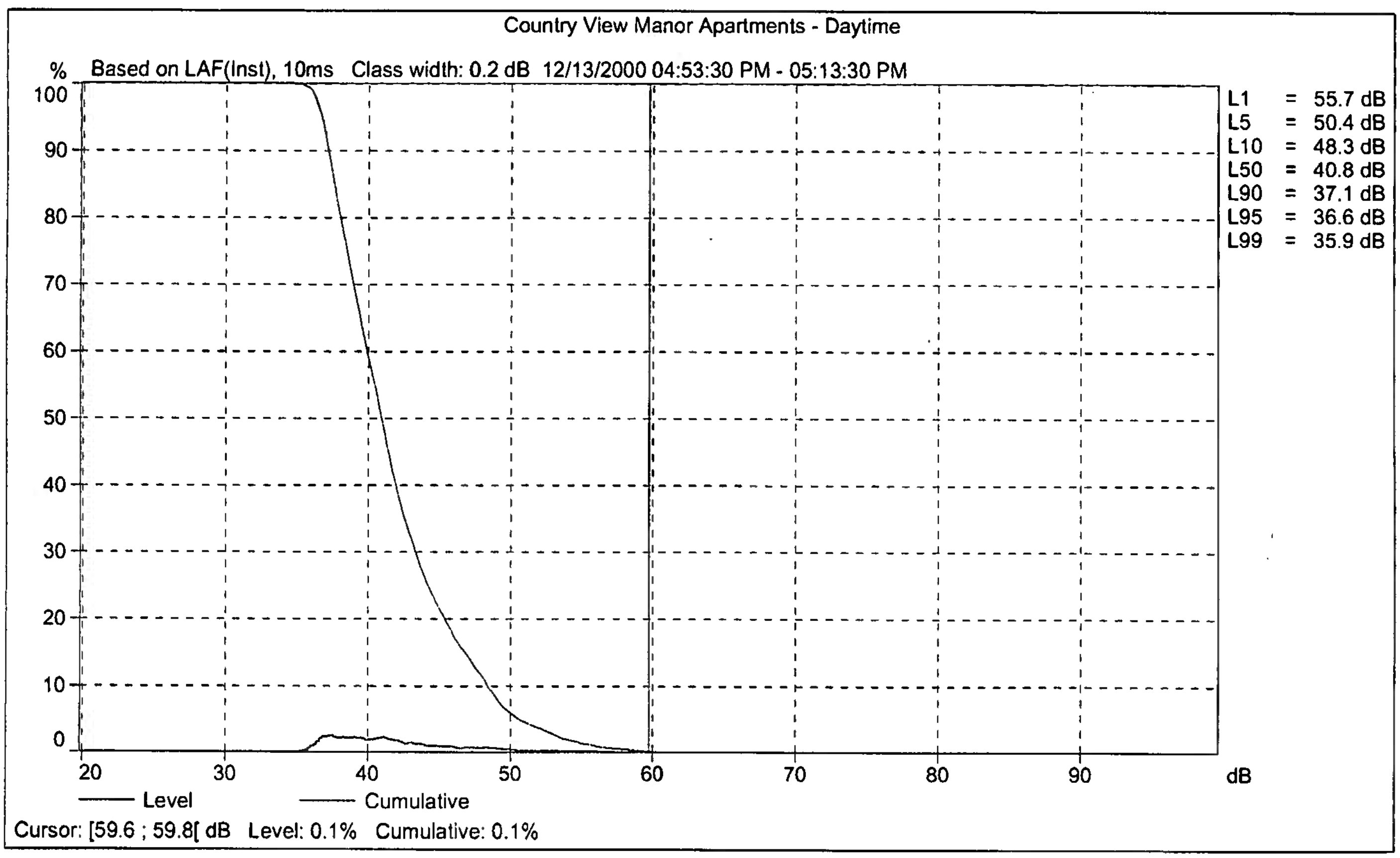
LLeq
LLF90
Cursor: (A) Leq=45.1 dB LF90=37.1 dB


Country View Manor Apartments - Daytime
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/13/2000 04:53:30 PM - 05:13:30 PM
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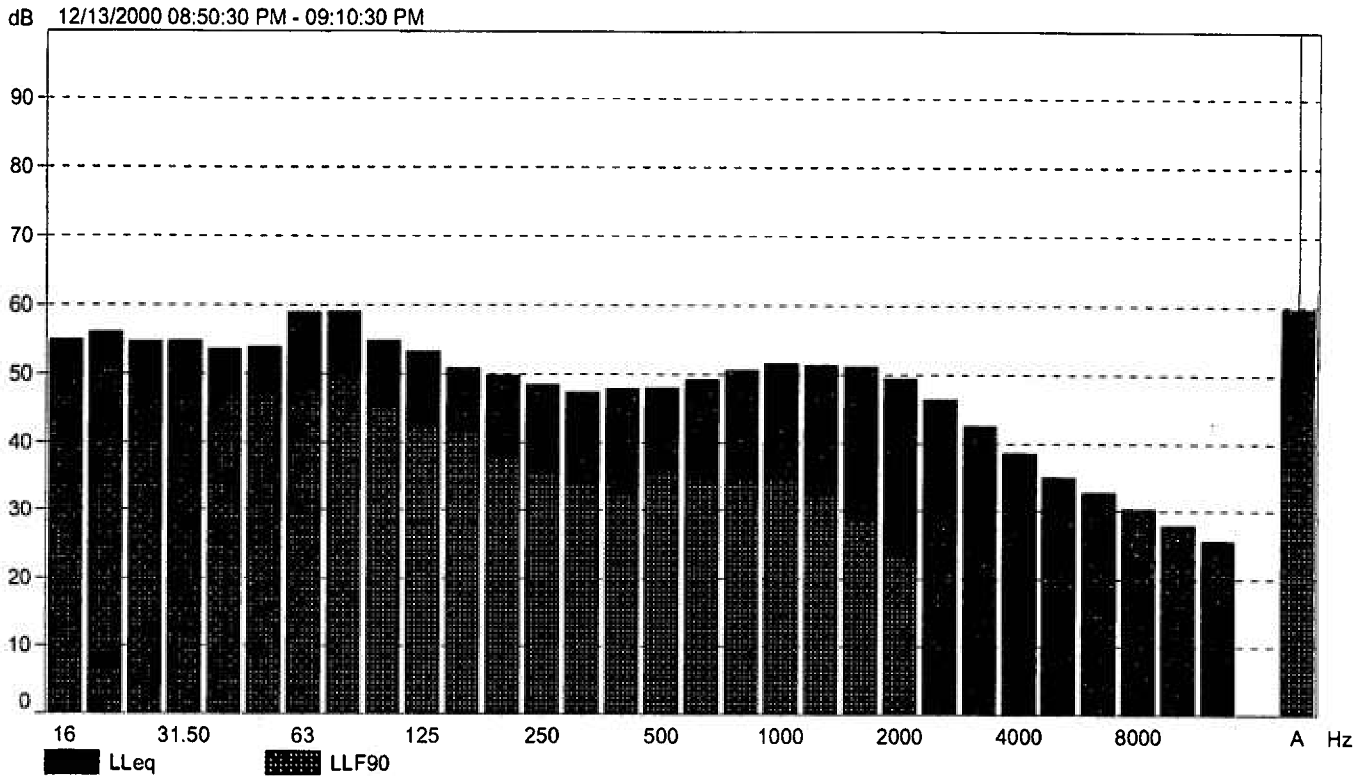
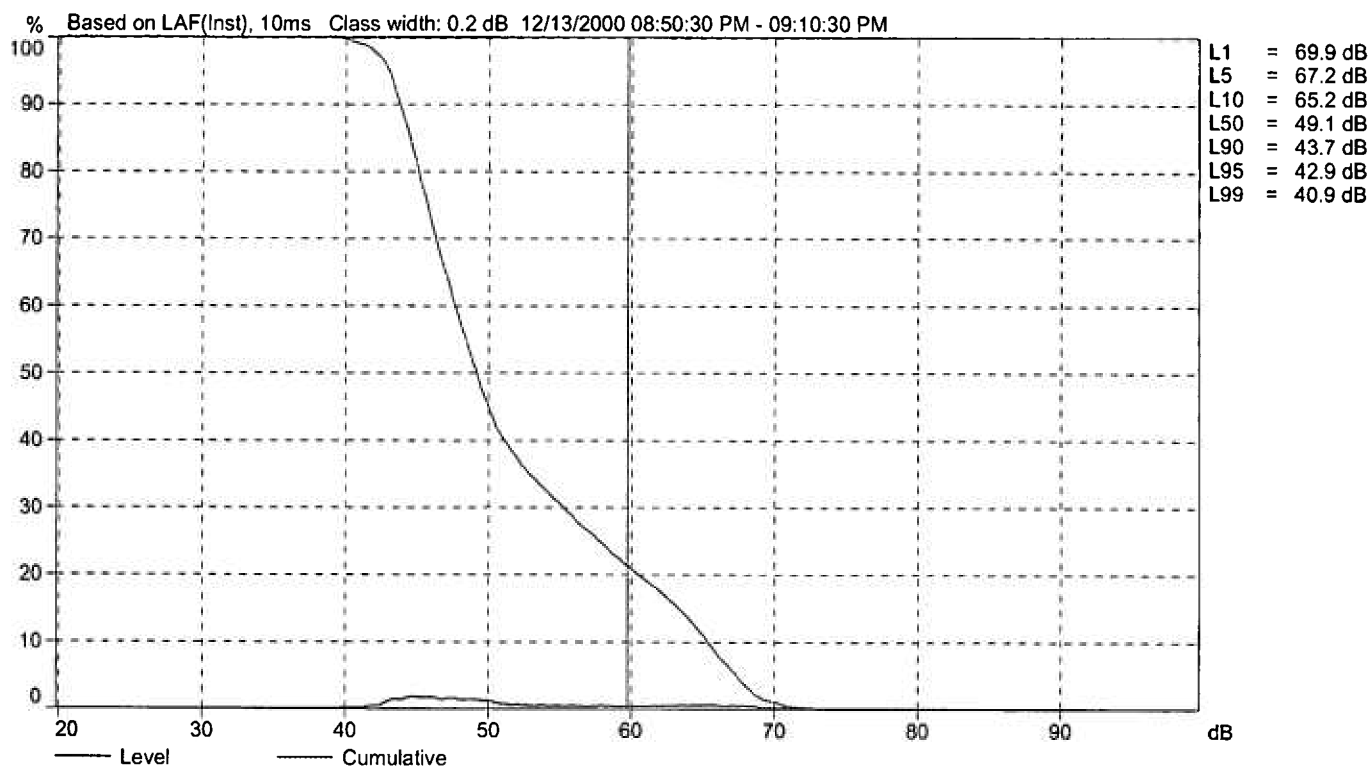
70
80
90
dB
L1 = 55.7 dB
L5 = 50.4 dB
L10 = 48.3 dB
L50 = 40.8 dB
L90 = 37.1 dB
L95 = 36.6 dB
L99 = 35.9 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.1% Cumulative: 0.1%

Nearest Eastern Residences - Evening



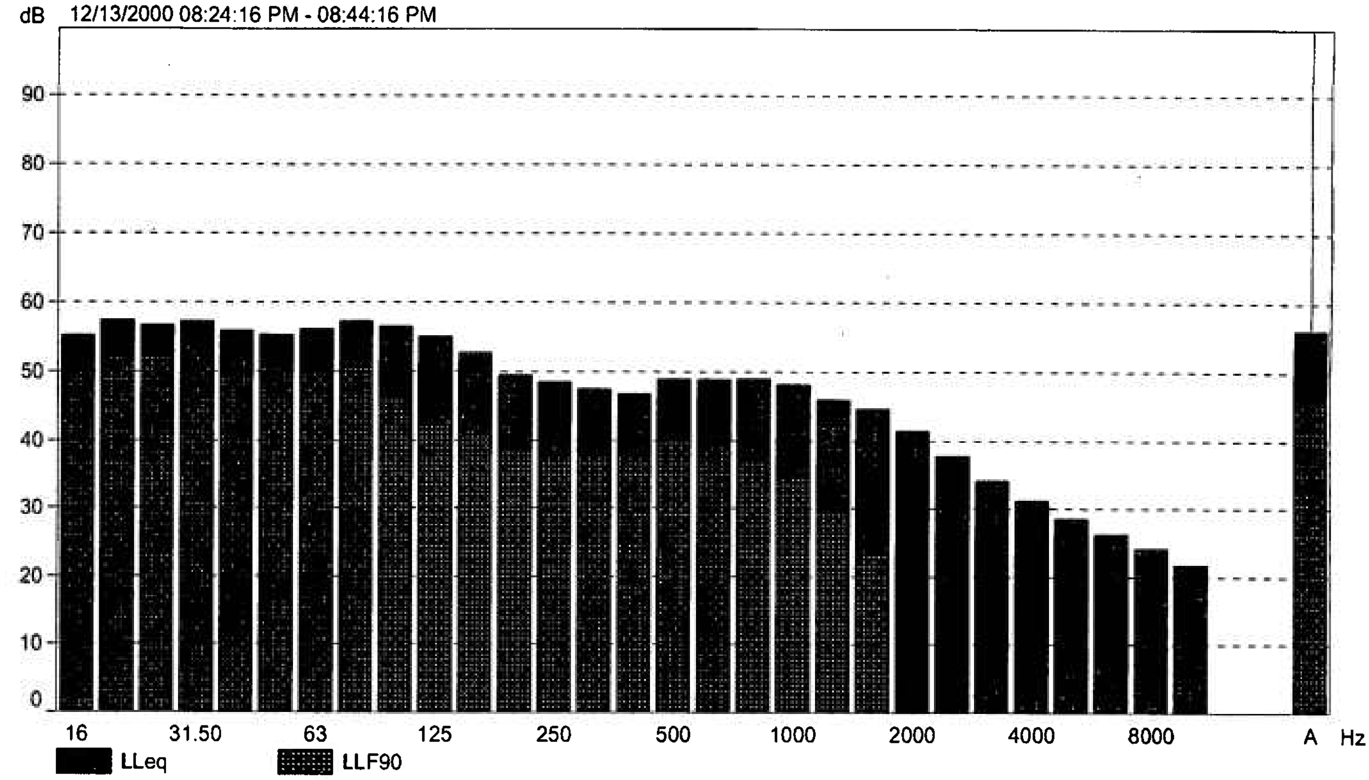
Cursor: (A) Leq=59.7 dB LF90=43.7 dB

Nearest Eastern Residences - Evening



Cursor: [59.6 ; 59.8[dB Level: 0.4% Cumulative: 21.3%

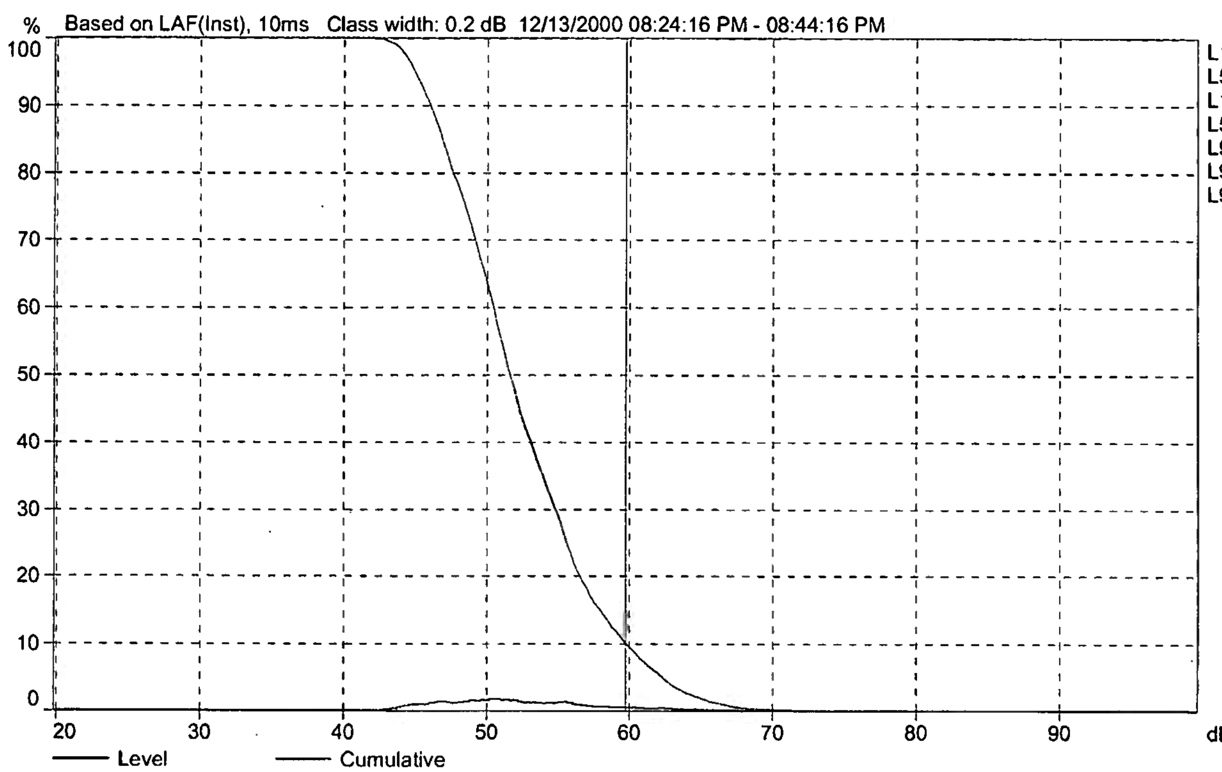
Nearest Western Residences - Evening



Cursor: (A) Leq=56.1 dB LF90=45.9 dB

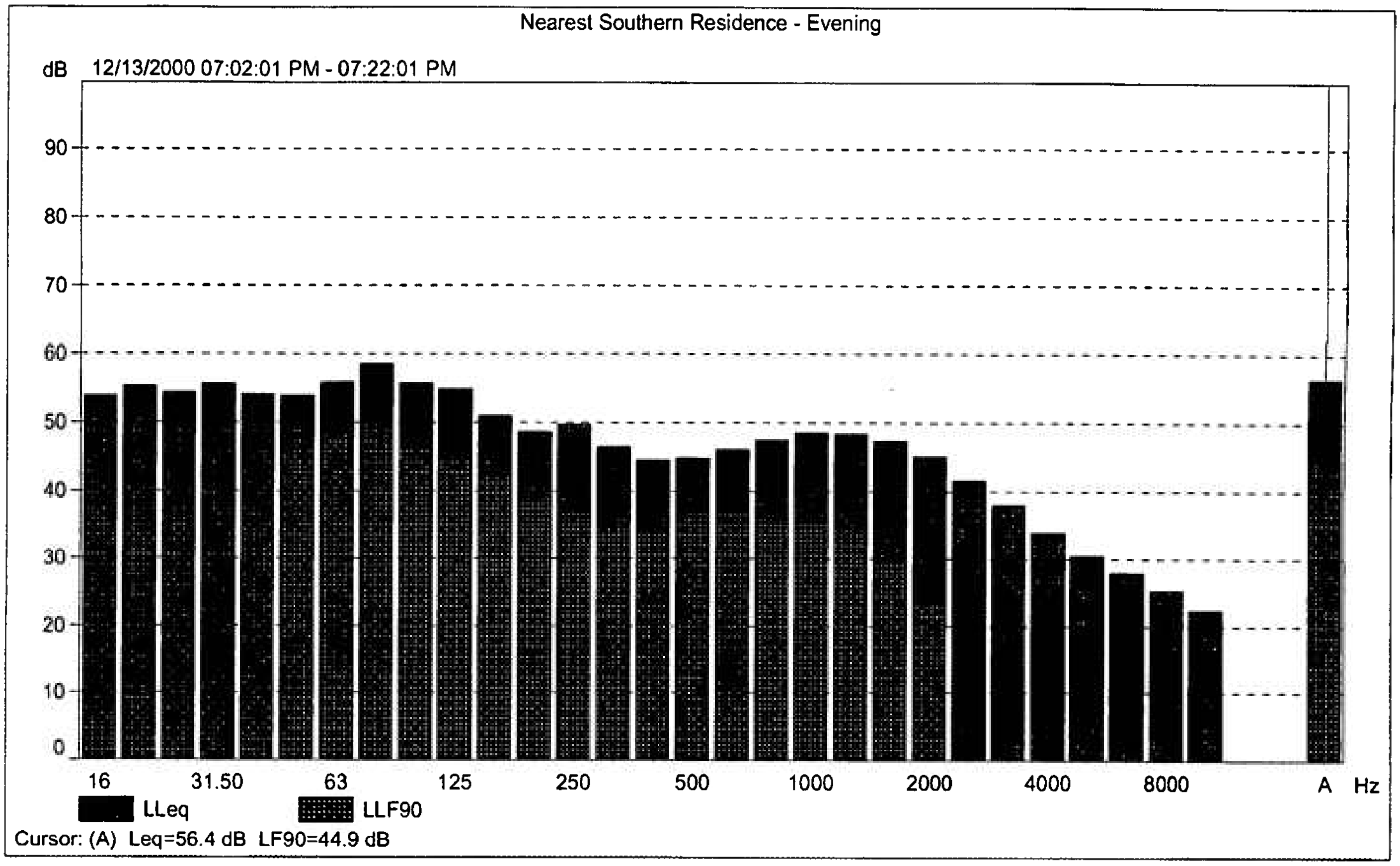
Nearest Western Residences - Evening

% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/13/2000 08:24:16 PM - 08:44:16 PM



L1	=	66.4 dB
L5	=	62.2 dB
L10	=	59.6 dB
L50	=	51.5 dB
L90	=	45.9 dB
L95	=	44.8 dB
L99	=	43.5 dB

Cursor: [59.6 ; 59.8[dB Level: 0.5% Cumulative: 10.1%


Nearest Southern Residence - Evening
dB 12/13/2000 07:02:01 PM - 07:22:01 PM
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16
31.50
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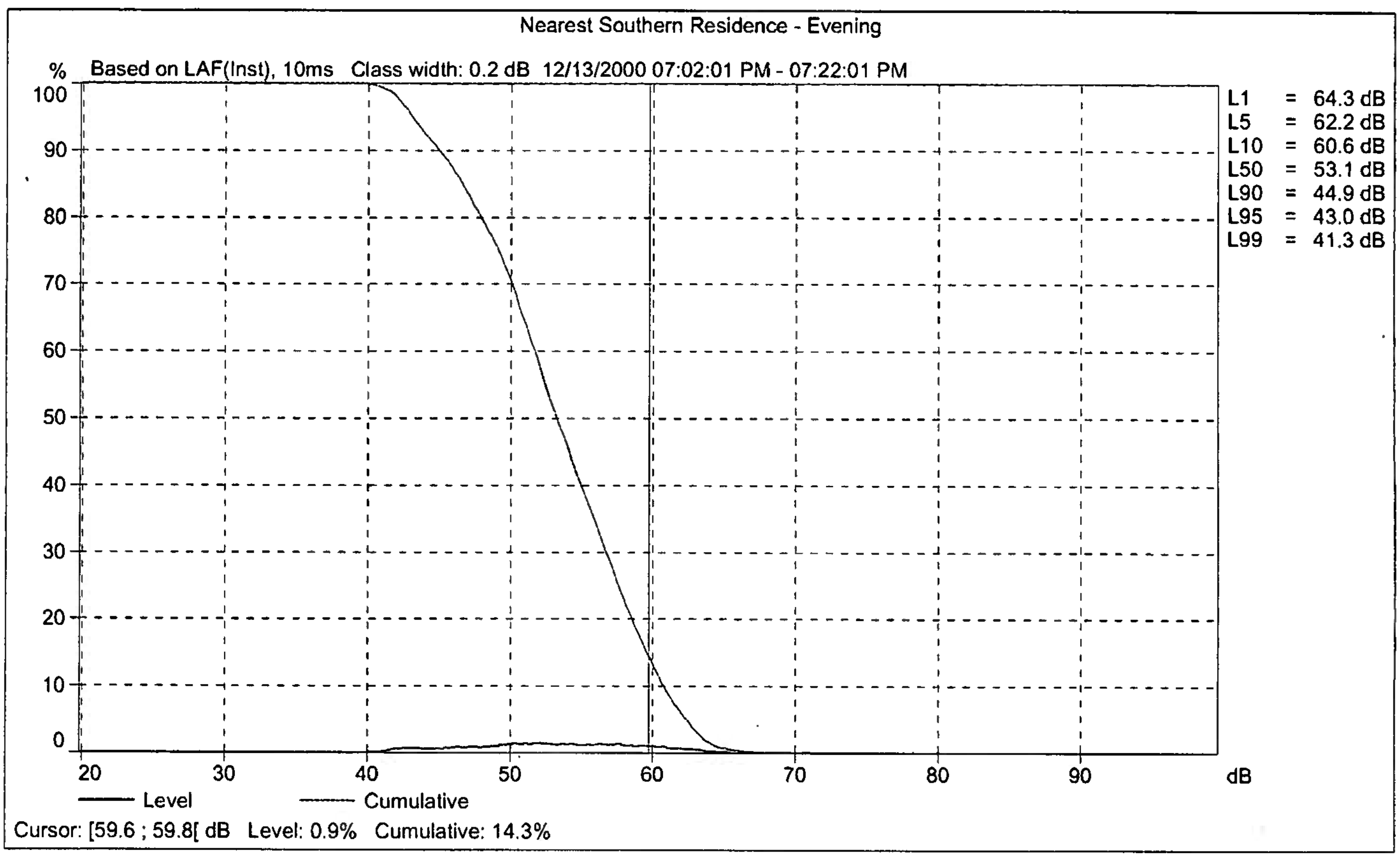
LLeq
LLF90
Cursor: (A) Leq=56.4 dB LF90=44.9 dB


Nearest Southern Residence - Evening
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/13/2000 07:02:01 PM - 07:22:01 PM
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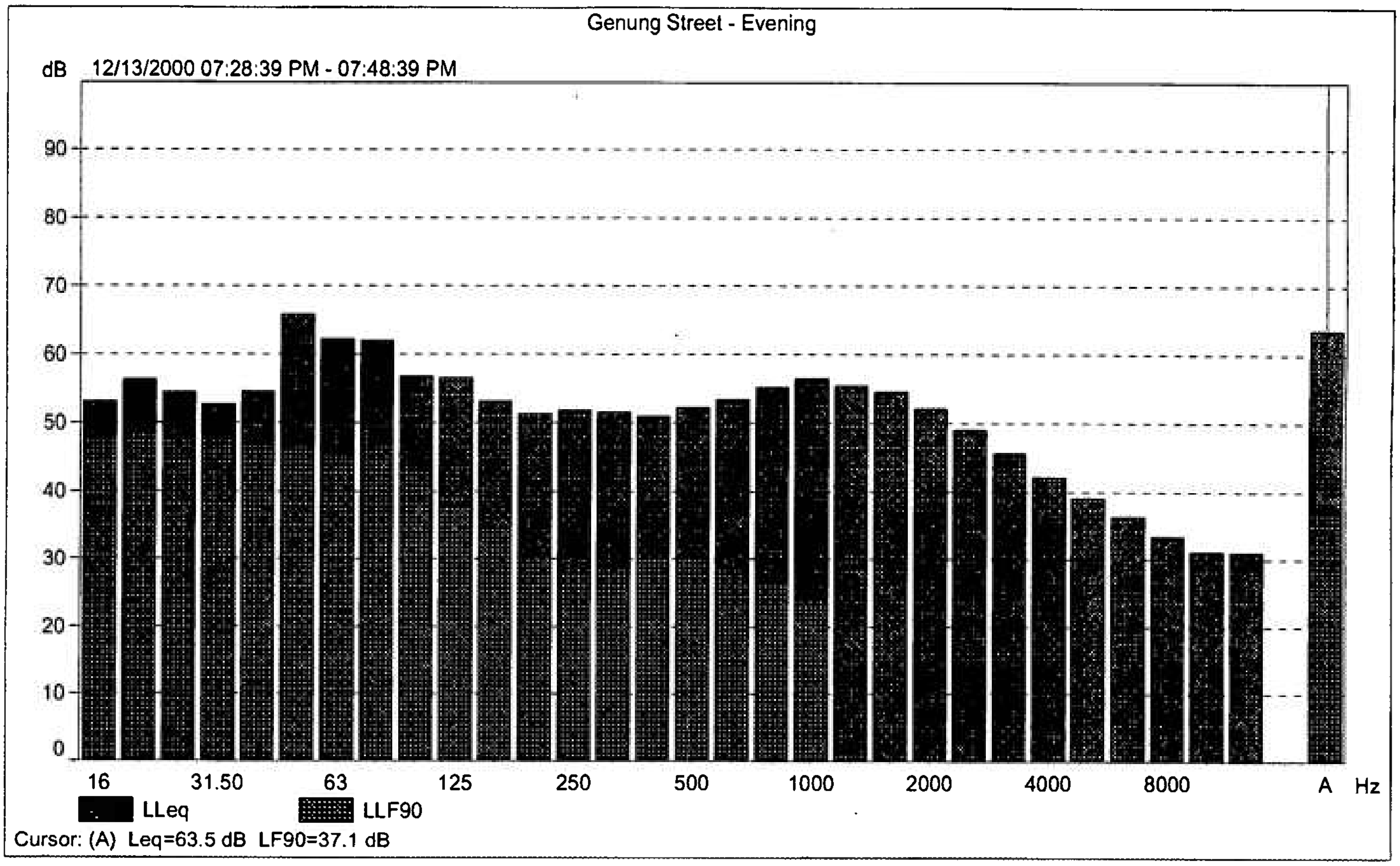
90
dB
L1 = 64.3 dB
L5 = 62.2 dB
L10 = 60.6 dB
L50 = 53.1 dB
L90 = 44.9 dB
L95 = 43.0 dB
L99 = 41.3 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.9% Cumulative: 14.3%


Genung Street - Evening
dB 12/13/2000 07:28:39 PM - 07:48:39 PM
90
80
70
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50
40
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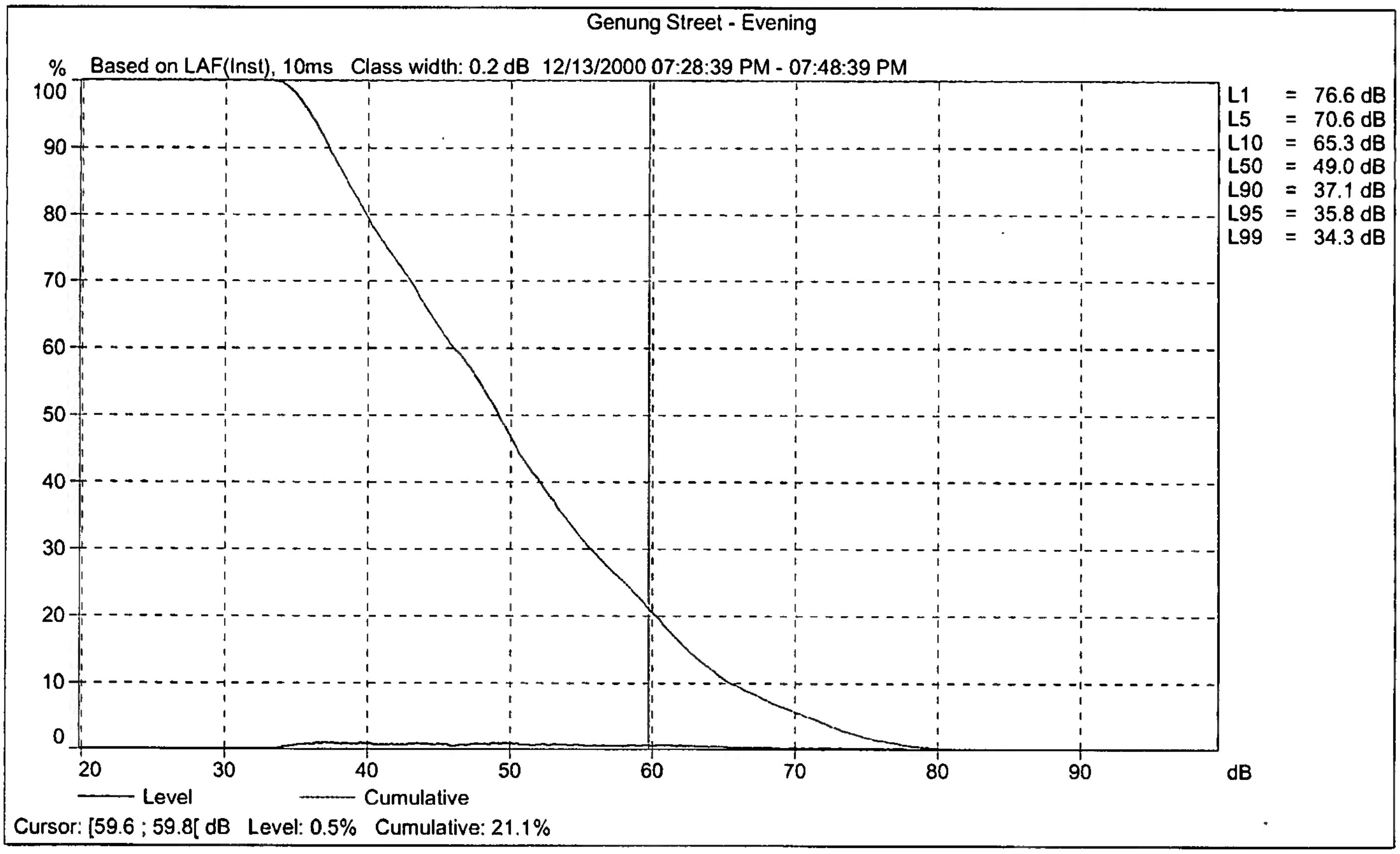
16 31.50 63 125 250 500 1000 2000 4000 8000 A Hz
LLeq
LLF90
Cursor: (A) Leq=63.5 dB LF90=37.1 dB


Genung Street - Evening
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/13/2000 07:28:39 PM - 07:48:39 PM
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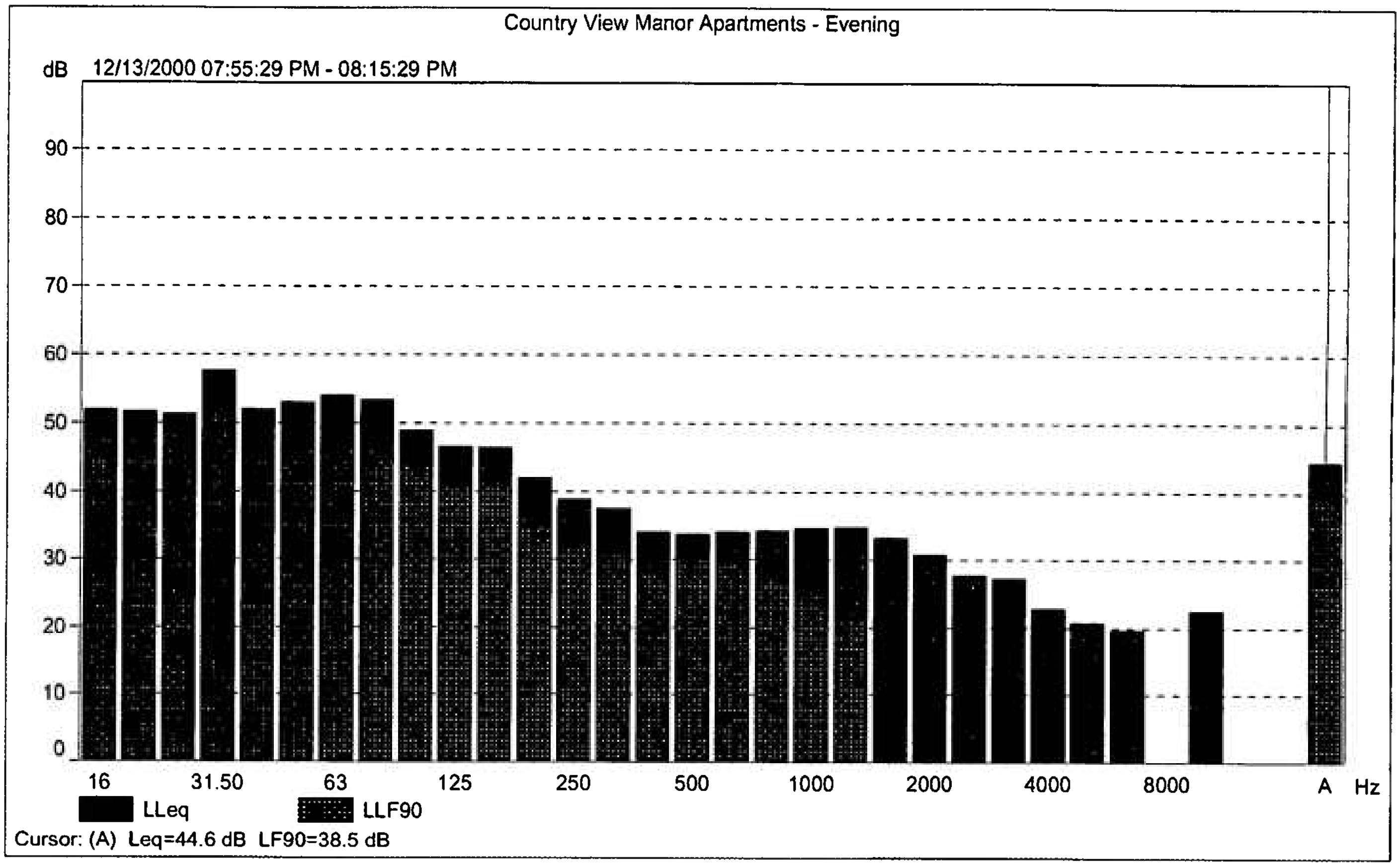
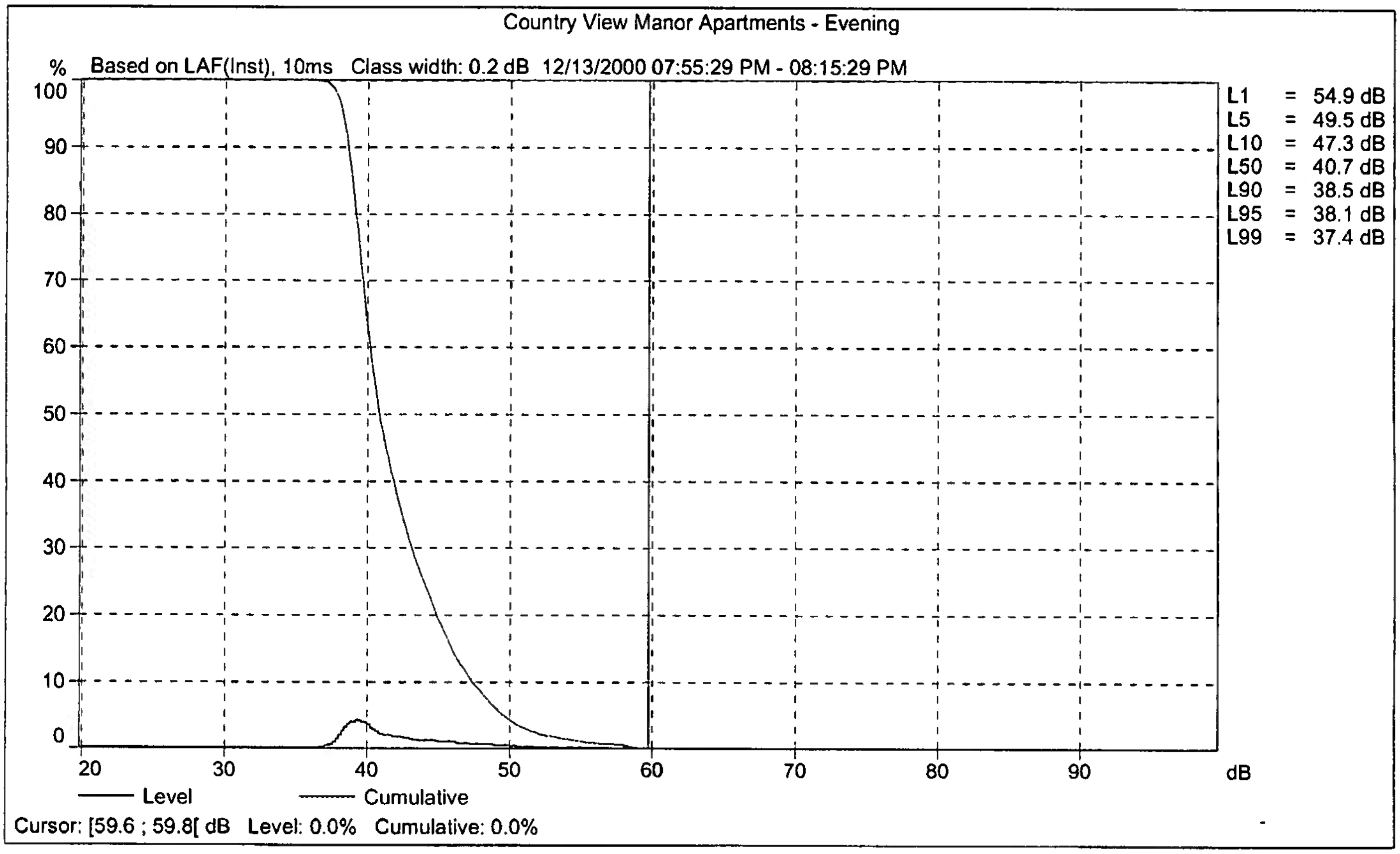
20
10
0
20 30 40 50 60 70 80 90 dB
L1 = 76.6 dB
L5 = 70.6 dB
L10 = 65.3 dB
L50 = 49.0 dB
L90 = 37.1 dB
L95 = 35.8 dB
L99 = 34.3 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.5% Cumulative: 21.1%



Country View Manor Apartments - Evening
dB 12/13/2000 07:55:29 PM - 08:15:29 PM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=44.6 dB LF90=38.5 dB



Country View Manor Apartments - Evening
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100
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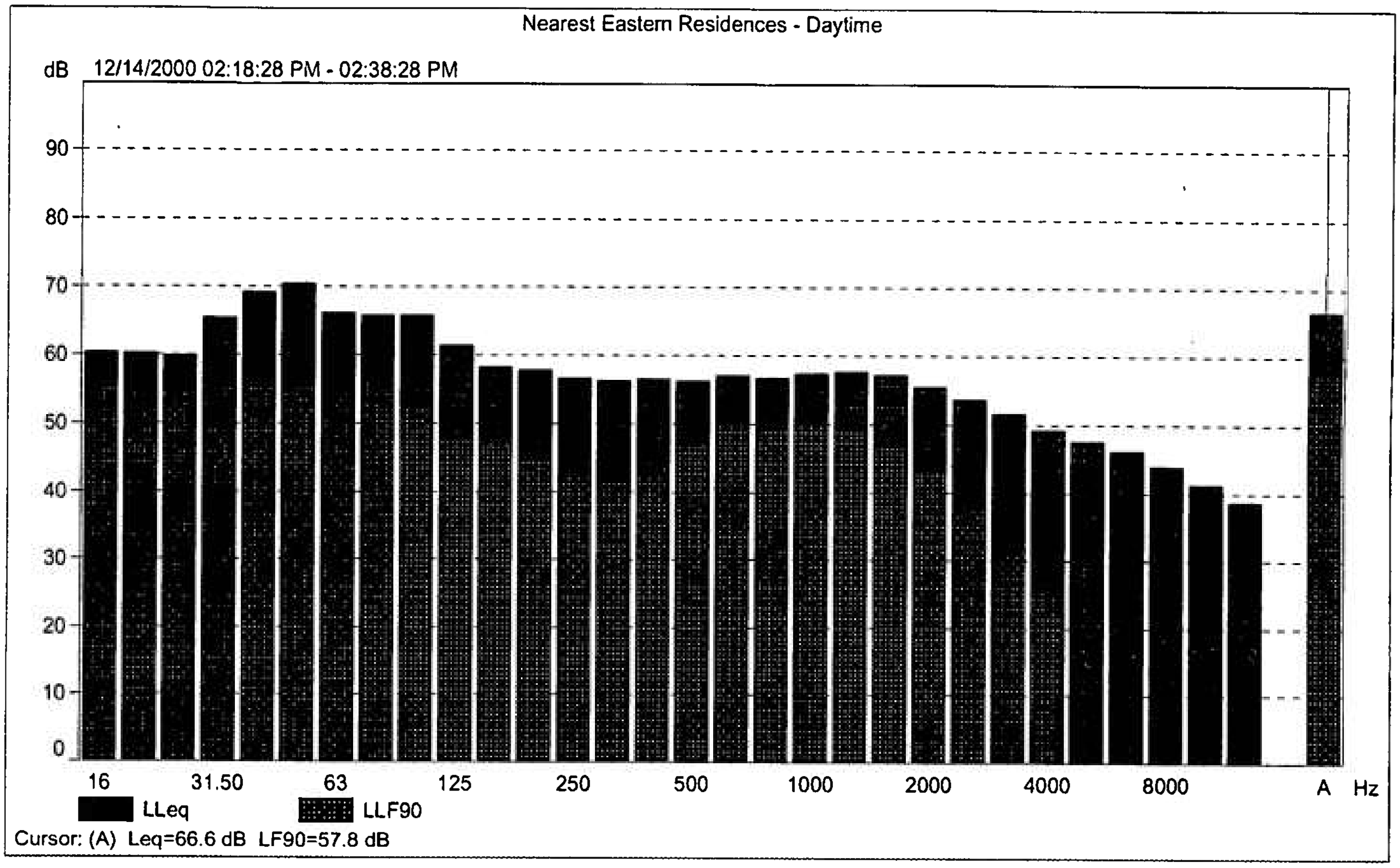
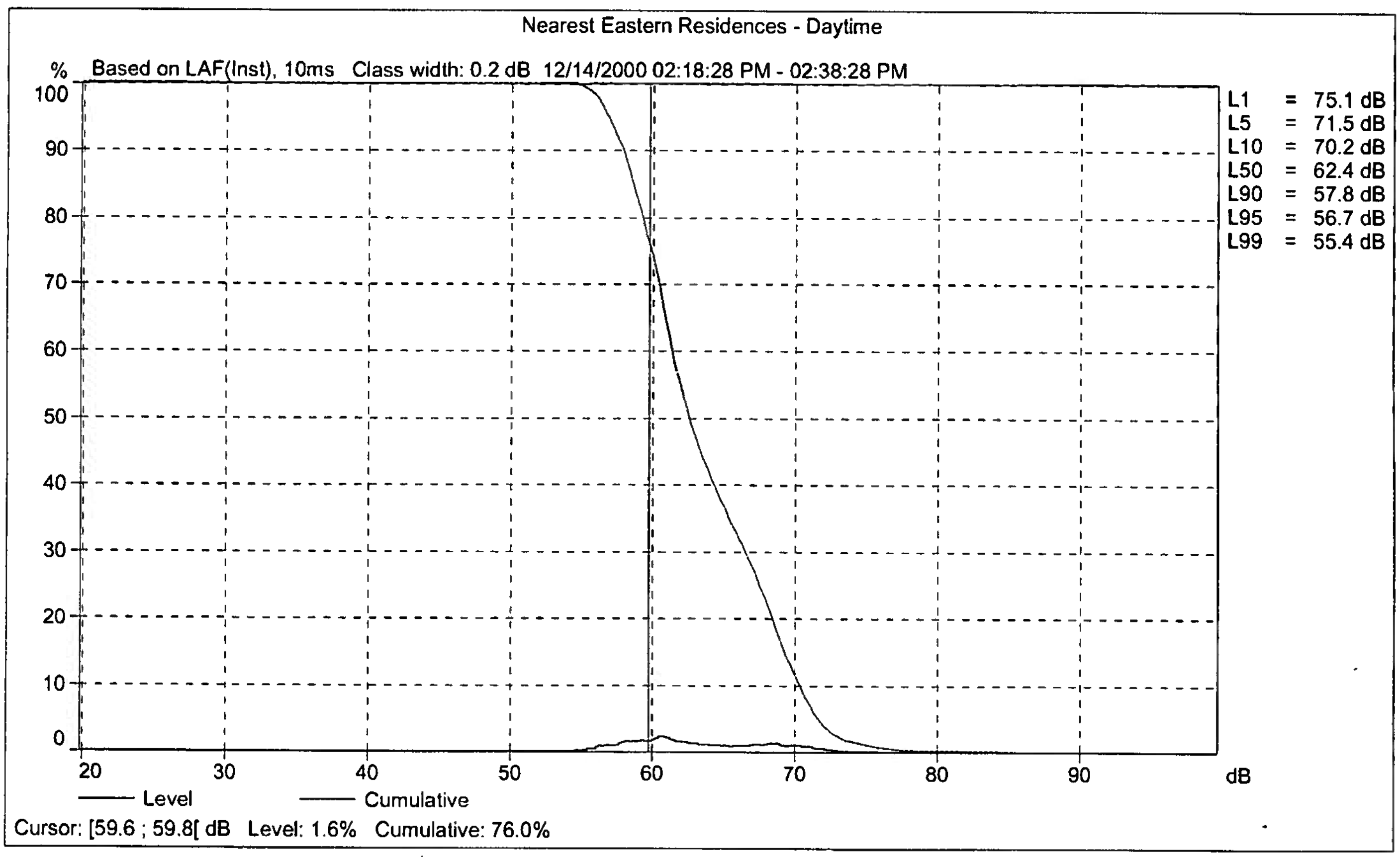
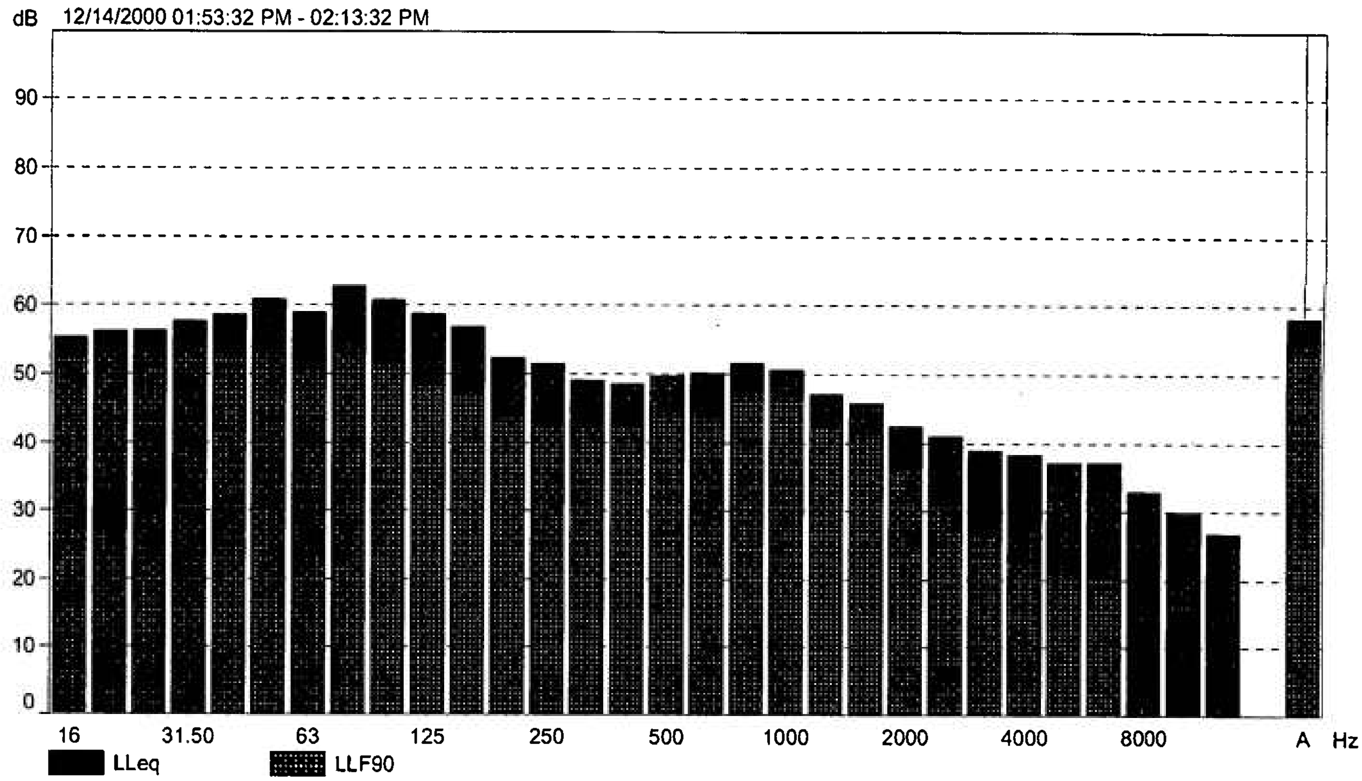
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 54.9 dB
L5 = 49.5 dB
L10 = 47.3 dB
L50 = 40.7 dB
L90 = 38.5 dB
L95 = 38.1 dB
L99 = 37.4 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.0% Cumulative: 0.0%


Nearest Eastern Residences - Daytime
dB 12/14/2000 02:18:28 PM - 02:38:28 PM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=66.6 dB LF90=57.8 dB

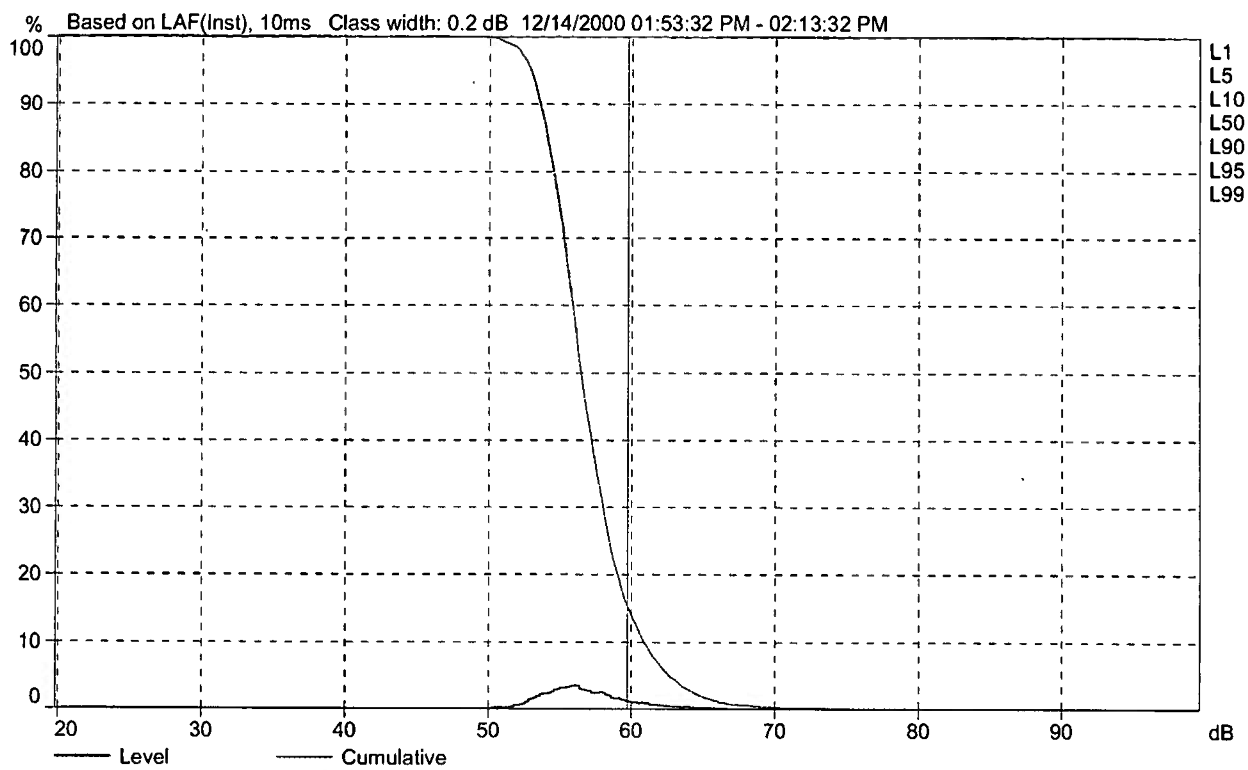

Nearest Eastern Residences - Daytime
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/14/2000 02:18:28 PM - 02:38:28 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 75.1 dB
L5 = 71.5 dB
L10 = 70.2 dB
L50 = 62.4 dB
L90 = 57.8 dB
L95 = 56.7 dB
L99 = 55.4 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 1.6% Cumulative: 76.0%

Nearest Western Residences - Daytime



Cursor: (A) Leq=58.3 dB LF90=53.5 dB

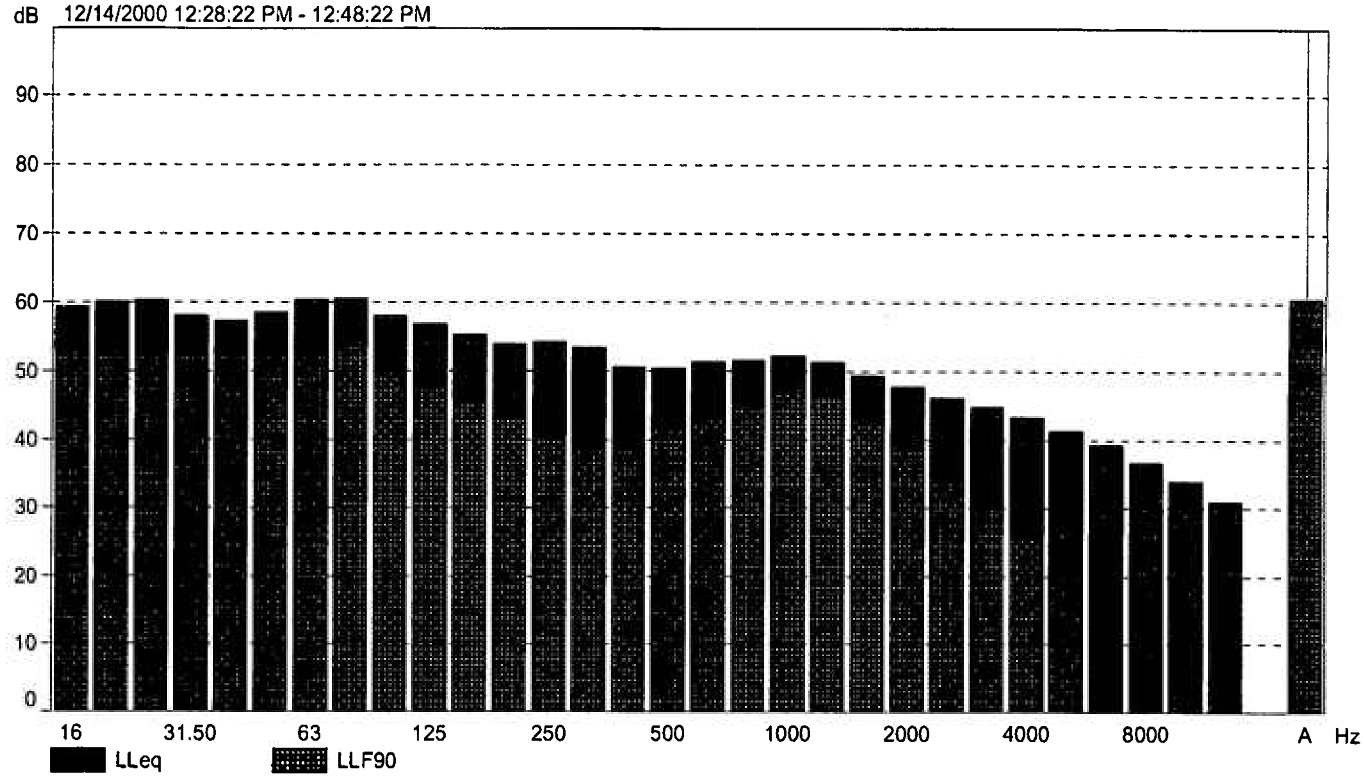
Nearest Western Residences - Daytime



L1	=	66.0 dB
L5	=	62.5 dB
L10	=	60.8 dB
L50	=	56.3 dB
L90	=	53.5 dB
L95	=	52.8 dB
L99	=	51.3 dB

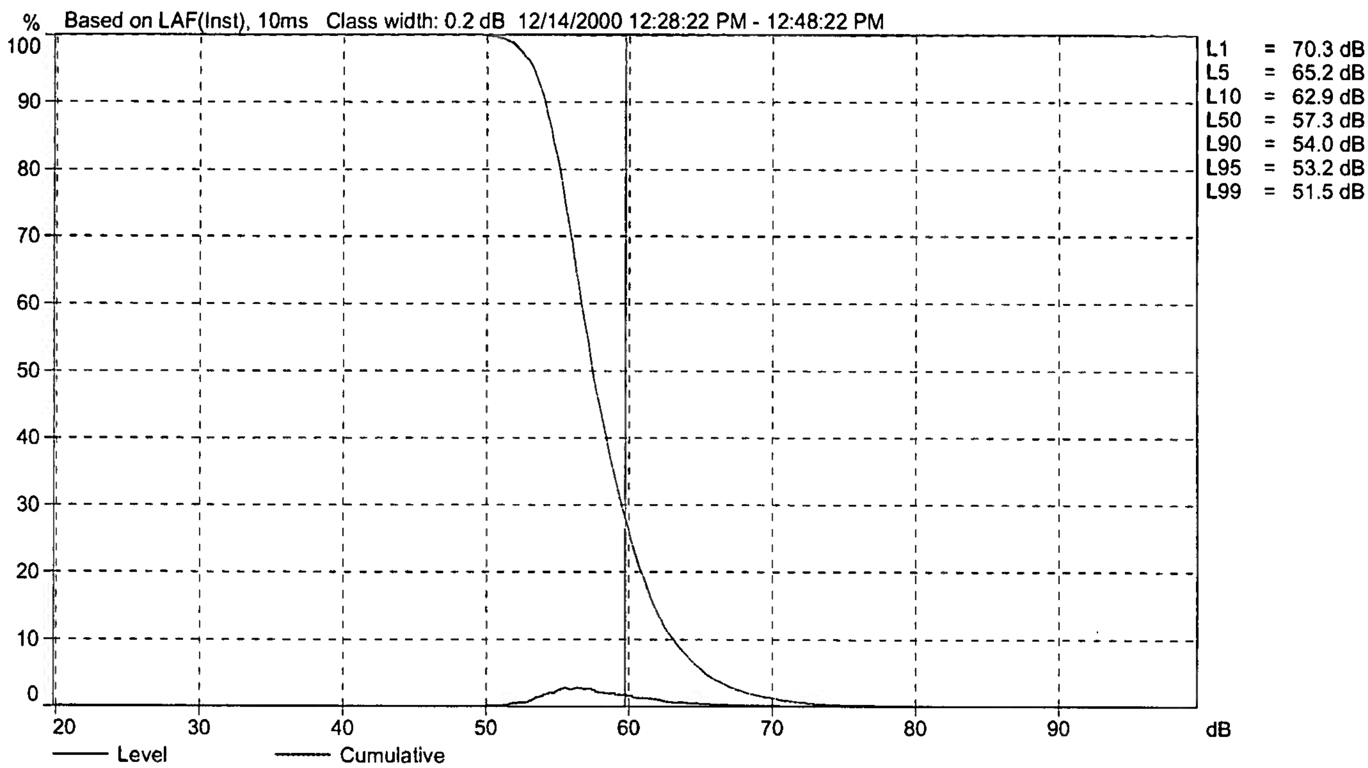
Cursor: [59.6 ; 59.8[dB Level: 1.1% Cumulative: 15.2%

Nearest Southern Residence - Daytime

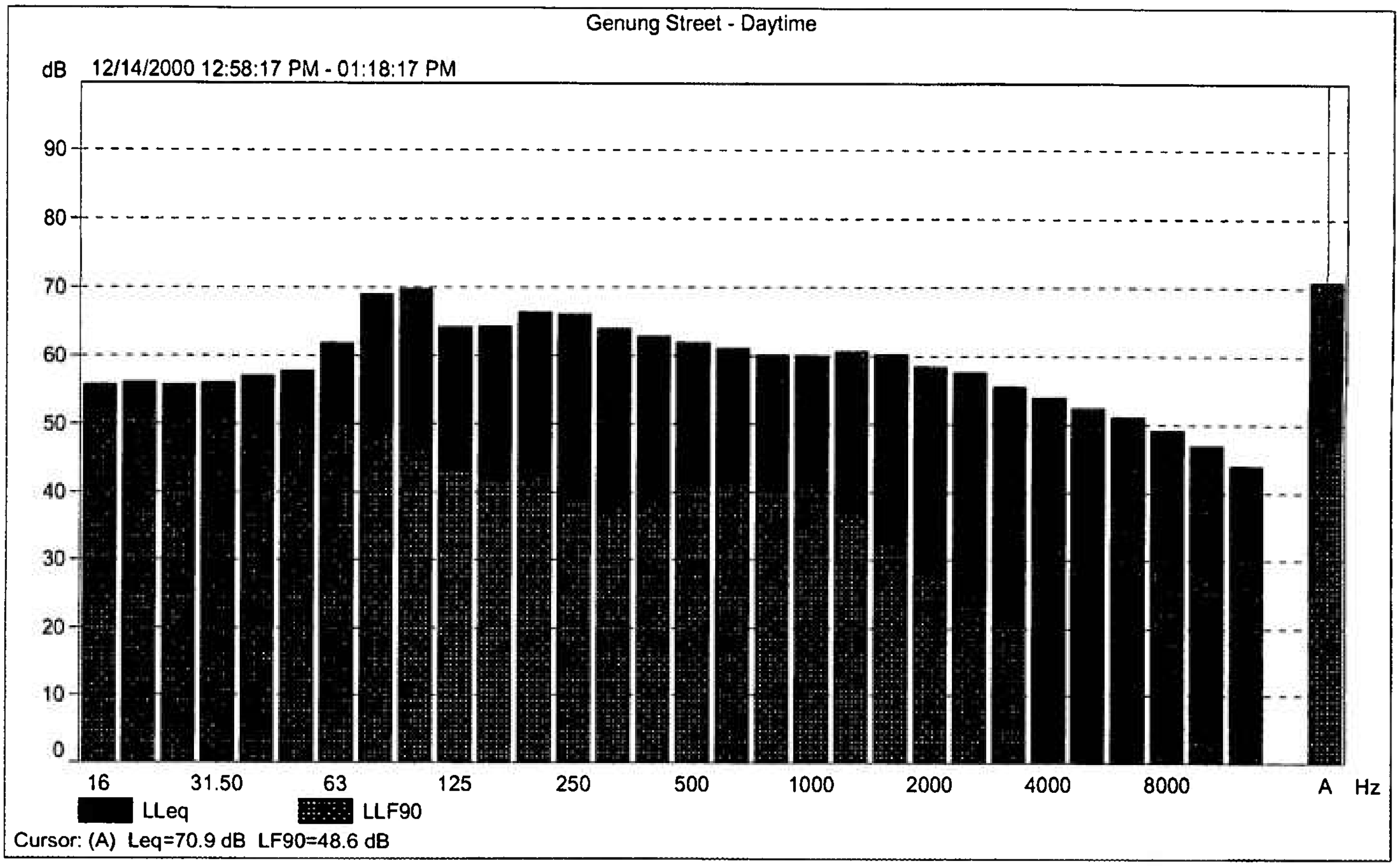


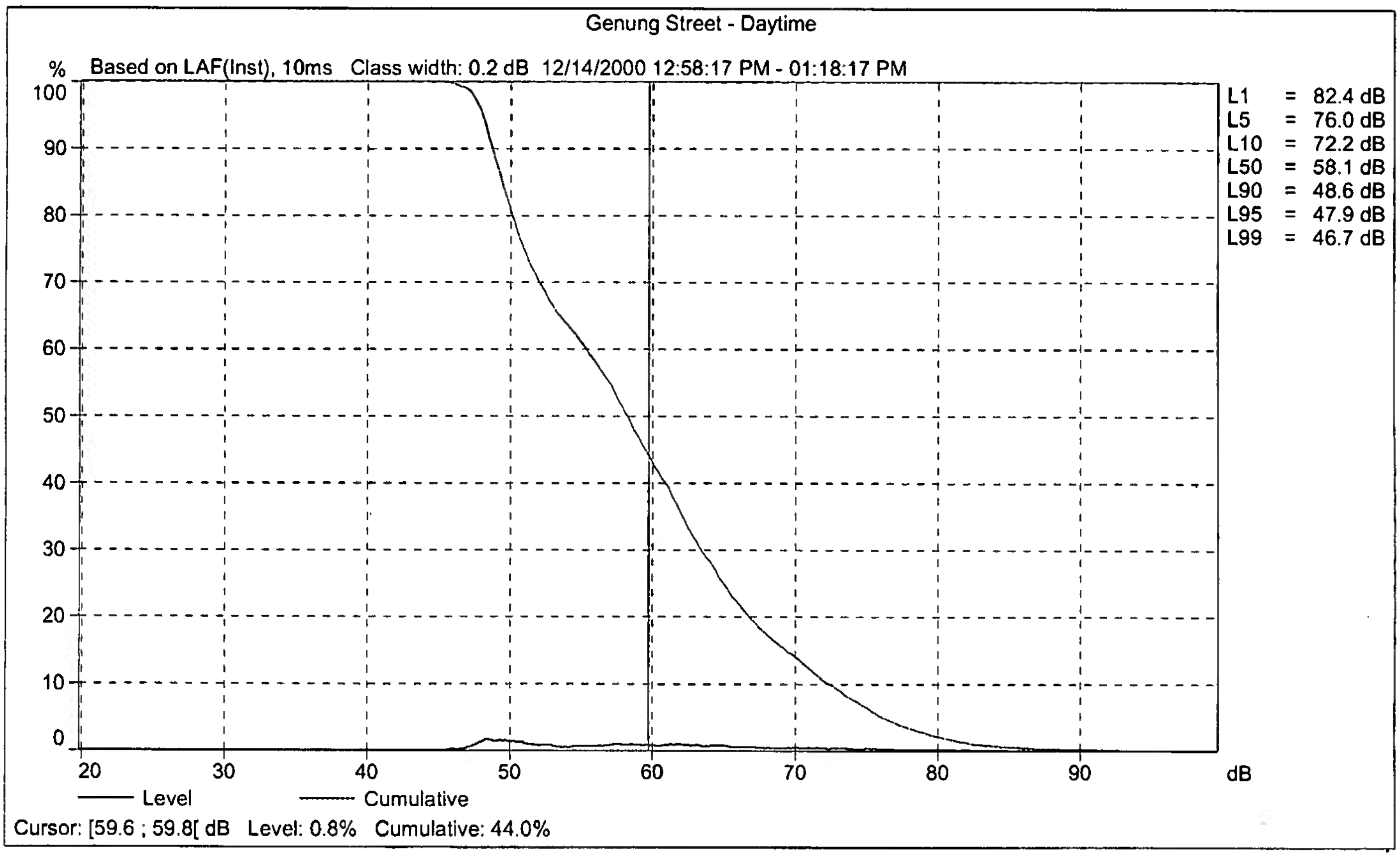
Cursor: (A) Leq=60.6 dB LF90=54.0 dB

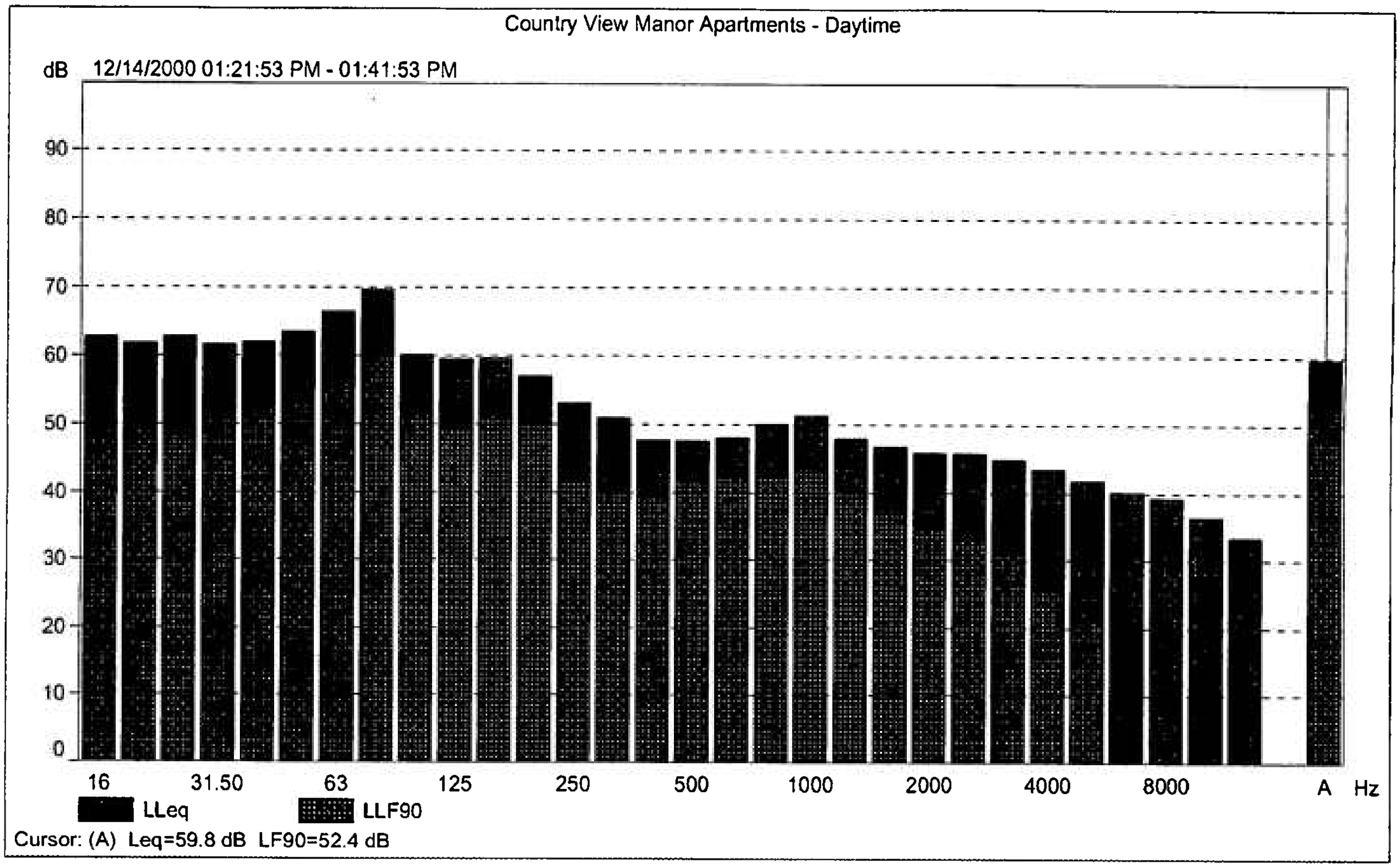
Nearest Southern Residence - Daytime

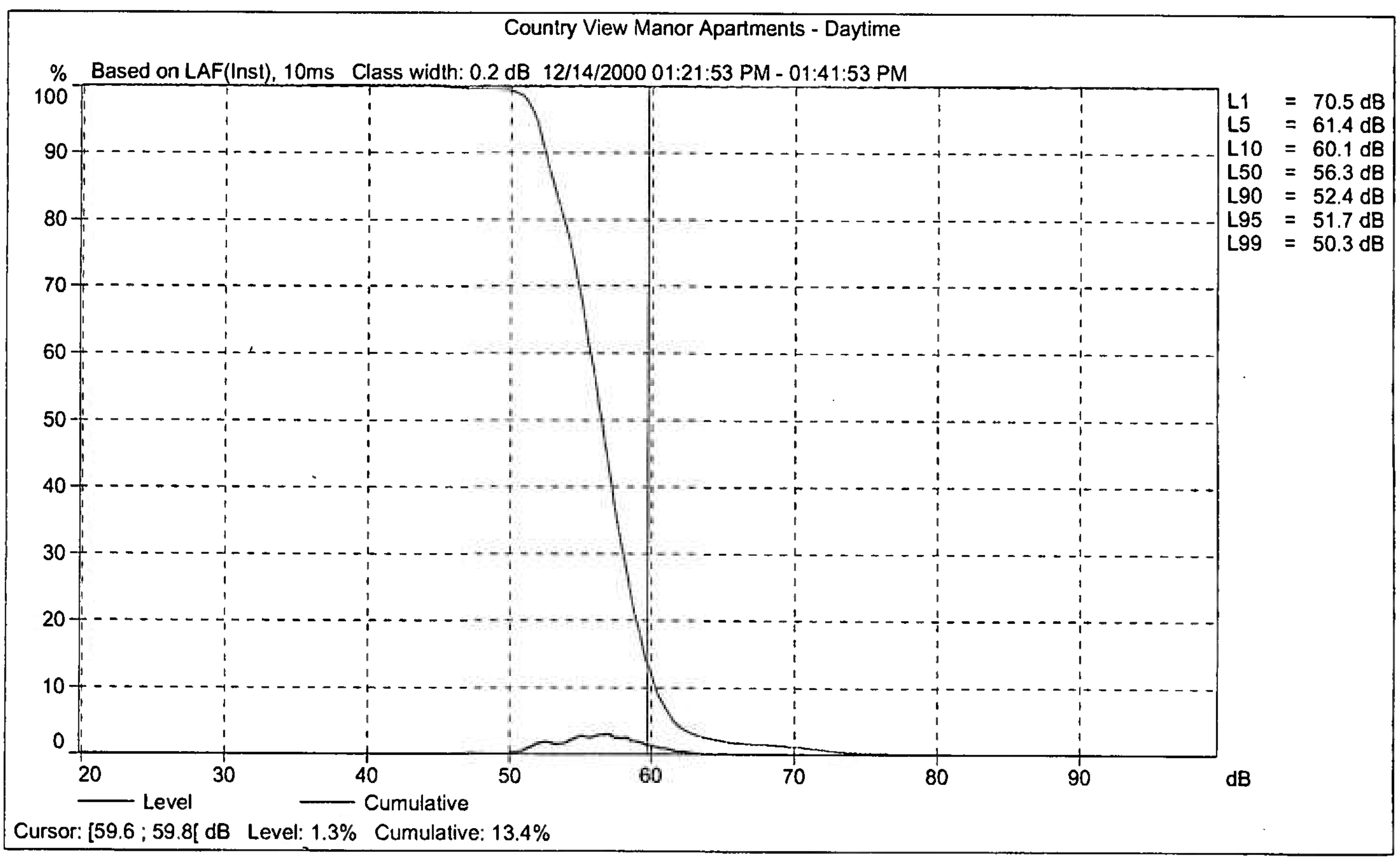


Cursor: [59.6 ; 59.8[dB Level: 1.6% Cumulative: 27.9%

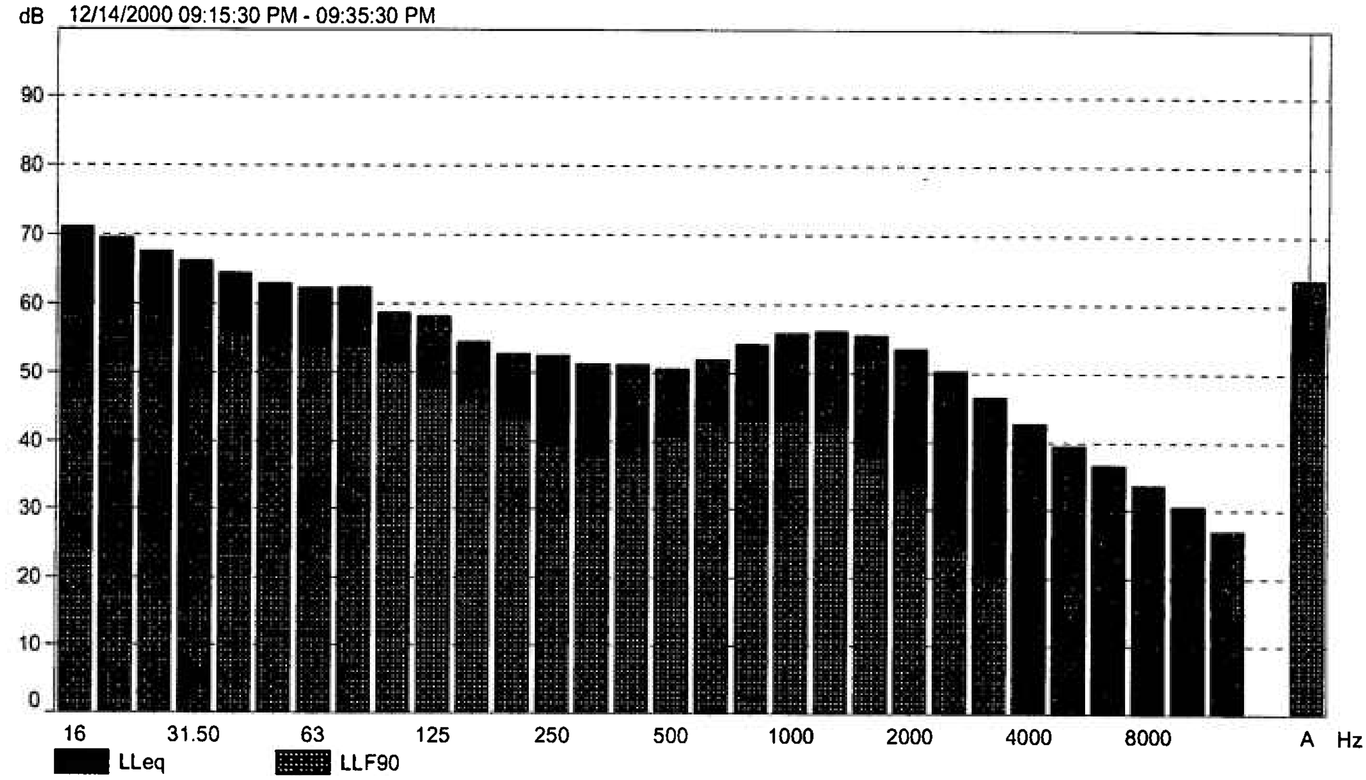

Genung Street - Daytime
dB 12/14/2000 12:58:17 PM - 01:18:17 PM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=70.9 dB LF90=48.6 dB


Genung Street - Daytime
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/14/2000 12:58:17 PM - 01:18:17 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 82.4 dB
L5 = 76.0 dB
L10 = 72.2 dB
L50 = 58.1 dB
L90 = 48.6 dB
L95 = 47.9 dB
L99 = 46.7 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.8% Cumulative: 44.0%


Country View Manor Apartments - Daytime
dB 12/14/2000 01:21:53 PM - 01:41:53 PM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=59.8 dB LF90=52.4 dB

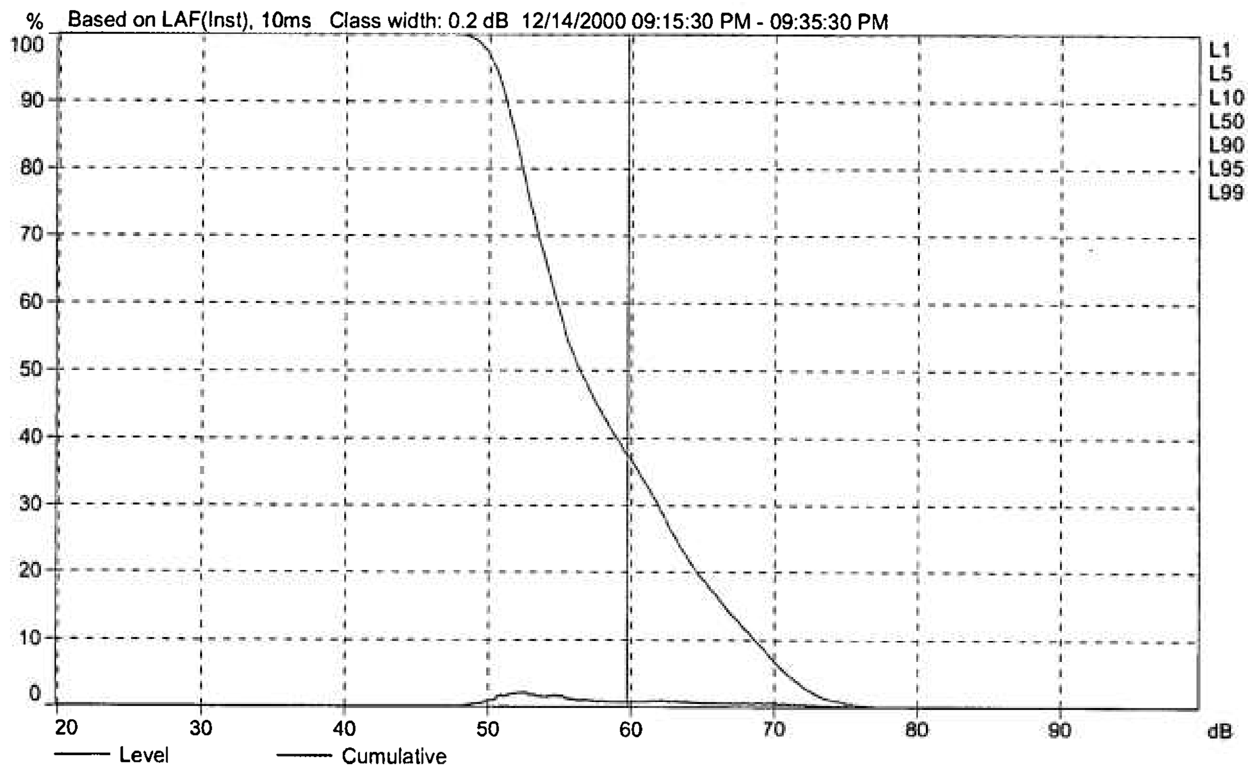

Country View Manor Apartments - Daytime
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/14/2000 01:21:53 PM - 01:41:53 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 70.5 dB
L5 = 61.4 dB
L10 = 60.1 dB
L50 = 56.3 dB
L90 = 52.4 dB
L95 = 51.7 dB
L99 = 50.3 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 1.3% Cumulative: 13.4%

Nearest Eastern Residences - Evening



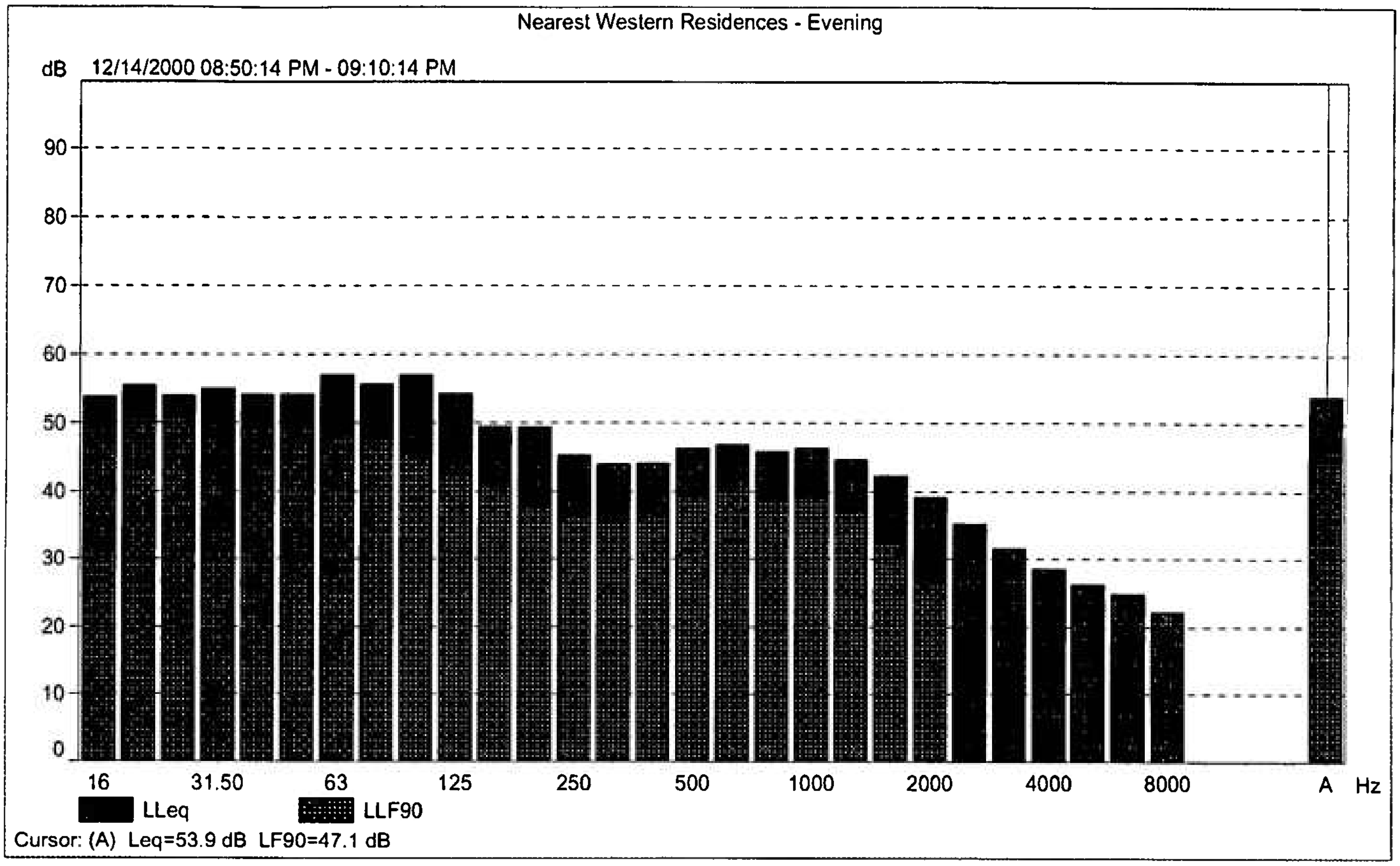
Cursor: (A) Leq=63.8 dB LF90=51.1 dB

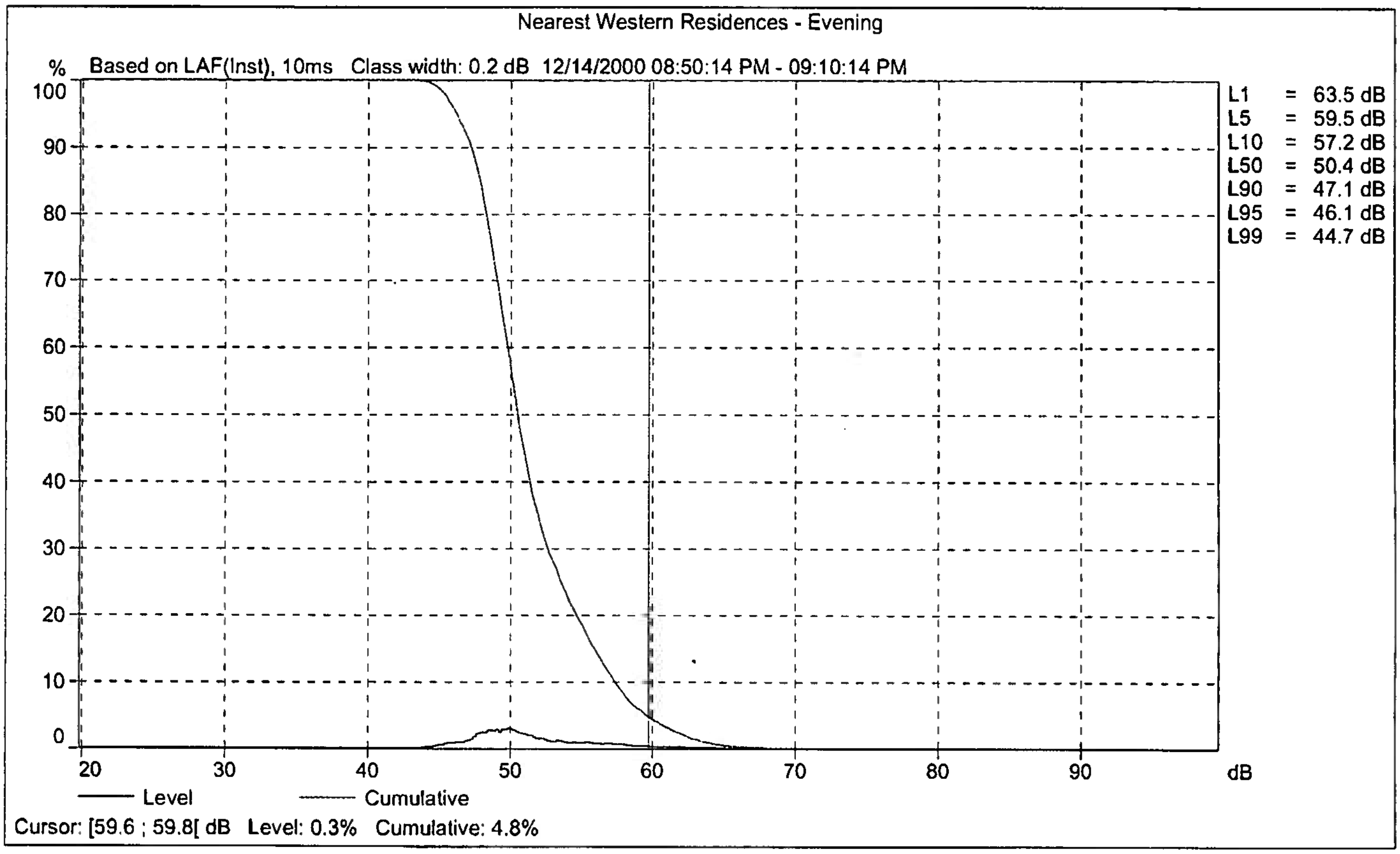
Nearest Eastern Residences - Evening

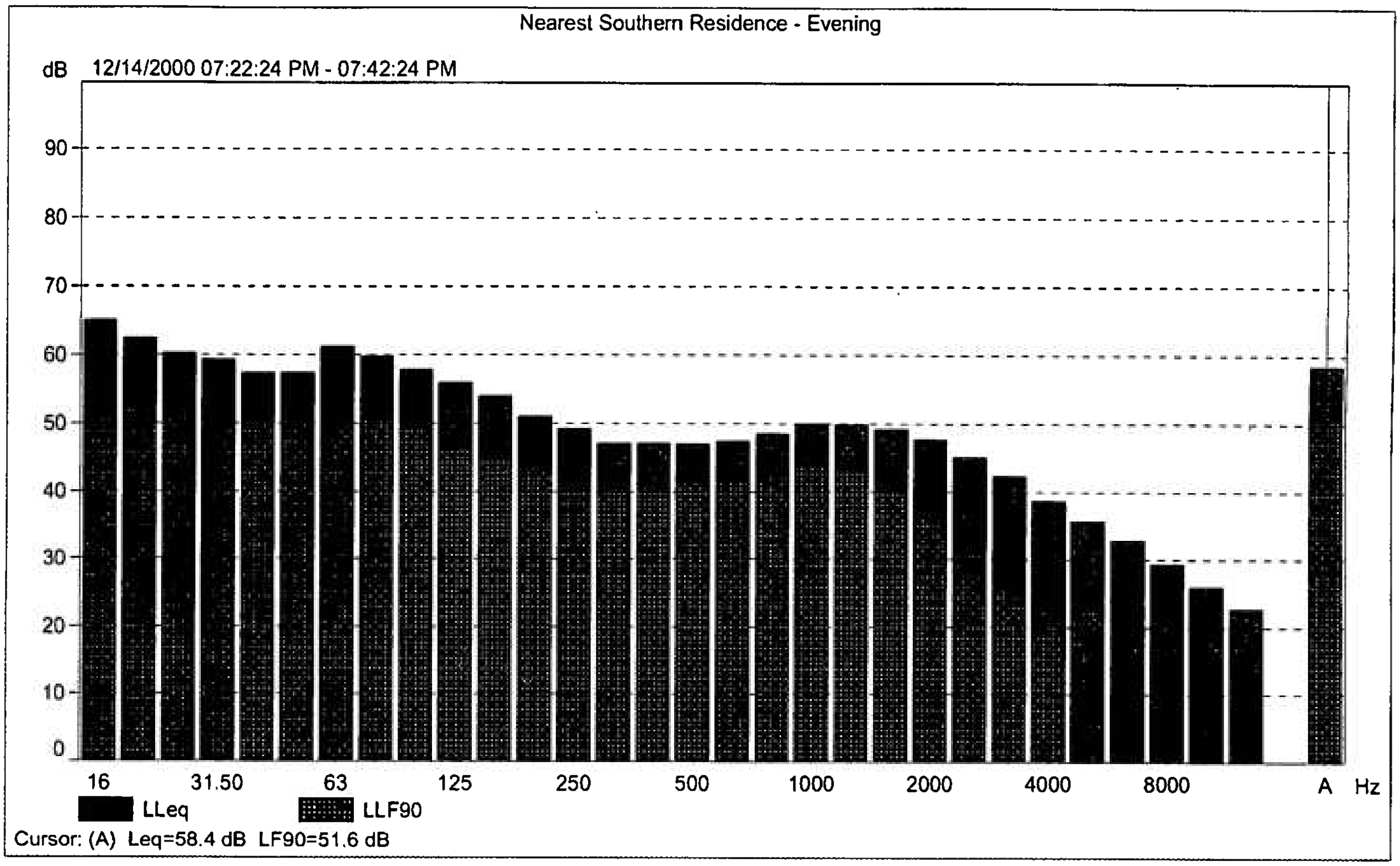


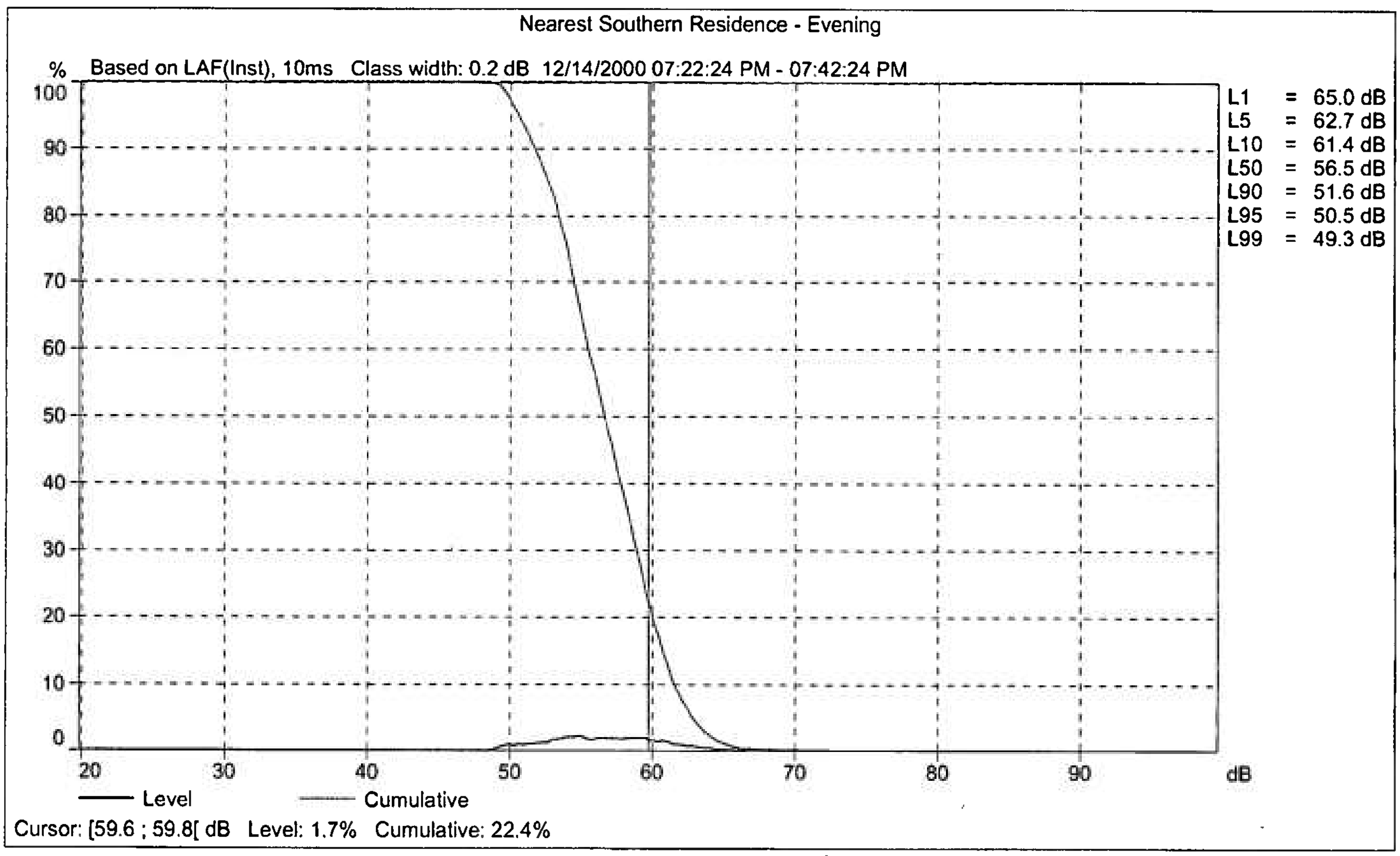
L1 = 73.9 dB
L5 = 70.7 dB
L10 = 68.5 dB
L50 = 56.3 dB
L90 = 51.1 dB
L95 = 50.3 dB
L99 = 49.1 dB

Cursor: [59.6 ; 59.8[dB Level: 0.6% Cumulative: 37.3%

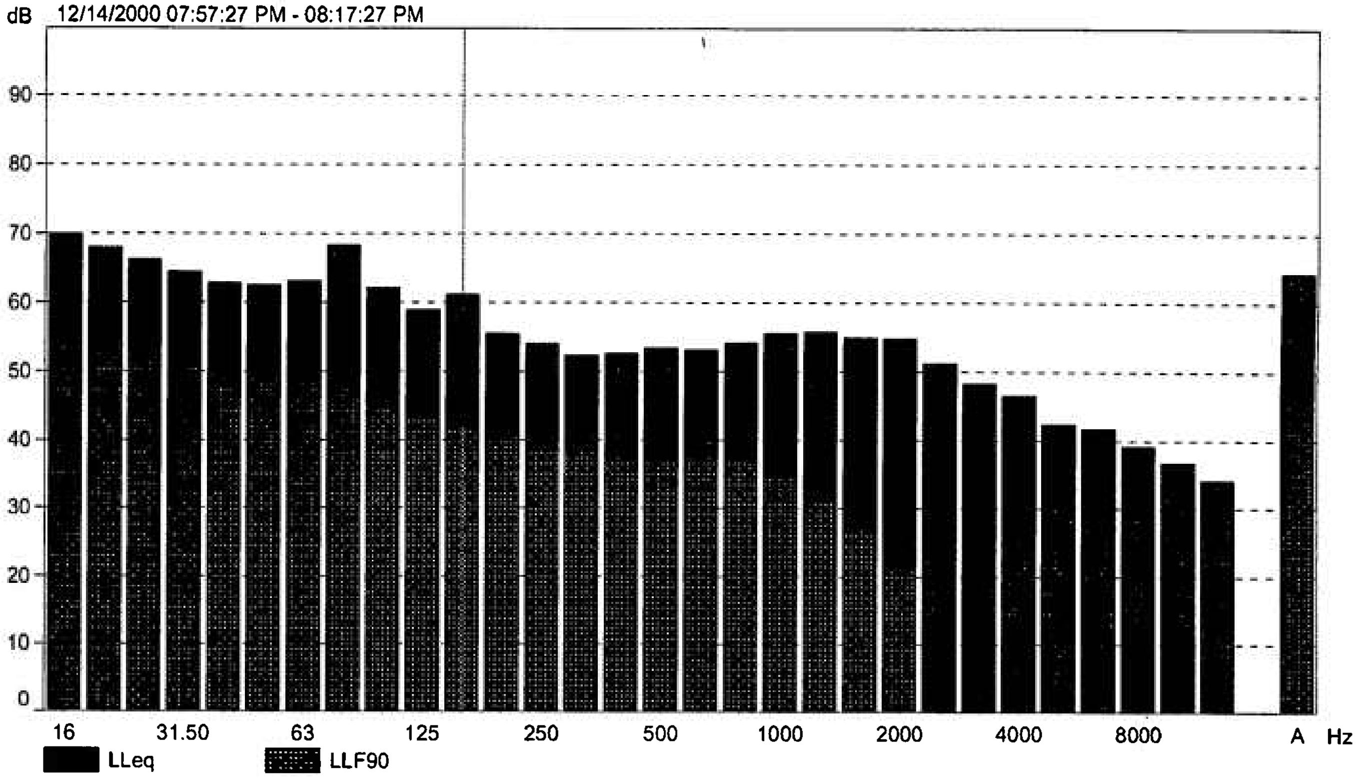

Nearest Western Residences - Evening
dB 12/14/2000 08:50:14 PM - 09:10:14 PM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=53.9 dB LF90=47.1 dB


Nearest Western Residences - Evening
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/14/2000 08:50:14 PM - 09:10:14 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 63.5 dB
L5 = 59.5 dB
L10 = 57.2 dB
L50 = 50.4 dB
L90 = 47.1 dB
L95 = 46.1 dB
L99 = 44.7 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.3% Cumulative: 4.8%


Nearest Southern Residence - Evening
dB 12/14/2000 07:22:24 PM - 07:42:24 PM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=58.4 dB LF90=51.6 dB

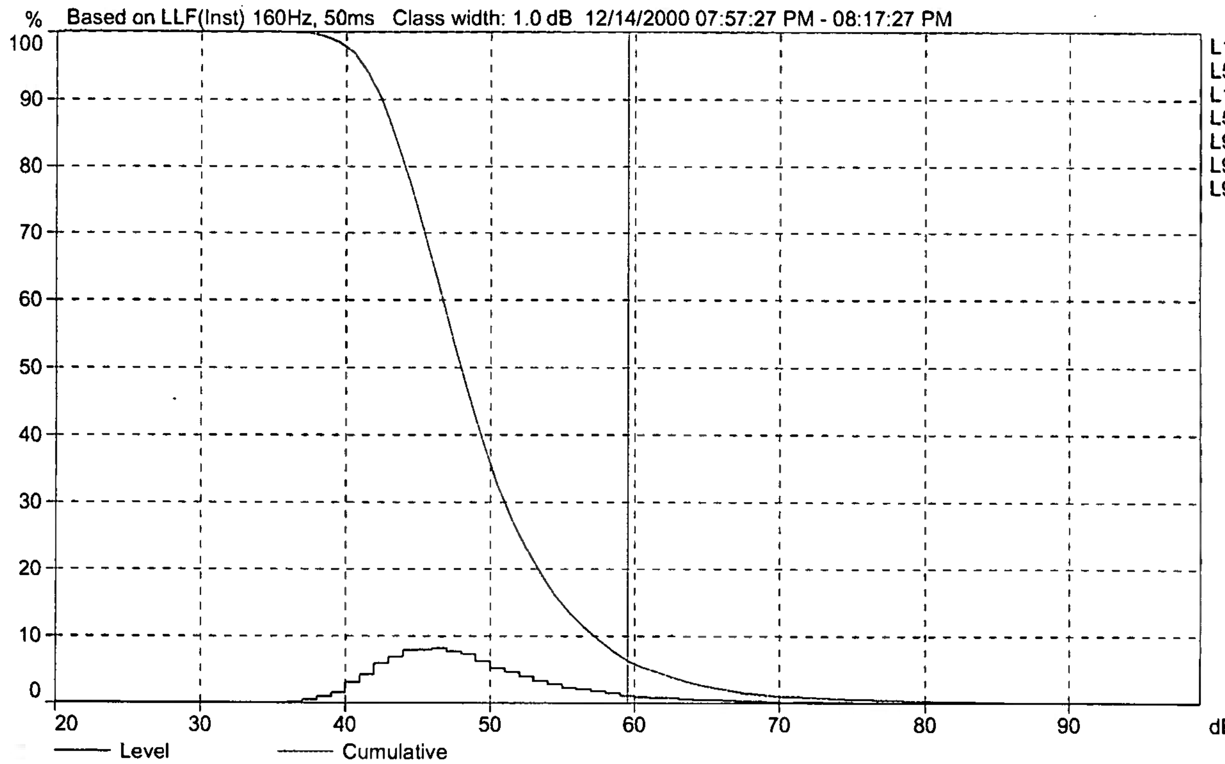

Nearest Southern Residence - Evening
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/14/2000 07:22:24 PM - 07:42:24 PM
L1 = 65.0 dB
L5 = 62.7 dB
L10 = 61.4 dB
L50 = 56.5 dB
L90 = 51.6 dB
L95 = 50.5 dB
L99 = 49.3 dB
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 1.7% Cumulative: 22.4%

Genung Street - Evening



Cursor: 160 Hz LLeq=61.1 dB LLF90=42.0 dB

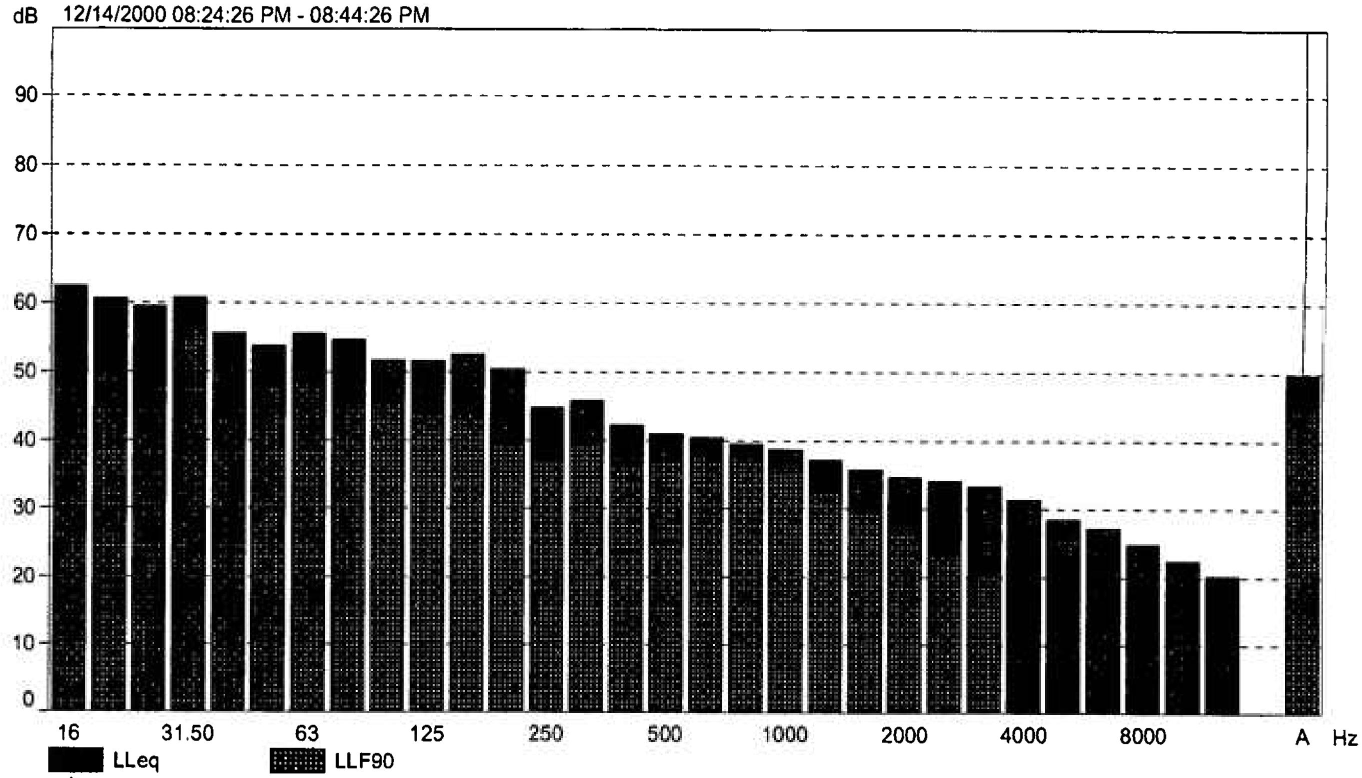
Genung Street - Evening



L1	=	69.3 dB
L5	=	60.4 dB
L10	=	56.6 dB
L50	=	47.5 dB
L90	=	42.0 dB
L95	=	40.7 dB
L99	=	38.4 dB

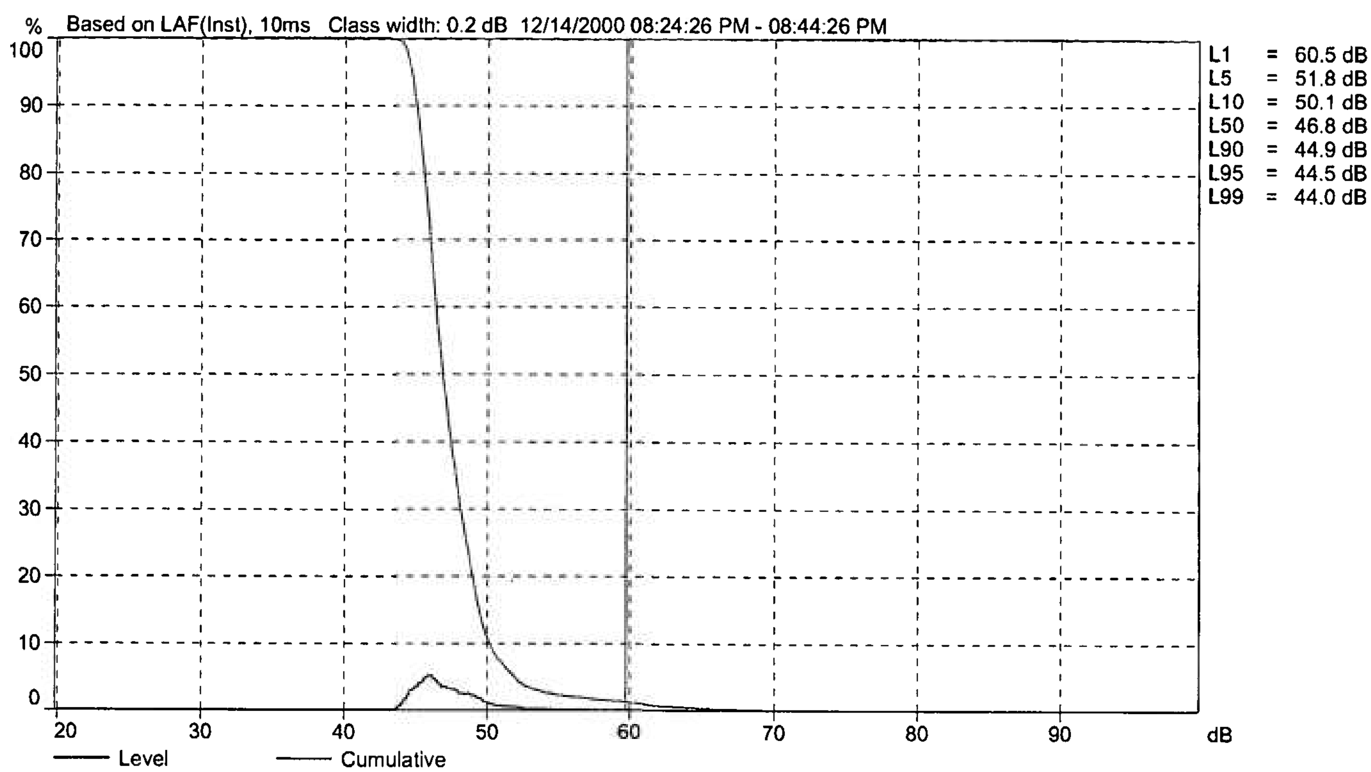
Cursor: [59.0 ; 60.0[dB Level: 1.0% Cumulative: 6.3%

Country View Manor Apartments - Evening

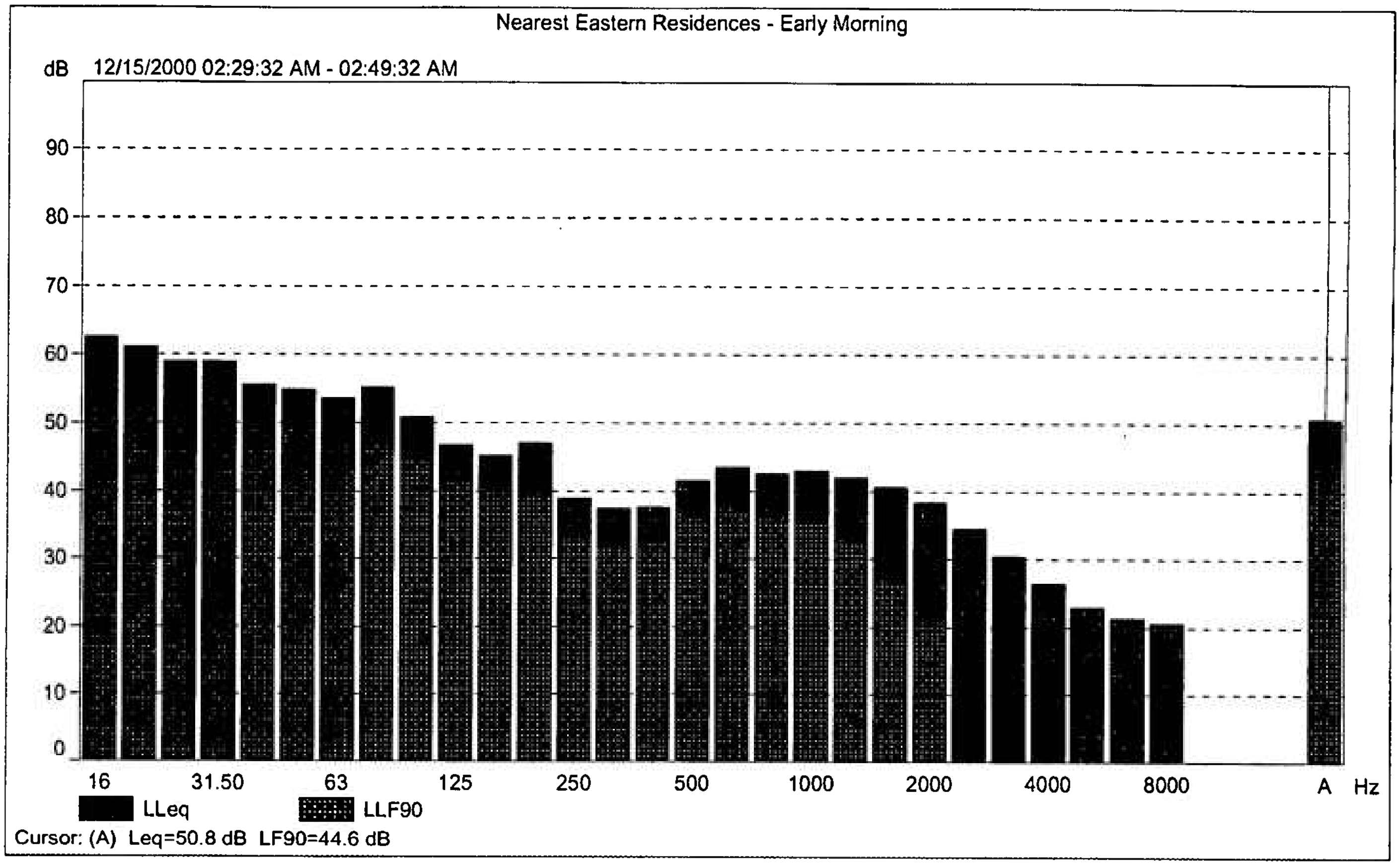


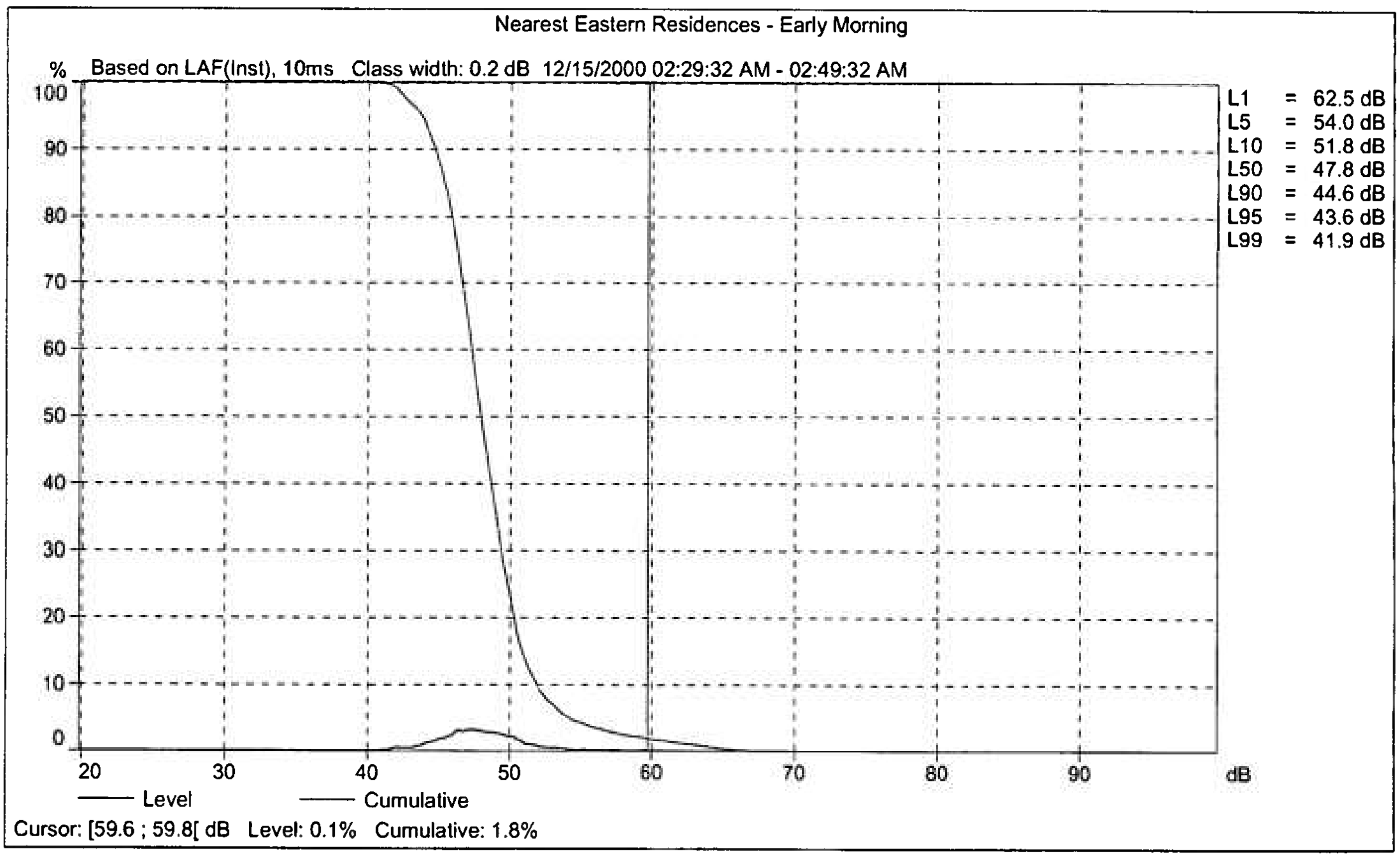
Cursor: (A) Leq=49.9 dB LF90=44.9 dB

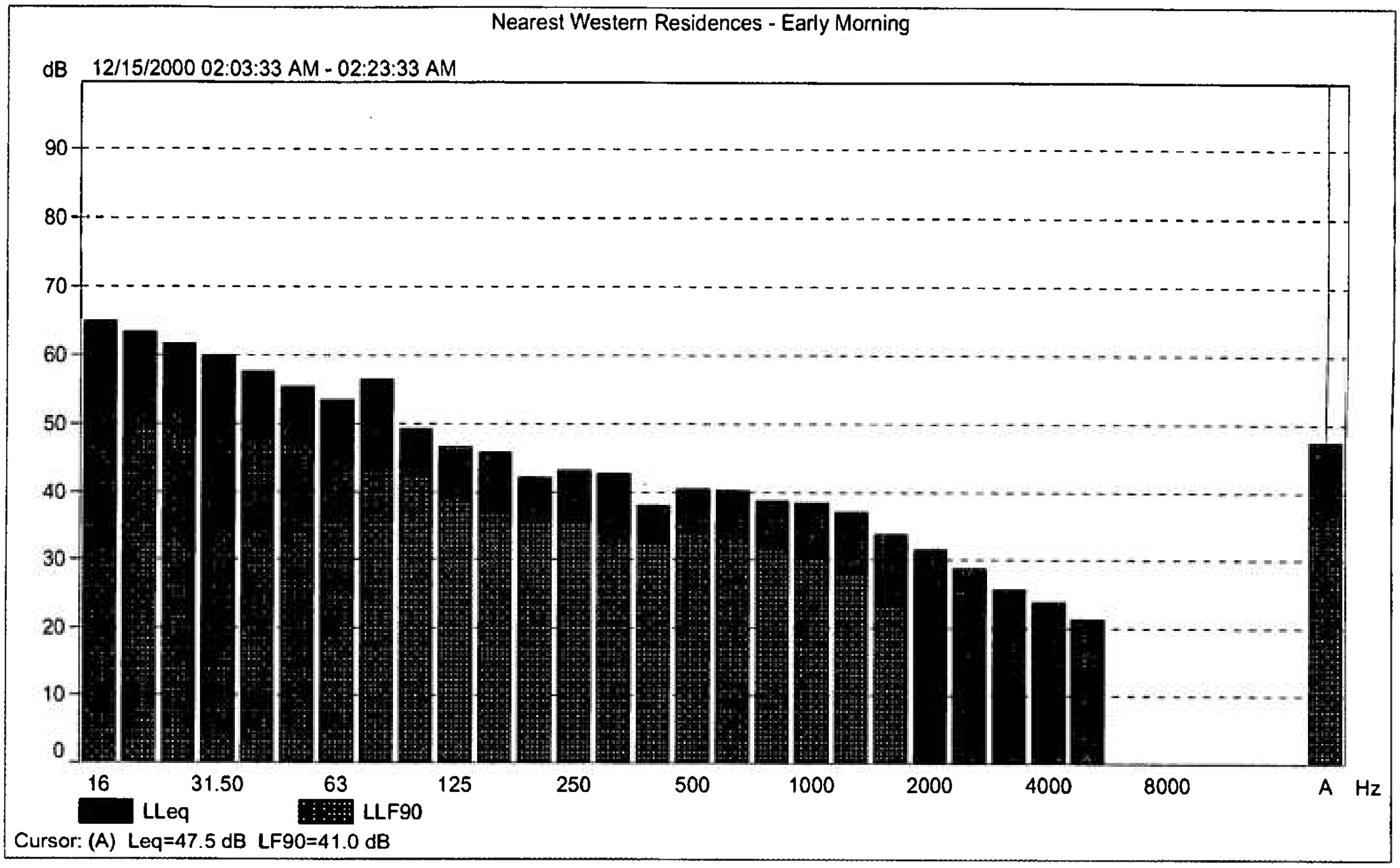
Country View Manor Apartments - Evening

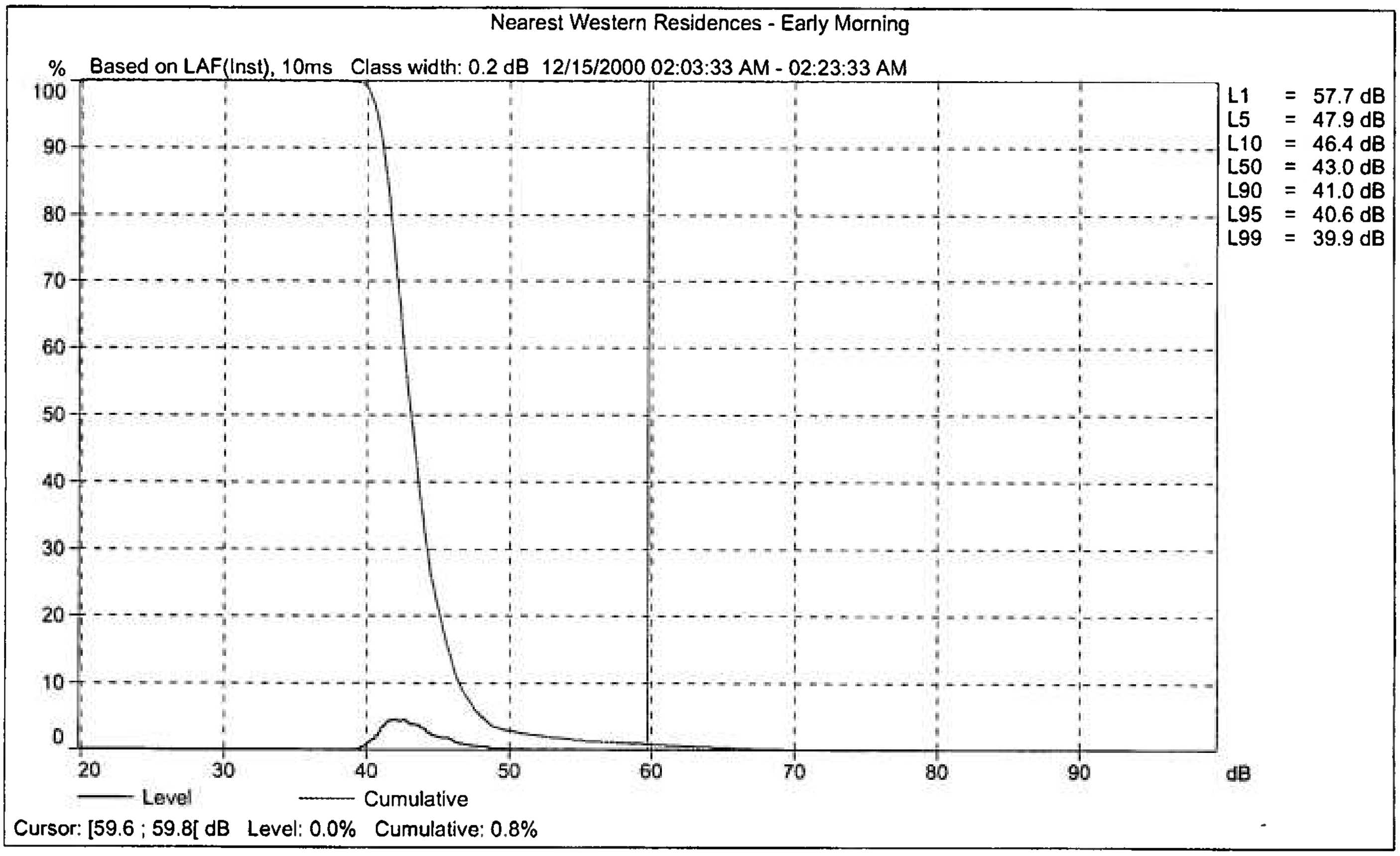


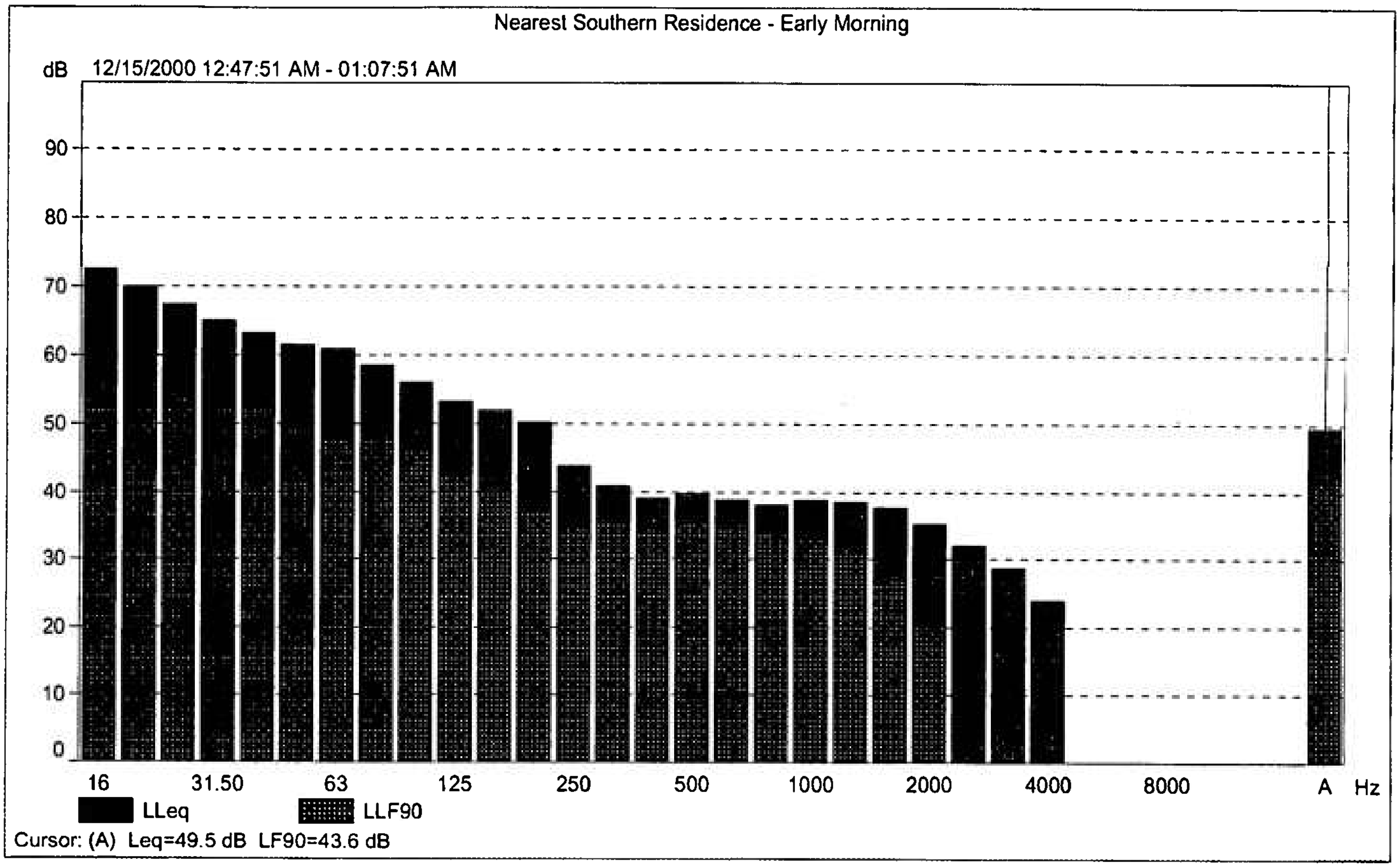
Cursor: [59.6 ; 59.8[dB Level: 0.0% Cumulative: 1.3%

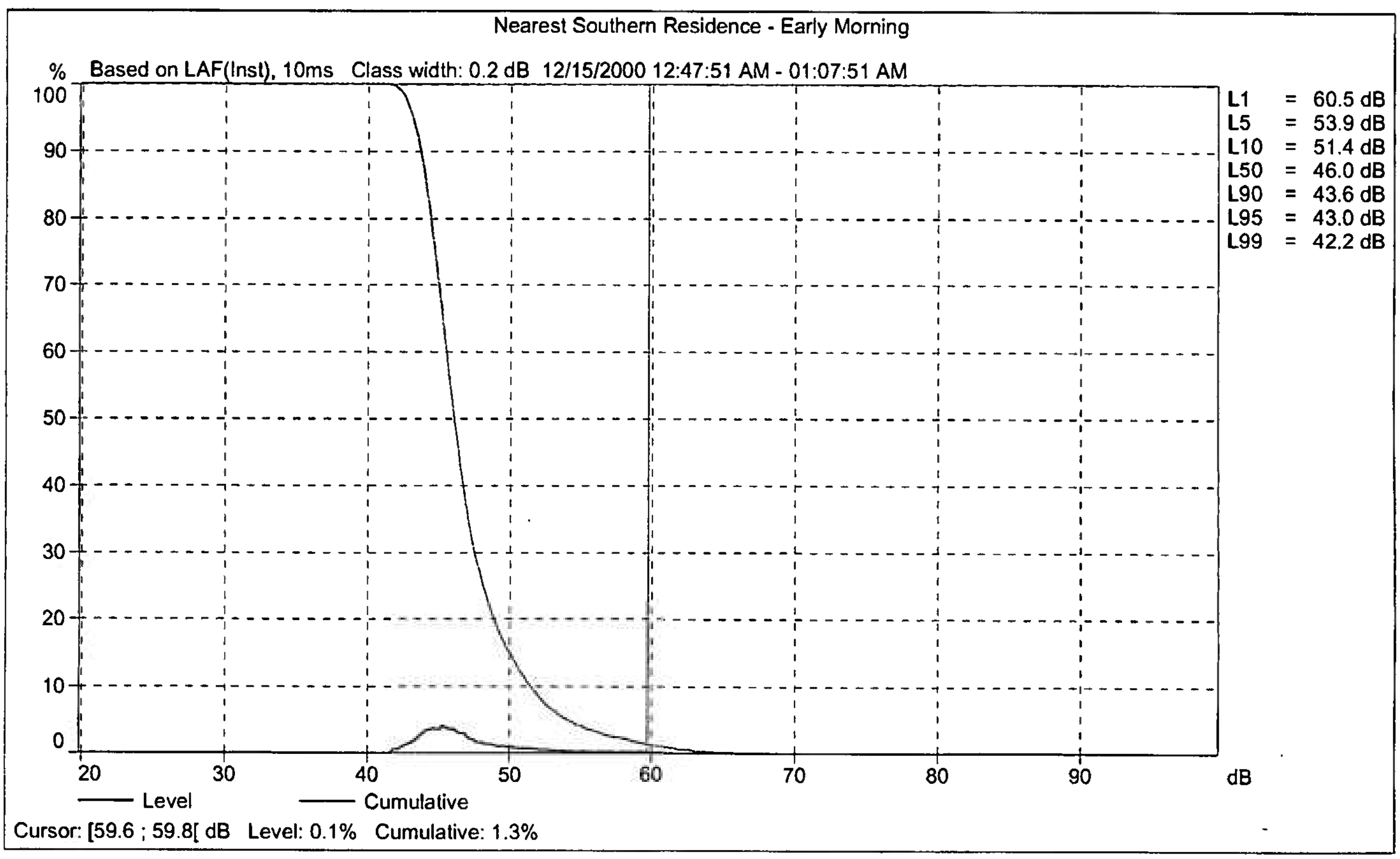

Nearest Eastern Residences - Early Morning
dB 12/15/2000 02:29:32 AM - 02:49:32 AM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=50.8 dB LF90=44.6 dB

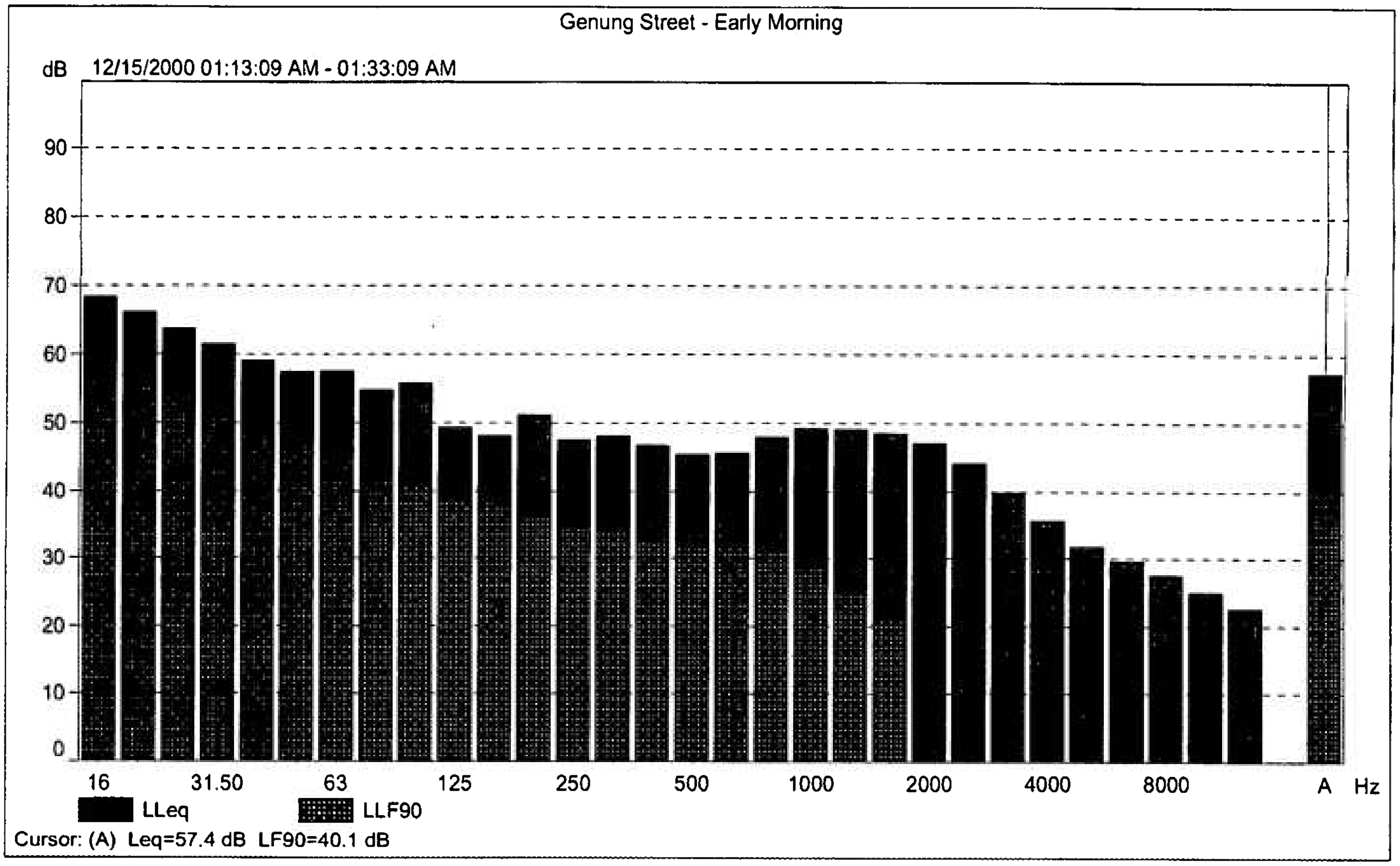

Nearest Eastern Residences - Early Morning
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/15/2000 02:29:32 AM - 02:49:32 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 62.5 dB
L5 = 54.0 dB
L10 = 51.8 dB
L50 = 47.8 dB
L90 = 44.6 dB
L95 = 43.6 dB
L99 = 41.9 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.1% Cumulative: 1.8%

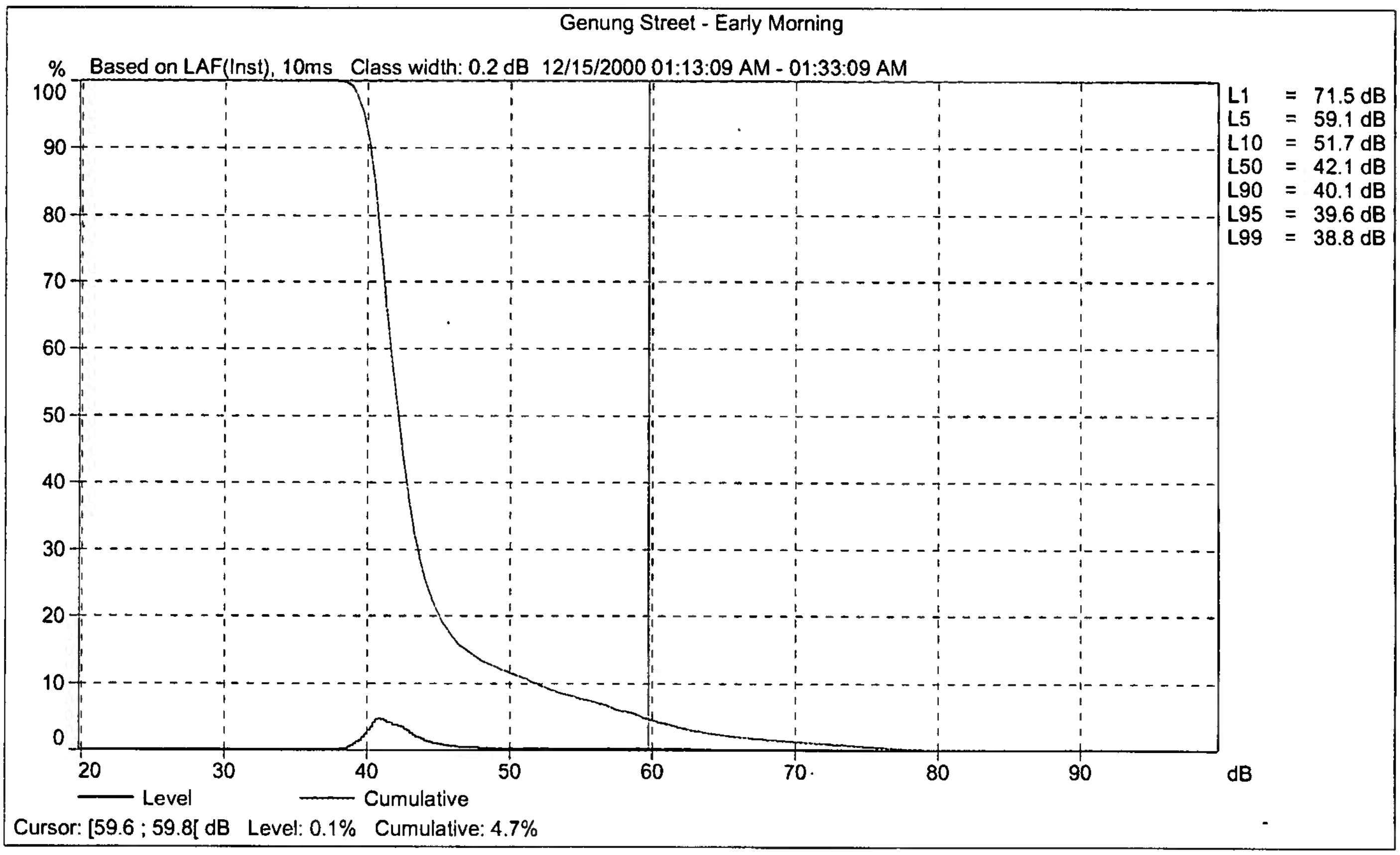

Nearest Western Residences - Early Morning
dB 12/15/2000 02:03:33 AM - 02:23:33 AM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=47.5 dB LF90=41.0 dB


Nearest Western Residences - Early Morning
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/15/2000 02:03:33 AM - 02:23:33 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 57.7 dB
L5 = 47.9 dB
L10 = 46.4 dB
L50 = 43.0 dB
L90 = 41.0 dB
L95 = 40.6 dB
L99 = 39.9 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.0% Cumulative: 0.8%

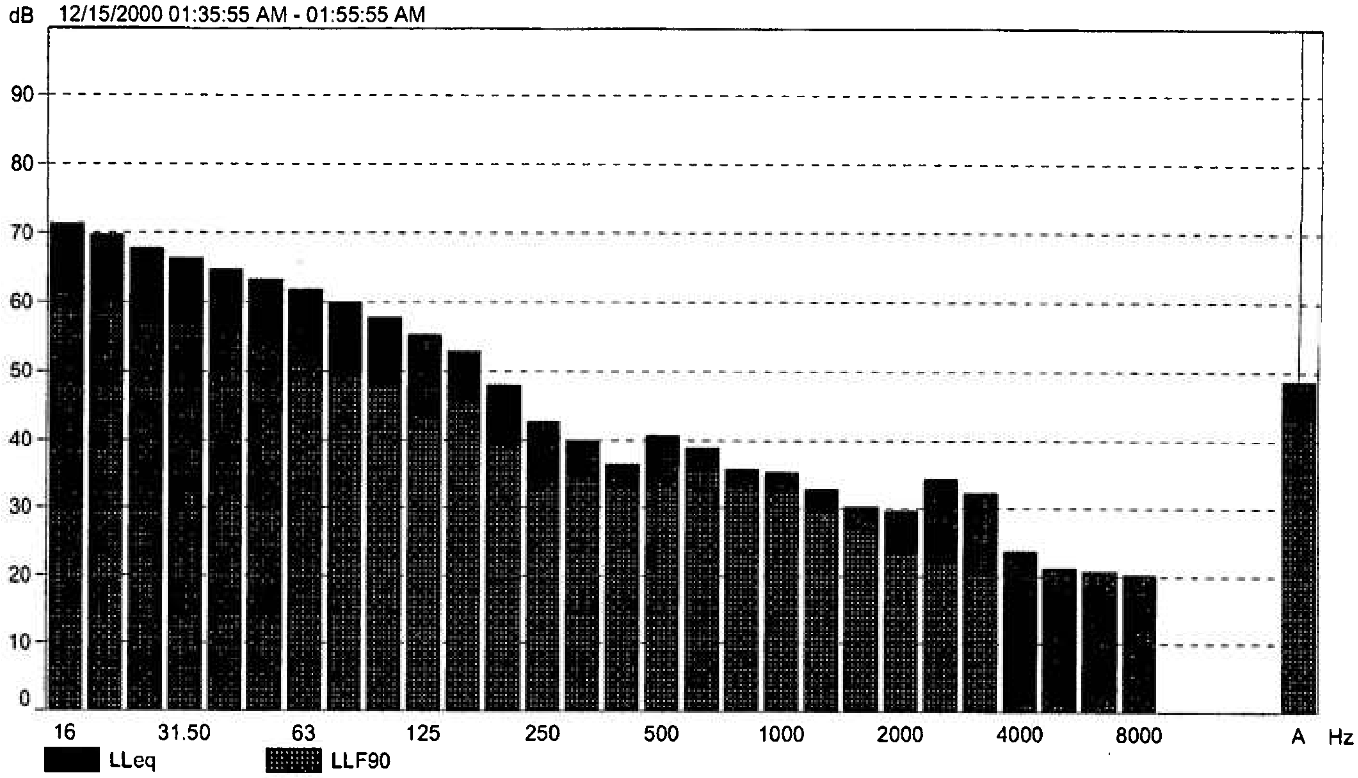

Nearest Southern Residence - Early Morning
dB 12/15/2000 12:47:51 AM - 01:07:51 AM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A Hz
LLeq
LLF90
Cursor: (A) Leq=49.5 dB LF90=43.6 dB


Nearest Southern Residence - Early Morning
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/15/2000 12:47:51 AM - 01:07:51 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 60.5 dB
L5 = 53.9 dB
L10 = 51.4 dB
L50 = 46.0 dB
L90 = 43.6 dB
L95 = 43.0 dB
L99 = 42.2 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.1% Cumulative: 1.3%


Genung Street - Early Morning
dB 12/15/2000 01:13:09 AM - 01:33:09 AM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=57.4 dB LF90=40.1 dB

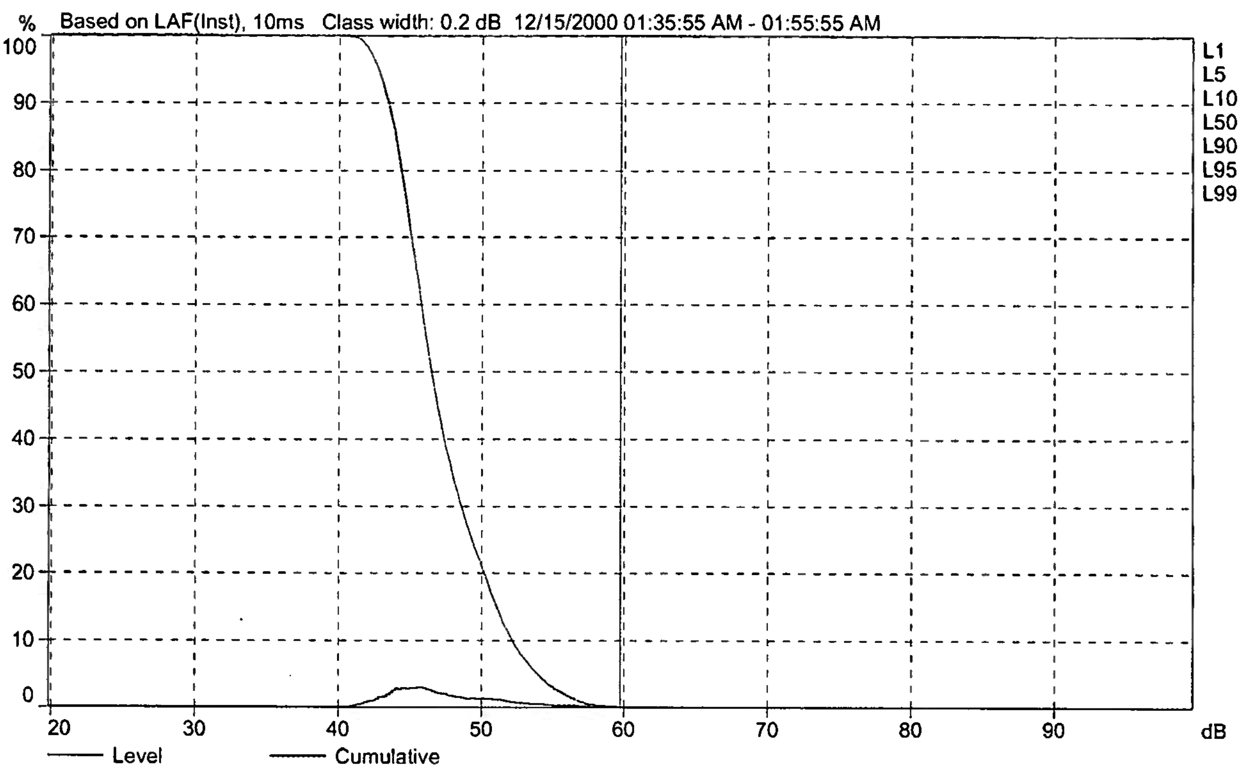

Genung Street - Early Morning
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/15/2000 01:13:09 AM - 01:33:09 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 71.5 dB
L5 = 59.1 dB
L10 = 51.7 dB
L50 = 42.1 dB
L90 = 40.1 dB
L95 = 39.6 dB
L99 = 38.8 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.1% Cumulative: 4.7%

Country View Manor Apartments - Early Morning



Cursor: (A) Leq=48.8 dB LF90=43.4 dB

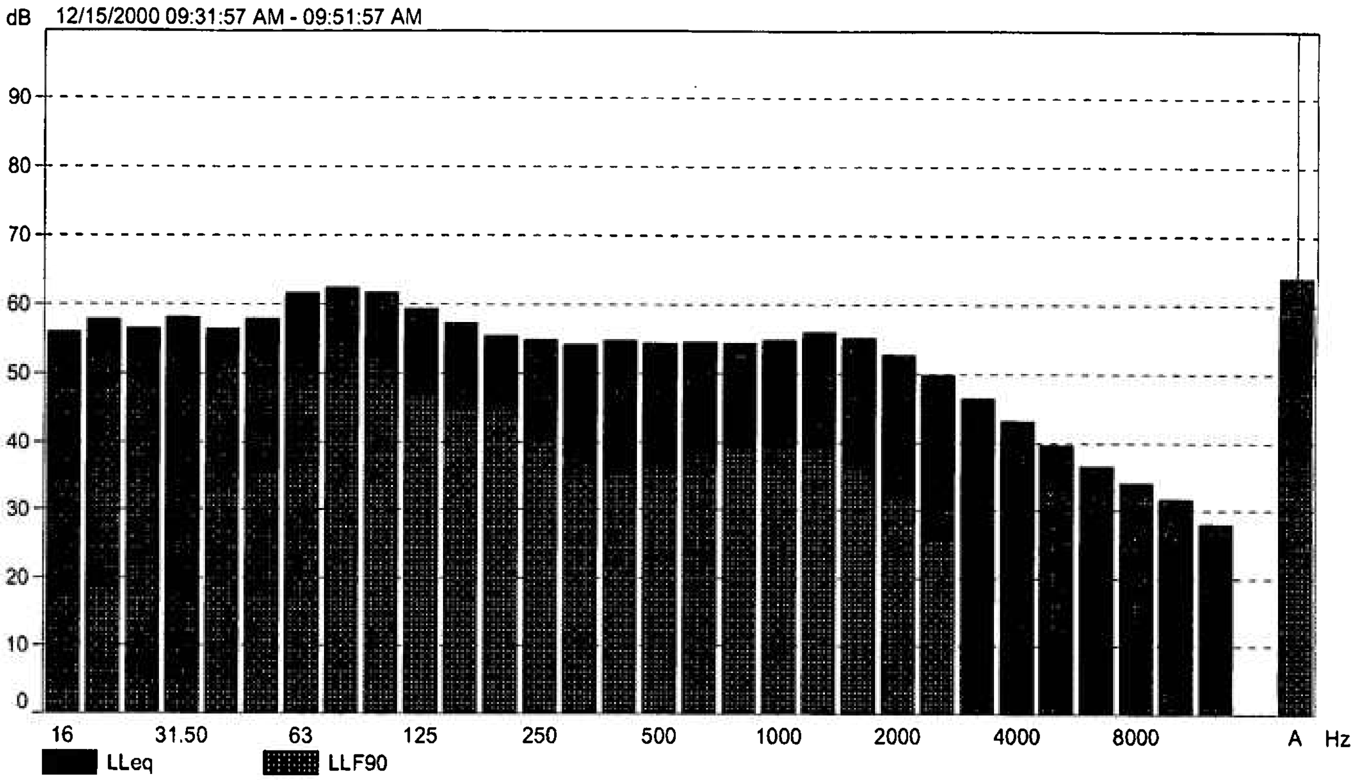
Country View Manor Apartments - Early Morning



L1	=	56.7 dB
L5	=	53.8 dB
L10	=	52.0 dB
L50	=	46.4 dB
L90	=	43.4 dB
L95	=	42.6 dB
L99	=	41.6 dB

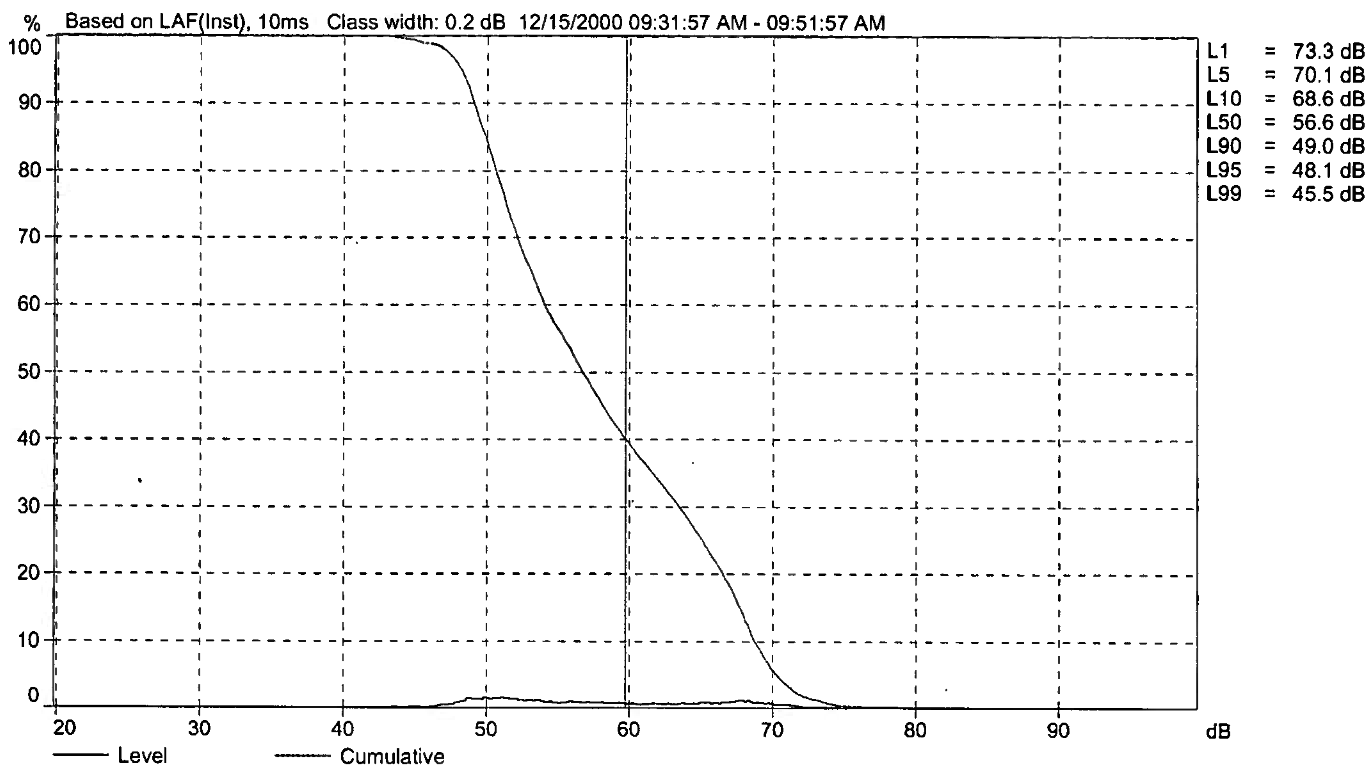
Cursor: [59.6 ; 59.8[dB Level: 0.0% Cumulative: 0.1%

Nearest Eastern Residences - Daytime

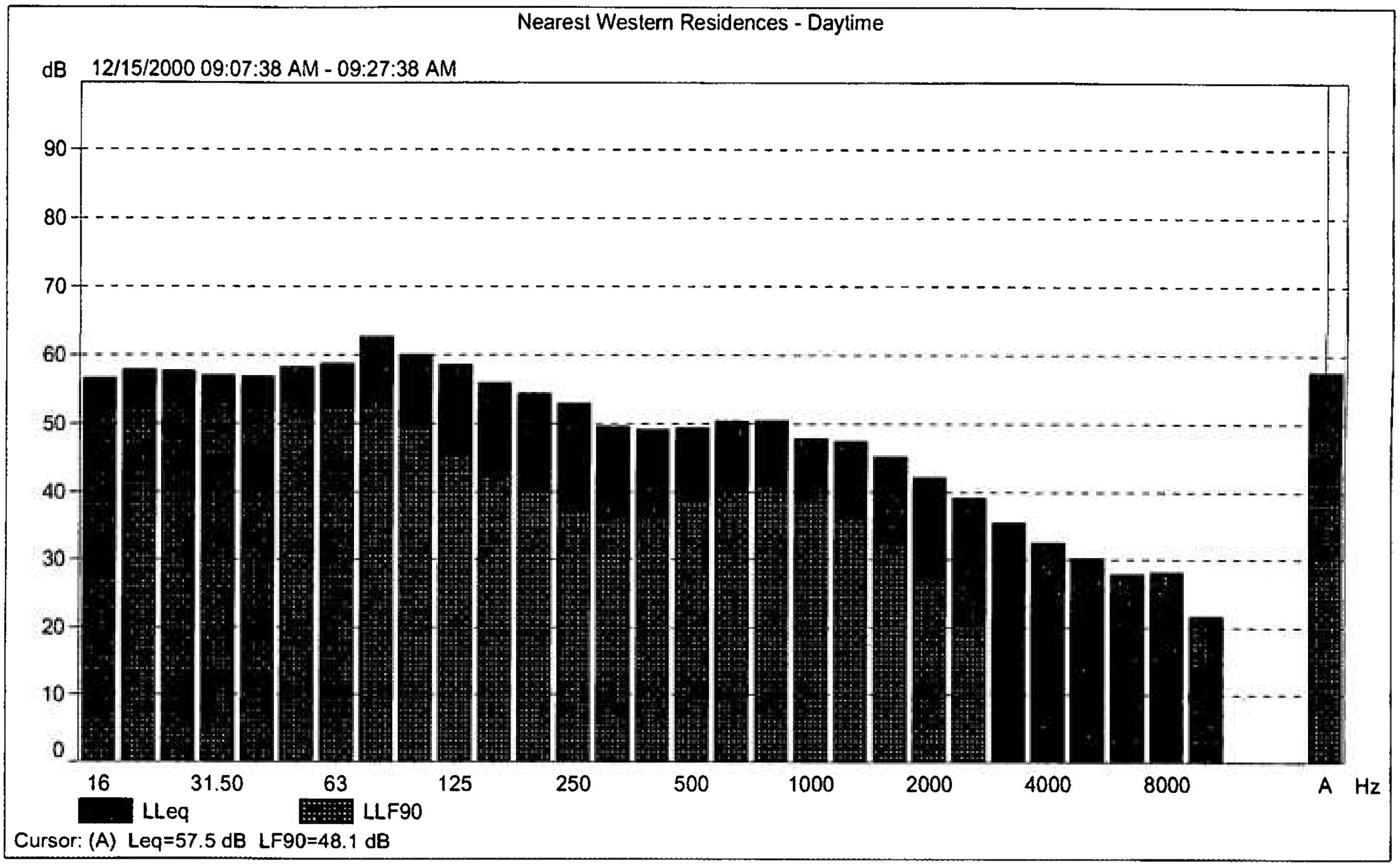


Cursor: (A) Leq=64.0 dB LF90=49.0 dB

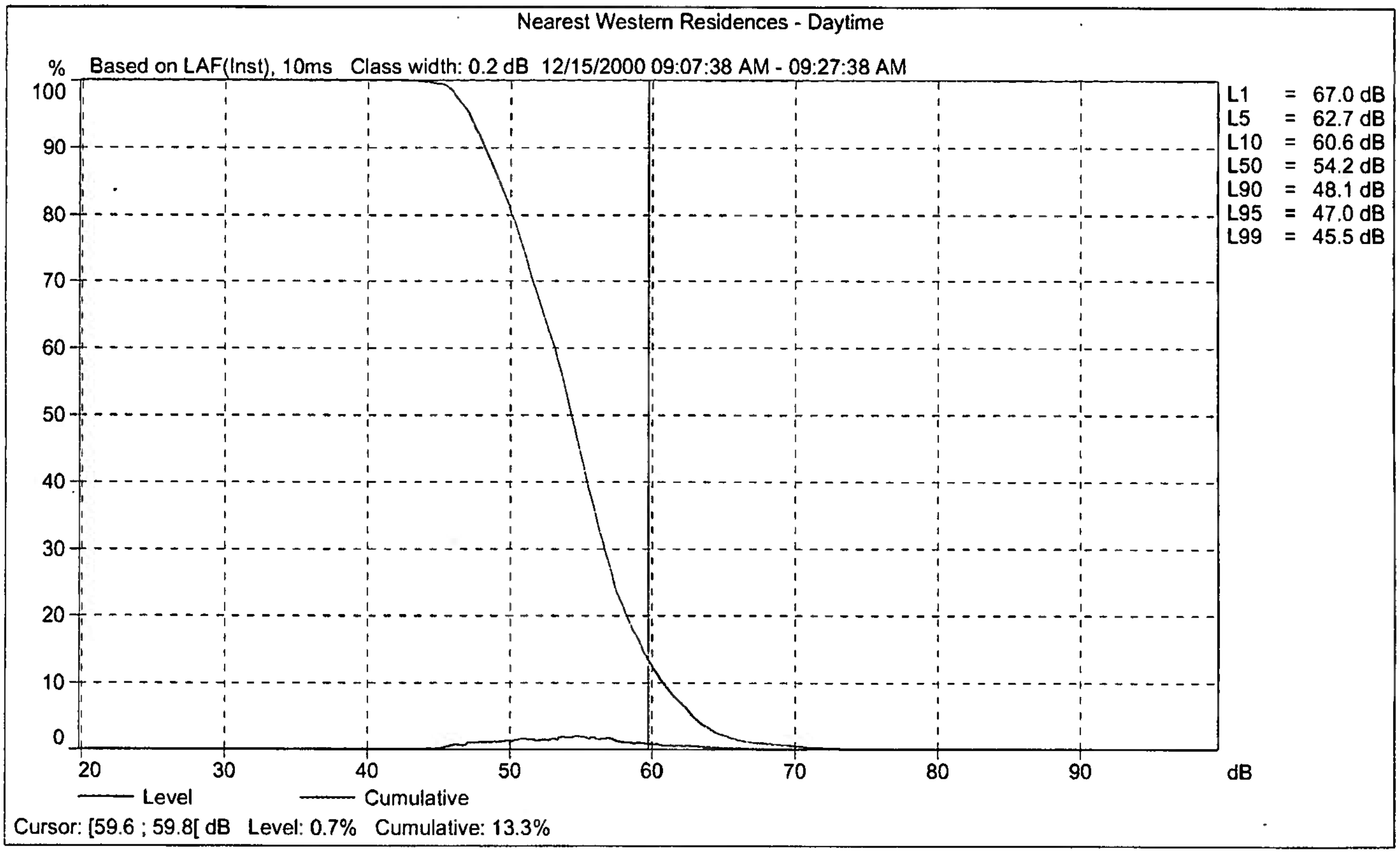
Nearest Eastern Residences - Daytime



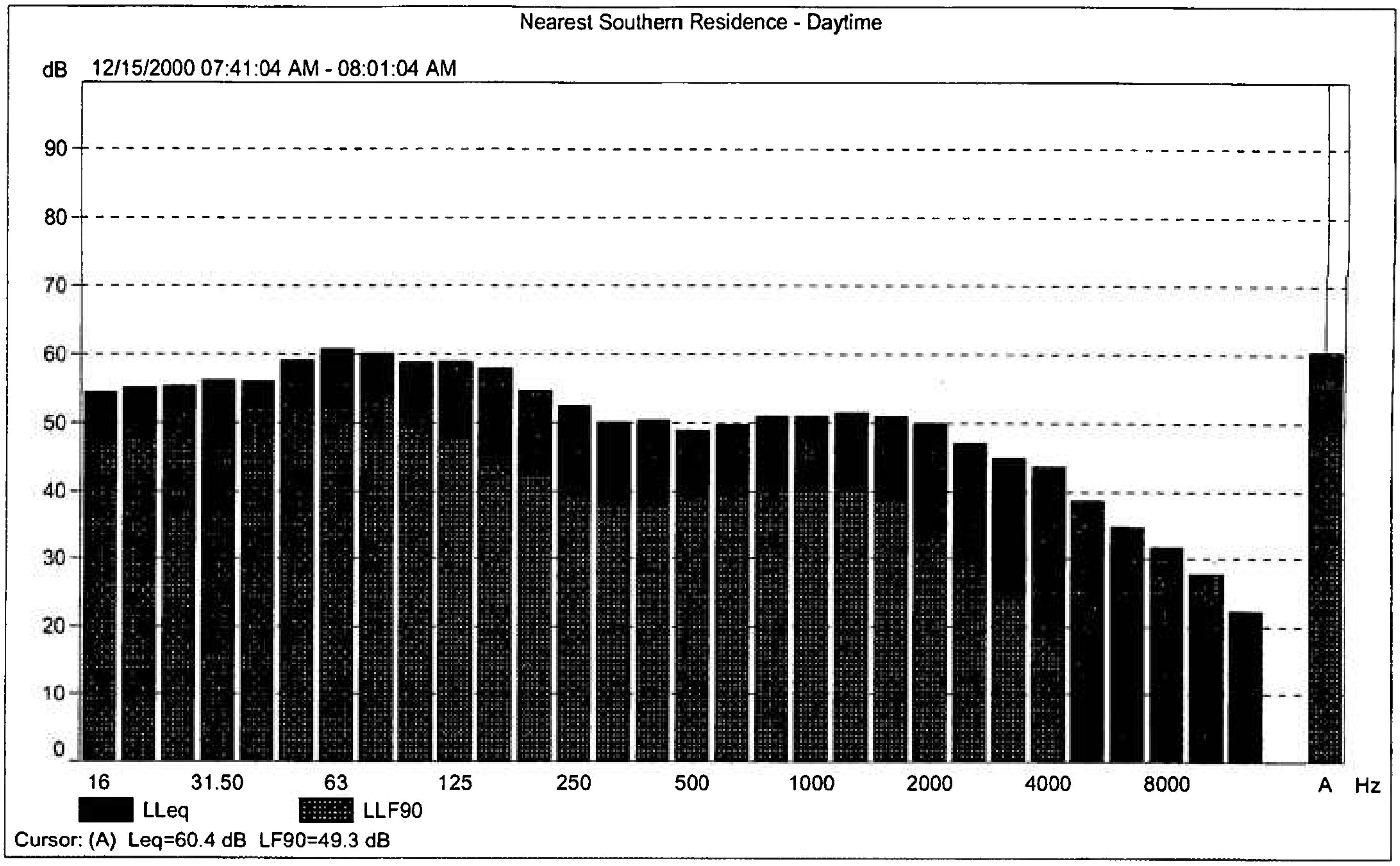
Cursor: [59.6 ; 59.8[dB Level: 0.6% Cumulative: 40.0%

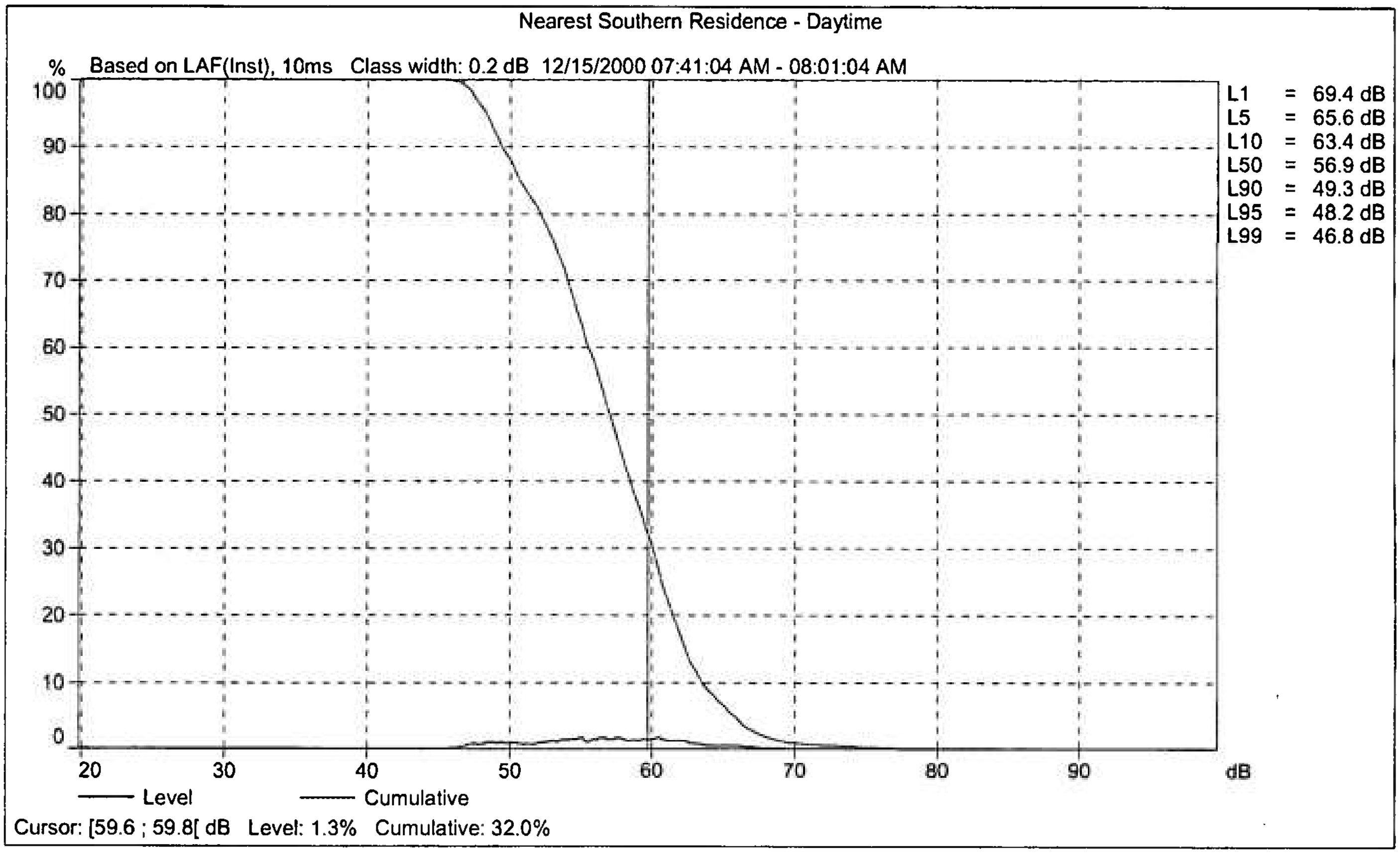


Nearest Western Residences - Daytime
dB 12/15/2000 09:07:38 AM - 09:27:38 AM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=57.5 dB LF90=48.1 dB

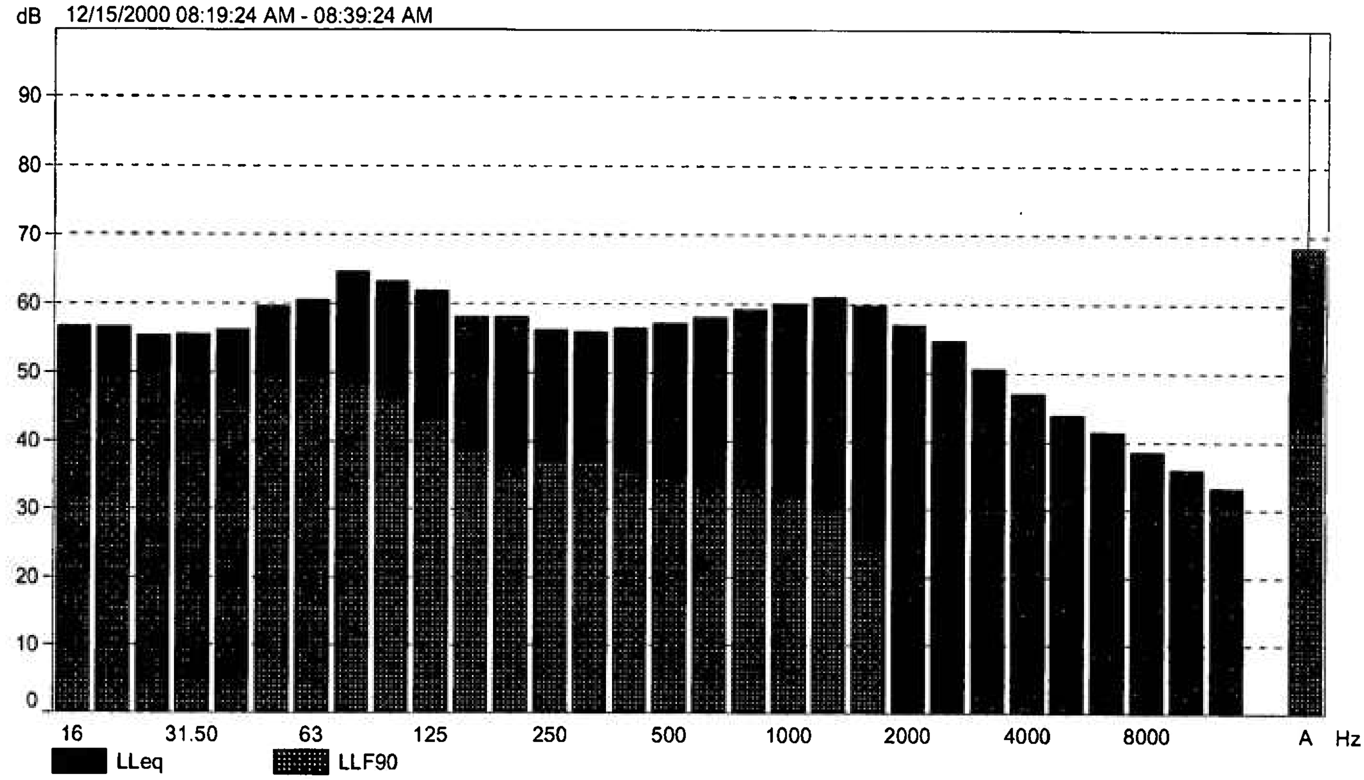


Nearest Western Residences - Daytime
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/15/2000 09:07:38 AM - 09:27:38 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 67.0 dB
L5 = 62.7 dB
L10 = 60.6 dB
L50 = 54.2 dB
L90 = 48.1 dB
L95 = 47.0 dB
L99 = 45.5 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.7% Cumulative: 13.3%


Nearest Southern Residence - Daytime
dB 12/15/2000 07:41:04 AM - 08:01:04 AM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=60.4 dB LF90=49.3 dB

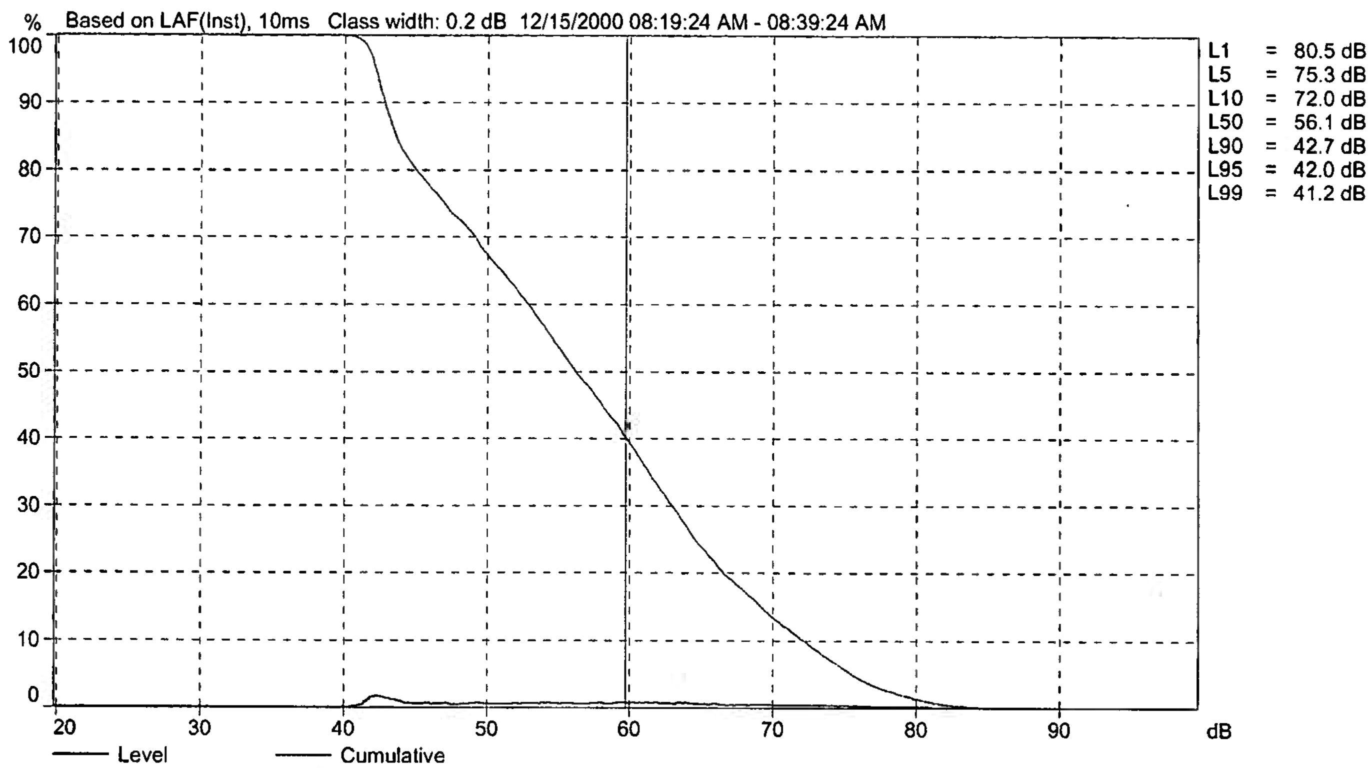

Nearest Southern Residence - Daytime
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/15/2000 07:41:04 AM - 08:01:04 AM
L1 = 69.4 dB
L5 = 65.6 dB
L10 = 63.4 dB
L50 = 56.9 dB
L90 = 49.3 dB
L95 = 48.2 dB
L99 = 46.8 dB
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 1.3% Cumulative: 32.0%

Genung Street - Daytime

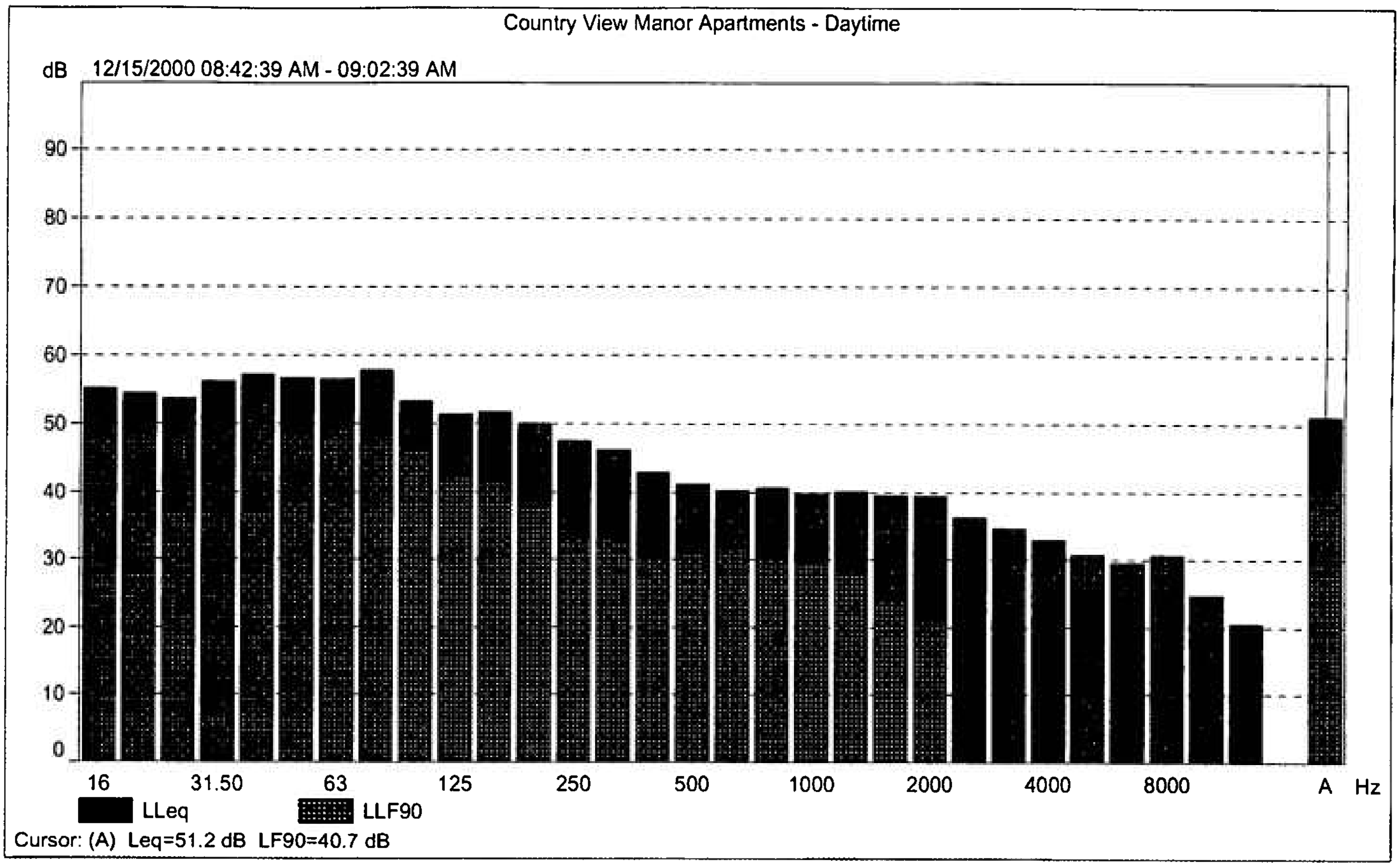


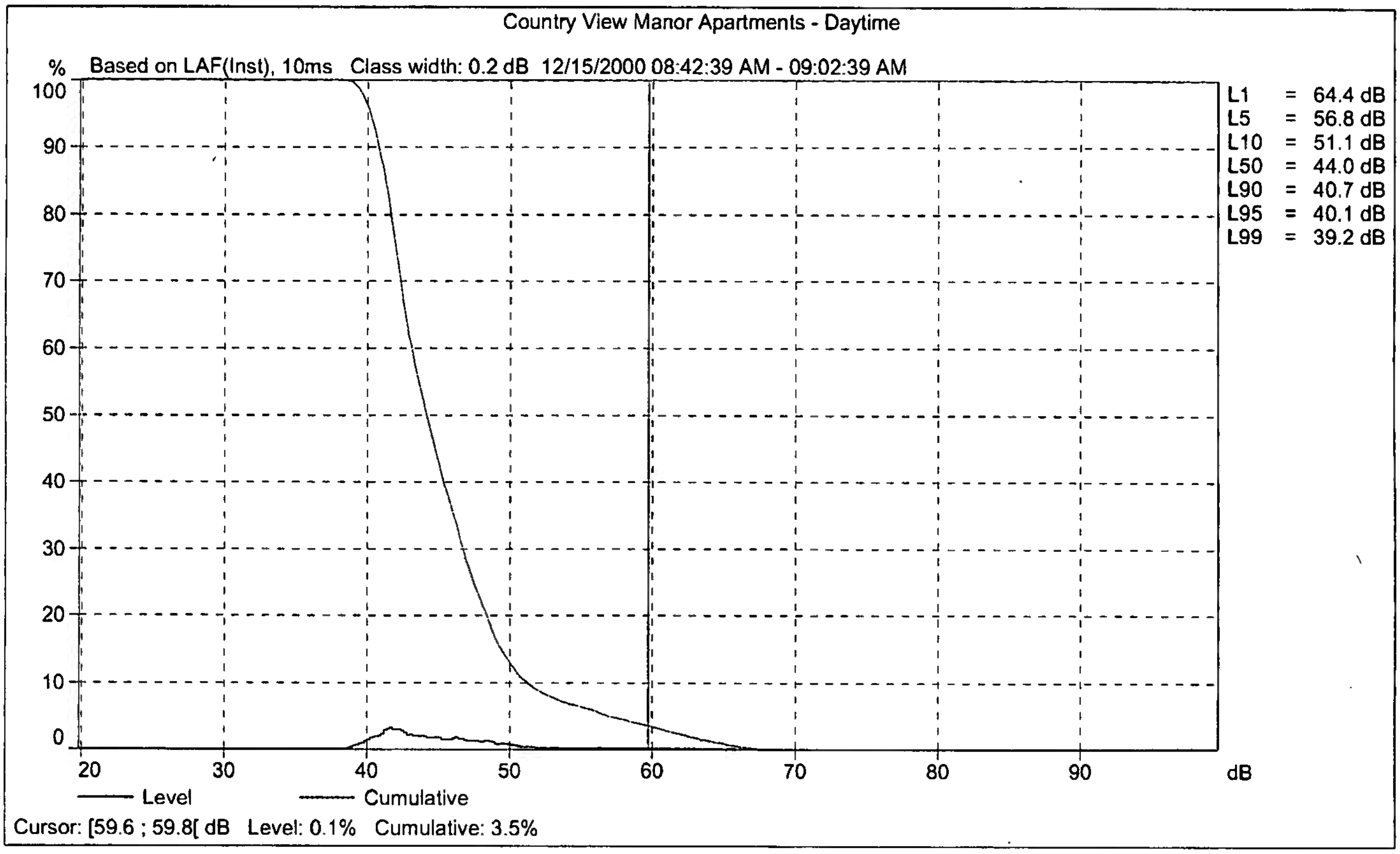
Cursor: (A) Leq=68.3 dB LF90=42.7 dB

Genung Street - Daytime



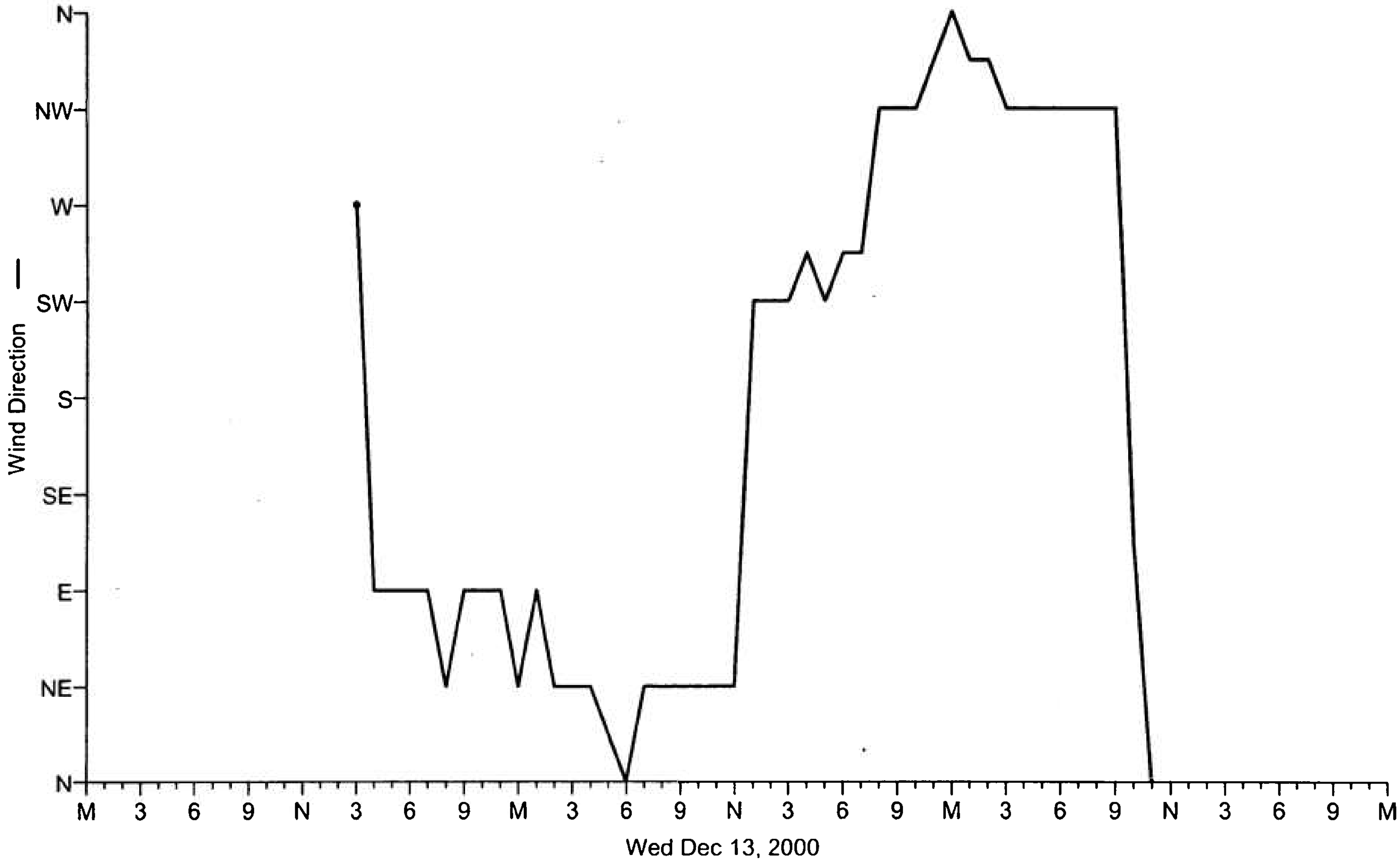
Cursor: [59.6 ; 59.8[dB Level: 0.7% Cumulative: 40.0%


Country View Manor Apartments - Daytime
dB 12/15/2000 08:42:39 AM - 09:02:39 AM
90
80
70
60
50
40
30
20
10
0
16
31.50
63
125
250
500
1000
2000
4000
8000
A
Hz
LLeq
LLF90
Cursor: (A) Leq=51.2 dB LF90=40.7 dB

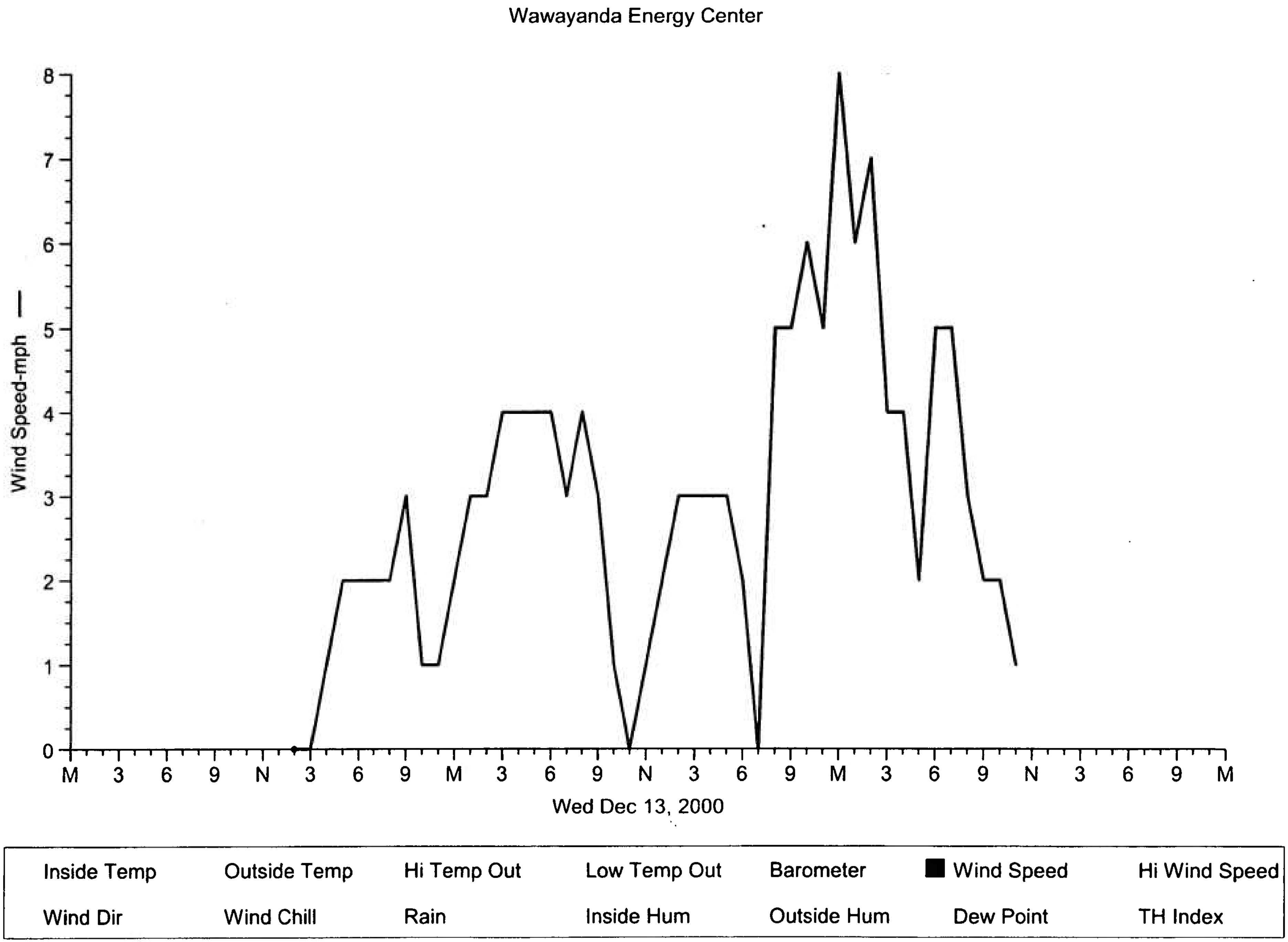

Country View Manor Apartments - Daytime
% Based on LAF(Inst), 10ms Class width: 0.2 dB 12/15/2000 08:42:39 AM - 09:02:39 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
dB
L1 = 64.4 dB
L5 = 56.8 dB
L10 = 51.1 dB
L50 = 44.0 dB
L90 = 40.7 dB
L95 = 40.1 dB
L99 = 39.2 dB
Level
Cumulative
Cursor: [59.6 ; 59.8[dB Level: 0.1% Cumulative: 3.5%

Winter Weather Monitor Data

Wawayanda Energy Center

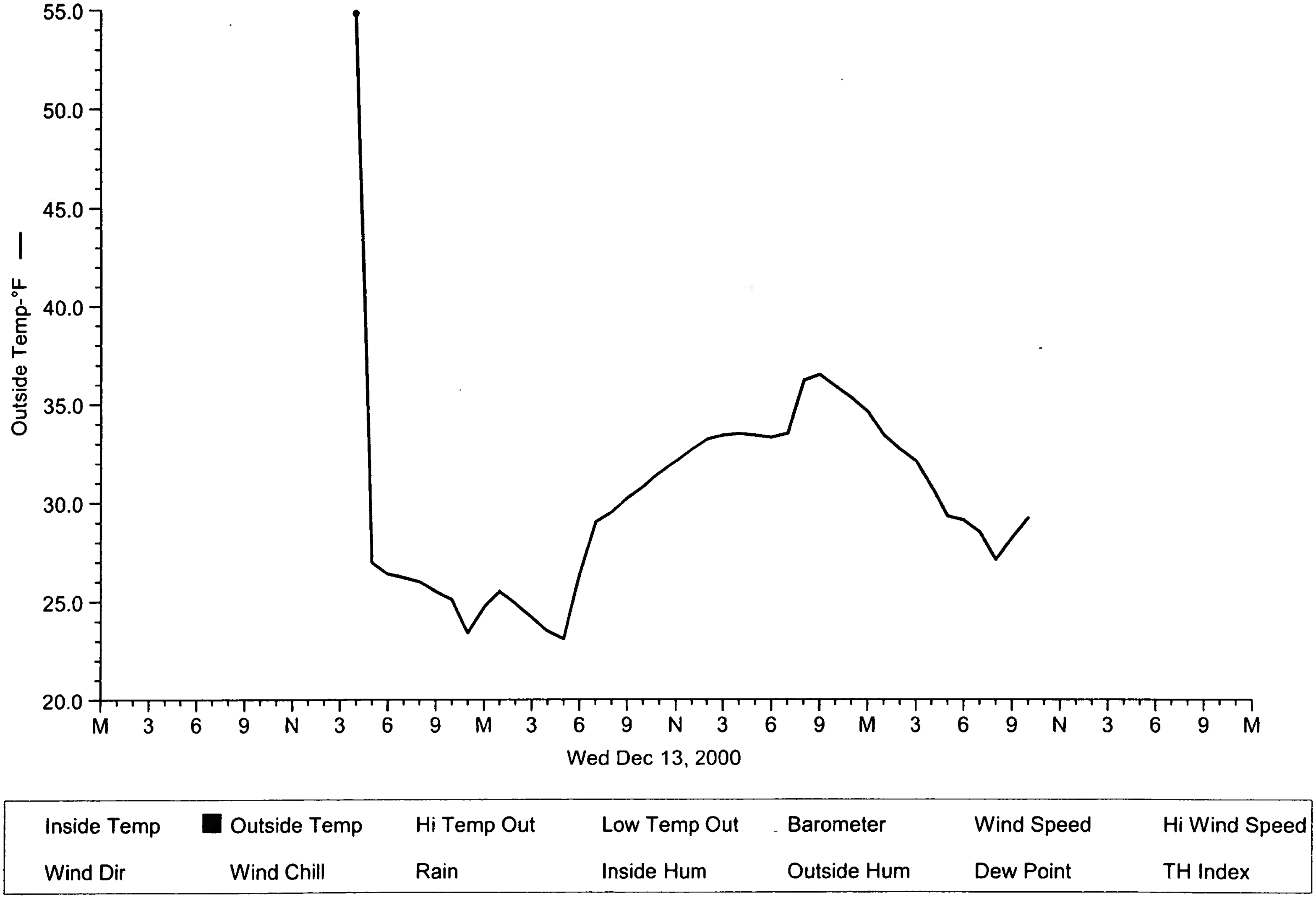


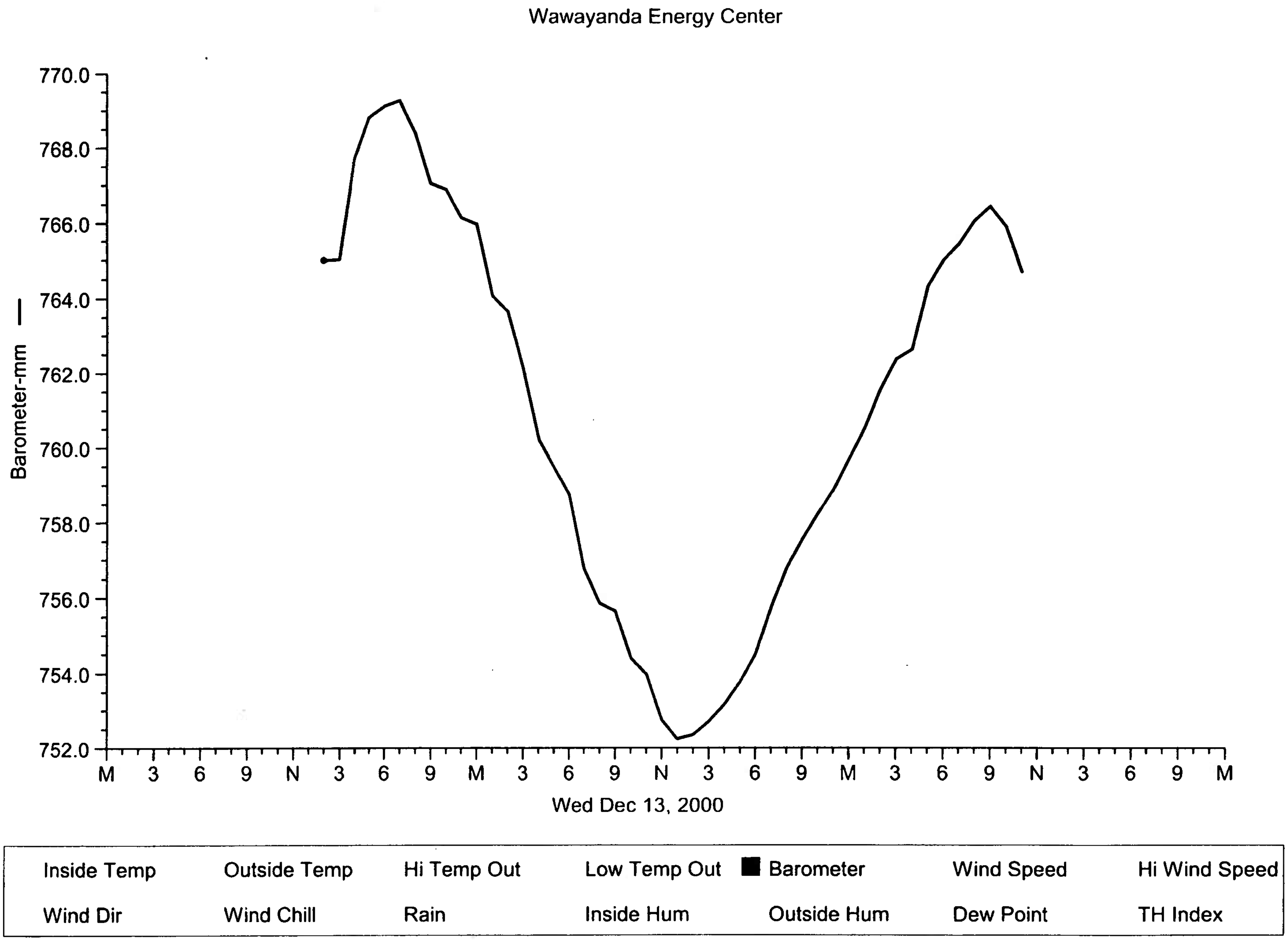
Inside Temp	Outside Temp	Hi Temp Out	Low Temp Out	Barometer	Wind Speed	Hi Wind Speed
Wind Dir	Wind Chill	Rain	Inside Hum	Outside Hum	Dew Point	TH Index



Wawayanda Energy Center
Wind Speed-mph
8
7
6
5
4
3
2
1
0
M 3 6 9 N 3 6 9 M 3 6 9 N 3 6 9 M 3 6 9 N 3 6 9 M
Wed Dec 13, 2000
Inside Temp
Outside Temp
Hi Temp Out
Low Temp Out
Barometer
Wind Speed
Hi Wind Speed
Wind Dir
Wind Chill
Rain
Inside Hum
Outside Hum
Dew Point
TH Index

Wawayanda Energy Center




Wawayanda Energy Center
Barometer-mm
770.0
768.0
766.0
764.0
762.0
760.0
758.0
756.0
754.0
752.0
M 3 6 9 N 3 6 9 M 3 6 9 N 3 6 9 M 3 6 9 N 3 6 9 M
Wed Dec 13, 2000
Inside Temp
Outside Temp
Hi Temp Out
Low Temp Out
Barometer
Wind Speed
Hi Wind Speed
Wind Dir
Wind Chill
Rain
Inside Hum
Outside Hum
Dew Point
TH Index

12/13/00	2:00p	--	--	--	--	--	--	--	0.0	0.0	---	765.0	69.0	37	60
12/13/00	3:00p	--	--	--	--	51.9	17	--	0.0	6.0	W	765.0	71.6	29	60
12/13/00	4:00p	54.8	54.8	54.8	64.1	29.1	35	27.7	1.0	5.0	E	767.7	64.2	24	60
12/13/00	5:00p	27.0	27.0	27.0	29.1	26.5	40	5.9	2.0	5.0	E	768.8	44.4	25	60
12/13/00	6:00p	26.4	26.4	26.4	26.6	26.2	45	8.0	2.0	5.0	E	769.1	36.8	25	60
12/13/00	7:00p	26.2	26.2	26.2	26.3	26.1	43	6.8	2.0	5.0	E	769.3	33.0	27	60
12/13/00	8:00p	26.0	26.0	26.0	26.1	25.9	45	7.6	2.0	4.0	NE	768.4	30.9	26	60
12/13/00	9:00p	25.5	25.5	25.5	26.1	25.0	45	7.1	3.0	6.0	E	767.1	29.4	26	60
12/13/00	10:00p	25.1	25.1	25.1	25.4	24.7	48	8.2	1.0	6.0	E	766.9	27.9	27	60
12/13/00	11:00p	23.4	23.4	23.4	24.7	22.7	52	8.4	1.0	4.0	E	766.1	26.1	27	60
12/13/00	12:00p	24.7	24.7	24.7	25.6	23.8	47	7.4	2.0	5.0	NE	766.0	25.4	27	60

12/14/00	12:00a	24.7	24.7	24.7	25.6	23.8	47	7.4	2.0	5.0	NE	766.0	25.4	27	60
12/14/00	1:00a	25.5	25.5	25.5	25.7	25.1	52	10.3	3.0	5.0	E	764.1	26.4	28	60
12/14/00	2:00a	24.9	24.9	24.9	25.1	24.8	66	15.2	3.0	6.0	NE	763.7	26.4	28	60
12/14/00	3:00a	24.2	24.2	24.2	25.0	23.6	77	18.0	4.0	7.0	NE	762.1	25.9	29	60
12/14/00	4:00a	23.5	23.5	23.5	23.7	22.7	84	19.4	4.0	9.0	NE	760.2	25.4	29	60
12/14/00	5:00a	23.1	23.1	23.1	24.3	22.6	86	19.5	4.0	8.0	NNE	759.5	25.1	29	60
12/14/00	6:00a	26.3	26.3	26.3	27.9	24.3	89	23.5	4.0	9.0	N	758.7	27.1	29	60
12/14/00	7:00a	29.0	29.0	29.0	29.4	28.0	89	26.2	3.0	8.0	NE	756.8	29.9	30	60
12/14/00	8:00a	29.5	29.5	29.5	29.9	29.2	89	26.7	4.0	9.0	NE	755.9	31.3	31	60
12/14/00	9:00a	30.2	30.2	30.2	30.3	29.9	89	27.4	3.0	6.0	NE	755.7	31.8	31	60
12/14/00	10:00a	30.8	30.8	30.8	31.2	30.3	89	27.9	1.0	4.0	NE	754.4	32.2	32	60
12/14/00	11:00a	31.5	31.5	31.5	31.9	31.2	90	28.9	0.0	2.0	NE	754.0	32.6	33	60
12/14/00	12:00p	32.1	32.1	32.1	32.5	31.9	90	29.5	1.0	3.0	NE	752.8	33.4	33	60
12/14/00	1:00p	32.7	32.7	32.7	33.1	32.5	89	29.8	2.0	6.0	SW	752.2	36.1	40	60
12/14/00	2:00p	33.2	33.2	33.2	33.6	32.9	89	30.3	3.0	8.0	SW	752.3	39.4	43	60
12/14/00	3:00p	33.4	33.4	33.4	33.6	33.2	91	31.1	3.0	8.0	SW	752.7	41.1	44	60
12/14/00	4:00p	33.5	33.5	33.5	33.7	33.3	92	31.4	3.0	7.0	WSW	753.2	40.6	44	60
12/14/00	5:00p	33.4	33.4	33.4	33.5	33.3	92	31.3	3.0	7.0	SW	753.8	38.7	46	60
12/14/00	6:00p	33.3	33.3	33.3	33.4	33.2	93	31.5	2.0	7.0	WSW	754.5	37.3	46	60
12/14/00	7:00p	33.5	33.5	33.5	33.5	33.3	92	31.4	0.0	2.0	WSW	755.8	36.6	46	60
12/14/00	8:00p	36.2	36.2	33.2	37.7	33.5	68	26.7	5.0	20.0	NW	756.8	36.6	47	60
12/14/00	9:00p	36.5	36.5	33.5	37.2	35.7	69	27.3	5.0	22.0	NW	757.6	37.0	48	60
12/14/00	10:00p	35.9	35.9	30.8	36.0	35.5	66	25.7	6.0	20.0	NW	758.2	36.4	49	60
12/14/00	11:00p	35.3	35.3	32.2	35.5	34.9	67	25.5	5.0	13.0	NNW	758.9	36.0	48	60
12/14/00	12:00p	34.6	34.6	25.2	35.0	34.0	63	23.3	8.0	20.0	N	759.7	35.8	49	60

Wawayanda Energy Center - 12/15/00

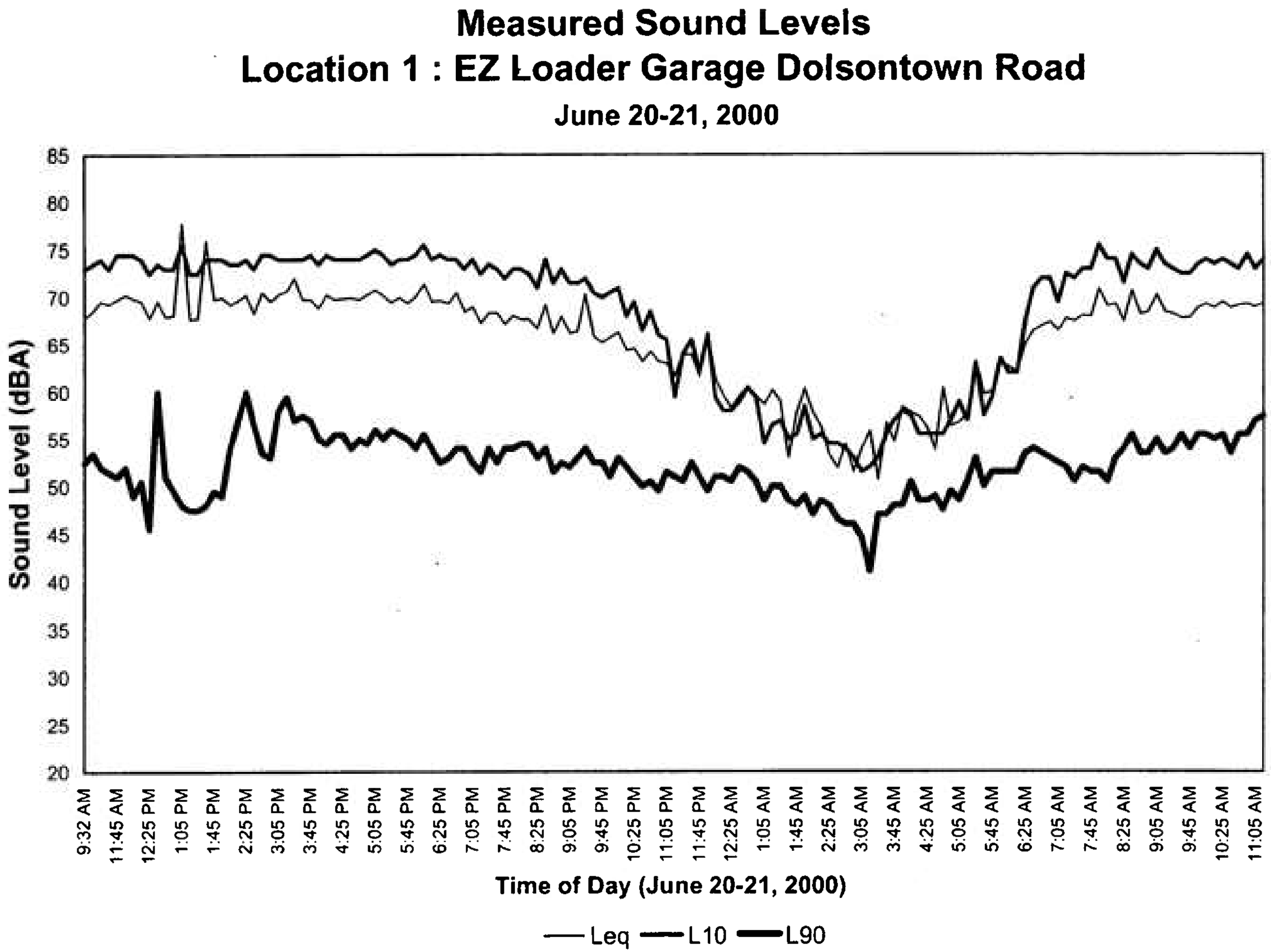
12/15/00	12:00a	34.6	34.6	25.2	35.0	34.0	63	23.3	8.0	20.0	N	759.7	35.8	49	60
12/15/00	1:00a	33.4	33.4	28.1	34.0	33.0	62	21.8	6.0	17.0	NNW	760.5	35.2	48	60
12/15/00	2:00a	32.7	32.7	25.1	33.1	32.3	63	21.5	7.0	15.0	NNW	761.6	34.3	48	60
12/15/00	3:00a	32.1	32.1	32.1	32.3	31.8	65	21.7	4.0	12.0	NW	762.4	33.6	48	60
12/15/00	4:00a	30.8	30.8	30.8	31.8	29.8	67	21.2	4.0	14.0	NW	762.6	32.3	48	60
12/15/00	5:00a	29.3	29.3	29.3	30.0	28.1	67	19.7	2.0	8.0	NW	764.3	29.2	47	60
12/15/00	6:00a	29.1	29.1	25.7	29.8	27.7	63	18.1	5.0	14.0	NW	765.0	27.2	47	60
12/15/00	7:00a	28.5	28.5	25.1	29.3	27.8	64	17.9	5.0	14.0	NW	765.4	27.3	47	60
12/15/00	8:00a	27.1	27.1	27.1	27.8	26.7	65	16.9	3.0	9.0	NW	766.1	26.5	47	60
12/15/00	9:00a	28.2	28.2	28.2	29.4	26.7	68	19.0	2.0	6.0	NW	766.4	27.2	55	60
12/15/00	10:00a	29.2	29.2	29.2	30.7	28.5	62	17.8	2.0	6.0	ESE	765.9	33.8	64	60
12/15/00	11:00a	--	--	--	--	30.7	--	--	1.0	7.0	N	764.7	41.9	61	60

Summer Long Term Monitor Data

19:15:21	67.3	72.5	51.5		141253.8	5370318		avg	8275904	199802.2
19:25:21	68.4	73.5	54	O	251188.6	6918310	24	$L_{eq(1-hr)}$	69.17815	53.006
19:35:21	68.4	73	52.5		177827.9	6918310				
19:45:21	67.2	72	54		251188.6	5248075				
19:55:21	68.1	73	54		251188.6	6456542				
20:05:21	67.7	73	54.5		281838.3	5888437				
20:15:21	67.7	72.5	54.5		281838.3	5888437		avg	6219685	249178.4
20:25:21	66.7	71	53	O	199526.2	4677351	1	$L_{eq(1-hr)}$	67.93768	53.9651
20:35:21	69.2	74	54		251188.6	8317638				
20:45:21	66.2	71.5	51.5		141253.8	4168694				
20:55:21	68	73	52.5		177827.9	6309573				
21:05:21	66.2	71.5	52		158489.3	4168694				
21:15:21	66.4	71.5	53		199526.2	4365158		avg	5334518	187968.7
21:25:21	70.3	72	54	O	251188.6	10715193	2	$L_{eq(1-hr)}$	67.27095	52.74086
21:35:21	65.9	70.5	52.5		177827.9	3890451				
21:45:21	65.2	70	52.5		177827.9	3311311				
21:55:21	65.7	70.5	51		125892.5	3715352				
22:05:21	66.3	71	53		199526.2	4265795				
22:15:21	64.4	68	52		158489.3	2754229		avg	4775389	181792.1
22:25:21	64.6	69.5	51		125892.5	2884032	3	$L_{eq(1-hr)}$	66.79009	52.59575
22:35:21	63.2	66.5	50		100000	2089296				
22:45:21	64.2	68.5	50.5		112201.8	2630268				
22:55:21	63.2	66	49.5		89125.09	2089296				
23:05:21	63	65.5	51.5		141253.8	1995262				
23:15:21	61.7	59.5	51		125892.5	1479108		avg	2194544	115727.6
23:25:21	63.9	64	50.5		112201.8	2454709	4	$L_{eq(1-hr)}$	63.41344	50.63437
23:35:21	63.9	65.5	52.5	O	177827.9	2454709				
23:45:21	61.6	62	51		125892.5	1445440				
23:55:21	66.2	66	49.5	O	89125.09	4168694				
0:05:21	61.4	59.5	51		125892.5	1380384				
0:15:21	59.7	58	51		125892.5	933254.3		avg	2139532	126138.8
0:25:21	58.3	58	50.5		112201.8	676083	5	$L_{eq(1-hr)}$	63.30319	51.00849
0:35:21	59.6	59	52		158489.3	912010.8				
0:45:21	60.5	60.5	51.5		141253.8	1122018				
0:55:21	59.6	59.5	50.5		112201.8	912010.8				
1:05:21	58.7	54.5	48.5		70794.58	741310.2				
1:15:21	60.2	56.5	50		100000	1047129		avg	901760.3	115823.6
1:25:21	59	57	50		100000	794328.2	6	$L_{eq(1-hr)}$	59.55091	50.63797
1:35:21	53	55	48.5		70794.58	199526.2				
1:45:21	57.8	55.5	48		63095.73	602559.6				
1:55:21	60.4	58.5	49		79432.82	1096478				
2:05:21	57.8	55	47		50118.72	602559.6				
2:15:21	56.3	55.5	48.5		70794.58	426579.5		avg	620338.6	72372.74
2:25:21	53.3	54.5	48		63095.73	213796.2	7	$L_{eq(1-hr)}$	57.92629	48.59575
2:35:21	51.9	54.5	46.5		44668.36	154881.7				
2:45:21	54.4	54	46		39810.72	275422.9				
2:55:21	51.5	53	46		39810.72	141253.8				
3:05:21	54	51.5	44.5		28183.83	251188.6				
3:15:21	55.8	52	41		12589.25	380189.4		avg	236122.1	38026.44
3:25:21	50.7	53	47		50118.72	117489.8	8	$L_{eq(1-hr)}$	53.73137	45.80086
3:35:21	56.7	55.5	47		50118.72	467735.1				
3:45:21	54.7	57	48		63095.73	295120.9				
3:55:21	58.4	58	48		63095.73	691831				
4:05:21	57.8	57.5	50.5		112201.8	602559.6				
4:15:21	57.4	55.5	48.5		70794.58	549540.9		avg	454046.2	68237.56
4:25:21	56.2	55.5	48.5		70794.58	416869.4	9	$L_{eq(1-hr)}$	56.571	48.34023
4:35:21	53.8	55.5	49		79432.82	239883.3				
4:45:21	60.4	55.5	47.5		56234.13	1096478				
4:55:21	56.4	57	49.5		89125.09	436515.8				
5:05:21	56.8	59	48.5		70794.58	478630.1				
5:15:21	57.6	57	50.5		112201.8	575439.9		avg	540636.1	79763.84

5:25:21	63.2	63	53		199526.2	2089296	10	$L_{eq(1\text{-}hr)}$	57.32905	49.01806
5:35:21	59.8	57.5	50		100000	954992.6				
5:45:21	60.1	59.5	51.5		141253.8	1023293				
5:55:21	63.1	63.5	51.5		141253.8	2041738				
6:05:21	62.6	62	51.5		141253.8	1819701				
6:15:21	62.1	62	51.5		141253.8	1621810		avg	1591805	144090.2
6:25:21	65.1	67.5	53.5		223872.1	3235937	11	$L_{eq(1\text{-}hr)}$	62.0189	51.58634
6:35:21	66.5	71	54		251188.6	4466836				
6:45:21	67	72	53.5		223872.1	5011872				
6:55:21	67.4	72	53		199526.2	5495409				
7:05:21	66.5	69.5	52.5		177827.9	4466836				
7:15:21	67.8	72.5	52	O	158489.3	6025596		avg	4783748	205796.1
7:25:21	67.5	72	50.5		112201.8	5623413	12	$L_{eq(1\text{-}hr)}$	66.79768	53.13437
7:35:21	68.1	73	52		158489.3	6456542				
7:45:21	68	73	51.5		141253.8	6309573				
7:55:21	70.9	75.5	51.5	O	141253.8	12302688				
8:05:21	69.1	74	50.5		112201.8	8128305				
8:15:21	69.3	74	53	O	199526.2	8511380		avg	7888650	144154.5
8:25:21	67.4	71.5	54		251188.6	5495409	13	$L_{eq(1\text{-}hr)}$	68.97003	51.58828
8:35:21	70.7	74.5	55.5	O	354813.4	11748976				
8:45:21	68.3	73.5	53.5		223872.1	6760830				
8:55:21	68.5	73	53.5	O	223872.1	7079458				
9:05:21	70.3	75	55	O	316227.8	10715193				
9:15:21	68.5	73.5	53.5		223872.1	7079458		avg	8146554	265641
9:25:21	68.3	73	54		251188.6	6760830	14	$L_{eq(1\text{-}hr)}$	69.10974	54.24295
9:35:21	67.8	72.5	55.5		354813.4	6025596				
9:45:21	67.9	72.5	54		251188.6	6165950				
9:55:21	68.9	73.5	55.5							
10:05:21	69.3	74	55.5							
10:15:21	68.9	73.5	55							
10:25:21	69.5	74	55.5	O						
10:35:21	68.9	73.5	53.5							
10:45:21	69.2	73	55.5	O						
10:55:21	69.3	74.5	55.5	O						
11:05:21	69	73	57	O						
11:15:21	69.4	74	57.5	O						

NIGHT AVERAGE ***49.8*** ***10 p.m. to 7 a.m.***


Measured Sound Levels
Location 1 : EZ Loader Garage Dolsontown Road
June 20-21, 2000
Sound Level (dBA)
85
80
75
70
65
60
55
50
45
40
35
30
25
20
9:32 AM
11:45 AM
12:25 PM
1:05 PM
1:45 PM
2:25 PM
3:05 PM
3:45 PM
4:25 PM
5:05 PM
5:45 PM
6:25 PM
7:05 PM
7:45 PM
8:25 PM
9:05 PM
9:45 PM
10:25 PM
11:05 PM
11:45 PM
12:25 AM
1:05 AM
1:45 AM
2:25 AM
3:05 AM
3:45 AM
4:25 AM
5:05 AM
5:45 AM
6:25 AM
7:05 AM
7:45 AM
8:25 AM
9:05 AM
9:45 AM
10:25 AM
11:05 AM
Time of Day (June 20-21, 2000)
Leq
L10
L90

Kings Park
Noise Monitoring June 20-21, 2000
Location 4 - Country View Manor Apartments
B&K 2236D S/N 2100600 — Cal Factors
Calibrator: B&K 4231 S/N 2115610 — Before: 1.2, After: 1.2
Range 20-100 dBA
Slow response
RMS:A Peak:C
20-100 dB

Time	Leq	L10	L90	Pause	Ovl	L90	Leq	Hour		Leq	L90
11:21:51	51.6	52	43	P		19952.62	144544				
11:31:51	45.1	47.5	42			15848.93	32359.37				
11:41:51	45.7	48	42			15848.93	37153.52				
11:51:51	45.1	47.5	41.5			14125.38	32359.37				
12:01:51	49.2	51.5	40.5			11220.18	83176.38				
12:11:51	53.9	59.5	42.5			17782.79	245470.9				
12:21:51	46.4	49	41.5			14125.38	43651.58				
12:31:51	46.8	48.5	42.5			17782.79	47863.01		avg	81612.46	15147.58
12:41:51	46.6	48	43.5		O	22387.21	45708.82	17	$L_{eq(1\text{-}hr)}$	49.11756	41.80343
12:51:51	47.2	49	43.5		O	22387.21	52480.75				
13:01:51	46.3	48	43.5			22387.21	42657.95				
13:11:51	46.3	49	42.5			17782.79	42657.95				
13:21:51	45	47	42			15848.93	31622.78				
13:31:51	46	48.5	42			15848.93	39810.72		avg	42489.83	19440.38
13:41:51	48.5	49.5	42.5			17782.79	70794.58	18	$L_{eq(1\text{-}hr)}$	46.28285	42.88705
13:51:51	46.7	48.5	42.5		O	17782.79	46773.51				
14:01:51	47.5	50	43			19952.62	56234.13				
14:11:51	47.8	49.5	44.5		O	28183.83	60255.96				
14:21:51	48.8	50.5	46.5			44668.36	75857.76				
14:31:51	49.2	51	46			39810.72	83176.38		avg	65515.39	28030.19
14:41:51	48.1	50	45.5			35481.34	64565.42	19	$L_{eq(1\text{-}hr)}$	48.16343	44.47626
14:51:51	49.5	52.5	45.5			35481.34	89125.09				
15:01:51	48.9	50.5	46			39810.72	77624.71				
15:11:51	48.2	50	45.5			35481.34	66069.34				
15:21:51	50.3	52.5	46.5			44668.36	107151.9				
15:31:51	50.9	53	47			50118.72	123026.9		avg	87927.23	40173.64
15:41:51	50.9	52	48			63095.73	123026.9	20	$L_{eq(1\text{-}hr)}$	49.44123	46.03941
15:51:51	51.5	54	47			50118.72	141253.8				
16:01:51	50.9	53.5	46.5			44668.36	123026.9				
16:11:51	51.4	54	46.5			44668.36	138038.4				
16:21:51	48.8	51	45			31622.78	75857.76				
16:31:51	47.6	49	45.5			35481.34	57543.99		avg	109791.3	44942.55
16:41:51	49.8	52.5	45.5			35481.34	95499.26	21	$L_{eq(1\text{-}hr)}$	50.40568	46.52658
16:51:51	48.3	50	46			39810.72	67608.3				
17:01:51	49.3	50.5	47			50118.72	85113.8				
17:11:51	47.8	49	45.5			35481.34	60255.96				
17:21:51	65.9	53.5	46.5			44668.36	3890451				
17:31:51	50.7	53	46.5			44668.36	117489.8		avg	719403.1	41704.81
17:41:51	49.1	51	46			39810.72	81283.05	22	$L_{eq(1\text{-}hr)}$	58.56972	46.20186
17:51:51	47.8	49	45.5			35481.34	60255.96				
18:01:51	51.4	53.5	47.5			56234.13	138038.4				
18:11:51	48.7	51	44.5			28183.83	74131.02				
18:21:51	49.3	51.5	46.5			44668.36	85113.8				
18:31:51	49.8	52	45.5			35481.34	95499.26		avg	89053.59	39976.62
18:41:51	48.2	50	45.5			35481.34	66069.34	23	$L_{eq(1\text{-}hr)}$	49.49651	46.01806
18:51:51	49	51	44.5			28183.83	79432.82				
19:01:51	48.4	50.5	44			25118.86	69183.1				
19:11:51	53.4	50	43			19952.62	218776.2				
19:21:51	48.1	49.5	45			31622.78	64565.42				

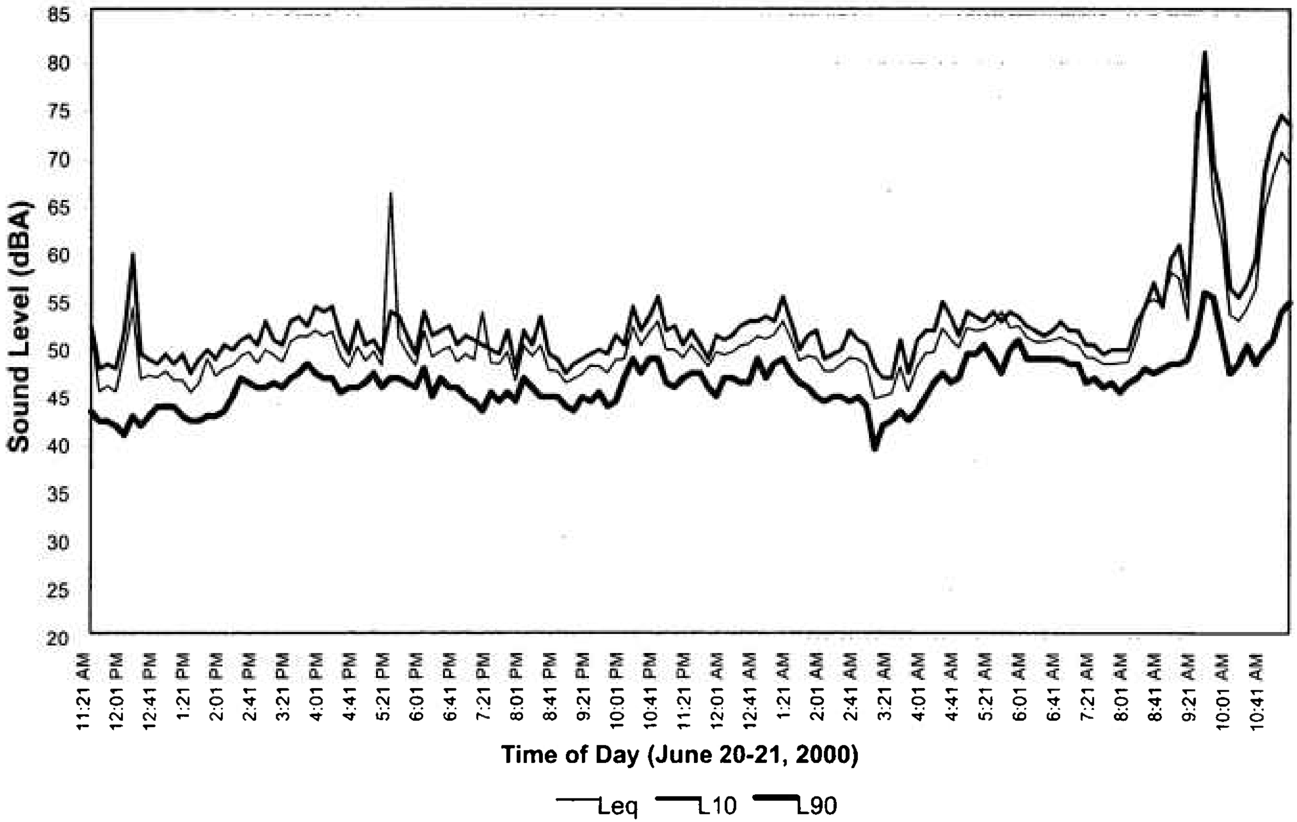
19:31:51	48	49	44		25118.86	63095.73		avg	93520.43	27579.72
19:41:51	49.2	51.5	45		31622.78	83176.38	24	$L_{eq(1\text{-}hr)}$	49.70906	44.4059
19:51:51	46.2	47.5	44		25118.86	41686.94				
20:01:51	49.9	51.5	46.5		44668.36	97723.72				
20:11:51	48.8	50	45.5		35481.34	75857.76				
20:21:51	49.9	53	44.5		28183.83	97723.72				
20:31:51	47.3	49	44.5		28183.83	53703.18		avg	74978.62	32209.83
20:41:51	47.2	48.5	44.5		28183.83	52480.75	1	$L_{eq(1\text{-}hr)}$	48.74937	45.07988
20:51:51	46	47	43.5		22387.21	39810.72				
21:01:51	46.4	48	43		19952.62	43651.58				
21:11:51	46.9	48.5	44.5		28183.83	48977.88				
21:21:51	47.8	49	44		25118.86	60255.96				
21:31:51	47.7	49.5	45		31622.78	58884.37		avg	50676.88	25908.19
21:41:51	47	49	43.5		22387.21	50118.72	2	$L_{eq(1\text{-}hr)}$	47.0481	44.13437
21:51:51	48.4	51	44		25118.86	69183.1				
22:01:51	48.5	50	46.5		44668.36	70794.58				
22:11:51	51.9	54	48.5		70794.58	154881.7				
22:21:51	49.9	51.5	47		50118.72	97723.72				
22:31:51	51.3	53	48.5		70794.58	134896.3		avg	96266.35	47313.72
22:41:51	52.5	55	48.5		70794.58	177827.9	3	$L_{eq(1\text{-}hr)}$	49.83474	46.74987
22:51:51	49.5	51.5	46		39810.72	89125.09				
23:01:51	49.5	52	45.5		35481.34	89125.09				
23:11:51	48.6	50	46.5		44668.36	72443.6				
23:21:51	50	51.5	47		50118.72	100000				
23:31:51	48.8	50	47		50118.72	75857.76		avg	100729.9	48498.74
23:41:51	47.7	48.5	45.5		35481.34	58884.37	4	$L_{eq(1\text{-}hr)}$	50.03158	46.8573
23:51:51	49.2	51	44.5		28183.83	83176.38				
0:01:51	48.9	50.5	46.5		44668.36	77624.71				
0:11:51	49.2	51	46.5		44668.36	83176.38				
0:21:51	49.9	52	46		39810.72	97723.72				
0:31:51	50.1	52.5	46		39810.72	102329.3		avg	83819.14	38770.55
0:41:51	50.9	52.5	48.5		70794.58	123026.9	5	$L_{eq(1\text{-}hr)}$	49.23343	45.88502
0:51:51	50.6	53	46.5		44668.36	114815.4				
1:01:51	51.1	52.5	48	O	63095.73	128825				
1:11:51	52.5	55	48.5		70794.58	177827.9				
1:21:51	50.6	52.5	47		50118.72	114815.4				
1:31:51	48.3	49.5	46		39810.72	67608.3		avg	121153.1	56547.12
1:41:51	48.8	51	45.5		35481.34	75857.76	6	$L_{eq(1\text{-}hr)}$	50.83335	47.5241
1:51:51	48.6	51.5	44.5		28183.83	72443.6				
2:01:51	47.2	48.5	44		25118.86	52480.75				
2:11:51	47.2	49	44.5		28183.83	52480.75				
2:21:51	47.9	49.5	44.5		28183.83	61659.5				
2:31:51	48.6	51.5	44		25118.86	72443.6		avg	64560.99	28378.43
2:41:51	48.5	50.5	44.5		28183.83	70794.58	7	$L_{eq(1\text{-}hr)}$	48.0997	44.52988
2:51:51	47.8	50	43.5		22387.21	60255.96				
3:01:51	44.3	47.5	39		7943.282	26915.35				
3:11:51	44.6	46.5	41.5		14125.38	28840.32				
3:21:51	44.9	46.5	42		15848.93	30902.95				
3:31:51	47.6	50.5	43		19952.62	57543.99		avg	45875.52	18073.54
3:41:51	45.1	47	42		15848.93	32359.37	8	$L_{eq(1\text{-}hr)}$	46.61581	42.57043
3:51:51	47.6	50.5	43		19952.62	57543.99				
4:01:51	49.1	51.5	44.5		28183.83	81283.05				
4:11:51	49.2	51.5	46		39810.72	83176.38				
4:21:51	51.7	54.5	47		50118.72	147910.8				
4:31:51	50.6	53	46		39810.72	114815.4		avg	86181.5	32287.59
4:41:51	49.7	51	46.5		44668.36	93325.43	9	$L_{eq(1\text{-}hr)}$	49.35414	45.09036
4:51:51	51.8	53.5	49		79432.82	151356.1				
5:01:51	51.5	53	49		79432.82	141253.8				
5:11:51	51.6	52.5	50		100000	144544				
5:21:51	52.1	53.5	48.5		70794.58	162181				
5:31:51	53.5	52.5	47		50118.72	223872.1		avg	152755.4	70741.22

5:41:51	51.8	53.5	49.5		89125.09	151356.1	10	$L_{eq(1\text{-}hr)}$	51.83997	48.49673
5:51:51	52	53	50.5	O	112201.8	158489.3				
6:01:51	50.8	52	48.5		70794.58	120226.4				
6:11:51	50.3	51.5	48.5		70794.58	107151.9				
6:21:51	50.3	51	48.5		70794.58	107151.9				
6:31:51	50.5	51.5	48.5		70794.58	112201.8		avg	126096.3	80750.88
6:41:51	50.8	52.5	48.5		70794.58	120226.4	11	$L_{eq(1\text{-}hr)}$	51.00702	49.07147
6:51:51	50.3	51.5	48		63095.73	107151.9				
7:01:51	50	51.5	48		63095.73	100000				
7:11:51	48.7	50	46		39810.72	74131.02				
7:21:51	48.6	50	46.5		44668.36	72443.6				
7:31:51	48	49	45.5	O	35481.34	63095.73		avg	89508.12	52824.41
7:41:51	48	49.5	46		39810.72	63095.73	12	$L_{eq(1\text{-}hr)}$	49.51862	47.22835
7:51:51	48.1	49.5	45		31622.78	64565.42				
8:01:51	48.2	49.5	46		39810.72	66069.34				
8:11:51	50.7	52.5	46.5		44668.36	117489.8				
8:21:51	54.3	54	47.5		56234.13	269153.5				
8:31:51	54.8	56.5	47		50118.72	301995.2		avg	147061.5	43710.9
8:41:51	54.2	54	47.5		56234.13	263026.8	13	$L_{eq(1\text{-}hr)}$	51.67499	46.4059
8:51:51	57.6	59	48		63095.73	575439.9				
9:01:51	57	60.5	48		63095.73	501187.2				
9:11:51	52.7	55	48.5		70794.58	186208.7				
9:21:51	74.1	71.5	51		125892.5	25703958				
9:31:51	76.2	80.5	55.5		354813.4	41686938		avg	11486126	122321
9:41:51	65.3	69	55		316227.8	3388442	14	$L_{eq(1\text{-}hr)}$	70.60174	50.87501
9:51:51	61	64.5	51		125892.5	1258925				
10:01:51	53.2	56	47		50118.72	208929.6				
10:11:51	52.6	55	48							
10:21:51	54	56.5	50							
10:31:51	55.9	59	48							
10:41:51	64.3	68	49.5							
10:51:51	67.7	72	50.5	O						
11:01:51	70.2	74	53.5							
11:11:51	68.9	73	54.5							

NIGHT AVERAGE ***45.98507***

Measured Sound Levels
Location 4 : Country View Manor Apartments

June 20-21, 2000



Summer Short Term Spectrum Data

[redacted] Wawayanda [redacted] 291456-0020-00000 [redacted] Jason Algor

[redacted] 2. 1081 Dolsontown Road

[redacted] B&K 2260/177216

[redacted] B&K 4231/2115610

[redacted]	6/20/2000	
[redacted]	1240-1300	
	Before	After
[redacted]	93.8	93.8
[redacted]	93.8	
[redacted]	-0.02	-0.02

[redacted]	6/21/2000	
[redacted]	0116-0136	
	Before	After
[redacted]	93.8	93.8
[redacted]	93.8	
[redacted]	-0.04	0.05

Octave Band	Daytime L_{90}	Whole Octaves	Daytime L_{10}	Whole Octaves	Daytime L_{eq}	Whole Octaves	Nighttime L_{90}	Whole Octaves	Nighttime L_{10}	Whole Octaves	Nighttime L_{eq}	Whole Octaves
16	50		58		58		50		56		54	
20	51		60		59		52		59		57	
25	52		60		58		51		58		55	
32	56	59	61	65	60	64	51	55	57	62	55	59
40	53		60		59		48		55		53	
50	51		60		59		49		55		54	
63	51	57	64	68	63	66	48	54	54	60	54	59
80	53		64		62		51		57		55	
100	49		63		62		47		53		52	
125	47	52	61	66	59	64	46	51	52	57	54	57
160	44		58		55		46		52		50	
200	41		58		55		45		52		49	
250	39	44	58	62	55	59	42	47	49	55	48	53
315	38		57		54		39		47		45	
400	37		58		55		38		45		44	
500	39	43	60	65	55	60	42	46	49	53	47	51
630	38		61		57		43		49		48	
800	37		62		58		42		48		48	
1000	36	41	64	68	59	63	42	46	48	52	49	52
1250	35		63		58		39		45		46	
1600	32		61		57		35		41		44	
2000	28	34	58	63	54	59	30	37	37	43	41	47
2500	25		55		51		25		33		38	
3150	21		52		48		19		28		34	
4000	17	23	49	54	46	51	13	20	23	30	31	36
5000	14		45		43		8		19		28	
6300	11		43		40		7		16		25	
8000	10	15	40	45	38	43	8	12	13	19	23	28
10000	10		36		35		8		11		19	
12500	10		32		33		8		9		16	
Combined dBA		45.3		70.5		66.2		48.9		55.2		55.5
Overall dBA		46.8		71.2		66.5		50		55		55.5

[redacted] Wawayanda [redacted] 291456-0020-00000 [redacted] Jason Algor

[redacted] 3, Ruth Court

[redacted] B&K 2260/177216

[redacted] B&K 4231/2115610

[redacted]	6/20/2000	
[redacted]	1309-1329	
	Before	After
[redacted]	93.8	93.8
[redacted]	93.8	
[redacted]	-0.02	-0.02

[redacted]	5/17/2000	
[redacted]	0145-0205	
	Before	After
[redacted]	93.8	93.8
[redacted]	93.8	
[redacted]	-0.04	0.05

Octave Band	Daytime L_{90}	Whole Octaves	Daytime L_{10}	Whole Octaves	Daytime L_{eq}	Whole Octaves	Nighttime L_{90}	Whole Octaves	Nighttime L_{10}	Whole Octaves	Nighttime L_{eq}	Whole Octaves
16	44		55		54		44		50		48	
20	47		55		56		45		52		50	
25	49		60		57		45		51		49	
32	50	53	54	62	55	60	49	51	53	56	52	55
40	46		53		52		43		48		47	
50	50		62		60		45		49		48	
63	49	54	55	64	54	62	45	51	50	56	49	55
80	48		58		56		48		54		52	
100	50		71		67		43		49		48	
125	47	52	67	74	61	69	40	46	45	52	47	51
160	43		67		61		39		45		44	
200	43		67		63		37		44		42	
250	41	46	64	70	59	66	35	41	41	47	43	47
315	39		63		60		36		41		40	
400	37		62		58		35		42		41	
500	36	41	62	67	58	63	38	42	47	51	45	49
630	35		63		58		39		48		45	
800	33		60		56		36		41		39	
1000	33	37	61	65	57	61	34	39	40	45	38	43
1250	32		59		56		31		38		37	
1600	30		57		54		27		33		33	
2000	29	34	57	61	53	58	23	30	28	35	28	35
2500	28		54		51		25		27		28	
3150	26		53		50		22		24		25	
4000	23	28	51	56	49	54	24	29	27	31	27	31
5000	20		50		47		26		28		28	
6300	16		48		45		23		25		25	
8000	12	18	46	51	44	49	23	26	25	28	25	28
10000	10		44		43		14		16		16	
12500	9		41		41		9		10		11	
Combined dBA		44.1		69.9		66.1		43.4		50.4		48.8
Overall dBA		45.4		70.4		67.6		44.6		51		48.9

[redacted] Wawayanda [redacted] 291456-0020-00000 [redacted] Jason Algor

[redacted] 4. Country View Manor Apartments

[redacted] B&K 2260/177216

[redacted] B&K 4231/2115610

[redacted]	6/20/2000	
[redacted]	1336-1356	
	Before	After
[redacted]	93.8	93.8
[redacted]	93.8	
[redacted]	-0.02	0.01

[redacted]	6/21/2000	
[redacted]	0212-0232	
	Before	After
[redacted]	93.8	93.8
[redacted]	93.8	
[redacted]	0.05	-0.01

Octave Band	Daytime L_{90}	Whole Octaves	Daytime L_{10}	Whole Octaves	Daytime L_{eq}	Whole Octaves	Nighttime L_{90}	Whole Octaves	Nighttime L_{10}	Whole Octaves	Nighttime L_{eq}	Whole Octaves
16	47		55		52		47		54		52	
20	49		56		55		48		54		52	
25	49		55		54		48		54		52	
32	51	55	56	60	54	59	52	54	56	59	55	58
40	49		56		54		47		52		50	
50	51		60		57		49		54		52	
63	51	55	58	64	56	61	48	59	52	63	51	62
80	50		58		57		58		62		61	
100	45		55		53		47		52		50	
125	44	49	51	57	49	55	46	51	49	55	49	54
160	43		48		47		44		49		47	
200	40		46		44		41		46		45	
250	46	48	49	52	49	51	41	46	46	51	45	50
315	41		46		45		42		47		46	
400	36		43		42		40		46		44	
500	38	42	44	48	42	47	41	45	48	52	46	50
630	36		44		42		40		48		46	
800	36		45		43		39		46		44	
1000	34	39	45	49	45	49	38	42	43	49	42	47
1250	33		42		43		35		41		39	
1600	32		41		43		32		37		36	
2000	30	36	38	44	40	45	29	34	32	39	32	38
2500	30		37		39		26		28		29	
3150	30		38		38		23		24		26	
4000	28	33	38	42	37	41	19	25	21	26	23	29
5000	26		35		33		17		18		20	
6300	22		28		27		14		16		17	
8000	19	25	23	30	23	29	11	17	13	19	14	19
10000	17		22		21		10		11		11	
12500	15		20		18		9		9		10	
Combined dBA		45.3		53.1		52.7		46.8		52.8		51.0
Overall dBA		47.4		53.4		52.6		48		53		51.2

[redacted] Wawayanda [redacted] 291456-0020-00000 [redacted] Jason Algor

[redacted] 5. 280 Genung Street

[redacted] B&K 2260/177216

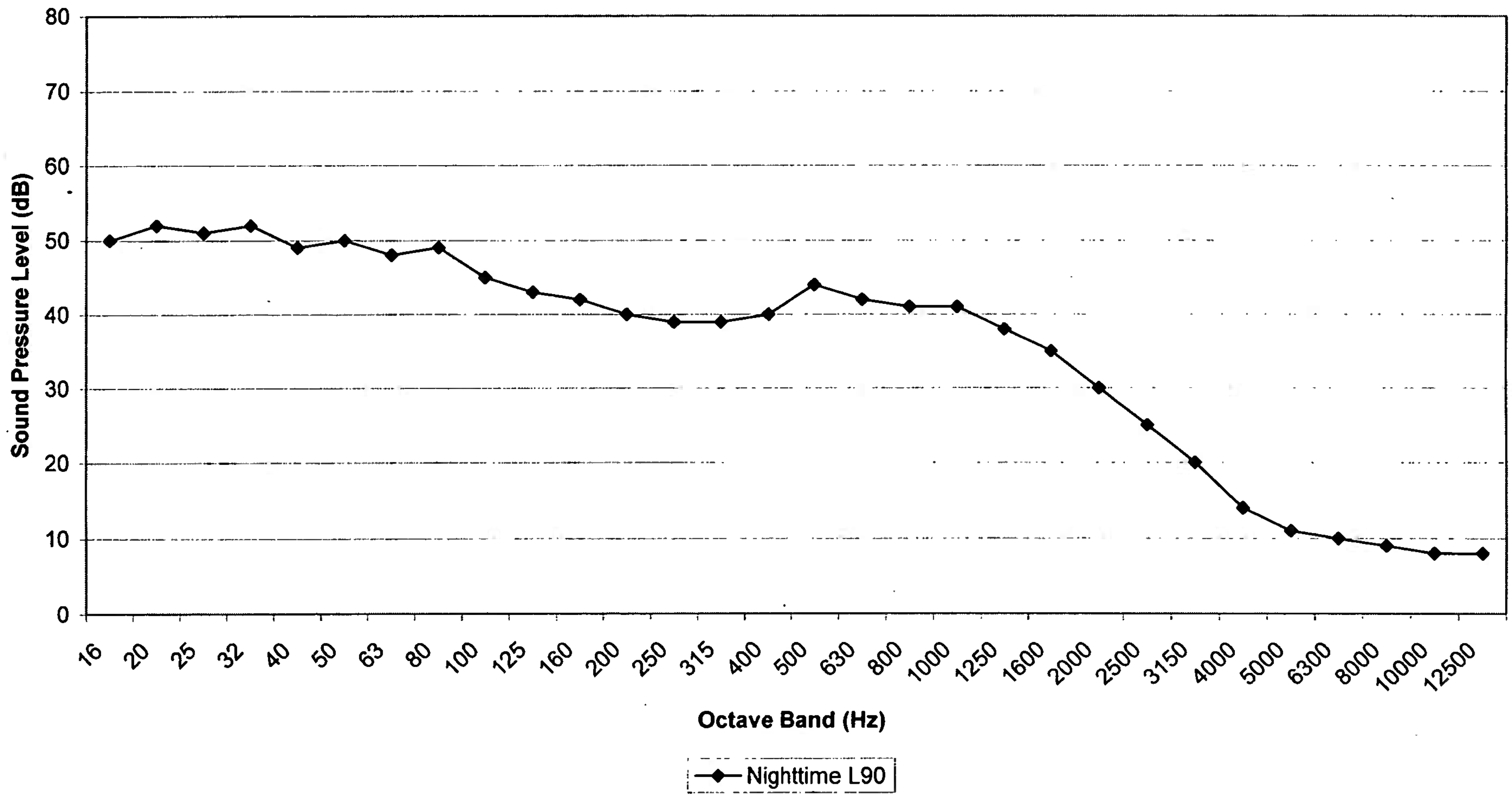
[redacted] B&K 4231/2115810

[redacted]	6/20/2000 1403-1423	
	Before	After
[redacted]	93.8	93.8
	93.8	
	0.01	-0.05

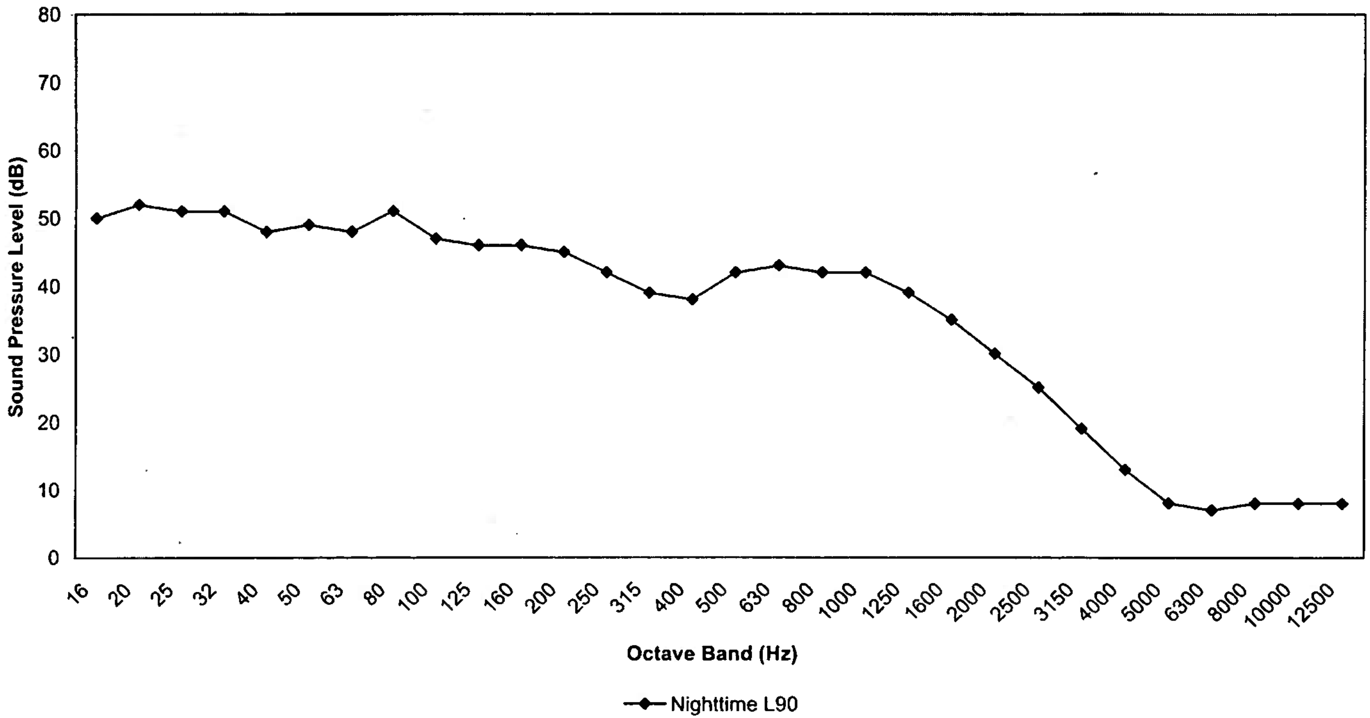
[redacted]	5/17/2000 0259-0319	
	Before	After
[redacted]	93.8	93.8
	93.8	
	-0.01	-0.02

Octave Band	Daytime L_{90}	Whole Octaves	Daytime L_{10}	Whole Octaves	Daytime L_{eq}	Whole Octaves	Nighttime L_{90}	Whole Octaves	Nighttime L_{10}	Whole Octaves	Nighttime L_{eq}	Whole Octaves
16	48		58		55		44		53		51	
20	49		58		56		44		53		51	
25	50		58		56		44		53		50	
32	50	55	63	66	58	62	46	49	51	56	49	54
40	50		60		58		43		47		46	
50	47		62		60		42		46		46	
63	48	53	63	68	62	66	42	50	47	59	46	57
80	50		65		63		49		59		56	
100	45		63		62		43		47		47	
125	43	48	61	66	59	65	44	50	50	54	49	54
160	42		59		57		48		51		50	
200	39		58		56		37		41		41	
250	38	42	58	62	55	60	36	41	41	46	41	46
315	35		57		55		34		42		41	
400	35		58		55		33		36		39	
500	35	39	60	64	56	60	36	40	42	45	42	46
630	34		60		55		35		40		42	
800	33		60		56		31		35		42	
1000	33	37	61	65	56	61	28	34	33	39	42	47
1250	31		61		56		29		34		43	
1600	30		60		55		28		33		42	
2000	27	33	57	63	52	58	25	30	29	35	40	45
2500	26		55		50		20		24		37	
3150	26		51		47		17		24		34	
4000	25	29	48	54	45	50	11	18	18	25	31	36
5000	22		46		42		8		15		28	
6300	17		43		40		7		13		25	
8000	12	19	40	45	37	42	8	12	12	17	24	28
10000	10		37		35		8		10		20	
12500	9		34		33		8		10		16	
Combined dBA		42.5		68.9		64.5		41.2		46.1		51.0
Overall dBA		44		70		65.4		42.8		46.2		51.1

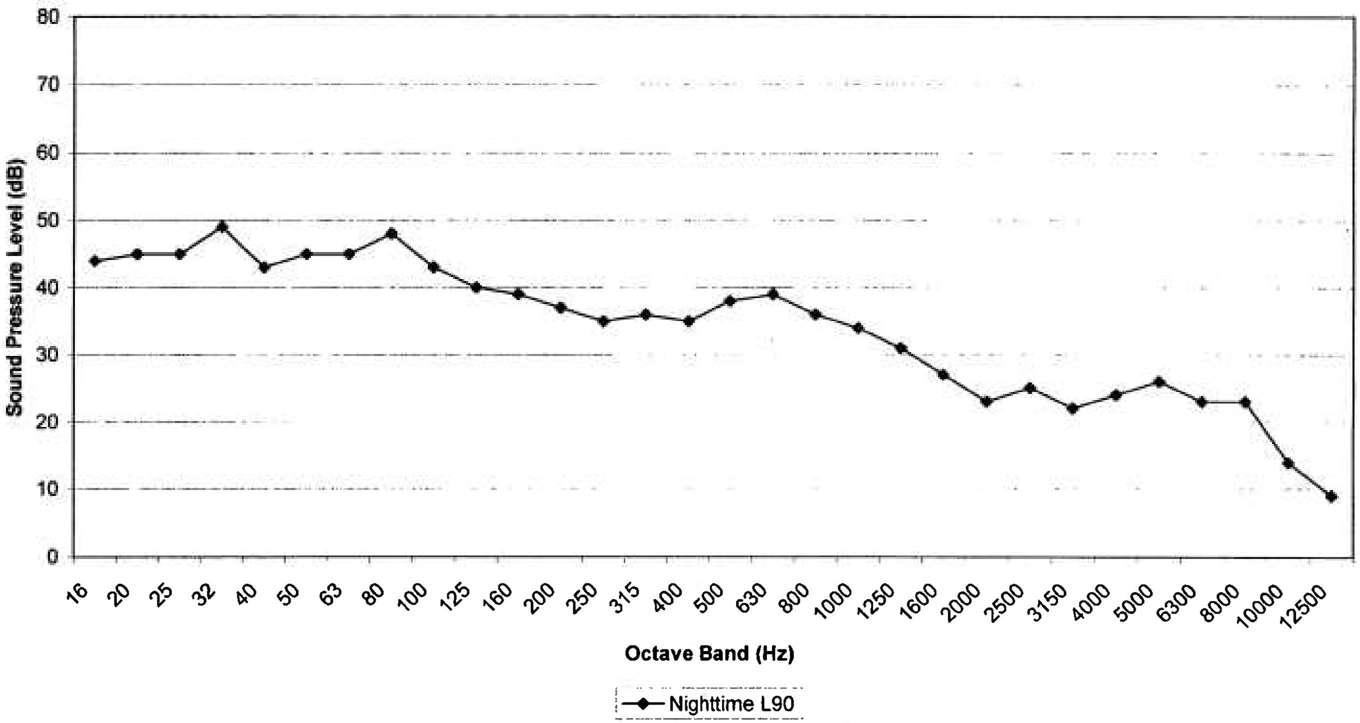
Measured Nighttime 1/3 L_{90} Octave Band Levels
June 21, 2000
Location 1 : EZ Loader Garage Dolsontown Road



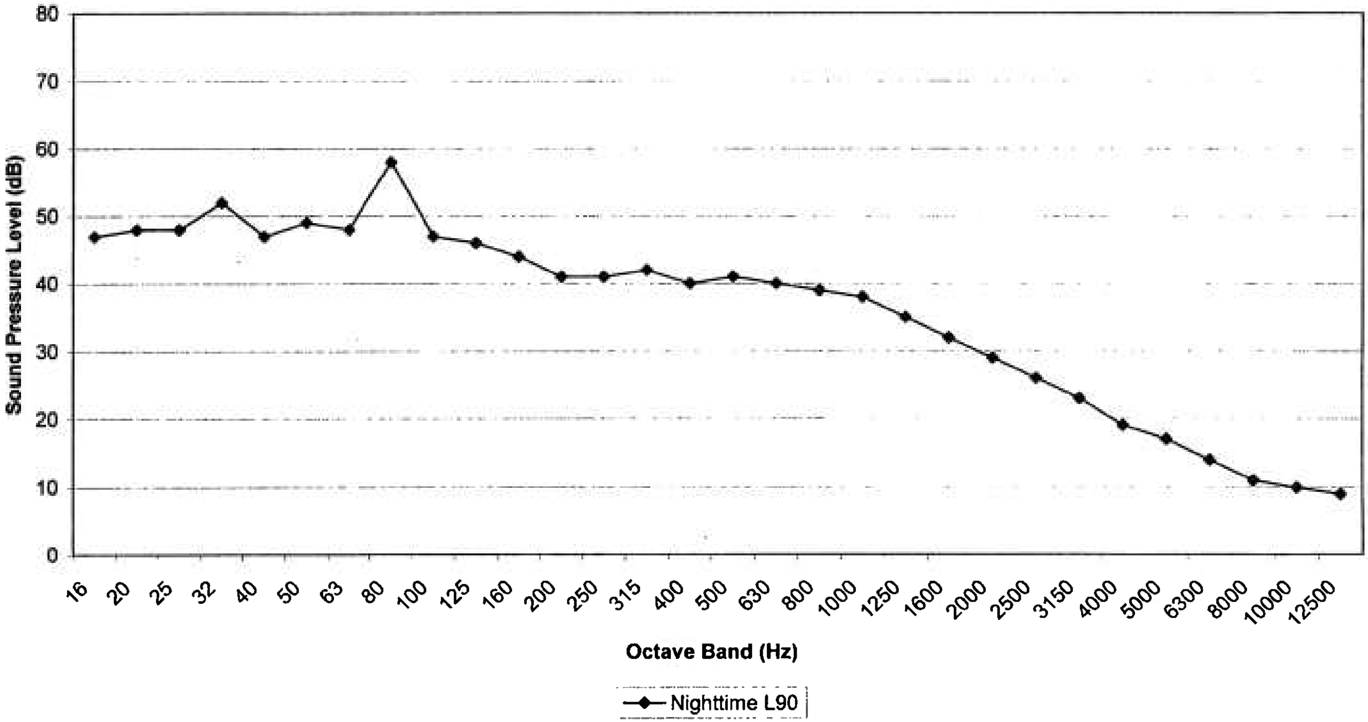
Measured Nighttime 1/3 L_{90} Octave Band Levels
June 21, 2000
Location 2 : 1081 Dolsontown Road



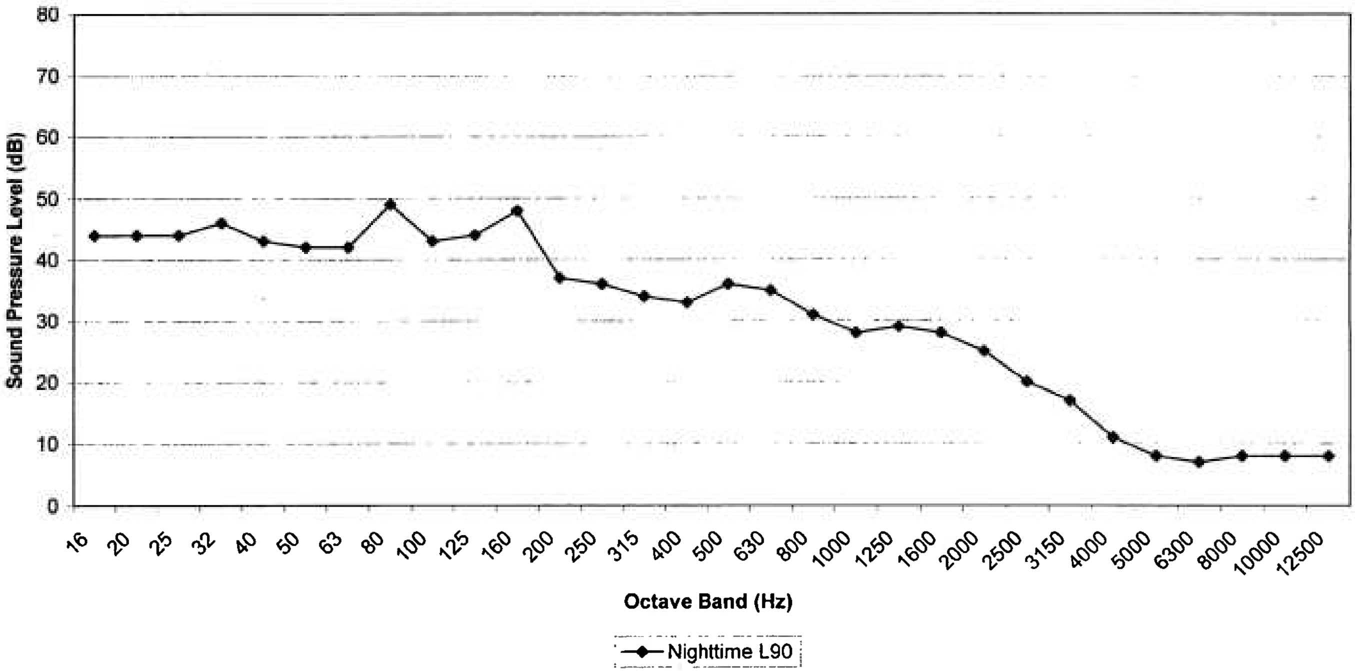
Measured Nighttime 1/3 L_{90} Octave Band Levels
June 21, 2000
Location 3 : Ruth Court



Measured Nighttime 1/3 L_{90} Octave Band Levels
June 21, 2000
Location 4 : Country View Manor Apartments



Measured Nighttime 1/3 L_{90} Octave Band Levels
June 21, 2000
Location 5 : 280 Genung Street



Instrumentation

Product Data

Modular Precision Sound Analyzer — 2260 Investigator™ with Sound Analysis Software BZ 7201 (2260 A) and Enhanced Sound Analysis Software BZ 7202 (2260 B)

USES:

- Detailed octave band analyses (BZ 7201)
- Detailed octave or $^1/_3$-octave band analyses (BZ 7202)
- Noise monitoring
- Appraisal of noise reduction efforts
- Gathering field-data for further analyses
- Research and development

FEATURES:

- IEC and ANSI Type 1 sound level meter
- Automatic event logging
- DAT recording ability
- Remote data gathering via modem link
- Automatic Charge Injection Calibration check
- Broad-band and spectral statistics
- 3-year guarantee

2260 Investigator is a programmable sound analyzer based on a standard PC architecture and file system. You change 2260 Investigator's role as easy as swapping from a wordprocessor to a spreadsheet. Two of the available roles are BZ 7201 and BZ 7202.

2260A consists of an Investigator loaded with BZ 7201 octave-band analyzer software. 2260B has BZ 7202 loaded, making the Investigator into an octave or $^1/_3$-octave band analyzer.

Automatic logging with events is available. 2260 Investigator is set to log a background sound field with few parameters at a slow rate and only switch over to many parameters at a fast rate when an event is detected.

Communication with external devices has been improved. You can now connect 2260 Investigator to a DAT recorder and the serial link has been enhanced to allow remote control of the instrument via a modem link.

The Charge Injection Calibration (CIC) facility can now be set to automatically run at specific intervals when doing long measurements, improving the reliability check of your measurements.

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Specifications — BZ7201 with 2260 Investigator (BZ7202 on last page)

Specifications apply to 2260 Investigator fitted with the supplied microphone and input stage, and running BZ7201 software

STANDARDS:
Conforms with the following:
- IEC 651 (1979) Type 1 plus Amendment 1
- IEC 804 (1985) Type 1 plus Amendment 2
- IEC 1260 (1995) Octave Bands Class 0
- ANSI S1.4 (1983) Type 1
- ANSI S1.43-199X Type 1 (Draft 1993)
- ANSI S1.11-1986 Octave Bands, Order 4, Type 0-B, Optional Range

SUPPLIED MICROPHONE:
Type 4189: Prepolarized Free-field 1/2″ Microphone
Nominal sensitivity: −26 dB ±1.5 dB re 1 V/Pa
Capacitance: 14 pF (at 250 Hz)

INPUT STAGE:
ZC 0026
Extension Cables: Up to 100 m in length between the input stage and the Type 2260 can be driven by the input stage

CALIBRATION:
Initial calibration is stored for comparison with later calibrations.
Acoustic: Using Multifunction Acoustic Calibrator Type 4226, Pistonphone Type 4228 or Sound Level Calibrator Type 4231
Electrical (internal): Uses internally generated electrical signal combined with a keyed-in value of microphone sensitivity.
CIC (Charge Injection Calibration): Injects internally generated electrical signal in parallel with the microphone diaphragm
- A reference CIC is done automatically during External or Internal calibration and stored for later comparison with a new CIC
- A manual CIC can be done whenever no measurement is in progress
- An automatic CIC can be part of a logging measurement, where the CIC repetition rate can be set to be up to 4 times in a 24 hr period.
- An automatic CIC starts at a "logical" break in a measurement sequence, shortening the following measurement period by 15 s

MEASURING RANGES:
Linear Operating Range: 80 dB adjustable to give full-scale readings from 70 dB to 130 dB in 10 dB steps
Max. Peak Level: 3 dB above full scale reading
Upper Limit (RMS) for Crest Factor = 10: 17 dB below full scale reading
Passive Attenuation: Microphone attenuator ZF 0023 (included) effectively increases all full-scale readings by 20 dB

OCTAVE BAND FILTERS:
Octave Bands centre frequencies: 31.5 Hz to 8 kHz

DETECTORS:
Overload detector which monitors the overload outputs of all the frequency weighted channels
Parallel detectors on every measurement:
A-weighted broad-band detector channel with three exponential time weightings (Fast, Slow, Impulse), one linearly averaging detector and one peak detector
C- or L-weighted (switchable) as above for A-weighted
Octave band filters, pre-weighted either A-, C- or L-, each with a detector channel containing one linearly averaging detector and one exponentially averaging detector switchable between Slow or Fast
Overload detector which monitors the overload outputs of all the frequency weighted channels.

INHERENT NOISE LEVEL:
(Combination of electrical noise and microphone thermal noise at 20°C). Typical values with supplied microphone of nominal sensitivity:

Weighting	Electrical Noise (2260)	Thermal Noise (4189)	Combined Noise
"A"	12.3 dB	14.6 dB	16.6 dB
"C"	14.0 dB	15.3 dB	17.7 dB
Lin. 5 Hz – 20 kHz	19.2 dB	15.3 dB	20.7 dB

MEASUREMENTS:
V = frequency weightings C or L
X = frequency weightings A, C or L
Y = time weightings S, F
N = number

For Display and Storage (Broad-band)

Start Date	Start Time	Measurem. No.
Stop Date	Stop Time	Overload %
Elapsed Time	No. of Pauses	Underrange %
Event No.	Event Sample	
Level Distribution	Cumulative Distribution	
$L_{Apk(MaxP)}$	$L_{Vpk(MaxP)}$	
#Peaks A>L	# PeaksV>L	$L_{AE(ASEL)}$
L_{Aeq}	L_{Veq}	L_{AIm}
L_{VIm}	$L_{Veq\text{-}LAeq}$	$L_{AIm\text{-}LAeq}$
L_{ASTm3}	L_{AFTm3}	L_{AITm3}
L_{VSTm3}	L_{VFTm3}	L_{VITm3}
L_{ASTm5}	L_{AFTm5}	L_{AITm5}
L_{VSTm5}	L_{VFTm5}	L_{VITm5}
L_{ASMax}	L_{AFMax}	L_{AIMax}
L_{ASMin}	L_{AFMin}	L_{AIMin}
L_{VSMax}	L_{VFMax}	L_{VIMax}
L_{VSMin}	L_{VFMin}	L_{VIMin}
L_{XYN1}	L_{XYN2}	L_{XYN3}
L_{XYN4}	L_{XYN5}	$L_{AEP,d}$

For Display and Storage (Spectrum):

L_{Xeq}	L_{XYMax}	L_{XYMin}
L_{XYN1}	L_{XYN2}	L_{XYN3}
L_{XYN4}	L_{XYN5}	
Level Distribution	Cumulative Distribution	

Only for Display as Numbers or Bargraphs (Broad-band)

$L_{AS(SPL)}$	$L_{AF(SPL)}$	$L_{AI(SPL)}$
$L_{VS(SPL)}$	$L_{VF(SPL)}$	$L_{VI(SPL)}$
$L_{AS(Inst)}$	$L_{AF(Inst)}$	$L_{AI(Inst)}$
$L_{VS(Inst)}$	$L_{VF(Inst)}$	$L_{VI(Inst)}$
L_{AST3}	L_{AFT3}	L_{AIT3}
L_{VST3}	L_{VFT3}	L_{VIT3}
L_{AST5}	L_{AFT5}	L_{AIT5}
L_{VST5}	L_{VFT5}	L_{VIT5}
$L_{Apk(Peak)}$	$L_{Vpk(Peak)}$	

For Storage During Logging (Broad-band)

Nothing *or*
All parameters *or*
All parameters without statistics *or*
6 Major Parameters:

L_{Aeq}	$L_{Cpk(MaxP)}$	(or $L_{Lpk(MaxP)}$ if L is selected)
L_{AFMax}	L_{Ceq}	(or L_{Leq} if L is selected)
L_{AFMin}	L_{AIm}	

For Storage During Logging (Spectrum)

Nothing *or*
All parameters *or*
All parameters without statistics *or*
L_{eq} (pre-weighting A, C or L as selected)

Only for Display as Numbers or Spectra (Spectrum Bands)

$L_{XY(SPL)}$ $L_{XY(Inst)}$

Specifications — BZ 7201 with 2260 Investigator (cont.)

The broad-band Level Distribution, Cumulative Distribution and Statistics $L_{XYN1\text{-}5}$ are based upon sampling $L_{XY(Inst)}$ every 10 ms into 0.2 dB wide classes over 80 dB

Octave band Level Distributions, Cumulative Distributions and $L_{XYN1\text{-}5}$ are based on $L_{XY(Inst)}$ samples and 1 dB class widths covering 80 dB

MEASUREMENT CONTROL:

Measurement types:

- *Manual* – manually controlled single measurement
- *Sequence* – repetition of a single measurement up to 9999 times (results stored with or without statistical data). Measurement time selectable from 1 s to 100 hours in 1 s steps
- *Logging* – a single measurement with a selectable duration of 1 s to 100 days in 1 s steps. Logging duration divided into logging intervals of 1 s to 100 hours in 1 s steps
- *Logging with Events* – as *Logging*, but with the ability to measure a different set of parameters and timebase when an event trigger is recognised

Elapsed time:

When not in Logging mode, elapsed time resets/starts and pauses/continues according to the respective command. In Logging Mode, elapsed time continues in real-time, regardless of pauses in a measurement

TRIGGERS:

Four types of event trigger are available:

- *Level* – monitors $L_{AF(Inst)}$ every 1 s. Event triggered when $L_{AF(Inst)}$ exceeds the set level for set period (both user-defined for 1 dB/1 s increments)
- *Softkey* – using <Start Event> and <Stop Event> softkeys
- *External* – +5V on pin 9 of serial interface
- *Remote* – start and stop commands sent over the serial interface

All triggers can have pre- and post-trigger time intervals of up to 15 s (in 1 s increments) allocated to them

GPS DATA:

A position can be attached to a measurement job by inputting data from a GPS (Global Positioning System) receiver via the Serial Interface

Receiver standards supported: NMEA 0183 ver.2.20, optional corrected to Differential GPS using RTCM 104 vers.2.1

Baud Rate: 4800

TIMERS:

Up to nine independent timers can be specified. Each timer "wakes-up" the analyzer at a specified date and time and initiates a measurement in accordance with pre-defined set-ups. Timed measurement can be repeated up to 999 times. Timers from different software applications can be mixed

BACK ERASE:

Up to the last 15 s of data can be erased, except when logging

MEASUREMENT DISPLAYS:

SLM: One main and five secondary parameters can be specified plus one analogue bar with zoom facilities

Cumulative Distribution for one of the spectrum bands, or broad-band plus one analogue bar

Level Distribution for one of the spectrum bands, or broad-band. Class width can be specified. Also with one analogue bar. Zoom facilities provided

Profile: The last 15 s of $L_{AF(Inst)}$ plus one analogue bar

Spectrum: Spectrum + two broad-band bars plus one peak bar. Zoom facilities provided.

The four graphical displays also have cursor read-out facilities

CIC: Periodic CIC's viewed during or after a measurement

STORAGE SYSTEM:

Internal hard disk: Up to 20 Mbyte for application software, user set-ups and data

Application Card for installation of application software

External Memory Card for store/recall of measurement data (SRAM or SanDisk ATA Flash Cards)

MS-DOS® compatible file system (from ver. 3.3)

SERIAL PRINTER/OUTPUT:

Set-ups and measurement data can be printed on an IBM Pro-printer (or compatible), Portable Printer Type 2322 or 2318. The formats can be screen dumps, tables or graphs

Measurement data can be output in spread sheet format or as a binary file for post processing on a PC

HELP AND USER LANGUAGES:

Concise context-sensitive help throughout in English, German, French, Italian, Spanish, Czech and Slovakian

CLOCK:

Back-up battery powered clock. Accuracy better than 1 minute per month

DISPLAY:

Type: Transflective back-lit LCD 192 × 128 dot matrix with internal temperature compensation

INPUT STAGE CONNECTION:

Connector: 10-pin LEMO

AUX OUTPUTS (2 independent):

Can be set to:

L_{AF}(Inst.) 0 to 4 V DC signal updated every 100 ms

Reference 4 V square-wave for output calibration

Meas. Status for triggering external devices during measurements (including SONY TCD–D7/D8 DAT)

Signal from amplified frequency weighted signal (A, C/L)

Event from amplified frequency weighted signal (A, C/L) during events only

Event Status as Meas. Status, but only during events

Limited Event status as Event Status, but with a maximum specified duration (1 s to 100 mins)

AC INPUTS/OUTPUTS (2):

As output: Buffered, unweighted microphone signal

Output impedance: 2 × 200 Ω

Maximum load: 47 kΩ || 200 pF (Short-circuit protected)

As input: Alternative to microphone input

Connector: 3-pin LEMO (balanced input)

SERIAL INPUT/OUTPUT:

Conforms to EIA ITIA 574 (RS 232), coupled as data terminal equipment (DTE)

Connector: 9-pin D-type male

Baud rates: 1200, 2400, 4800, 9600, 19200, 38400

Word length: 8 bits, no parity or stop bits

Handshake: None, XON/XOFF, RTS/CTS

PCMCIA INPUT/OUTPUT:

Computer with PCMCIA/JEIDA standards release 1.0.

SETTLING TIME:

From Power On: approximately 35 s

BATTERIES:

Type: 6 × LR14/C-size 1.5 V alkaline

Lifetime (at 20°C): 5 to 9 hours continuous operation

EXTERNAL DC POWER SUPPLY:

Voltage: regulated or smoothed 10 to 14 V, max. ripple 100 mV

Power: 3.5 W, current: 300 mA, Inrush current: 1000 mA

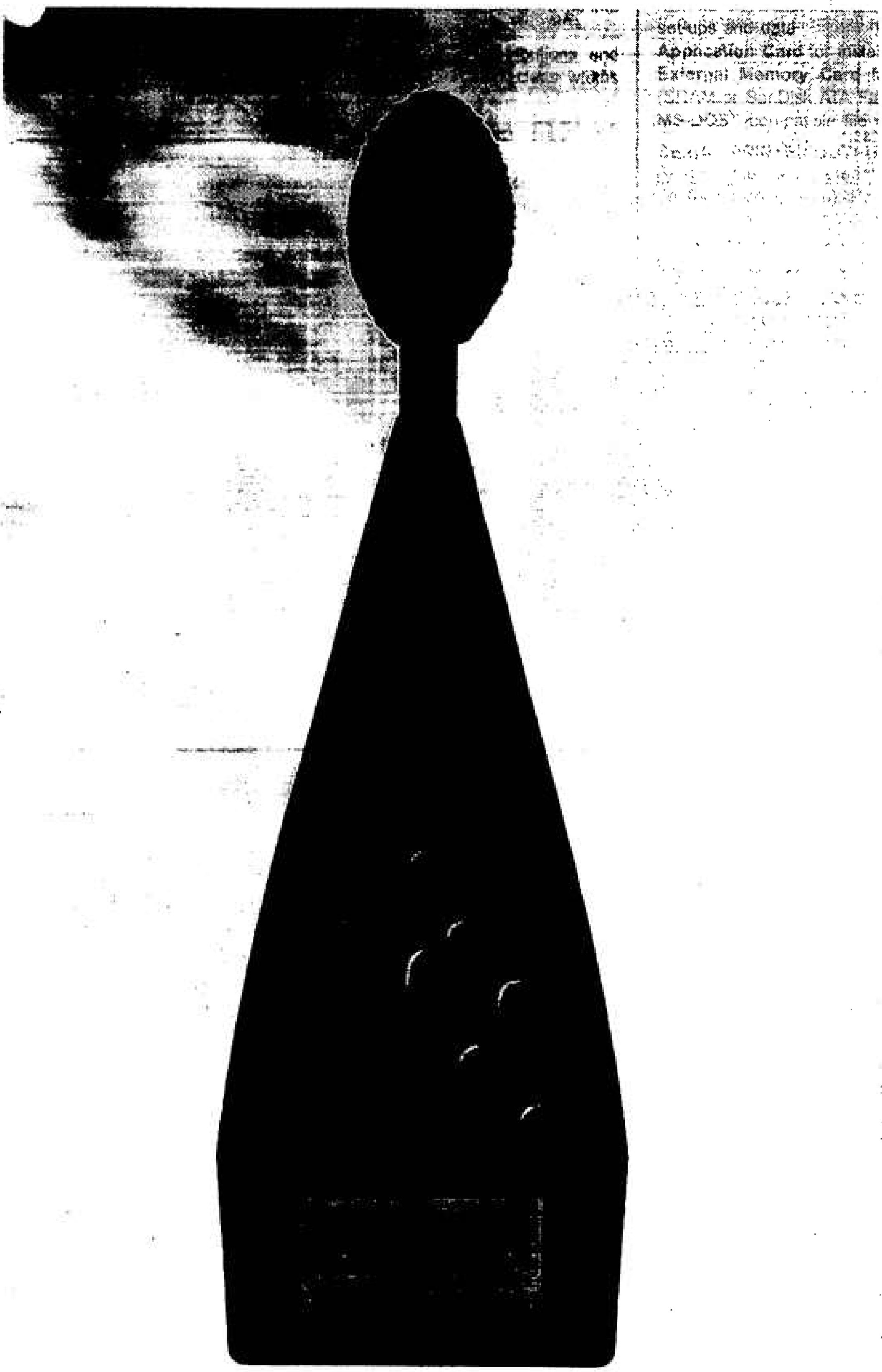
Socket: Ø5.5 mm with Ø2 mm pin (positive)

WEIGHT AND DIMENSIONS (as illustrated):

1.2 kg (with batteries), 375 × 120 × 52 mm

PRODUCT DATA

2238 Mediator with Basic SLM Software BZ 7126



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The 2238 Mediator is a high quality Class 1 integrating sound level meter that strikes an ideal balance between simplicity and power. Offering a sensible user interface and a variety of high-end features – including simultaneous measurement of RMS and Peak via two independently frequency weighted detectors – the Mediator executes basic measurements with enviable efficiency.

It is possible to store up to 500 measurement files in the 2238 for later transfer to a PC. Other attractive features include a filter to correct for windscreen effects and a stored calibration history.

What's more, the 2238 range includes a number of optional software modules for tackling more complex measurement tasks, making the Mediator an uncommonly flexible and powerful instrument.

2238 Mediator

Tentative

Brüel & Kjær

Specifications 2238 with BZ 7126

Specifications apply to the 2238 Mediator fitted with the supplied microphone and preamplifier and running Basic SLM Software (supplied as standard with each 2238 Mediator)

STANDARDS:
Conforms with the following:
- IEC 651-1979 Type 1 I, EN 60651 Type 1 I
- IEC 804-1985 Type 1, EN 60804 Type 1
- Draft IEC 1672 / EN 61672-April 1997 Class 1
- ANSI S1.43-1983 Type S1

SUPPLIED MICROPHONE:
Type 4188 Prepolarized Free-field 1/2" Condenser Microphone
Nominal Sensitivity: -30 dB
Frequency Range: 8 Hz-16 kHz ±2 dB
Capacitance: 12 pF

MICROPHONE PREAMPLIFIER:
ZC 0030
Extension Cables: Available in lengths of 3 m and 10 m

MEASURING RANGES:
Linear Operation Range: 80 dB, adjustable to give full-scale readings from 100 to 140 dB in 10 dB steps
Max. Peak Level: 3 dB above full scale reading
Upper Limit (RMS) for Crest Factor = 10: 17 dB below full scale reading

DETECTORS:
Simultaneous detection of RMS and Peak with independent frequency weightings
RMS: Three selectable exponential time weightings (Fast, Slow, Impulse) and a linear averaging detector. Selectable frequency weighting A, C or Lin
Peak: Selectable frequency weighting C or Lin
Overload Detector: Monitors all the frequency weighted channels
Exchange Rate: 3 dB. In addition, 4 or 5 dB can be selected
Criterion Level: Can be set to OFF or in the range 70-140 dB
Threshold Level: Can be set in the range 0-120 dB

INHERENT NOISE LEVEL:
This is due to the combination of electrical noise and microphone thermal noise at 20°C (68°F). Typical values with supplied microphone of nominal sensitivity (in dB):

Weighting	Electrical noise (2238)	Thermal noise (4188)	Combined Noise
"A"	14	14.5	17.4
"C"	17	13.2	18.5
Lin. 5 Hz-20 kHz	22	14.2	23

DISPLAY:
128 X 64 dot matrix display with backlight
Measurement Display: Range and quasi-analogue bar, plus four measurement parameters that can be freely selected from all available parameters during measurements

MEASUREMENTS:
The available measurement parameters are listed below. RMS and Peak measurements run in parallel with individual frequency weightings

Symbol Key:
V: Frequency weighting C or L
X: Frequency weighting A, C or L
Y: Time weighting F, S or I
Z: Time weighting F and S
Q: Exchange rate = 4 or 5 dB

Stored	Instantaneous (display only)
L_{Xeq}	L_{XYp}
L_{XZavQ}	L_{XYInst}
L_{AE}	L_{Vpk}
$L_{Aep,d}$	
E_A	
L_{XYmax}	
L_{XYmin}	
L_{Vpkmax}	
Number of Peaks	
Dose%$_X$	
Dose%$_{XZQ}$	
Overload%	
Underrange%	
Elapsed Time	

MEASUREMENT CONTROL:
Manual control, or pre-set measurement time in the range 1 s-24 h with automatic storage of measurement
Timers
The Mediator supports a total of four timers which allow set-up of measurement start times up to a month in advance

CALIBRATION:
Can be performed using Sound Level Calibrator Type 4231 or Multifunction Acoustic Calibrator Type 4226. Initial calibration is stored for comparison with later calibrations
Calibration History: 20 latest calibrations

MEMORY:
2 Mbytes. Up to 500 measurements can be stored, including time stamp, complete set-up and calibration data

SERIAL PRINTER:
Measurement data can be printed on Portable Printer Type 2322 or on an IBM Proprinter-compatible printer

Aux 1 OUTPUT:
Connector: 2 pin LEMO
AC Output Signal: Range-adjusted AC output, unweighted or with the frequency weighting selected on the RMS detector. Short-circuit protected
Output: 1 V RMS corresponding to full-scale indication
Max. Load: 10 kΩ || 1 nF
Output Impedance: Typically 100 Ω

Aux 2 OUTPUT:
Connector: 2 pin LEMO
DC Output Signal: DC version of signal on RMS detector 1 (Fast, Inst). Short-circuit protected
Output: 0 to 4.0 V DC (50 mV/dB)
Update Rate: 160 times per second
Max. Load: 10 kΩ || 1 nF
Output Impedance: Typically 100 Ω

CLOCK:
Real-time (calendar)

Specifications (cont.)

SERIAL INPUT/OUTPUT:
Conforms to EIA/TIA 574 (RS232), coupled as Data Terminal Equipment (DTE). Cable is supplied with the 2238 Mediator
Connector: 9-pin D-type male
Baud Rates: 4800, 9600 and 19200. (38400 and 115200 for file transfer)
Word Length: 8 bits, no parity, 1 stop bit
Handshake: XON/XOFF, hardwired, modem

SETTLING TIME:
From Power On: < 10 s

ENVIRONMENTAL EFFECTS:
Storage Temperature: –25 to +60° C (–13 to +140° F)
Operating Temperature: –10 to +50° C (14 to 122° F)
Effect of Temperature: < 0.5 dB (–10 to +50° C)
Effect of Humidity: < 0.5 dB for 30% < RH < 90% (at 40° C, 1 kHz)

CE	CE-mark indicates compliance with: EMC Directive and Low Voltage Directive.
EMC Emission	**EN 50081-1:** Generic emission standard. Part 1: Residential, commercial and light industry. **EN 50081-2:** Generic emission standard. Part 2: Industrial environment. **CISPR 22:** Radio disturbance characteristics of information technology equipment. Class B Limits. **FCC Rules, Part 15:** Complies with the limits for a Class B digital device.
EMC Immunity	**EN 50082-1:** Generic immunity standard. Part 1: Residential, commercial and light industry. RF immunity implies that sound level indications of 45 dB or greater will be affected by no more than 0.5 dB. **EN 50082-2:** Generic immunity standard. Part 2: Industrial environment. RF immunity implies that sound level indications of 60 dB or greater will be affected by no more than 0.5 dB.
	These levels of immunity are 14 dB better than required by IEC 1672.
Note: The above conformance is guaranteed only when using accessories listed in this Product Data sheet.	

BATTERIES:
Four 1.5 V LR6/AA alkaline cells
Lifetime (at room temperature): Typically > 8 hours

EXTERNAL DC POWER SUPPLY:
Voltage: regulated 7 to 14 V
Power: approximately 120 mA at 7 V

WEIGHT AND DIMENSIONS:
460 g (with batteries), 257 × 97 × 41 mm

LANGUAGE:
Each instrument is loaded with English, German, French, Italian and Spanish text. You can select any of these languages at any time

Additional Specifications for 2238-A-002 (version with filter set installed)

STANDARDS:
Conforms with the following:
- EN 61260/IEC 1260 (1995) Octave and $^1/_3$-octave Bands Class 1
- ANSI S1.11-1986 Octave and $^1/_3$-octave Bands, Order 3, Type 1D

MEASURING RANGES:
Two Additional Ranges: Full-scale readings of 80 and 90 dB

OCTAVE AND $^1/_3$-OCTAVE BAND FILTERS:
Nominal Octave Band Centre Frequencies: 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz and 8 kHz
Nominal $^1/_3$-octave Band Centre Frequencies: 20 Hz, 25 Hz, 31.5 Hz, 40 Hz, 50 Hz, 63 Hz, 80 Hz, 100 Hz, 125 Hz, 160 Hz, 200 Hz, 250 Hz, 315 Hz, 400 Hz, 500 Hz, 630 Hz, 800 Hz, 1 kHz, 1.25 kHz, 1.6 kHz, 2 kHz, 2.5 kHz, 3.15 kHz, 4 kHz, 5 kHz, 6.3 kHz, 8 kHz, 10 kHz and 12.5 kHz

BATTERIES:
Lifetime (at room temperature):
With filter selected: Typically > 6 hours

Product Data

Precision Integrating Sound Level Meter — Type 2236

USES:

- ❍ Measuring environmental noise
- ❍ Measuring occupational noise
- ❍ Frequency analysis of sound sources

FEATURES:

- ❍ Conforms with IEC 651 (1979) and 804 (1985) Type 1
- ❍ Conforms with ANSI S1.4-1983 and Draft S1.43-199X Type 1
- ❍ Calculates and displays L_N values*
- ❍ Simultaneous RMS and Peak measurements with independent frequency weighting
- ❍ Automatic logging of results
- ❍ Performs complete statistical analyses
- ❍ 40 records of manually stored results
- ❍ Back-lit display
- ❍ Automatic-start allows for unattended measurements
- ❍ Optional octave filter

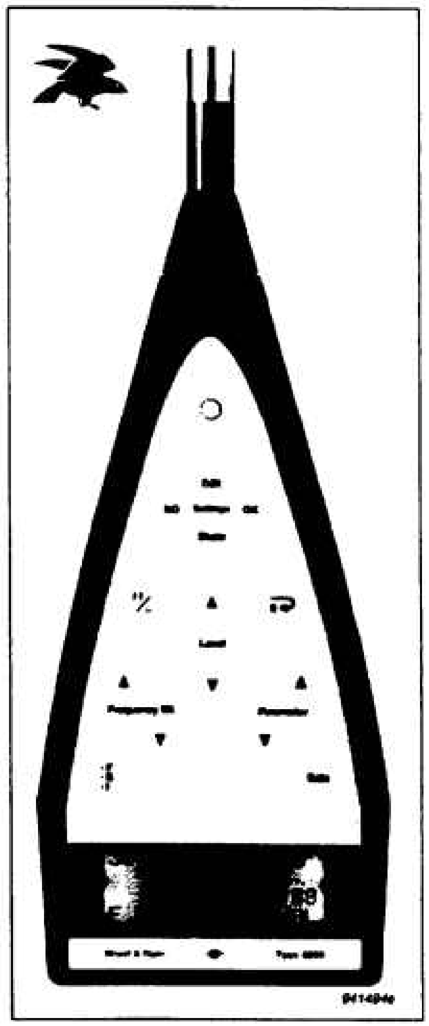
* user-definable for USA, UKe and Japanese models

Precision Integrating Sound Level Meter Type 2236 is a Type 1 instrument, designed to meet stringent standards in environmental- and occupational-noise measurement.

As Type 2236 is designed to fulfil the national standards and directives, all parameters can be obtained from the one measurement. This saves both time and money.

Measurements are displayed on a large (4 lines, 16 characters/line) LCD screen. The SPL (RMS) is continuously monitored on a quasi-analogue display. The digital output allows interfacing with personal computers and printers, for further data processing/presentation and printing.

The linearly-weighted AC output allows for a direct calibrated recording (on Digital Audio Tape, for example), enabling later analysis.



Description

Precision Integrating Sound Level Meter Type 2236 has been designed specifically for environmental- and occupational-noise measurements.

Double-detector
A unique feature of the 2236 is that RMS and Peak detection occurs in parallel. In this way the sound level meter can display both the RMS value and the Peak value of the same signal — particularly useful when analyzing transients or impulses.

Intuitive User-interface
The clearly marked arrows and symbols on the front panel, combined with the large LCD screen (with back light) make the sound level meter very easy to learn and use. The display is clear and concise, and an interactive dialog guides you through your measurement, quickly and efficiently. Warnings are also given when you attempt to change a set-up parameter once you have started your measurement.

Statistics
The sound level meter has three user-definable L_N values (only two fixed ones for the International version). With the USA and UKe models you can also perform Level and Cumulative Distributions on the results, allowing basic statistics on the spot.

Real-time Clock
The 2236 sound level meter has a real-time clock for marking results with the date and time of any measurement — particularly useful for storing data for future use or pres-

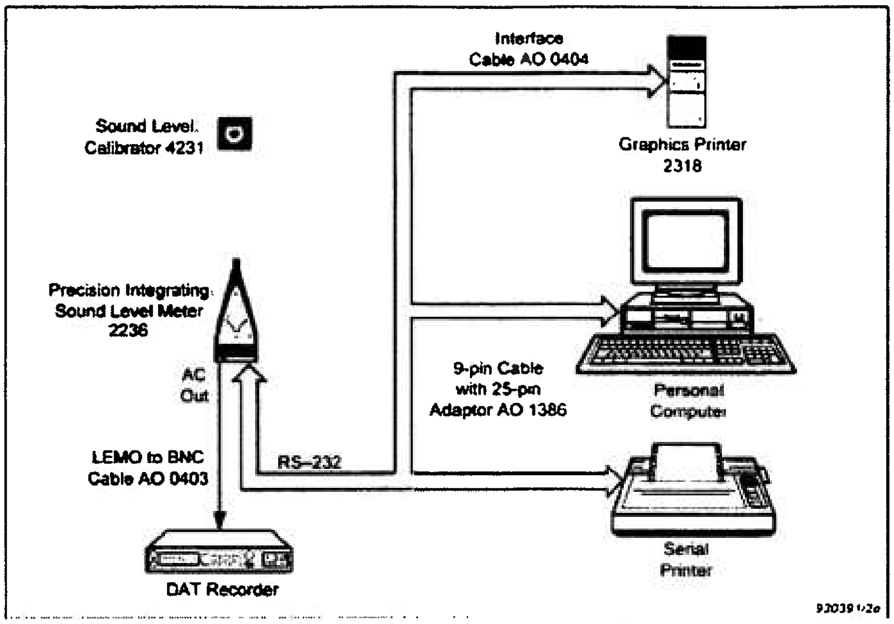


Fig. 1 System setup for printing, recording and transferring results from the sound level meter

entation. The clock can be set directly from the front panel of the sound level meter, or over the digital interface.

Auto-start
The real-time clock has a timer feature which allows you to set up the sound level meter so that it automatically starts measuring at a predefined point in time (up to one month ahead).

Data Storage & Processing
For each individual measurement, the sound level meter logs the time, L_{eq}, and depending on the version, MaxL and MaxP, or L_{10} and L_{90}. This information is stored as a set. You can store up to 21600 sets of results (for example, 6 hrs logging at 1 s intervals) in the sound level meter's 128Kbyte non-volatile memory. These results can be transferred in a spreadsheet-compatible format via the built-in serial interface to a PC for additional analysis or graphical presentation.

Interfacing to External Devices
The sound level meter communicates to external devices via the interface. By using the 9-pole to LEMO Cable AO 0404, and 9-pole Cable with 25-pole Adaptor AO 1386 you can easily connect the sound level meter to Graphics Printer Type 2318, a PC or a serial printer.

The AC output of the sound level meter can also be connected to a DAT recorder via LEMO to BNC Cable AO 0403.

AC & DC Outputs
The AC output from the sound level meter is the unweighted output signal from the preamplifier. This can be recorded on a DAT recorder, and used for further spectral analysis and noise source identification.

The DC output is the analogue equivalent of whatever parameter is currently being measured, except that it does not include the correction for the range and the microphone K-factor.

Printing Results
Once you've finished measuring you can print your results, either on the lightweight Graphics Printer Type 2318, Serial Printer Types WQ 1138, EQ 4001 or EQ 4002, or any standard serial printer.

Simplified Calibration
The sound level meter employs a very user-friendly calibration technique. Once you have fitted the calibrator (Sound Level Calibrator Type 4231, Multifunction Acoustic Calibrator Type 4226 or a similar calibrator), the sound level meter calculates the correction and prompts you either to continue with the old calibration, or do an automatic re-calibration.

Optional Features

Internal Filters
Type 2236 is also available with nine built-in 1/1-octave filters at 1/1-octave intervals. These band-pass filters have centre frequencies of 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz and 8 kHz.

dB2XL Software
The dB2XL software allows you to transfer the measurement results from the sound level meter directly into a Microsoft® Excel spreadsheet, and to produce basic graphs.

Reporter™ Software
This, more comprehensive software, allows you to generate reports from the measurement results obtained from the sound level meter and display them.

Accredited Calibration
The sound level meter can also be sold with an accredited calibration that conforms to IEC 651 and IEC 804.

Example Printout

Fig. 2 shows a printout from Graphics Printer Type 2318 for a Level Distribution measurement.

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```
------------------------
     Bruel & Kjaer
    SLM  Type 2236

SETTINGS:
------------------------
F                50-130 dB
RMS: A            Peak:C

LOGGED RESULTS:
------------------------
12 Apr 1993     15:11:19

          Leq   MaxL  MaxP
hhmmss   [dB]   [dB]  [dB]

151119   73.8   82.0   95.7
151120   78.6   89.1   99.0
151124P  76.1   86.8   96.5
151125   78.4   92.3  102.6
151126O  75.1   91.2  103.7
151128&  78.1   93.5  103.9
151129   77.7   93.0  103.3
151130   77.7   93.0  103.3
151131   72.8   88.9   98.8
151132   74.3   91.5  101.6
151133   63.7   79.9   88.8
151134   69.3   83.8   93.1
151135   60.6   77.7   84.4
151136   70.2   88.4   98.2
151137   68.0   87.1   96.8
```
931171/1e

Fig. 2 Printer (24 character/line) output format with short heading

Specifications 2236

STANDARDS:
Conforms with IEC651 (1979) and 804 (1985) Type 1, and ANSI S1.4 – 1983 and Draft S1.43, 6th September, 1992 Type 1
¹/₁-octave filter set conforms with IEC225 – 1966 and ANSI S1.11–86, order 3, Type 1–D (Types 2236 C and 2236 D only)

MEASURING RANGES:

Range (dB)	Max. Peak level	Upper limit (RMS) for signals with crest factor = 10 (20dB)
10* – 90	93	73
20† – 100	103	83
30 – 110	113	93
40 – 120	123	103
50 – 130	133	113
60 – 140	143	123

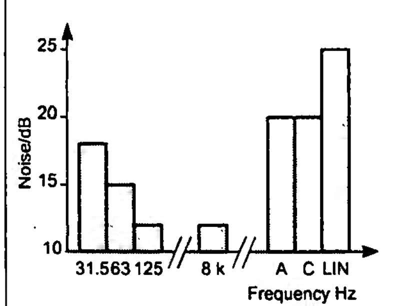
* Only available with Types 2236 C and 2236 D when filter selected.
Level non-linearity caused by noise floor is <0.4dB at 30dB(A) (re IEC651) and <1dB at 26dB(A)
† Level non-linearity caused by noise floor is <0.4dB at 30dB(A) (re IEC651) and <1dB at 26dB(A)

NOISE FLOOR:
Typically: 18dB(A)
Maximum: 20dB(A) RMS
Includes preamplifier's electrical noise and microphone's thermal noise

DETECTORS:
Simultaneous RMS and Peak with independent frequency weightings
Linearity Range: 80dB
Pulse Range: 83dB
Non-linear Distortion: Too small to affect accuracy
Peak Detector Rise Time: <50µs

FREQUENCY WEIGHTING:
Selected independently for RMS and Peak
RMS:
A, C according to IEC651 Type 1
L: flat from 10Hz to 20kHz (±2dB) with Type 1 tolerances
Peak:
C according to IEC651 Type 1
L: flat from 10Hz to 20kHz (±2dB) with Type 1 tolerances

FILTER (only available with Types 2236 C and 2236 D):
Band-pass Filters: Nine ¹/₁-octave filters at ¹/₁-octave intervals (base 10)
Centre Frequencies: 31.5, 63, 125, 250, 500Hz, 1, 2, 4, 8kHz
Maximum Noise Floor in Each Frequency Band:
See diagram for details



TIME WEIGHTING:

Int.	USA	UKi	UKe	Jap.
S, F, I	S, F, I	S, F	S, F, I	S, F, I

according to IEC651 Type 1

DISPLAY:
4 line LCD showing:
- Measuring range and quasi-analogue bar showing input signal
- Battery low, pause and overload with hold indicators
- Time weighting and elapsed measurement time
- Frequency weighting (Peak or RMS) or filter centre frequency (only available with Types 2236 C and 2236 D), selected parameter with level

Optional back-light
The quasi-analogue bar is updated 15 times per second
Displayed parameter level updated once per second

PARAMETERS:
Common (and UKi only): MaxL, MinL, MaxP, Peak, SPL, L_{eq}, SEL, $L_{EP,d}$ and Overload in % of measurement time
Specific:

	Int.	USA	UKe	Jap.
L_{Im}	✓	✓	✓	✓
Inst.				✓
IEL	✓	✓	✓	
LAE				✓
LCE				✓
LLE				✓
$L_{AV,4}$		✓		
$L_{AV,5}$		✓		✓
Variable L_N		✓	✓	✓
Defaults (fixed for Int. Version)	L_{95} L_5	L_{90} L_{50} L_{10}	L_{90} L_{50} L_1	L_{95} L_{50} L_5

Resolution:
L_N Values: 0.5dB
Other Parameters: 0.1dB

EXCHANGE RATE:

Int.	USA	UKi	UKe	Jap.
3	3, 4, 5	3	3	3, 5

RESET:
Resets Buffer (including elapsed time) to zero.
Warning prior to reset if elapsed time > 1min.
Reset when changing frequency or time weighting
Resets all results in Log, Memory and Buffer if held down together with ⟨Data⟩
Optional reset when changing level of measurement range (L_Ns not available if range change is without reset)

MICROPHONE:
Type 4188 prepolarized free-field ½″ condenser microphone
Sensitivity: −30dB re 1V/Pa ±2dB
Frequency Range: 8Hz to 12.5kHz ±2dB
Capacitance: 12pF

MEMORY:
40 Records of Overall Results
RESULT LOGGING:

Int.	USA	UKi	UKe	Jap.
L_{eq}	L_{eq}	L_{eq}	L_{eq}	L_{eq}
MaxL	L_{10}	MaxL	L_{10}	L_5
MaxP	L_{90}	MaxP	L_{90}	L_{95}

Log Rate	Log Cap.	Int.	USA	UKi	UKe	Jap.
0.1s*	36 m		✓		✓	✓
1s	6 h	✓	✓	✓	✓	✓
10s	2½ d		✓	✓	✓	✓
30s	7½ d			✓	✓	✓
1m	15 d	✓	✓	✓	✓	✓
5m	75 d			✓	✓	✓
10m	150 d		✓	✓	✓	✓
15m	225 d			✓	✓	✓
30 m	450 d		✓	✓	✓	✓
60 m	900 d		✓	✓	✓	✓

* only L_{eq} logged at this rate

Logged To: log or interface
Memory Capacity: 128Kbytes (Types 2236 A and 2236 C). Equivalent to 21600 sets of results (for example, 6hrs of 1s logging).
512Kbytes (Types 2236 B and 2236 D). Equivalent to 86400 sets of results (for example, 24hrs of 1s logging)

SERIAL INTERFACE:
Compatible with EIA-574
Compatible with EIA-232-E with 25-pole adaptor
Baud Rate: 1200 – 19200 (1200 – 9600 for Japanese version)
Data Bits: 8
Stop Bit: 1
Parity: None
Handshake: Hardwire, XON/XOFF or None

Result Output Formats	Int.	USA	UKi	UKe	Jap.
Overall	✓	✓	✓	✓	✓
Logged (Printer)	✓	✓	✓	✓	✓
Logged (2318)	✓	✓	✓	✓	✓
Logged (Spreadsheet)	✓	✓	✓	✓	✓
Level Distribution		✓		✓	✓
Cumulative Disribution		✓		✓	✓
Distribution Resolution (dB)		1 or 5		1 or 5	0.5, 1, 2, 5, 10

Heading: Long or short (only short for USA model)

DC OUTPUT:
Short-circuit protected coaxial LEMO socket (series 00)

Output: 50mV/dB equivalent to 0 – 4.15V
Output Resistance: 100Ω
Output Parameter: Same as the Displayed Parameter (Detector Output on Japanese model)
Updated: every second (160 times/second for Japanese model)

AC OUTPUT:
Short-circuit protected coaxial LEMO socket (series 00)
Max. Output: 0.5V RMS corresponding to the top of the selected measurement range ±2dB depending on the microphone's sensitivity
Output Resistance: 100Ω
Output: Output signal from preamplifier (L frequency weighting)

CLOCK:
Real-time (calendar) and measurement duration
Factory set to CET (GMT+1)

WARM-UP TIME:
<5s

SETTLING TIME:
At Range Change without Reset: <4ms

CALIBRATION CONDITIONS:
Reference Frequency: 1000Hz
Reference SPL: 94dB
Reference Range: 50 – 130dB (set automatically during calibration sequence)
Reference Direction of Incidence: Frontal
Calibration Correction with Extension Cable: 0dB

ENVIRONMENTAL EFFECTS:
Storage Temperature: –25 to +70°C (–13 to +158°F)
Operating Temperature: –10 to +50°C (14 to 122°F)
Effect of Temperature: <0.5dB (–10 to +50°C)
Effect of Humidity: <0.5dB for 30%<RH<90% **(at 40°C, 1kHz)**

VIBRATION SENSITIVITY:
<80dB with L-weighting at $1 m/s^{-2}$

EFFECT OF MAGNETIC FIELD:
80A/m (1Ørsted) at 50Hz gives <34dB (L)

ELECTROMAGNETIC COMPATIBILTY:
Designed to Fulfil:
Emission:
EN50081–1: residential, commercial and light industry (including EN55022 class B)
EN50081–2: industrial environment
FCC class B part 15J
CISPR22 class B
Immunity:
EN50082–1: residential, commercial and light industry
prEN50082–2: industrial environment

BATTERIES:
Four 1.5V LR6/AA size alkaline cells
Lifetime (at room temperature):
Typically >12hrs for Types 2236A and 2236B
Typically >10hrs for Types 2236C and 2236D
Internal back-up battery:
Charging time: ~10hours (1st time)
Keeps clock and memories operating for at least 6months (typically) if fully charged

EXTERNAL POWER SUPPLY:
Must fulfil the following specifications
Voltage: regulated or smoothed 7–15V DC
Voltage Ripple: <100mV peak to peak
Maximum Current: 400mA
Average Current: ~100mA at 7V
Socket:
- **Pin:** Positive
- **Casing:** Signal Ground
- **Pin Diameter:** 2.0mm
- **External Diameter:** 5.5mm

PHYSICAL CHARACTERISTICS:
Size: 257×97×41mm
Weight: 460g (including batteries)

Ordering Information

2236A–xxx	Precision Integrating Sound Level Meter with 128Kbyte memory
2236B–xxx	Precision Integrating Sound Level Meter with 512Kbyte memory
2236C–xxx	Precision Integrating Sound Level Meter with 128Kbyte memory and 1/1-octave filter set
2236D–xxx	Precision Integrating Sound Level Meter with 512Kbyte memory and 1/1-octave filter set

The *–xxx* extension refers to the particular English-language version.

Version	–xxx Extension
International (Int.)	–002
United States (US)	–007
United Kingdom Industrial-noise (UKi)	–008
United Kingdom Environmental- and Industrial-noise (UKe)	–009
Japanese (Jap.)	–010

Includes the following accessories:

4 × QB0013	1.5V LR6/AA alkaline cells
Type 4188	Prepolarized Free-field 1/2" Microphone
KE0323	Shoulder Bag
UA1236	Protective Cover

Optional Accessories

For Measuring:

Type 4231	Sound Level Calibrator
Type 4226	Multifunction Acoustic Calibrator
UA1251	Tripod
UA0801	Tripod
UA1254	Microphone Holder (for tripod)
UA0459	Windscreen (Ø 65mm)
AO0408	Microphone Extension Cable (3m)
AO0409	Microphone Extension Cable (10m)
ZT0326	Octave Filter Set Upgrade
Type 4189	Prepolarized Free-field 1/2" Microphone

For Transferring Results to a PC:

AO1386	9-pole Cable with 25-pole Adaptor

For Recording on a DAT Recorder, Transferring Signals to an Analyzer or Using with Headphones:

AO0403	LEMO to BNC Cable

For Printing:

Type 2318	Graphics Printer
WQ1138	Serial Printer (Euro version)
EQ4001	Serial Printer (US version)
EQ4002	Serial Printer (UK version)
AO0404	9-pole to LEMO Cable (for 2318)
AO1386	9-pole Cable with 25-pole Adaptor (for serial printer)

Upgrades:

ZT0326	Octave Filter Set (for A and B models)

Carrying Case:

KE0325	Carrying Case with insert for sound level meter, Sound Level Calibrator Type 4231, Serial Printer WQ1138 and Tripod UA1251

Services available with delivery:

EK0102	Accredited Calibration re IEC651 and IEC804

Brüel & Kjær

WORLD HEADQUARTERS:
DK-2850 Naerum · Denmark · Telephone: +45 45 80 05 00 · Fax: +45 45 80 14 05 · Internet: http://www.bk.dk · e-mail: info@bk.dk
Australia (02) 9450-2066 · Austria 00 43-1-865 74 00 · Belgium 016/44 92 25 · Brazil (011) 246-8166 · Canada: (514) 695-8225 · China 10 6841 9625 / 10 6843 7426
Czech Republic 02-67 021100 · Finland 90-229 3021 · France (01) 69 90 69 00 · Germany 0610 3/908-5 · Holland (0)30 6039994 · Hong Kong 254 8 7486
Hungary (1) 215 83 05 · Italy (02) 57 60 4141 · Japan 03-3779-8671 · Republic of Korea (02) 3473-0605 · Norway 66 90 4410 · Poland (0-22) 40 93 92 · Portugal (1) 47114 53
Singapore (65) 275-8816 · Slovak Republic 07-37 6181 · Spain (91) 36810 00 · Sweden (08) 71127 30 · Switzerland 01/94 0 09 09 · Taiwan (02) 713 9303
United Kingdom and Ireland (0181) 954-236 6 · USA 1 - 800 - 332 - 2040
Local representatives and service organisations worldwide

BP 1535–11

Product Data

The Falcon™ Range $^1/_2$″ Microphones — Types 4188 to 4193

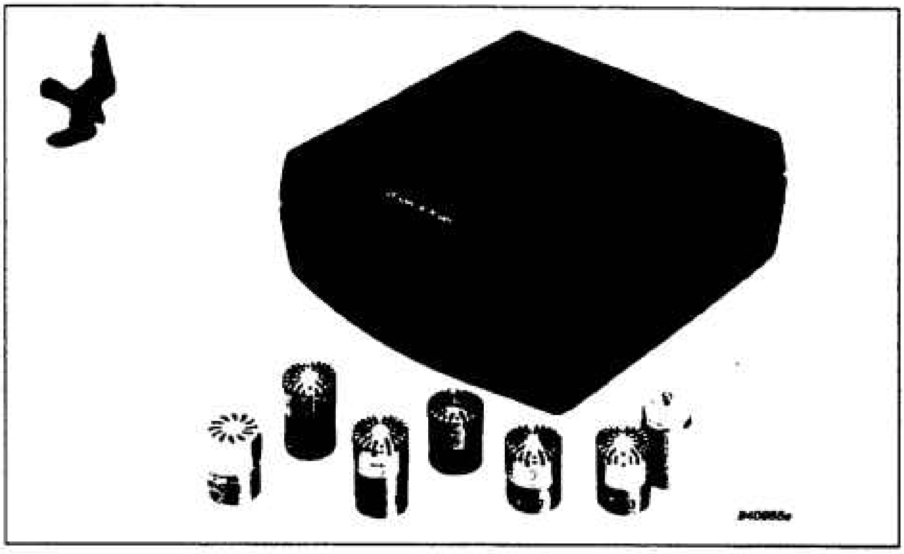
USES:

- ❍ For sound level meters
- ❍ In noise measurement systems satisfying IEC and ANSI standards
- ❍ Transport-noise measurements
- ❍ Architectural acoustics
- ❍ Electro-acoustics

FEATURES:

- ❍ Choice of free or pressure-field frequency response
- ❍ Choice of pre- or external polarization
- ❍ Wide dynamic ranges typically from 14.2 dB(A) to 146 dB and 20 dB(A) to 162 dB (3% distortion limit)
- ❍ Very wide operating temperature range and low ambient-temperature coefficient
- ❍ Individual calibration charts
- ❍ Individual data disks for Types 4189 to 4193 for use with Microsoft® Windows™
- ❍ Withstand IEC 68-2-32 1 m drop test (<0.1 dB sensitivity change) and industrial environments
- ❍ Falcon™ Range product with a three-year guarantee

The Falcon™ Range microphones are six new high-quality, $^1/_2$″ diameter precision condenser microphones. They cover requirements for free-, random- and pressure-field measurements. They are the latest in Brüel & Kjær's range of precision microphones for accurate and reliable electro-acoustic, IEC or ANSI sound measurements. Their corrosion resistance has been improved and their temperature range has been extended. They are the result of a new and robust design which ensures greater reliability and accuracy.



Introduction

The six $^1/_2$″ condenser microphones of Brüel & Kjær's Falcon™ Range cover, between them, a very wide range of needs and applications.

They are the culmination of 40 years of leadership in top quality condenser microphones for precision acoustic measurements. These Falcon™ Range microphones will meet your demands whether they be in complying with ANSI or IEC standards or in acoustic research.

Robust and Stable
They are robust and suffer less than a ±0.1 dB change in sensitivity when subjected to an IEC 68-2-32 1 m drop test onto a hard wooden block. They are made of carefully selected materials and alloys to ensure excellent stability and are virtually unaffected by industrial and similarly hostile environments. Furthermore, each Falcon™ Range microphone comes with an extended guarantee period of three years.

During manufacture, each microphone is artificially aged at a high temperature to ensure good long-term stability.

No ecologically damaging materials are used in the manufacture and packaging of these microphones. The Types 4189 to 4193 are packaged as shown above.

Selecting a Microphone for Your Needs

To make sure you select the right microphone to match your needs, you will probably have to consider one or more of the following:

Standards (IEC or ANSI)
Free- or pressure-field response
Frequency range
Polarization (0 V or 200 V)

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Specifications 4188

OPEN-CIRCUIT SENSITIVITY (1000 Hz):
−30 dB ±2 dB re 1 V/Pa, 31.6 mV/Pa*
POLARIZATION VOLTAGE (external): 0 V
FREQUENCY RESPONSE:
0° incidence free-field response:
±1 dB, 12.5 Hz to 8 kHz
±2 dB, 8 Hz to 12.5 kHz
In accordance with IEC 651, Type 1 and ANSI S1.4 – 1983
LOWER LIMITING FREQUENCY (−3 dB):
1 Hz to 5 Hz (vent exposed to sound)
PRESSURE EQUALIZATION VENT:
Rear vented
DIAPHRAGM RESONANCE FREQUENCY:
9 kHz (90° phase shift)
CAPACITANCE (POLARIZED, 1000 Hz): 12 pF
EQUIVALENT AIR VOLUME (101.3 kPa):
65 mm^3
CALIBRATOR LOAD VOLUME (250 Hz):
208 mm^3
PISTONPHONE TYPE 4228 CORRECTION (with DP 0776): +0.02 dB
CARTRIDGE THERMAL NOISE:
14.2 dB (A), 14.5 dB (Lin.)

* Individually calibrated

UPPER LIMIT OF DYNAMIC RANGE (3% distortion): >146 dB SPL
MAXIMUM SOUND PRESSURE LEVEL:
157 dB (peak)

Environmental

OPERATING TEMPERATURE RANGE:
−30 to +125°C (−22 to +257°F)
Max. 70°C (158°F) when fitted with Random-incidence Corrector DZ 9566
OPERATING HUMIDITY RANGE:
0 to 100% RH (without condensation)
STORAGE TEMPERATURE:
−30 to +70°C (−22 to +158°F)
Data Disk: 5 to 50°C (41 to +122°F)
TEMPERATURE COEFFICIENT (250 Hz):
+0.005 dB/°C (for the range −10 to +50°C (14 to +122°F))
PRESSURE COEFFICIENT (250 Hz):
−0.021 dB/kPa
INFLUENCE OF HUMIDITY: <0.1 dB/100%RH
VIBRATION SENSITIVITY (<1000 Hz):
63.5 dB equivalent SPL for 1 m/s^2 axial acceleration

MAGNETIC FIELD SENSITIVITY:
7 dB SPL for 80 A/m, 50 Hz field
ESTIMATED LONG-TERM STABILITY:
>1000 years/dB (dry air at 20°C (68°F))
>10 hours/dB (dry air at 125°C (257°F))
>40 years/dB (air at 20°C (68°F), 90% RH)
>6 months/dB (air at 50°C (122°F), 90% RH)

Dimensions

Diameter: 13.2 mm (0.52") (with grid)
12.7 mm (0.50") (cartridge housing)
14.35 mm (0.56") (with DZ 9566)
Height: 14.9 mm (0.59") (with grid)
14.0 mm (0.55") (without grid)
16.7 mm (0.66") (with DZ 9566)
Thread for preamplifier mounting:
11.7 mm – 60 UNS

Note: All values are typical at 23°C (73.4°F) 101.3 kPa and 50% RH, unless measurement uncertainty or tolerance field is specified. All uncertainty values are specified at 2σ (i.e. expanded uncertainty using a coverage factor of 2)

Ordering Information 4188

Type 4188 Prepolarized Free-field 1/2" Microphone
Includes the following accessories:
DZ 9566: Random-incidence Corrector
BC 0211: Calibration Chart*

* Quote mic. serial number when re-ordering

Optional Accessories

Type 2669: 1/2" Microphone Preamplifier
Type 4231: Sound Level Calibrator
Type 4226: Multifunction Acoustic Calibrator
Type 4228: Pistonphone
UA 0308: Dehumidifier
UA 0254: Set of 6 Windscreens (UA 0237), 90 mm (3.5")
UA 0469: Set of 6 Windscreens (UA 0459), 65 mm (2.6")
BA 5105: Microphone Handbook

Specifications 4189

OPEN-CIRCUIT SENSITIVITY (250 Hz):
−26 dB ±1.5 dB re 1 V/Pa, 50 mV/Pa*
POLARIZATION VOLTAGE (external): 0 V
FREQUENCY RESPONSE*:
0° incidence free-field response:
±1 dB, 10 Hz to 8 kHz
±2 dB, 6.3 Hz to 20 kHz
In accordance with IEC 651, Type 1
LOWER LIMITING FREQUENCY (−3 dB):
2 Hz to 4 Hz (vent exposed to sound)
PRESSURE EQUALIZATION VENT:
Rear vented
DIAPHRAGM RESONANCE FREQUENCY:
14 kHz (90° phase shift)
CAPACITANCE (POLARIZED, 250 Hz): 14 pF
EQUIVALENT AIR VOLUME (101.3 kPa):
46 mm^3
CALIBRATOR LOAD VOLUME (250 Hz):
260 mm^3
PISTONPHONE TYPE 4228 CORRECTION (with DP 0776): 0.00 dB
CARTRIDGE THERMAL NOISE:
14.6 dB (A), 15.3 dB (Lin.)

* Individually calibrated

UPPER LIMIT OF DYNAMIC RANGE (3% distortion): >146 dB SPL
MAXIMUM SOUND PRESSURE LEVEL:
158 dB (peak)

Environmental

OPERATING TEMPERATURE RANGE:
−30 to +150°C (−22 to 302°F)
OPERATING HUMIDITY RANGE:
0 to 100% RH (without condensation)
STORAGE TEMPERATURE:
−30 to +70°C (−22 to 158°F)
Data Disk: 5 to 50°C (41 to +122°F)
TEMPERATURE COEFFICIENT (250 Hz):
−0.001 dB/°C (for the range −10 to +50°C (14 to 122°F))
PRESSURE COEFFICIENT (250 Hz):
−0.010 dB/kPa
INFLUENCE OF HUMIDITY:
<0.1 dB/100%RH
VIBRATION SENSITIVITY (<1000 Hz):
62.5 dB equivalent SPL for 1 m/s^2 axial acceleration

MAGNETIC FIELD SENSITIVITY:
6 dB SPL for 80 A/m, 50 Hz field
ESTIMATED LONG-TERM STABILITY:
>1000 years/dB (dry air at 20°C (68°F))
>2 hours/dB (dry air at 150°C (302°F))
>40 years/dB (air at 20°C (68°F), 90% RH)
>1 year/dB (air at 50°C (122°F), 90% RH)

Dimensions

Diameter: 13.2 mm (0.52") (with grid)
12.7 mm (0.50") (without grid)
Height: 17.6 mm (0.69") (with grid)
16.3 mm (0.64") (without grid)
Thread for preamplifier mounting:
11.7 mm – 60 UNS

Note: All values are typical at 23°C (73.4°F) 101.3 kPa and 50% RH, unless measurement uncertainty or tolerance field is specified. All uncertainty values are specified at 2σ (i.e. expanded uncertainty using a coverage factor of 2)

Ordering Information 4189

Type 4189 Prepolarized Free-field 1/2" Microphone
Includes the following accessories:
BC 0224: Calibration Chart*

* Quote mic. serial number when re-ordering

BC 5002: Microphone-data Disk*

Optional Accessories

Type 2669: 1/2" Microphone Preamplifier
Type 4231: Sound Level Calibrator
Type 4226: Multifunction Acoustic Calibrator
Type 4228: Pistonphone
UA 0308: Dehumidifier
UA 0254: Set of 6 Windscreens (UA 0237), 90 mm (3.5")
UA 0469: Set of 6 Windscreens (UA 0459), 65 mm (2.6")
BA 5105: Microphone Handbook

Product Data

Sound Level Calibrator — Type 4231

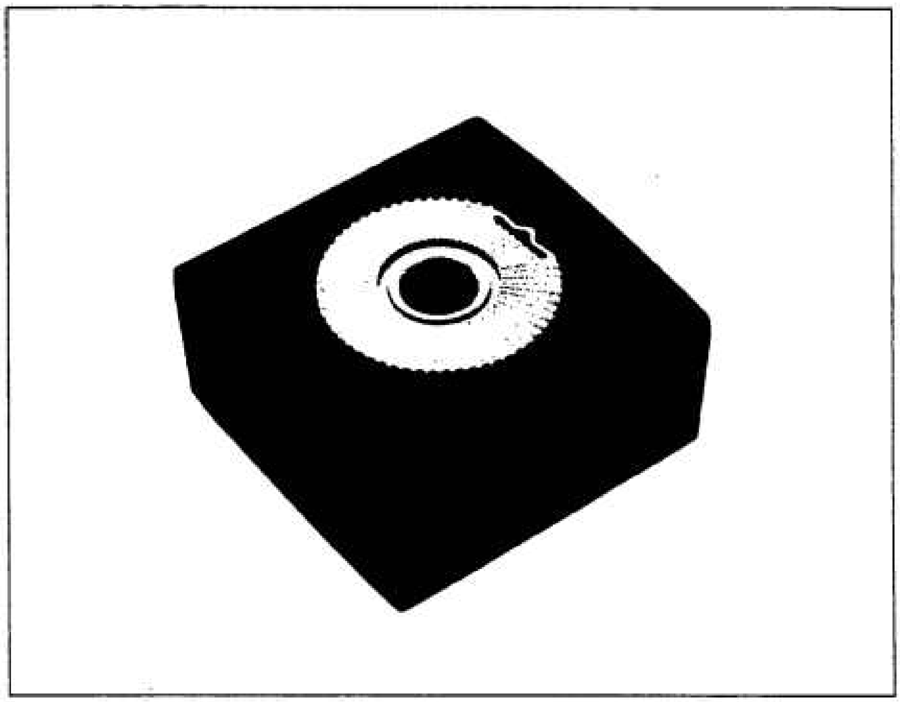
USES:

- Calibration of sound level meters and other sound measurement equipment

FEATURES:

- Conforms to IEC 942 (1988) Class 1 and ANSI S1.40–1984
- Robust pocket-size design with highly stable level and frequency
- Calibration accuracy ±0.2 dB
- 94 dB SPL, or 114 dB SPL for calibration in noisy environments
- Extremely small influence of static pressure
- Sound pressure independent of microphone equivalent volume
- 1 kHz calibration frequency for correct calibration level independent of weighting networks
- Fits Brüel & Kjær 1″ and ½″ microphones (¼″ and ⅛″ microphones with adaptor)
- Switches off automatically when removed from the microphone

The Sound Level Calibrator Type 4231 is a handy, portable sound source for calibration of sound level meters and other sound measurement equipment. The calibrator is very robust and stable and conforms to IEC 942 Class 1 and ANSI S1.40-1984.



The Sound Level Calibrator Type 4231 is a pocket-sized, battery operated sound source for quick and direct calibration of sound level meters and other sound measuring systems. It fits Brüel & Kjær 1″ and ½″ microphones and, with adaptors, it can be used for ¼″ and ⅛″ microphones as well.

The calibration frequency is 1000 Hz (the reference frequency for the standardized international weighting networks), so the same calibration value is obtained for all weighting networks (A, B, C, D and Linear). The calibration pressure of 94 ±0.2 dB re 20 μPa is equal to 1 Pa or 1 N/m^2. The +20 dB level step gives 114 dB SPL which is convenient for calibration in noisy environments.

The design of the 4231 is based on a feed-back arrangement to ensure a highly stable sound pressure level and ease of use. The feed-back loop uses a condenser microphone (see Fig. 1), which is specially developed for this purpose. This microphone is optimized to have extremely high stability and independence of variations in static pressure and temperature around the 1 kHz calibration frequency. The result of this is a user-friendly calibrator where exact fitting of the microphone is non critical and the effects of changes in temperature and static pressure are negligible.

The calibrator gives a continuous sound pressure level when fitted on a microphone (see Fig. 2) and activated. The sensitivity of the sound measuring equipment can then be adjusted until it indicates the correct sound pressure level. The calibrator is automatically switched off when removed from the microphone.

A leather protecting case, which does not need to be removed to use the calibrator, is supplied.

Specifications 4231

STANDARDS SATISFIED:
IEC 942 (1988), Sound Calibrators, Class 1
ANSI S1.40–1984, Specifications for Acoustic Calibrators
NOMINAL SOUND PRESSURE LEVEL:
94.0 dB ±0.2 dB or 114.0 dB ±0.2 dB re 20 μPa at reference conditions
FREQUENCY: 1 kHz ±0.1%
SPECIFIED MICROPHONE TYPES:
(Conforms to IEC 942 Class 1)
Brüel & Kjær (and similar types) 1″ and $^1/_2$″, $^1/_4$″, $^1/_8$″ with adaptors
EQUIVALENT FREE-FIELD LEVEL:
(0° incidence, re Nominal Sound Pressure Level)
−0.15 dB for $^1/_2$″ Brüel & Kjær Microphones. See the 4231 User Manual for other microphones
EQUIVALENT RANDOM INCIDENCE LEVEL:
(re Nominal Sound Pressure Level)
+0.0 dB for 1″, $^1/_2$″, $^1/_4$″ and $^1/_8$″ Brüel & Kjær Microphones.
NOMINAL EFFECTIVE COUPLER VOLUME:
>200 cm^3 at reference conditions
TOTAL HARMONIC DISTORTION (THD): <1%
LEVEL STABILITY:
Stabilization Time: 5 s
Short-term: Better than 0.02 dB (as specified in IEC 942)
1 Year: Better than 0.05 dB
REFERENCE CONDITIONS:
Ambient Temperature: 20°C (68°F)
Ambient Pressure: 1013 hPa
Ambient Humidity: 65% RH
Load: Microphone Type 4134 (effective load volume: 0.25 cm^3)

Environmental

AMBIENT CONDITIONS:
Pressure: 650 to 1080 hPa
Humidity: 10 to 90% RH (without condensation)
Effective Load Volume: 0 to 1.5 cm^3
INFLUENCE OF AMBIENT CONDITIONS:
Temperature Coefficient: ±0.0015 dB/°C
Pressure Coefficient: $+8 \times 10^{-5}$ dB/hPa
Humidity Coefficient: 0.001 dB/%RH

Power Supply

Batteries: 2 × 1.5 V IEC Type LR6 ("AA" size)
Lifetime: Typically 100 hours continuous operation with alkaline batteries at 20°C (68°F)
Check: When about 10 hours of the batteries' lifetime remain, the calibrator can only be operated by keeping the On/Off button pressed. The generated sound level will be within the tolerances as long as the calibrator can be operated

Dimensions and Weight:

Height: 30 mm (1.2″)
Width: 72 mm (2.8″)
Depth: 72 mm (2.8″)
Weight: 150 g (0.33 lb), including batteries

Note: All values are typical at 25°C (77°F), unless measurement uncertainty or tolerance field is specified. All uncertainty values are specified at 2σ (i.e. expanded uncertainty using a coverage factor of 2)

COMPLIANCE WITH STANDARDS:

CE	CE-mark indicates compliance with: EMC Directive.
Safety	EN 61010–1 and IEC 1010–1: Safety requirements for electrical equipment for measurement, control and laboratory use.
EMC Emission	EN 50081–1: Generic emission standard. Part 1: Residential, commercial and light industry. EN 50081–2: Generic emission standard. Part 2: Industrial environment. CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits. FCC Rules, Part 15: Complies with the limits for a Class B digital device.
EMC Immunity	EN 50082–1: Generic immunity standard. Part 1: Residential, commercial and light industry. EN 50082–2: Generic immunity standard. Part 2: Industrial environment.
Temperature	IEC 68–2–1 & IEC 68–2–2: Environmental Testing. Cold and Dry Heat. Operating Temperature: −10 to +50°C (14 to 122°F) Storage Temperature: −25 to 70°C (−13 to 158°F)
Humidity	IEC 68–2–3: Damp Heat: 90% RH (non-condensing at 40°C (104°F))
Enclosure	IEC 529 (1989): Protection provided by enclosures: IP 50

Ordering Information

Type 4231 Sound Level Calibrator
Includes the following accessories:
KE 0317: Leather Case
2 × QB 0013: Alkaline Batteries Type LR6
UC 0210: Adaptor for $^1/_2$″ microphones

Optional Accessories

DP 0775: Adaptor for $^1/_4$″ microphones
DP 0774: Adaptor for $^1/_8$″ microphones
DP 0682: Adaptor for Studio Microphones Types 4003 and 4006
DP 0750: Adaptor for Studio Microphones Types 4004 and 4007
DP 0887: Adaptor for Head and Torso Simulator Type 4128
DP 0888: Adaptor for Intensity Probe Sets Types 3545, 3548, 3583, 3584

Calibration Certificates

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

SOUND ANALYZER

Manufactured by:	BRUEL & KJAER
Model No:	2260
Serial No:	1772319
Calibration Recall No:	8341

Submitted By:

Customer:	MICHAEL THERIAULT
Company:	MICHAEL THERIAULT ASSOCIATES, INC.

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Specification No. 2260 BRUE

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached report.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements of MIL-STD-45662A

Approved by:

F.C.

Felix Christopher

Calibration Date:	18-Jul-00
Calibration Due:	18-Jul-01
Certificate No:	8341 -3

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration

1086 Bloomfield Avenue
West Caldwell
New Jersey
07006

Telephone
(201) 882-4900
Fax
(201) 808-9297

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

MICROPHONE

Manufactured by:	BRUEL & KJAER
Model No:	4189
Serial No:	1783679
Calibration Recall No:	8341

Submitted By:

Customer: MICHAEL THERIAULT

Company: MICHAEL THERIAULT ASSOCIATES, INC.

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Specification No. 4189 BRLE

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached report.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements of MIL-STD-45662A

Calibration Date:	18-Jul-00
Calibration Due:	18-Jul-01
Certificate No:	8341 -1

Approved by:

FC

Felix Christopher

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration

1086 Bloomfield Avenue
West Caldwell
New Jersey
07006

Telephone
(201) 882 4900
Fax
(201) 808-9297

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

ACOUSTICAL CALIBRATOR

Manufactured by:	BRUEL & KJAER
Model No:	4231
Serial No:	1882710
Calibration Recall No:	8341

Submitted By:

Customer:	MICHAEL THERIAULT
Company:	MICHAEL THERIAULT ASSOCIATES, INC.

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Specification No. 4231 BRUE

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached report.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements of MIL-STD-45662A

Calibration Date:	18-Jul-00
Calibration Due:	18-Jul-01
Certificate No:	8341 -2

Approved by:

FC.

Felix Christopher

West Caldwell Calibration Laboratories, Inc.

uncompromised calibration

1086 Bloomfield Avenue
West Caldwell
New Jersey
07006

Telephone
(201) 882-4900
Fax
(201) 808-9297

MANUFACTURER'S CERTIFICATE OF CONFORMANCE

We certify that Brüel & Kjær 2260 Serial No 2248385
has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001 (1994) assuring that all calibration data for test equipment are retained on file and are available for inspection upon request

Nærum 15. September 2000

Torben Bjørn
Production Manager

Please note that this document is not a calibration certificate. For information on calibration services please contact your nearest Brüel & Kjær Service Center

WORLD HEADQUARTERS, DK-2850 Nærum · Denmark
Telephone: +45 45 80 05 00 · Fax: +45 45 80 14 05 · http://www.bk.dk · e-mail: info@bk.dk

Brüel & Kjær

MANUFACTURER'S CERTIFICATE OF CONFORMANCE

We certify that Brüel & Kjær 4231 Serial No 2263289
has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001 (1994) assuring that all calibration data for test equipment are retained on file and are available for inspection upon request.

Nærum 22. September 2000

Torben Bjørn
Production Manager

Please note that this document is not a calibration certificate. For information on calibration services please contact your nearest Brüel & Kjær Service Center.

WORLD HEADQUARTERS, DK-2850 Nærum · Denmark
Telephone: +45 45 80 05 00 · Fax: +45 45 80 14 05 · http://www.bk.dk · e-mail: info@bk.dk

Brüel & Kjær

MANUFACTURER'S CERTIFICATE OF CONFORMANCE

We certify that Brüel & Kjær 2238-F-001 Serial No 2246211
has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test.

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001 (1994) assuring that all calibration data for test equipment are retained on file and are available for inspection upon request.

Nærum 10. October 2000

Torben Bjørn
Production Manager

Please note that this document is not a calibration certificate, for information on accredited calibration services, please contact your nearest Brüel & Kjær Service Center

WORLD HEADQUARTERS: DK-2850 Nærum · Denmark
Telephone: +45 45 80 05 00 · Fax: +45 45 80 14 05 · http://www.bk.dk · e-mail: info@bk.dk

Brüel & Kjær

MANUFACTURER'S CERTIFICATE OF CONFORMANCE

We certify that Brüel & Kjær 2238 -F-001 Serial No 2255689
has been tested and passed all production tests, confirming compliance with the manufacturer's published specification at the date of the test.

The final test has been performed using calibrated equipment, traceable to National or International Standards or by ratio measurements.

Brüel & Kjær is certified under ISO 9001 (1994) assuring that all calibration data for test equipment are retained on file and are available for inspection upon request.

Nærum 30. November 2000

Torben Bjørn
Production Manager

Please note that this document is not a calibration certificate, for information on accredited calibration services, please contact your nearest Brüel & Kjær Service Center

WORLD HEADQUARTERS: DK-2850 Nærum · Denmark
Telephone: +45 45 80 05 00 · Fax: +45 45 80 14 05 · http://www.bk.dk · e-mail: info@bk.dk

Brüel & Kjær

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

ACOUSTICAL CALIBRATOR

Manufactured by: BRUEL & KJAER

Model No: 4231

Serial No: 2115610

Calibration Recall No: 8451

Submitted By:

Customer: ANTHONY AGRESTI

Company: TRC ENGINEERING CORPORATION

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Specification No. 4231 BRUE

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached report.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25 and ISO 9002

Approved by:

Calibration Date: 14-Aug-00

Calibration Due: 14-Aug-01

Certificate No: 8451 -1

F.C.

Felix Christopher
Quality Manager

uncompromised calibration West Caldwell Calibration Laboratories, Inc.

1086 Bloomfield Avenue
West Caldwell
New Jersey
07006

Telephone
(973) 882-4900
Fax
(973) 808-9297

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

MICROPHONE

Manufactured by:	BRUEL & KJAER
Model No:	4188
Serial No:	2057665
Calibration Recall No:	7913

Submitted By:

Customer:	ANTHONY AGRESTI
Company:	TRC ENGINEERING CORPORATION

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Specification No. 4188 BRUE

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached report.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25 and ISO 9002

Calibration Date:	29-Mar-00
Calibration Due:	29-Mar-01
Certificate No:	7913 -2

Approved by:

Felix Christopher

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration

1086 Bloomfield Avenue
West Caldwell
New Jersey
07006

Telephone
(973) 882-4900
Fax
(973) 808 9297

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

SOUND LEVEL METER

Manufactured by:	BRUEL & KJAER
Model No:	2236
Serial No:	2100600
Calibration Recall No:	7913

Submitted By:

Customer:	ANTHONY AGRESTI
Company:	TRC ENGINEERING CORPORATION

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Specification No. 2236 BRUE

Upon receipt for Calibration, the instrument was found to be:

Outside (X) see attached report.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25 and ISO 9002

Approved by:

Felix Christopher

Calibration Date:	29-Mar-00
Calibration Due:	29-Mar-01
Certificate No:	7913 -1

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration

1086 Bloomfield Avenue
West Caldwell
New Jersey
07006

Telephone
(973) 882-4900
Fax
(973) 808-9297

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1086 Bloomfield Avenue, West Caldwell, NJ 07006, U.S.A.
Web Site: www.wccl.com

Phone: (973) 882 - 4900 Fax.: (973) 808 - 9297
E - Mail: info@wccl.com

REPORT OF CALIBRATION

for

BRUEL & KJAER ACOUSTICAL CALIBRATOR

Model No.: 4231 **Serial No.: 2115610**

Submitted by:
Company: TRC ENGINEERING CORPORATION

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **4231B&K** Revision **Feb. 2000**

Calibration results:

SPL as per spec. is 114.0 dB + - 0.2 dB re. 20 uPa at 1000 Hz + - 0.1 %.
Sound Pressure Level measured was 114.0 dB re. 20 uPa at 999.8 Hz.

SPL as per spec. is 94.0 dB + - 0.2 dB re. 20 uPa at 1000 Hz + - 0.1 %.
Sound Pressure Level measured was 94.0 dB re. 20 uPa at 999.8 Hz.

This Calibration is traceable through NIST test number: 822/261834-99 D1129
Uncertainty: The absolute uncertainty of calibration: 0.15dB at 99% confidence level.
Unless otherwise noted, the reported value is both the "as found" and "as left" data.

Calibration was performed by West Caldwell Calibration Laboratories Inc under Operating Procedures intended to implement the requirements of ANSI/NCSL Z540-1,(MIL-STD-45662A), and ISO 9002

Certified References:		Date of Cal.	Due Date	NIST Test No.
Bruel & Kjaer 4228	S/N1742061	5 Jun. 2000	5 Jun. 2001	822/261834-99 D1129
Bruel & Kjaer 4160	S/N1560036	5 May 1999	5 May 2001	822/261834-99 D1129

Laboratory Environment:

Ambient Temperature:	**22.3**	C
Ambient Humidity:	**55.5**	% RH
Ambient Pressure:	**100.71**	kPa (10mbar)
Calibration Date:	**8/14/00**	
Calibration Due:	**8/14/01**	
Report Number:	**8451-1**	
Control Number:	**8451**	

Measurements performed by:

VB
Vina Baldonado

Form Calib\B30329-10

West Caldwell Calibration Laboratories, Inc.
ɔompromised calibration

ACCREDITATION
ISO/IEC GUIDE 25
CALIBRATION TRACEABLE TO N.I.S.T.
REGI-STAR, INC.
ANSI/NCSL Z540-1 1994
(MIL-STD-45662A)
ISO 9002 REGISTERED COMPANY
ISO 9002

1086 Bloomfield Avenue, West Caldwell, NJ 07006, U.S.A.
Web Site: www.wccl.com
Phone: (973) 882 - 4900 Fax.: (973) 808 - 9
E - Mail: info@wccl.com

REPORT OF CALIBRATION

for

BRUEL & KJAER SOUND LEVEL METER

Model No. 2236 **Serial No.: 2100600**

Company : TRC ENGINEERING CORPORATION

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **2236B&K** Revision **Feb. 2000**

Calibration results:

The above listed instrument was found to meet or exceed manufacturer's specifications.

This Calibration is traceable through NIST test numbers:
822/261834-99 D1129 822/261898-99

Fault: (x) Unit did not turn off, power supply circuit was defective. (Replaced)
(x) Battery socket was damaged. (Replaced)

Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ANSI/NCSL Z540-1,(MIL-STD-45662A), and ISO 9002.

Certified References:		Date of Cal.	Due Date	NIST Test No.
Bruel & Kjaer 4160	S/N1560036	5 May 1999	5 May 2001	822/261834-99 D1129
Bruel & Kjaer 8305	S/N1777437	28 May. 1999	28 May 2001	822/261898-99
Hewlett Packard 3458A	S/N2823A00324	15 Apr.1999	15 Apr. 2000	2452M255702

Laboratory Environment:

Ambient Temperature:	**25.3**	°C
Ambient Humidity:	**29.6**	% RH
Ambient Pressure:	**99.53**	kPa (10mbar)
Calibration Date:	**3/29/00**	
Calibration Due:	**3/29/01**	
Report Number:	**7913-1**	
Control Number:	**7913**	

Measurements performed by:

Mark MacFarlane

Form-Inst920423-1

West Caldwell Calibration Laboratories, Inc.
[Un]compromised calibration
[1]086 Bloomfield Avenue, West Caldwell, NJ 07006, U.S.A.
Web Site: www.wccl.com
ACCREDITATION
ISO/IEC GUIDE 25
REGI-STAR, INC.
ANSI/NCSL Z540-1: 1994 (MIL-STD-45662A)
CALIBRATION TRACEABLE TO N I S T
ISO 9002 REGISTERED COMPANY
Phone: (973) 882 - 4900 Fax.: (973) 808 - 9297
E - Mail: info@wccl.com

REPORT OF CALIBRATION

for

Bruel & Kjaer Microphone **Model: 4188** **Serial No: 2057665**

Submitted by:

Company: **TRC ENGINEERING CORPORATION**

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure: 4188 B&K Revision: Jun-95

Calibration results:

Microphone open circuit sensitivity at: 1000 Hz is -30.9 dB re.1V/Pa. or 28.7 mV/Pa

Open circuit correction factor Ko = 4.9 - dB re.50mV/Pa. Polarization voltage (External): 0 Volts

Manufacturer's Specifications: PASSED

This Calibration is traceable through NIST test number 822/261834-99

Uncertainty:

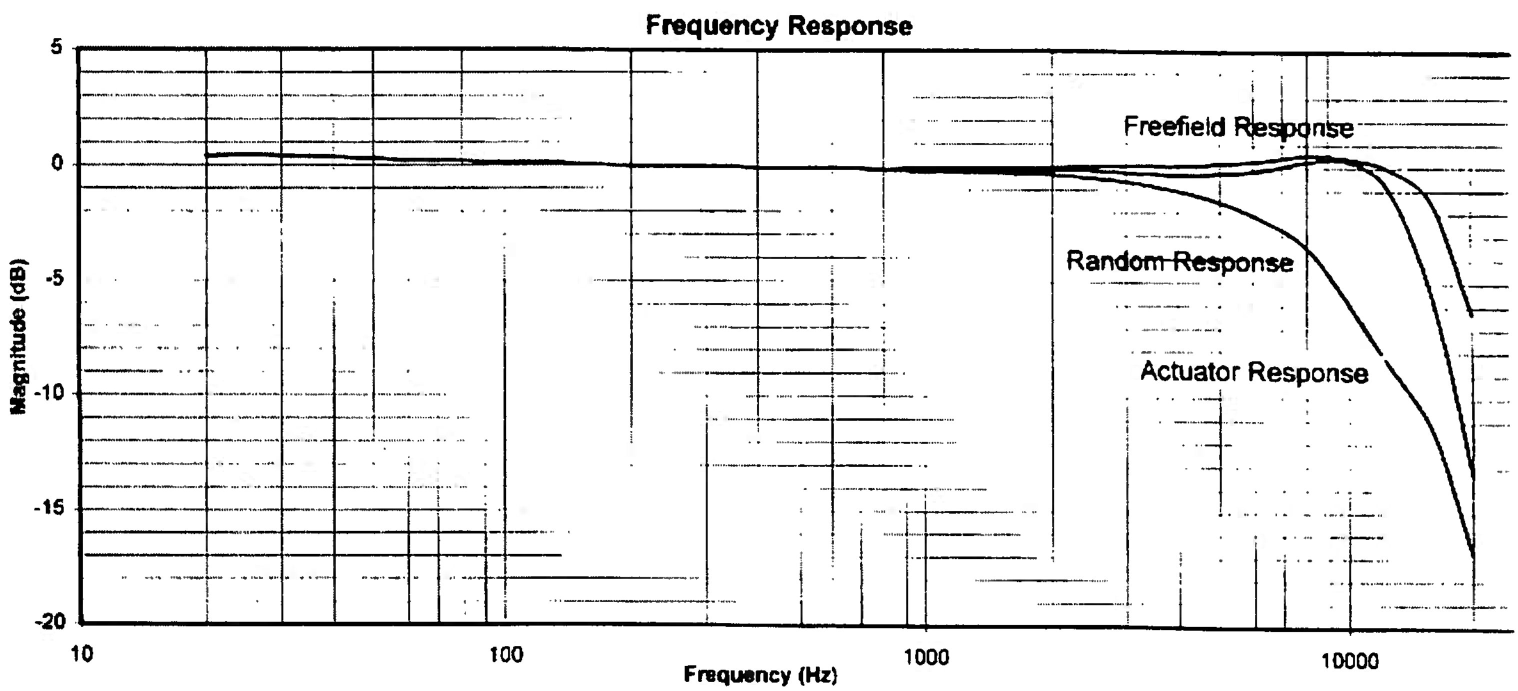
The absolute uncertainty of calibration: 0.15dB at 99% confidence level.

Unless otherwise noted, the reported value is both the "as found" and "as left" data.

Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ANSI/NCSL Z540-1 (MIL-STD-45662A), and ISO 9002.

Certified References :				Date of Cal	Due Date	NIST Test No.
Bruel & Kjaer	4134	S/N	1768848	8-Jun-99	8-Jun-00	822/261834-99

The lower curve is the pressure response recorded with electrostatic actuator.



Laboratory Environment:

Temperature:	25.3	°C
Relative Humidity:	29.6	%
Barometric Pressure:	99.53	kPa (10mbar)
Calibration Date:	29-Mar-00	
Calibration Due:	29-Mar-01	
Report Number:	7913-2	
Control no:	7913	

Measurements performed by:

Digo Bos

MIC960718-7F

Excalibur Engineering
11 Music
Irvine, CA 92618
Phone : (949) 454-6603
Fax : (949) 454-6642

Certificate Of Calibration

Customer	EXCALIBUR ENGINEERING SALES	**Dept.**	SALES
Report #	3-4820	**Bar Code #**	
Date Received	FRIDAY, NOVEMBER 10, 2000	**P.O. #**	
Manufacturer	BRUEL & KJAER	**Serial #**	1772216
Model #	2260A	**Asset #**	8111
Description	SOUND ANALYZER		

Date Calibrated 11/10/2000 **Calibration Due Date** 11/10/2001 **Calibration Interval** 12

Maintenance Procedure 4226

Temperature 23 ° C **Humidity** 33 % **Calibration Performed By** 7

Accuracy ANSI type 1

Received In Tolerance

Remarks Device meets ANSI type 1 specifications under laboratory conditions

Returned In Tolerance

Remarks

ID #	Manufacturer	Model #	Description	Calibration Expires
878	BRUEL & KJAER	4226	SLM CALIBRATOR	7/6/01
048	HEWLETT PACKARD	3458A	SYSTEM MULTIMETER	8/24/01

Excalibur Engineering, Inc. certifies that the instrument specified above meets the manufacturer's specifications and has been calibrated using standards and instruments also listed above whose accuracies are traceable to the National Institute of Standards and Technology (NIST), and the calibration systems and records are in compliance to ISO-10012 and ANSI Z540-1-1994.

This certificate/report shall not be reproduced without the written approval of Excalibur Engineering, Inc.

James C Hagan EEQA 6 MAR 1 6 2001 Supplement to Calibration Certificate

Approved By

Excalibur Engineering
11 Music
Irvine, CA 92618
Phone : (949) 454-6603
Fax : (949) 454-6642

Certificate Of Calibration

Customer	EXCALIBUR ENGINEERING SALES	**Dept.**	SALES
Report #	3-4938	**Bar Code #**	
Date Received	FRIDAY, DECEMBER 15, 2000	**P.O. #**	
Manufacturer	BRUEL & KJAER	**Serial #**	1914281
Model #	2236-007A	**Asset #**	19016
Description	SOUND LEVEL METER		

Date Calibrated 12/15/2000 **Calibration Due Date** 12/15/2001 **Calibration Interval** 12

Maintenance Procedure 4226

Temperature 22 ° C **Humidity** 42 % **Calibration Performed By** 4

Accuracy ANSI TYPE 1

Received In Tolerance

Remarks

Returned In Tolerance

Remarks Device meets ANSI Type 1 specifications under laboratory conditions.

ID #	Manufacturer	Model #	Description	Calibration Expires
890	BRUEL & KJAER	2610	MEASURING AMP	9/6/01
866	HEWLETT PACKARD	8903B/K	AUDIO ANALYZER	8/24/01
051	BRUEL & KJAER	2639	PREAMPLIFIER	1/13/01
089	BRUEL & KJAER	4228	PISTONPHONE	7/6/02
593	BRUEL & KJAER	4165	MICROPHONE	8/9/01
878	BRUEL & KJAER	4226	SLM CALIBRATOR	7/6/01

Excalibur Engineering, Inc. certifies that the instrument specified above meets the manufacturer's specifications and has been calibrated using standards and instruments also listed above whose accuracies are traceable to the National Institute of Standards and Technology (NIST), and the calibration systems and records are in compliance to ISO-10012 and ANSI Z540-1-1994.

James C Hegner EEQA 8 MAR 1 6 2001 Supplement to Calibration Certificate

Approved By

Construction Noise Analysis

Construction Noise Analysis - Dolstontown Road East

Kings Park
Noise Monitoring June 20-21, 2000
Location 1 - EZ Loader Garage Dolsontown Road
B&K 2236D S/N 2100600

Calibrator: B&K 4231 S/N 2115610

Cal Factors	
Before	After
2.2	2.2

Range 20-100 dBA
Slow response
RMS:A Peak:C
20-100 dB
Summertime Long Term Monitoring

Time	Leq	L10	L90
9:32:21	67.9	73.0	52.5
11:15:21	68.6	73.5	53.5
11:25:21	69.6	74.0	52.0
11:35:21	69.3	73.0	51.5
11:45:21	69.8	74.5	51.0
11:55:21	70.3	74.5	52.0
12:05:21	69.9	74.5	49.0
12:15:21	69.6	74.0	50.5
12:25:21	67.8	72.5	45.5
12:35:21	69.6	73.5	60.0
12:45:21	68.0	73.0	51.0
12:55:21	68.1	73.0	49.5
13:05:21	77.7	75.5	48.0
13:15:21	67.7	72.5	47.5
13:25:21	67.8	72.5	47.5
13:35:21	75.9	74.0	48.0
13:45:21	69.8	74.0	49.5
13:55:21	70.0	74.0	49.0
14:05:21	69.2	73.5	54.0
14:15:21	69.7	73.5	57.0
14:25:21	70.3	74.0	60.0
14:35:21	68.3	73.0	56.5
14:45:21	70.5	74.5	53.5
14:55:21	69.6	74.5	53.0
15:05:21	70.3	74.0	58.0
15:15:21	70.7	74.0	59.5
15:25:21	72.0	74.0	57.0
15:35:21	69.8	74.0	57.5
15:45:21	69.8	74.5	57.0
15:55:21	68.9	73.5	55.0
16:05:21	70.3	74.5	54.5
16:15:21	69.8	74.0	55.5
16:25:21	69.9	74.0	55.5
16:35:21	70.0	74.0	54.0
16:45:21	69.8	74.0	55.0
16:55:21	70.3	74.5	54.5
17:05:21	70.8	75.0	56.0
17:15:21	70.2	74.5	55.0
17:25:21	69.5	73.5	56.0
17:35:21	70.0	74.0	55.5
17:45:21	69.4	74.0	55.0
17:55:21	70.1	74.5	54.0
18:05:21	71.4	75.5	55.5
18:15:21	69.6	74.0	54.0
18:25:21	69.7	74.5	52.5
18:35:21	69.4	74.0	53.0
18:45:21	70.5	74.0	54.0
18:55:21	68.5	73.0	54.0
19:05:21	69.0	74.0	52.5
19:15:21	67.3	72.5	51.5
19:25:21	68.4	73.5	54.0
19:35:21	68.4	73.0	52.5
19:45:21	67.2	72.0	54.0
19:55:21	68.1	73.0	54.0
20:05:21	67.7	73.0	54.5
20:15:21	67.7	72.5	54.5
20:25:21	66.7	71.0	53.0
20:35:21	69.2	74.0	54.0
20:45:21	66.2	71.5	51.5
20:55:21	68.0	73.0	52.5
21:05:21	66.2	71.5	52.0
21:15:21	66.4	71.5	53.0
21:25:21	70.3	72.0	54.0
21:35:21	65.9	70.5	52.5
21:45:21	65.2	70.0	52.5
21:55:21	65.7	70.5	51.0
22:05:21	66.3	71.0	53.0
22:15:21	64.4	68.0	52.0
22:25:21	64.6	69.5	51.0
22:35:21	63.2	66.5	50.0
22:45:21	64.2	68.5	50.5
22:55:21	63.2	66.0	49.5
23:05:21	63.0	65.5	51.5
23:15:21	61.7	59.5	51.0
23:25:21	63.9	64.0	50.5
23:35:21	63.9	65.5	52.5
23:45:21	61.6	62.0	51.0
23:55:21	66.2	66.0	49.5
0:05:21	61.4	59.5	51.0
0:15:21	59.7	58.0	51.0
0:25:21	58.3	58.0	50.5
0:35:21	59.6	59.0	52.0
0:45:21	60.5	60.5	51.5
0:55:21	59.6	59.5	50.5
1:05:21	58.7	54.5	48.5
1:15:21	60.2	56.5	50.0
1:25:21	59.0	57.0	50.0
1:35:21	53.0	55.0	48.5
1:45:21	57.8	55.5	48.0
1:55:21	60.4	58.5	49.0
2:05:21	57.8	55.0	47.0
2:15:21	56.3	55.5	48.5
2:25:21	53.3	54.5	48.0
2:35:21	51.9	54.5	46.5
2:45:21	54.4	54.0	46.0
2:55:21	51.5	53.0	46.0
3:05:21	54.0	51.5	44.5
3:15:21	55.8	52.0	41.0
3:25:21	50.7	53.0	47.0
3:35:21	56.7	55.5	47.0
3:45:21	54.7	57.0	48.0
3:55:21	58.4	58.0	48.0
4:05:21	57.8	57.5	50.5
4:15:21	57.4	55.5	48.5
4:25:21	56.2	55.5	48.5
4:35:21	53.8	55.5	49.0
4:45:21	60.4	55.5	47.5
4:55:21	56.4	57.0	49.5
5:05:21	56.8	59.0	48.5
5:15:21	57.6	57.0	50.5
5:25:21	63.2	63.0	53.0
5:35:21	59.8	57.5	50.0
5:45:21	60.1	59.5	51.5
5:55:21	63.1	63.5	51.5
6:05:21	62.6	62.0	51.5
6:15:21	62.1	62.0	51.5
6:25:21	65.1	67.5	53.5
6:35:21	66.5	71.0	54.0
6:45:21	67.0	72.0	53.5
6:55:21	67.4	72.0	53.0
7:05:21	66.5	69.5	52.5
7:15:21	67.8	72.5	52.0
7:25:21	67.5	72.0	50.5
7:35:21	68.1	73.0	52.0
7:45:21	68.0	73.0	51.5
7:55:21	70.9	75.5	51.5
8:05:21	69.1	74.0	50.5
8:15:21	69.3	74.0	53.0
8:25:21	67.4	71.5	54.0
8:35:21	70.7	74.5	55.5
8:45:21	68.3	73.5	53.5
8:55:21	68.5	73.0	53.5
9:05:21	70.3	75.0	55.0
9:15:21	68.5	73.5	53.5
9:25:21	68.3	73.0	54.0
9:35:21	67.8	72.5	55.5
9:45:21	67.9	72.5	54.0
9:55:21	68.9	73.5	55.5
10:05:21	69.3	74.0	55.5
10:15:21	68.9	73.5	55.0
10:25:21	69.5	74.0	55.5
10:35:21	68.9	73.5	53.5
10:45:21	69.2	73.0	55.5
10:55:21	69.3	74.5	55.5
11:05:21	69.0	73.0	57.0
11:15:21	69.4	74.0	57.5

Leq Daytime (7am-4pm) Average 69.3

Construction Noise Analysis - Dolsontown Road West

	Winter Daytime Measurements			Summer Daytime	
	SET 1	SET 3	SET 6	only set	
HZ	LEQ	LEQ	LEQ	LEQ	AVERAGE
16	56.7	55.3	56.7	57.5	56.6
20	57.7	56.2	57.9	59.1	57.7
25	57.6	56.2	57.6	58.2	57.4
31.5	58.4	57.6	57.0	60.0	58.2
40	58.7	58.6	56.8	58.7	58.2
50	60.1	60.8	58.3	58.9	59.5
63	65.0	58.9	58.8	62.5	61.3
80	64.0	62.7	62.6	62.0	62.8
100	60.2	60.7	60.1	61.7	60.7
125	63.3	58.7	58.6	58.9	59.9
160	57.9	56.9	55.8	55.1	56.4
200	56.6	52.3	54.3	54.6	54.4
250	52.4	51.5	52.9	55.0	52.9
315	52.2	49.0	49.6	53.9	51.2
400	50.9	48.5	49.1	54.8	50.8
500	51.7	49.7	49.4	55.4	51.5
630	52.5	50.2	50.4	56.5	52.4
800	53.1	51.6	50.4	57.9	53.3
1000	53.8	50.7	47.9	59.2	52.9
1250	52.7	47.2	47.4	58.4	51.4
1600	51.1	45.8	45.2	57.0	49.8
2000	48.6	42.5	42.2	53.7	46.8
2500	45.6	41.0	39.2	50.6	44.1
3150	42.4	38.9	35.6	48.1	41.3
4000	40.3	38.4	32.7	45.6	39.3
5000	39.9	37.3	30.2	42.5	37.5
6300	35.5	37.3	27.9	40.1	35.2
8000	34.4	33.1	28.2	37.5	33.3
10000	33.1	30.0	21.6	35.2	30.0
12500	29.9	26.8	20.0	32.9	27.4
A	61.5	58.3	57.5	66.0	60.8
L	72.5	70.3	71.0		71.3

Leq Daytime (7am-4pm) Average 60.8

Construction Noise Analysis - Dolsontown Road South

Location:	**Dolsontown Road - South**	
Time:	**24-hour Monitoring**	
Season:	**Winter**	
Instrument:		2238
Application:		BZ7124 version 1.1
Start Time:		12/13/2000 03:39:40 PM
End Time:		12/15/2000 11:22:59 AM
Elapsed Time:		43:43:19
Bandwidth:		Broad band
Detector 1/2	RMS	Peak
Range:		20.0-100.0 dB
	Time	Frequency
Detector 1:	S F I	A
Detector 2:	Peak	L
Statistic	F	A
Criterion Level:		100.0 dB
Threshold:		0.0 dB
Exchange Rate		3 and 260
Exposure Time:		7:30:00
Peaks Over:		140.0 dB
Instrument Serial Number:		2246211
Microphone Serial Number:		2231023
Input:		Microphone
Windscreen Correction:		Off
S. I. Correction:		Random
Calibration Level:		94.0 dB
Sensitivity:		-30.8 dB
Microphone:		2231023

Start date	Start time	LAeq	LAF90
12/13/2000	03:39:40 PM	63.6	54.5
12/13/2000	04:39:40 PM	57.1	53.5
12/13/2000	05:39:40 PM	56.5	52.5
12/13/2000	06:39:40 PM	55.7	51.0
12/13/2000	07:39:40 PM	55.5	51.0
12/13/2000	08:39:40 PM	55.4	50.0
12/13/2000	09:39:40 PM	54.8	50.0
12/13/2000	10:39:40 PM	53.5	46.5
12/13/2000	11:39:40 PM	53.1	45.5
12/14/2000	12:39:40 AM	52.5	45.0
12/14/2000	01:39:40 AM	56.1	49.0
12/14/2000	02:39:40 AM	56.3	51.0
12/14/2000	03:39:40 AM	52.8	46.5
12/14/2000	04:39:40 AM	53.4	48.0
12/14/2000	05:39:40 AM	56.0	49.0
12/14/2000	06:39:40 AM	55.2	50.5
12/14/2000	07:39:40 AM	54.5	50.0
12/14/2000	08:39:40 AM	54.9	50.0
12/14/2000	09:39:40 AM	57.2	52.0
12/14/2000	10:39:40 AM	60.3	56.0
12/14/2000	11:39:40 AM	60.0	56.0
12/14/2000	12:39:40 PM	58.2	55.0
12/14/2000	01:39:40 PM	59.0	55.5
12/14/2000	02:39:40 PM	59.7	57.0
12/14/2000	03:39:40 PM	59.9	57.0
12/14/2000	04:39:40 PM	60.3	57.5
12/14/2000	05:39:40 PM	60.4	58.0
12/14/2000	06:39:40 PM	66.6	53.0
12/14/2000	07:39:40 PM	62.2	50.5
12/14/2000	08:39:40 PM	57.2	50.0
12/14/2000	09:39:40 PM	53.5	48.5
12/14/2000	10:39:40 PM	50.8	46.5
12/14/2000	11:39:40 PM	49.5	45.0
12/15/2000	12:39:40 AM	47.8	43.5
12/15/2000	01:39:40 AM	47.8	43.0
12/15/2000	02:39:40 AM	50.0	43.5
12/15/2000	03:39:40 AM	49.3	44.0
12/15/2000	04:39:40 AM	48.9	44.0
12/15/2000	05:39:40 AM	49.7	45.5
12/15/2000	06:39:40 AM	53.5	49.0
12/15/2000	07:39:40 AM	56.4	52.5
12/15/2000	08:39:40 AM	56.1	51.5
12/15/2000	09:39:40 AM	54.2	44.5
12/15/2000	10:39:40 AM	72.5	19.9

Leq Daytime (7am-4pm) Average | **54.0**

Construction Noise Analysis - Genung Street

	Winter Daytime Measurements			Summer Daytime	
	SET 1	SET 3	SET 6	only set	
HZ	LEQ	LEQ	LEQ	LEQ	AVERAGE
16	54.0	55.8	56.7	55.0	55.4
20	55.0	56.2	56.7	56.3	56.0
25	54.7	55.7	55.3	55.8	55.4
31.5	55.0	56.1	55.5	58.3	56.2
40	55.8	57.0	56.1	58.3	56.8
50	59.8	57.8	59.5	60.1	59.3
63	64.8	61.9	60.5	61.6	62.2
80	65.3	69.0	64.6	62.9	65.4
100	62.5	69.7	63.2	62.0	64.4
125	57.9	64.2	61.8	59.1	60.7
160	57.9	64.2	58.0	57.2	59.4
200	54.8	66.3	58.0	55.6	58.7
250	53.8	66.1	56.1	55.4	57.8
315	54.6	64.0	55.9	55.2	57.4
400	54.3	62.8	56.5	55.2	57.2
500	55.6	61.9	57.2	55.9	57.6
630	57.5	61.1	58.0	55.4	58.0
800	59.1	60.1	59.2	55.7	58.5
1000	60.5	60.0	60.0	56.2	59.2
1250	60.0	60.6	61.0	55.8	59.3
1600	59.3	60.3	59.8	55.2	58.6
2000	57.3	58.4	57.0	52.4	56.3
2500	54.2	57.5	54.6	50.3	54.2
3150	50.3	55.5	50.6	47.0	50.8
4000	46.4	53.9	47.0	44.6	48.0
5000	43.0	52.4	43.9	41.9	45.3
6300	40.5	51.1	41.5	39.7	43.2
8000	38.1	49.2	38.6	37.1	40.8
10000	35.6	46.9	36.0	35.0	38.4
12500	31.7	43.9	33.3	33.0	35.5
A	67.9	70.9	68.3	64.5	67.9
L	73.1	77.7	74.8		75.2

Leq Daytime (7am-4pm) Average 67.9

Construction Noise Analysis - Country View Manor

Location:	**Country View Manor Apartments**	
Time:	**24-hour Monitoring**	
Season:	**Winter**	
Instrument:		2238
Application:		BZ7124 version 1.1
Start Time:		12/13/2000 04:52:35 PM
End Time:		12/15/2000 11:07:31 AM
Elapsed Time:		42:14:56
Bandwidth:		Broad band
Detector 1/2	RMS	Peak
Range:		20.0-100.0 dB
	Time	Frequency
Detector 1:	S F I	A
Detector 2:	Peak	L
Statistic	F	A
Criterion Level:		100.0 dB
Threshold:		0.0 dB
Exchange Rate		3 and 260
Exposure Time:		7:30:00
Peaks Over:		140.0 dB
Instrument Serial Number:		2255689
Microphone Serial Number:		2250456
Input:		Microphone
Windscreen Correction:		Off
S. I. Correction:		Random
Calibration Level:		94.0 dB
Sensitivity:		-30.6 dB
Microphone:		2250456

Start date	Start time	LAeq	LAF90
12/13/2000	04:52:35 PM	67.8	38.5
12/13/2000	05:52:35 PM	44.2	38.0
12/13/2000	06:52:35 PM	44.5	37.5
12/13/2000	07:52:35 PM	45.4	38.0
12/13/2000	08:52:35 PM	41.2	37.5
12/13/2000	09:52:35 PM	41.2	37.5
12/13/2000	10:52:35 PM	74.6	36.5
12/13/2000	11:52:35 PM	46.6	37.0
12/14/2000	12:52:35 AM	80.2	42.5
12/14/2000	01:52:35 AM	59.5	53.0
12/14/2000	02:52:35 AM	59.0	55.0
12/14/2000	03:52:35 AM	55.6	49.5
12/14/2000	04:52:35 AM	57.5	52.5
12/14/2000	05:52:35 AM	53.7	42.5
12/14/2000	06:52:35 AM	53.7	42.0
12/14/2000	07:52:35 AM	52.1	43.5
12/14/2000	08:52:35 AM	47.0	42.5
12/14/2000	09:52:35 AM	51.8	43.0
12/14/2000	10:52:35 AM	52.8	45.0
12/14/2000	11:52:35 AM	52.1	46.0
12/14/2000	12:52:35 PM	63.7	46.0
12/14/2000	01:52:35 PM	57.8	45.0
12/14/2000	02:52:35 PM	48.2	43.5
12/14/2000	03:52:35 PM	50.9	44.5
12/14/2000	04:52:35 PM	47.8	44.0
12/14/2000	05:52:35 PM	48.0	45.5
12/14/2000	06:52:35 PM	46.8	43.5
12/14/2000	07:52:35 PM	46.2	41.5
12/14/2000	08:52:35 PM	54.2	41.5
12/14/2000	09:52:35 PM	45.2	40.5
12/14/2000	10:52:35 PM	47.6	41.5
12/14/2000	11:52:35 PM	45.3	38.5
12/15/2000	12:52:35 AM	77.2	38.5
12/15/2000	01:52:35 AM	41.8	38.0
12/15/2000	02:52:35 AM	46.8	37.5
12/15/2000	03:52:35 AM	39.5	37.0
12/15/2000	04:52:35 AM	41.5	38.0
12/15/2000	05:52:35 AM	47.7	40.5
12/15/2000	06:52:35 AM	46.2	40.5
12/15/2000	07:52:35 AM	46.7	39.5
12/15/2000	08:52:35 AM	45.9	39.0
12/15/2000	09:52:35 AM	60.4	38.5
12/15/2000	10:52:35 AM	73.4	29.5

WINTER Leq daytime (7am-4pm) average= 53.3

Summer LONG TERM

Time	Leq	Leq 7am4pm
11:21:51	51.6	51.6
11:31:51	45.1	45.1
11:41:51	45.7	45.7
11:51:51	45.1	45.1
12:01:51	49.2	49.2
12:11:51	53.9	53.9
12:21:51	46.4	46.4
12:31:51	46.8	46.8
12:41:51	46.6	46.6
12:51:51	47.2	47.2
13:01:51	46.3	46.3
13:11:51	46.3	46.3
13:21:51	45.0	45.0
13:31:51	46.0	46.0
13:41:51	48.5	48.5
13:51:51	46.7	46.7
14:01:51	47.5	47.5
14:11:51	47.8	47.8
14:21:51	48.8	48.8
14:31:51	49.2	49.2
14:41:51	48.1	48.1
14:51:51	49.5	49.5
15:01:51	48.9	48.9
15:11:51	48.2	48.2
15:21:51	50.3	50.3
15:31:51	50.9	50.9
15:41:51	50.9	50.9
15:51:51	51.5	51.5
16:01:51	50.9	
16:11:51	51.4	
16:21:51	48.8	
16:31:51	47.6	
16:41:51	49.8	
16:51:51	48.3	
17:01:51	49.3	
17:11:51	47.8	
17:21:51	65.9	
17:31:51	50.7	
17:41:51	49.1	
17:51:51	47.8	
18:01:51	51.4	
18:11:51	48.7	
18:21:51	49.3	
18:31:51	49.8	
18:41:51	48.2	
18:51:51	49.0	
19:01:51	48.4	
19:11:51	53.4	
19:21:51	48.1	
19:31:51	48.0	
19:41:51	49.2	
19:51:51	46.2	
20:01:51	49.9	
20:11:51	48.8	
20:21:51	49.9	
20:31:51	47.3	
20:41:51	47.2	
20:51:51	46.0	
21:01:51	46.4	
21:11:51	46.9	
21:21:51	47.8	
21:31:51	47.7	
21:41:51	47.0	
21:51:51	48.4	
22:01:51	48.5	
22:11:51	51.9	
22:21:51	49.9	
22:31:51	51.3	
22:41:51	52.5	
22:51:51	49.5	
23:01:51	49.5	
23:11:51	48.6	
23:21:51	50.0	

Time	Leq	Leq 7am4pm
23:31:51	48.8	
23:41:51	47.7	
23:51:51	49.2	
0:01:51	48.9	
0:11:51	49.2	
0:21:51	49.9	
0:31:51	50.1	
0:41:51	50.9	
0:51:51	50.6	
1:01:51	51.1	
1:11:51	52.5	
1:21:51	50.6	
1:31:51	48.3	
1:41:51	48.8	
1:51:51	48.6	
2:01:51	47.2	
2:11:51	47.2	
2:21:51	47.9	
2:31:51	48.6	
2:41:51	48.5	
2:51:51	47.8	
3:01:51	44.3	
3:11:51	44.6	
3:21:51	44.9	
3:31:51	47.6	
3:41:51	45.1	
3:51:51	47.6	
4:01:51	49.1	
4:11:51	49.2	
4:21:51	51.7	
4:31:51	50.6	
4:41:51	49.7	
4:51:51	51.8	
5:01:51	51.5	
5:11:51	51.6	
5:21:51	52.1	
5:31:51	53.5	
5:41:51	51.8	
5:51:51	52.0	
6:01:51	50.8	
6:11:51	50.3	
6:21:51	50.3	
6:31:51	50.5	
6:41:51	50.8	
6:51:51	50.3	
7:01:51	50.0	50.0
7:11:51	48.7	48.7
7:21:51	48.6	48.6
7:31:51	48.0	48.0
7:41:51	48.0	48.0
7:51:51	48.1	48.1
8:01:51	48.2	48.2
8:11:51	50.7	50.7
8:21:51	54.3	54.3
8:31:51	54.8	54.8
8:41:51	54.2	54.2
8:51:51	57.6	57.6
9:01:51	57.0	57.0
9:11:51	52.7	52.7
9:21:51	74.1	74.1
9:31:51	76.2	76.2
9:41:51	65.3	65.3
9:51:51	61.0	61.0
10:01:51	53.2	53.2
10:11:51	52.6	52.6
10:21:51	54.0	54.0
10:31:51	55.9	55.9
10:41:51	64.3	64.3
10:51:51	67.7	67.7
11:01:51	70.2	70.2
11:11:51	68.9	68.9

SUMMER LEQ DAYTIME (7AM-4PM) AVERAGE 52.5

WINTER AND SUMMER Leq DAYTIME (7AM-4PM) AVERAGE 52.9

Construction Noise Analysis - Ruth Court

Project: **Wawayanda**

Site Location/Name: **3. Ruth Court**

Sound Level Meter Model/SN: **B&K 2260/177216**

Calibrator Model/SN: **B&K 4231/2115610**

Date:	**6/20/2000**	
Monitoring Time:	**1309-1329**	
	Before	After
Calibration Factor:	**93.8**	**93.8**
Calibrator Level:	**93.8**	
Deviation:	**-0.02**	**-0.02**

Octave Band	Daytime L_{eq}	Whole Octaves
16	54	
20	56	
25	57	
32	55	**60**
40	52	
50	60	
63	54	**62**
80	56	
100	67	
125	61	**69**
160	61	
200	63	
250	59	**66**
315	60	
400	58	
500	58	**63**
630	58	
800	56	
1000	57	**61**
1250	56	
1600	54	
2000	53	**58**
2500	51	
3150	50	
4000	49	**54**
5000	47	
6300	45	
8000	44	**49**
10000	43	
12500	41	
Combined dBA		**66.1**
Overall dBA		**67.6**

Leq Daytime (7am-4pm) Average **66.1**

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Leq)
Site Excavation

Floor	Name	Daytime level dB(A)
1. Floor	Country View Manor	51.1
2. Floor		51.2
1. Floor	Dolsontown Road - East	61.2
2. Floor		61.2
1. Floor	Dolsontown Road - South	67.6
2. Floor		67.7
1. Floor	Dolsontown Road - West	61.3
2. Floor		61.4
1. Floor	Genung Street	48.0
2. Floor		48.1
1. Floor	Moon School	45.3
2. Floor		45.4
1. Floor	Public Space	60.0
2. Floor		60.1
1. Floor	Ruth Court	47.3
2. Floor		47.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Leq)
Concrete Pouring

Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	47.1
2. Floor		47.2
1. Floor	Dolsontown Road - East	57.2
2. Floor		57.2
1. Floor	Dolsontown Road - South	63.6
2. Floor		63.7
1. Floor	Dolsontown Road - West	57.3
2. Floor		57.4
1. Floor	Genung Street	44.0
2. Floor		44.1
1. Floor	Moon School	41.3
2. Floor		41.4
1. Floor	Public Space	56.0
2. Floor		56.1
1. Floor	Ruth Court	43.3
2. Floor		43.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Leq)
Steel Erection

Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	51.1
2. Floor		51.2
1. Floor	Dolsontown Road - East	61.2
2. Floor		61.2
1. Floor	Dolsontown Road - South	67.6
2. Floor		67.7
1. Floor	Dolsontown Road - West	61.3
2. Floor		61.4
1. Floor	Genung Street	48.0
2. Floor		48.1
1. Floor	Moon School	45.3
2. Floor		45.4
1. Floor	Public Space	60.0
2. Floor		60.1
1. Floor	Ruth Court	47.3
2. Floor		47.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Leq)
Equipment Installation

Floor	Name	Daytime level (dB(A))
1. Floor	Country View Manor	46.1
2. Floor		46.2
1. Floor	Dolsontown Road - East	56.2
2. Floor		56.2
1. Floor	Dolsontown Road - South	62.6
2. Floor		62.7
1. Floor	Dolsontown Road - West	56.3
2. Floor		56.4
1. Floor	Genung Street	43.0
2. Floor		43.1
1. Floor	Moon School	40.3
2. Floor		40.4
1. Floor	Public Space	55.0
2. Floor		55.1
1. Floor	Ruth Court	42.3
2. Floor		42.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Leq)
Site Clean-Up & Plant Finishing

Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	41.1
2. Floor		41.2
1. Floor	Dolsontown Road - East	51.2
2. Floor		51.2
1. Floor	Dolsontown Road - South	57.6
2. Floor		57.7
1. Floor	Dolsontown Road - West	51.3
2. Floor		51.4
1. Floor	Genung Street	38.0
2. Floor		38.1
1. Floor	Moon School	35.3
2. Floor		35.4
1. Floor	Public Space	50.0
2. Floor		50.1
1. Floor	Ruth Court	37.3
2. Floor		37.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Lmax)
Site Excavation

Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	66.1
2. Floor		66.2
1. Floor	Dolsontown Road - East	76.2
2. Floor		76.2
1. Floor	Dolsontown Road - South	82.6
2. Floor		82.7
1. Floor	Dolsontown Road - West	76.3
2. Floor		76.4
1. Floor	Genung Street	63.0
2. Floor		63.1
1. Floor	Moon School	60.3
2. Floor		60.4
1. Floor	Public Space	75.0
2. Floor		75.1
1. Floor	Ruth Court	62.3
2. Floor		62.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Lmax)
Concrete Pouring

Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	62.1
2. Floor		62.2
1. Floor	Dolsontown Road - East	72.2
2. Floor		72.2
1. Floor	Dolsontown Road - South	78.6
2. Floor		78.7
1. Floor	Dolsontown Road - West	72.3
2. Floor		72.4
1. Floor	Genung Street	59.0
2. Floor		59.1
1. Floor	Moon School	56.3
2. Floor		56.4
1. Floor	Public Space	71.0
2. Floor		71.1
1. Floor	Ruth Court	58.3
2. Floor		58.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Lmax)
Steel Erection

Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	66.1
2. Floor		66.2
1. Floor	Dolsontown Road - East	76.2
2. Floor		76.2
1. Floor	Dolsontown Road - South	82.6
2. Floor		82.7
1. Floor	Dolsontown Road - West	76.3
2. Floor		76.4
1. Floor	Genung Street	63.0
2. Floor		63.1
1. Floor	Moon School	60.3
2. Floor		60.4
1. Floor	Public Space	75.0
2. Floor		75.1
1. Floor	Ruth Court	62.3
2. Floor		62.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Lmax)
Equipment Installation

Floor	Name	Daytime level dB(A)
1. Floor	Country View Manor	61.1
2. Floor		61.2
1. Floor	Dolsontown Road - East	71.2
2. Floor		71.2
1. Floor	Dolsontown Road - South	77.6
2. Floor		77.7
1. Floor	Dolsontown Road - West	71.3
2. Floor		71.4
1. Floor	Genung Street	58.0
2. Floor		58.1
1. Floor	Moon School	55.3
2. Floor		55.4
1. Floor	Public Space	70.0
2. Floor		70.1
1. Floor	Ruth Court	57.3
2. Floor		57.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Lmax)
Site Clean-Up & Plant Finishing

Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	56.1
2. Floor		56.2
1. Floor	Dolsontown Road - East	66.2
2. Floor		66.2
1. Floor	Dolsontown Road - South	72.6
2. Floor		72.7
1. Floor	Dolsontown Road - West	66.3
2. Floor		66.4
1. Floor	Genung Street	53.0
2. Floor		53.1
1. Floor	Moon School	50.3
2. Floor		50.4
1. Floor	Public Space	65.0
2. Floor		65.1
1. Floor	Ruth Court	52.3
2. Floor		52.4

Wawayanda Energy Facility - Receiver Sound Levels
Site Excavation - C-Weighted

Name	[illegible] dB(C)
Country View Manor	66.1 66.1
Dolsontown Road - East	74.7 74.7
Dolsontown Road - South	80.6 80.6
Dolsontown Road - West	74.9 74.9
Genung Street	63.6 63.6
Moon School	61.3 61.4
Public Space	73.9 73.9
Ruth Court	63.0 63.0

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Boston, Massachusetts 02118
(617) 437-9887

Wawayanda Energy Facility - Receiver Sound Levels
Concrete Pouring - C-Weighted

Name	[illegible] dB(C)
Country View Manor	62.1 62.1
Dolsontown Road - East	70.7 70.7
Dolsontown Road - South	76.6 76.6
Dolsontown Road - West	70.9 70.9
Genung Street	59.6 59.6
Moon School	57.3 57.4
Public Space	69.9 69.9
Ruth Court	59.0 59.0

Wawayanda Energy Facility - Receiver Sound Levels
Steel Erection - C-Weighted

[illegible]	dB(C)
Country View Manor	66.1
	66.1
Dolsontown Road - East	74.7
	74.7
Dolsontown Road - South	80.6
	80.6
Dolsontown Road - West	74.9
	74.9
Genung Street	63.6
	63.6
Moon School	61.3
	61.4
Public Space	73.9
	73.9
Ruth Court	63.0
	63.0

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Boston, Massachusetts 02118
(617) 437-9887

Wawayanda Energy Facility - Receiver Sound Levels
Equipment Installation - C-Weighted

Name	dB(C)
Country View Manor	61.1
	61.1
Dolsontown Road - East	69.7
	69.7
Dolsontown Road - South	75.6
	75.6
Dolsontown Road - West	69.9
	69.9
Genung Street	58.6
	58.6
Moon School	56.3
	56.4
Public Space	68.9
	68.9
Ruth Court	58.0
	58.0

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Boston, Massachusetts 02118
(617) 437-9887

Wawayanda Energy Facility - Receiver Sound Levels
Site Clean-Up & Plant Finishing - C-Weighted

Name	Ld/n dB(C)
Country View Manor	56.1 56.1
Dolsontown Road - East	64.7 64.7
Dolsontown Road - South	70.6 70.6
Dolsontown Road - West	64.9 64.9
Genung Street	53.6 53.6
Moon School	51.3 51.4
Public Space	63.9 63.9
Ruth Court	53.0 53.0

Wawayanda Energy Facility - Receiver Sound Levels
Maximum Site Excavation - C-Weighted

Name	Lr,d dB(C)
Country View Manor	81.1 81.1
Dolsontown Road - East	89.7 89.7
Dolsontown Road - South	95.6 95.6
Dolsontown Road - West	89.9 89.9
Genung Street	78.6 78.6
Moon School	76.3 76.4
Public Space	88.9 88.9
Ruth Court	78.0 78.0

Wawayanda Energy Facility - Receiver Sound Levels
Maximum Concrete Pouring - C-Weighted

Name	[illegible] dB(C)
Country View Manor	77.1
	77.1
Dolsontown Road - East	85.7
	85.7
Dolsontown Road - South	91.6
	91.6
Dolsontown Road - West	85.9
	85.9
Genung Street	74.6
	74.6
Moon School	72.3
	72.4
Public Space	84.9
	84.9
Ruth Court	74.0
	74.0

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SoundPLAN 5.0 - 11/13/2000

Wawayanda Energy Facility - Receiver Sound Levels
Maximum Steel Erection - C-Weighted

Name	[illegible] dB(C)
Country View Manor	81.1
	81.1
Dolsontown Road - East	89.7
	89.7
Dolsontown Road - South	95.6
	95.6
Dolsontown Road - West	89.9
	89.9
Genung Street	78.6
	78.6
Moon School	76.3
	76.4
Public Space	88.9
	88.9
Ruth Court	78.0
	78.0

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Boston, Massachusetts 02118
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Wawayanda Energy Facility - Receiver Sound Levels
Maximum Equipment Installation - C-Weighted

Name	Ld dB(C)
Country View Manor	76.1
	76.1
Dolsontown Road - East	84.7
	84.7
Dolsontown Road - South	90.6
	90.6
Dolsontown Road - West	84.9
	84.9
Genung Street	73.6
	73.6
Moon School	71.3
	71.4
Public Space	83.9
	83.9
Ruth Court	73.0
	73.0

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Boston, Massachusetts 02118
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Wawayanda Energy Facility - Receiver Sound Levels
Maximum Site Clean-Up & Plant Finishing - C-Weighted

Name	LrD dB(C)
Country View Manor	71.1
	71.1
Dolsontown Road - East	79.7
	79.7
Dolsontown Road - South	85.6
	85.6
Dolsontown Road - West	79.9
	79.9
Genung Street	68.6
	68.6
Moon School	66.3
	66.4
Public Space	78.9
	78.9
Ruth Court	68.0
	68.0

Wawayanda Energy Facility - Receiver Sound Levels
Site Excavation - Linear

Name	LrD dB(L)
Country View Manor	66.8 66.8
Dolsontown Road - East	75.3 75.4
Dolsontown Road - South	81.2 81.3
Dolsontown Road - West	75.5 75.6
Genung Street	64.2 64.3
Moon School	62.0 62.0
Public Space	74.5 74.6
Ruth Court	63.6 63.7

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Wawayanda Energy Facility - Receiver Sound Levels
Concrete Pouring - Linear

Name	LrD dB(L)
Country View Manor	62.8 62.8
Dolsontown Road - East	71.3 71.4
Dolsontown Road - South	77.2 77.3
Dolsontown Road - West	71.5 71.6
Genung Street	60.2 60.3
Moon School	58.0 58.0
Public Space	70.5 70.6
Ruth Court	59.6 59.7

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Boston, Massachusetts 02118
(617) 437-9887

Wawayanda Energy Facility - Receiver Sound Levels
Steel Erection - Linear

Name	Leq dB(A)
Country View Manor	66.8
	66.8
Dolsontown Road - East	75.3
	75.4
Dolsontown Road - South	81.2
	81.3
Dolsontown Road - West	75.5
	75.6
Genung Street	64.2
	64.3
Moon School	62.0
	62.0
Public Space	74.5
	74.6
Ruth Court	63.6
	63.7

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15 Worcester Square, Suite 4
Boston, Massachusetts 02118
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Wawayanda Energy Facility - Receiver Sound Levels
Equipment Installation - Linear

[illegible]	[illegible]
Country View Manor	61.8 61.8
Dolsontown Road - East	70.3 70.4
Dolsontown Road - South	76.2 76.3
Dolsontown Road - West	70.5 70.6
Genung Street	59.2 59.3
Moon School	57.0 57.0
Public Space	69.5 69.6
Ruth Court	58.6 58.7

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Boston, Massachusetts 02118
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Wawayanda Energy Facility - Receiver Sound Levels
Site Clean-Up & Plant Finishing - Linear

Name	Lеq dB( )
Country View Manor	56.8 56.8
Dolsontown Road - East	65.3 65.4
Dolsontown Road - South	71.2 71.3
Dolsontown Road - West	65.5 65.6
Genung Street	54.2 54.3
Moon School	52.0 52.0
Public Space	64.5 64.6
Ruth Court	53.6 53.7

Wawayanda Energy Facility - Receiver Sound Levels
Maximum Site Excavation - Linear

Name	[illegible]
Country View Manor	81.8 81.8
Dolsontown Road - East	90.3 90.4
Dolsontown Road - South	96.2 96.3
Dolsontown Road - West	90.5 90.6
Genung Street	79.2 79.3
Moon School	77.0 77.0
Public Space	89.5 89.6
Ruth Court	78.6 78.7

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Wawayanda Energy Facility - Receiver Sound Levels
Concrete Pouring - Linear

Name	Leq dB(A)
Country View Manor	62.1 62.2
Dolsontown Road - East	72.2 72.2
Dolsontown Road - South	78.6 78.7
Dolsontown Road - West	72.3 72.4
Genung Street	59.0 59.1
Moon School	56.3 56.4
Public Space	71.0 71.1
Ruth Court	58.3 58.4

Wawayanda Energy Facility - Receiver Sound Levels
Maximum Steel Erection - Linear

Name	[illegible] dB(A)
Country View Manor	81.8
	81.8
Dolsontown Road - East	90.3
	90.4
Dolsontown Road - South	96.2
	96.3
Dolsontown Road - West	90.5
	90.6
Genung Street	79.2
	79.3
Moon School	77.0
	77.0
Public Space	89.5
	89.6
Ruth Court	78.6
	78.7

Wawayanda Energy Facility - Receiver Sound Levels
Maximum Equipment Installation - Linear

Name	dB(L)
Country View Manor	76.8
	76.8
Dolsontown Road - East	85.3
	85.4
Dolsontown Road - South	91.2
	91.3
Dolsontown Road - West	85.5
	85.6
Genung Street	74.2
	74.3
Moon School	72.0
	72.0
Public Space	84.5
	84.6
Ruth Court	73.6
	73.7

Wawayanda Energy Facility - Receiver Sound Levels
Maximum Site Clean-Up & Plant Finishing - Linear

Name	Lr dB(A)
Country View Manor	71.8 71.8
Dolsontown Road - East	80.3 80.4
Dolsontown Road - South	86.2 86.3
Dolsontown Road - West	80.5 80.6
Genung Street	69.2 69.3
Moon School	67.0 67.0
Public Space	79.5 79.6
Ruth Court	68.6 68.7

Sound Power Levels Developed for Construction Phases Using Reference 2 — Wawayanda Energy Facility

Element name	Unit	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz	Sum
Excavation	dB(A)/unit		108.8	112.9	113.4	116.8	119.0	115.2	112.0			123.5
Concrete Pouring	dB(A)/unit		104.8	108.9	109.4	112.8	115.0	111.2	108.0			119.5
Steel Erection	dB(A)/unit		108.8	112.9	113.4	116.8	119.0	115.2	112.0			123.5
Mechanical	dB(A)/unit		103.8	107.9	108.4	111.8	114.0	110.2	107.0			118.5
Clean-Up	dB(A)/unit		98.8	102.9	103.4	106.8	109.0	105.2	102.0			113.5
Excavation maximum	dB(A)/unit		121.8	125.9	126.4	129.8	132.0	128.2	125.0			136.5
Concrete Pouring maximum	dB(A)/unit		117.8	121.9	122.4	125.8	128.0	124.2	121.0			132.5
Steel Erection maximum	dB(A)/unit		121.8	125.9	126.4	129.8	132.0	128.2	125.0			136.5
Mechanical maximum	dB(A)/unit		116.8	120.9	121.4	124.8	127.0	123.2	120.0			131.5
Clean-Up maximum	dB(A)/unit		111.8	115.9	116.4	119.8	122.0	118.2	115.0			126.5

Sound Power Levels Developed for Construction Phases Using Reference 2 Wawayanda Energy Facility

Element name	Unit	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	16 kHz	Sum
Excavation	dB/unit		135.0	129.0	122.0	120.0	119.0	114.0	111.0			136.4
Concrete Pouring	dB/unit		131.0	125.0	118.0	116.0	115.0	110.0	107.0			132.4
Steel Erection	dB/unit		135.0	129.0	122.0	120.0	119.0	114.0	111.0			136.4
Mechanical	dB/unit		130.0	124.0	117.0	115.0	114.0	109.0	106.0			131.4
Clean-Up	dB/unit		125.0	119.0	112.0	110.0	109.0	104.0	101.0			126.4
Excavation maximum	dB/unit		150.0	144.0	137.0	135.0	134.0	129.0	126.0			151.4
Concrete Pouring maximum	dB/unit		146.0	140.0	133.0	131.0	130.0	125.0	122.0			147.4
Steel Erection maximum	dB/unit		150.0	144.0	137.0	135.0	134.0	129.0	126.0			151.4
Mechanical maximum	dB/unit		145.0	139.0	132.0	130.0	129.0	124.0	121.0			146.4
Clean-Up maximum	dB/unit		140.0	134.0	127.0	125.0	124.0	119.0	116.0			141.4

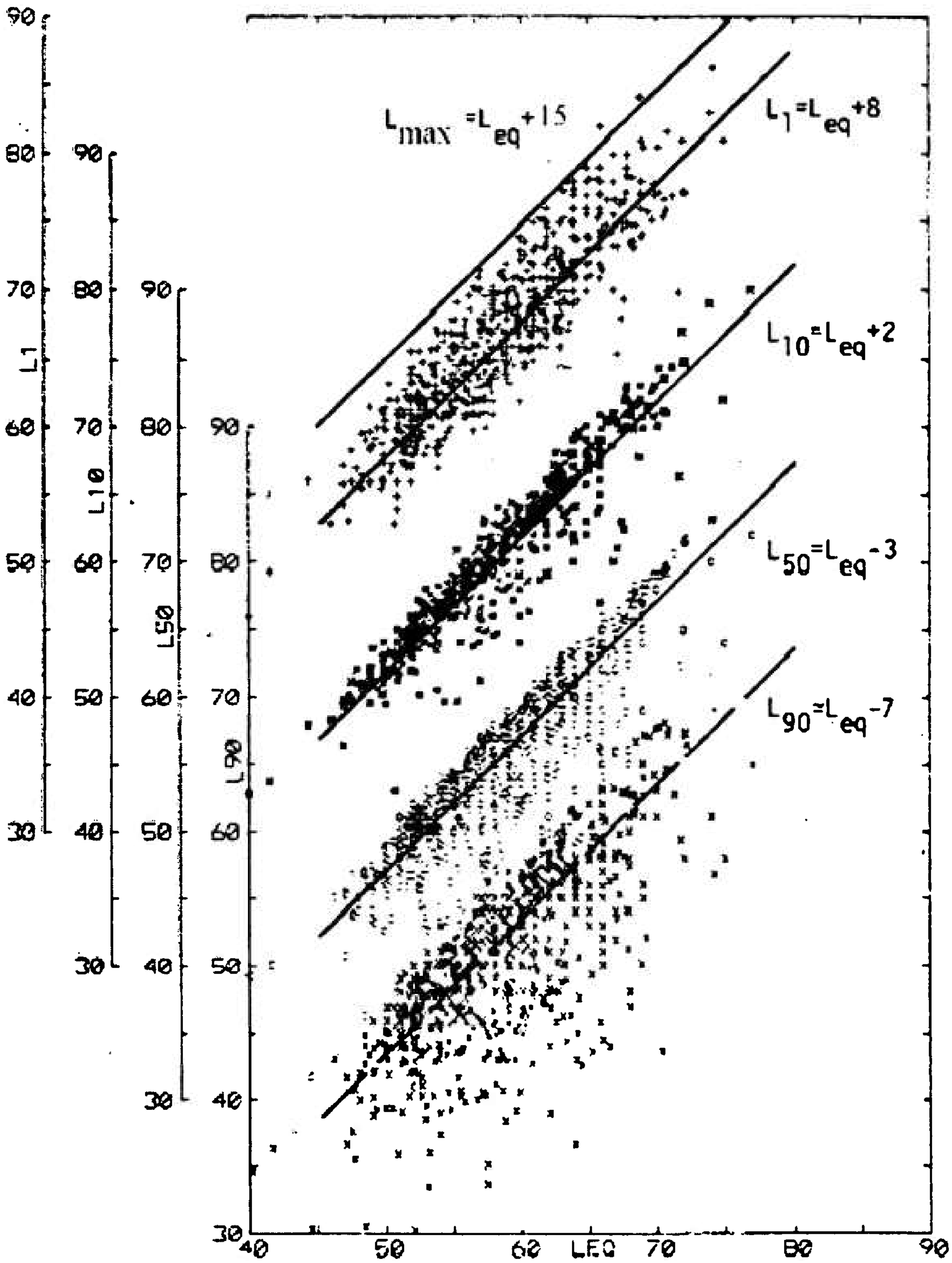


FIG. 3.1. HOURLY MEASURED SOUND LEVELS [dB(A)]
DECILE LEVELS VS. EQUIVALENT LEVELS
SITES 1 THROUGH 15 - ALL PHASES

Project Noise Modeling

MCNR Analysis

Dolstontown Road East - Winter Short Term Data

Location:	**Dolsontown Road - East**		
Time:	**Daytime**		
Season:	**Winter**		
Instrument:		2260	
Application:		BZ7202 version 1.1	
Start Time:		12/13/2000 05:47:55 PM	
End Time:		12/13/2000 06:07:55 PM	
Elapsed Time:		0:20:00	
Bandwidth:		1/3 Octave	
Peaks Over:		140.0 dB	
Range:		19.6-99.6 dB	
	Time	Frequency	
Broad-band measurements:	S F I	A L	
Broad-band statistics:	F	A	
Octave measurements:	F	L	
Instrument Serial Number:			
Microphone Serial Number:		1783679	
Input:		Microphone	
Pol. Voltage:		0 V	
S. I. Correction:		Random	
Calibration Level:		93.9 dB	
Sensitivity:		-25.8 dB	
ZF0023:		Not used	

12/13/2000 05:47:55 PM - 06:07:55 PM

Hz	LLF90	
16	51.3	
20	52.4	
25	52.6	
31.50	52.9	**57**
40	52.0	
50	50.8	
63	51.0	**56**
80	52.4	
100	48.3	
125	44.9	**51**
160	42.9	
200	40.4	
250	38.2	**43**
315	35.4	
400	34.0	
500	37.0	**42**
630	38.9	
800	39.9	
1000	40.8	**45**
1250	39.0	
1600	35.9	
2000	31.0	**37**
2500	24.6	
3150	—	
4000	—	**20**
5000	—	
6300	—	
8000	—	**20**
10000	—	
12500	—	
		47.1

Location:	**Dolsontown Road - East**		
Time:	**Daytime**		
Season:	**Winter**		
Instrument:		2260	
Application:		BZ7202 version 1.1	
Start Time:		12/14/2000 02:18:28 PM	
End Time:		12/14/2000 02:38:28 PM	
Elapsed Time:		0:20:00	
Bandwidth:		1/3 Octave	
Peaks Over:		140.0 dB	
Range:		19.6-99.6 dB	
	Time	Frequency	
Broad-band measurements:	S F I	A L	
Broad-band statistics:	F	A	
Octave measurements:	F	L	
Instrument Serial Number:			
Microphone Serial Number:		1783679	
Input:		Microphone	
Pol. Voltage:		0 V	
S. I. Correction:		Random	
Calibration Level:		93.9 dB	
Sensitivity:		-25.8 dB	
ZF0023:		Not used	

12/14/2000 02:18:28 PM - 02:38:28 PM

Hz	LLF90	
16	55.2	
20	55.6	
25	55.0	
31.50	55.9	**60**
40	55.2	
50	55.3	
63	54.6	**60**
80	56.6	
100	52.4	
125	48.0	**55**
160	47.1	
200	45.0	
250	42.3	**48**
315	41.8	
400	42.5	
500	47.1	**52**
630	49.7	
800	49.6	
1000	50.2	**54**
1250	49.3	
1600	47.2	
2000	43.2	**49**
2500	38.0	
3150	32.2	
4000	26.0	**20**
5000	—	
6300	—	
8000	—	**20**
10000	—	
12500	—	
		56.8

Location:	**Dolsontown Road - East**		
Time:	**Daytime**		
Season:	**Winter**		
Instrument:		2260	
Application:		BZ7202 version 1.1	
Start Time:		12/15/2000 09:31:57 AM	
End Time:		12/15/2000 09:51:57 AM	
Elapsed Time:		0:20:00	
Bandwidth:		1/3 Octave	
Peaks Over:		140.0 dB	
Range:		19.6-99.6 dB	
	Time	Frequency	
Broad-band measurements:	S F I	A L	
Broad-band statistics:	F	A	
Octave measurements:	F	L	
Instrument Serial Number:			
Microphone Serial Number:		1783679	
Input:		Microphone	
Pol. Voltage:		0 V	
S. I. Correction:		Random	
Calibration Level:		93.9 dB	
Sensitivity:		-25.8 dB	
ZF0023:		Not used	

12/15/2000 09:31:57 AM - 09:51:57 AM

Hz	LLF90	
16	52.2	
20	53.2	
25	52.7	
31.50	54.1	**58**
40	52.4	
50	53 0	
63	53.1	**58**
80	54.6	
100	52.1	
125	47.1	**54**
160	45.1	
200	44.5	
250	39.9	**46**
315	37.5	
400	35.3	
500	36.8	**42**
630	38.4	
800	39.5	
1000	39.8	**44**
1250	39.2	
1600	36.6	
2000	31.7	**38**
2500	25.8	
3150	—	
4000	—	**20**
5000	—	
6300	—	
8000	—	**20**
10000	—	
12500	—	
		47.5

Dolstontown Road East - Winter Short Term Data

Location: Dolsontown Road - East
Time: Evening
Season: Winter

Instrument: 2260
Application: BZ7202 version 1.1
Start Time: 12/13/2000 08:50:30 PM
End Time: 12/13/2000 09:10:30 PM
Elapsed Time: 0:20:00
Bandwidth: 1/3 Octave
Peaks Over: 140.0 dB
Range: 19.6-99.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L

Instrument Serial Number:
Microphone Serial Number: 1783679
Input: Microphone
Pol. Voltage: 0 V
S. I. Correction: Random

Calibration Level: 93.9 dB
Sensitivity: -25.8 dB
ZF0023: Not used

12/13/2000 08:50:30 PM - 09:10:30 PM

Hz	LLF90	
16	51.2	
20	51.8	
25	50.8	
31.50	51.0	55
40	49.0	
50	47.5	
63	47.7	53
80	50.2	
100	45.5	
125	42.1	48
160	42.0	
200	38.1	
250	35.8	41
315	34.1	
400	32.7	
500	35.3	39
630	34.7	
800	35.2	
1000	35.0	39
1250	32.3	
1600	29.0	
2000	23.3	20
2500	---	
3150	---	
4000	---	20
5000	---	
6300	---	
8000	---	20
10000	---	
12500	---	
		42.2

Location: Dolsontown Road - East
Time: Evening
Season: Winter

Instrument: 2260
Application: BZ7202 version 1.1
Start Time: 12/14/2000 09:15:30 PM
End Time: 12/14/2000 09:35:30 PM
Elapsed Time: 0:20:00
Bandwidth: 1/3 Octave
Peaks Over: 140.0 dB
Range: 19.6-99.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L

Instrument Serial Number:
Microphone Serial Number: 1783679
Input: Microphone
Pol. Voltage: 0 V
S. I. Correction: Random

Calibration Level: 93.9 dB
Sensitivity: -25.8 dB
ZF0023: Not used

12/14/2000 09:15:30 PM - 09:35:30 PM

Hz	LLF90	
16	60.6	
20	59.6	
25	58.4	
31.50	57.8	62
40	55.4	
50	54.5	
63	54.1	59
80	54.1	
100	51.2	
125	47.6	54
160	45.4	
200	43.6	
250	39.2	46
315	37.8	
400	37.6	
500	40.7	46
630	42.8	
800	43.6	
1000	43.1	48
1250	41.6	
1600	38.2	
2000	33.1	40
2500	27.0	
3150	20.5	
4000	---	20
5000	---	
6300	---	
8000	---	20
10000	---	
12500	---	
		50.0

Location: Dolsontown Road - East
Time: Early Morning
Season: Winter

Instrument: 2260
Application: BZ7202 version 1.1
Start Time: 12/15/2000 02:29:32 AM
End Time: 12/15/2000 02:49:32 AM
Elapsed Time: 0:20:00
Bandwidth: 1/3 Octave
Peaks Over: 140.0 dB
Range: 19.6-99.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L

Instrument Serial Number:
Microphone Serial Number: 1783679
Input: Microphone
Pol. Voltage: 0 V
S. I. Correction: Random

Calibration Level: 93.9 dB
Sensitivity: -25.8 dB
ZF0023: Not used

12/15/2000 02:29:32 AM - 02:49:32 AM

Hz	LLF90	
16	52.1	
20	52.2	
25	51.0	
31.50	54.0	57
40	49.8	
50	50.0	
63	47.0	53
80	47.3	
100	44.9	
125	41.3	47
160	39.8	
200	39.3	
250	33.0	41
315	31.6	
400	32.5	
500	36.2	41
630	38.2	
800	36.6	
1000	35.6	40
1250	33.0	
1600	26.8	
2000	20.8	28
2500	20.0	
3150	20.0	
4000	20.0	25
5000	20.0	
6300	20.0	
8000	20.0	25
10000	20.0	
12500	20.0	
		43.3

Dolstontown Road East - Summer Short Term Data

Location:	Dolsontown Road - East		Location:	Dolsontown Road - East	
Time:	Daytime		Time:	Nighttime	
Season:	Summer		Season:	Summer	
Sound Level Meter Model/SN:	B&K 2260/177216		Sound Level Meter Model/SN:	B&K 2260/177216	
Calibrator Model/SN:	B&K 4231/2115610		Calibrator Model/SN:	B&K 4231/2115610	
Date:	6/20/2000		Date:	6/21/2000	
Monitoring Time:	1213-1233		Monitoring Time:	0049-0109	
	Before	After		Before	After
Calibration Factor:	93.8	93.8	Calibration Factor:	93.8	93.8
Calibration Level:	93.8		Calibration Level:	93.8	
Derivation:	0.03	-0.02	Derivation:	-0.05	-0.04
Octave Band	Daytime L_{90}	Whole Octaves	Octave Band	Nighttime L_{90}	Whole Octaves
16	52		16	50	
20	53		20	52	
25	52		25	51	
32	55	58	32	52	56
40	53		40	49	
50	52		50	50	
63	52	56	63	48	54
80	51		80	49	
100	48		100	45	
125	46	51	125	43	48
160	44		160	42	
200	43		200	40	
250	41	46	250	39	44
315	40		315	39	
400	40		400	40	
500	41	45	500	44	47
630	41		630	42	
800	42		800	41	
1000	41	46	1000	41	45
1250	40		1250	38	
1600	39		1600	35	
2000	37	42	2000	30	37
2500	34		2500	25	
3150	32		3150	20	
4000	28	34	4000	14	21
5000	24		5000	11	
6300	20		6300	10	
8000	17	23	8000	9	14
10000	15		10000	8	
12500	16		12500	8	
Combined dBA		49.5	Combined dBA		48.3
Overall dBA		51	Overall dBA		49.6

Dolstontown Road East - Summer Long Term Data

Location: Dolsontown East
Time: 24-hour Monitoring
Season: Summer

Kings Park
Noise Monitoring June 20-21, 2000
B&K 2236D S/N 2100600
Calibrator: B&K 4231 S/N 2115610
Range 20-100 dBA
Slow response
RMS:A Peak:C
20-100 dB

Cal Factors	
Before	After
2.2	2.2

Time	L90	L90 10pm-7am
9:32:21	52.5	
11:15:21	53.5	
11:25:21	52.0	
11:35:21	51.5	
11:45:21	51.0	
11:55:21	52.0	
12:05:21	49.0	
12:15:21	50.5	
12:25:21	45.5	
12:35:21	60.0	
12:45:21	51.0	
12:55:21	49.5	
13:05:21	48.0	
13:15:21	47.5	
13:25:21	47.5	
13:35:21	48.0	
13:45:21	49.5	
13:55:21	49.0	
14:05:21	54.0	
14:15:21	57.0	
14:25:21	60.0	
14:35:21	56.5	
14:45:21	53.5	
14:55:21	53.0	
15:05:21	58.0	
15:15:21	59.5	
15:25:21	57.0	
15:35:21	57.5	
15:45:21	57.0	
15:55:21	55.0	
16:05:21	54.5	
16:15:21	55.5	
16:25:21	55.5	
16:35:21	54.0	
16:45:21	55.0	
16:55:21	54.5	
17:05:21	56.0	
17:15:21	55.0	
17:25:21	56.0	
17:35:21	55.5	
17:45:21	55.0	
17:55:21	54.0	
18:05:21	55.5	
18:15:21	54.0	
18:25:21	52.5	
18:35:21	53.0	
18:45:21	54.0	
18:55:21	54.0	
19:05:21	52.5	
19:15:21	51.5	
19:25:21	54.0	
19:35:21	52.5	
19:45:21	54.0	
19:55:21	54.0	
20:05:21	54.5	
20:15:21	54.5	
20:25:21	53.0	
20:35:21	54.0	
20:45:21	51.5	
20:55:21	52.5	
21:05:21	52.0	
21:15:21	53.0	
21:25:21	54.0	
21:35:21	52.5	
21:45:21	52.5	
21:55:21	51.0	51.0
22:05:21	53.0	53.0
22:15:21	52.0	52.0
22:25:21	51.0	51.0
22:35:21	50.0	50.0

(Continued)
Location: Dolsontown East
Time: 24-hour Monitoring
Season: Summer

Time	L90	L90 10pm-7am
22:45:21	50.5	50.5
22:55:21	49.5	49.5
23:05:21	51.5	51.5
23:15:21	51.0	51.0
23:25:21	50.5	50.5
23:35:21	52.5	52.5
23:45:21	51.0	51.0
23:55:21	49.5	49.5
0:05:21	51.0	51.0
0:15:21	51.0	51.0
0:25:21	50.5	50.5
0:35:21	52.0	52.0
0:45:21	51.5	51.5
0:55:21	50.5	50.5
1:05:21	48.5	48.5
1:15:21	50.0	50.0
1:25:21	50.0	50.0
1:35:21	48.5	48.5
1:45:21	48.0	48.0
1:55:21	49.0	49.0
2:05:21	47.0	47.0
2:15:21	48.5	48.5
2:25:21	48.0	48.0
2:35:21	46.5	46.5
2:45:21	46.0	46.0
2:55:21	46.0	46.0
3:05:21	44.5	44.5
3:15:21	41.0	41.0
3:25:21	47.0	47.0
3:35:21	47.0	47.0
3:45:21	48.0	48.0
3:55:21	48.0	48.0
4:05:21	50.5	50.5
4:15:21	48.5	48.5
4:25:21	48.5	48.5
4:35:21	49.0	49.0
4:45:21	47.5	47.5
4:55:21	49.5	49.5
5:05:21	48.5	48.5
5:15:21	50.5	50.5
5:25:21	53.0	53.0
5:35:21	50.0	50.0
5:45:21	51.5	51.5
5:55:21	51.5	51.5
6:05:21	51.5	51.5
6:15:21	51.5	51.5
6:25:21	53.5	53.5
6:35:21	54.0	54.0
6:45:21	53.5	53.5
6:55:21	53.0	53.0
7:05:21	52.5	
7:15:21	52.0	
7:25:21	50.5	
7:35:21	52.0	
7:45:21	51.5	
7:55:21	51.5	
8:05:21	50.5	
8:15:21	53.0	
8:25:21	54.0	
8:35:21	55.5	
8:45:21	53.5	
8:55:21	53.5	
9:05:21	55.0	
9:15:21	53.5	
9:25:21	54.0	
9:35:21	55.5	
9:45:21	54.0	
9:55:21	55.5	
10:05:21	55.5	
10:15:21	55.0	
10:25:21	55.5	
10:35:21	53.5	
10:45:21	55.5	
10:55:21	55.5	
11:05:21	57.0	
11:15:21	57.5	

L90 24-hour average= 53.3
L90 nighttime average= 51.4

Dolstontown Road East - MCNR Analysis

Location: Dolsontown Road - East
Time: Short Term/Long Term
Season: Winter/Summer

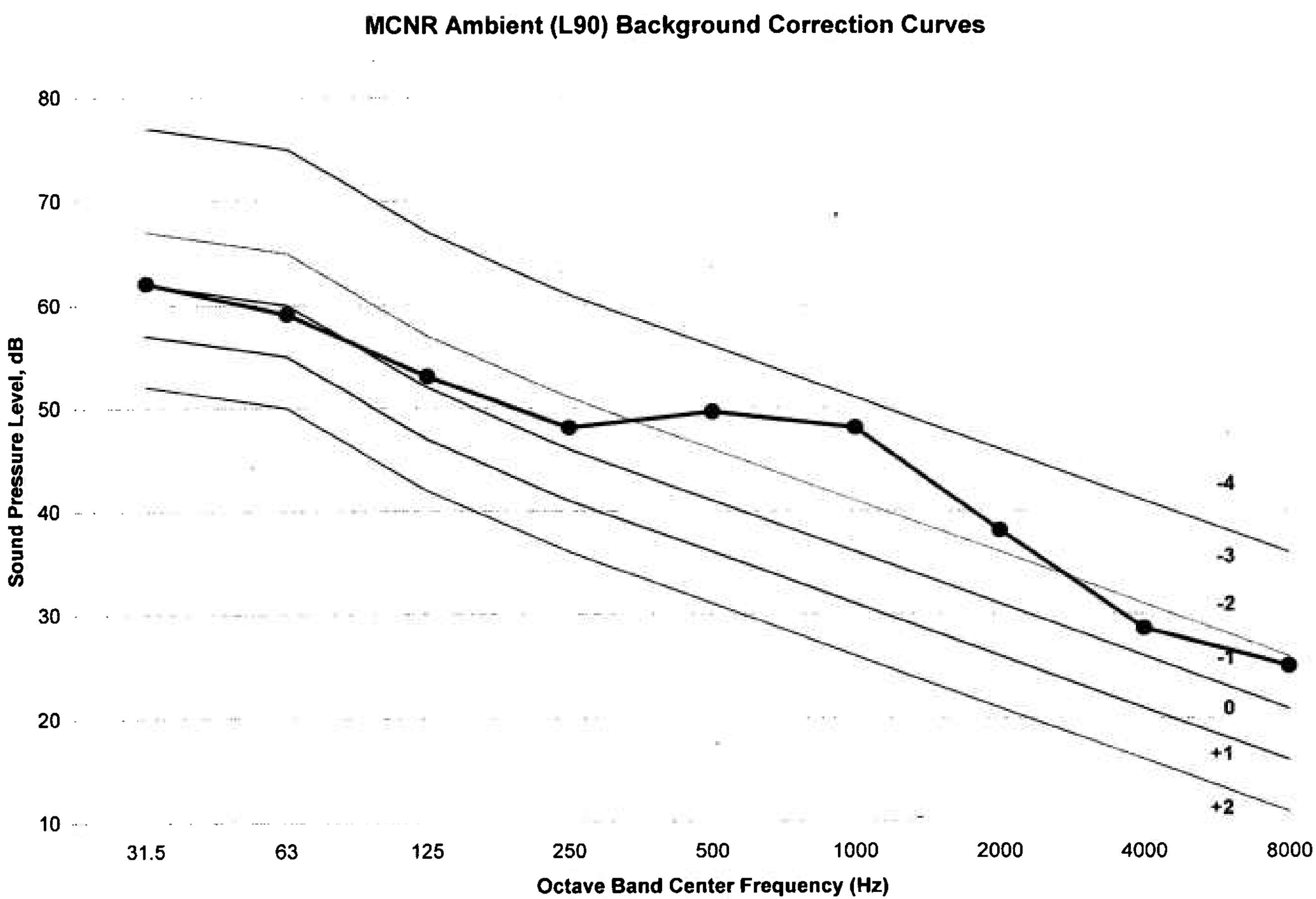
Location	Reaction Rating Goal	Previous Exposure	Spectrum	Intermittancy	Winter or Summer	Day or Night	Background	Allowable Noise Level Rank
Dolsontown-East	C	0	0	0	0	0	-1	d
	D	0	0	0	0	0	-1	e

	Octave Band Center Frequency (Hertz)									
	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
L90 Short Term Winter	57	53	47	41	41	40	28	25	25	43.3
L90 Short Term Summer	56	54	48	44	47	45	37	21	14	48.3
Average Short Term L90	57	54	48	43	44	43	33	23	20	46
L90 Long Term Average										51.4
Spectrum Adjust	6	6	6	6	6	6	6	6	6	
Average L90 Spectrum	*62*	*59*	*53*	*48*	*50*	*48*	*38*	*29*	*25*	*51*
Background Curve Selection	---	0	-1	-1	-2	-3	-2	-1	-1	-1
Predicted Plant SPL for Reaction C	*66*	*58*	*51*	*44*	*39*	*36*	*31*	*23*	*0*	*43*
Predicted Plant SPL for Reaction D	*66*	*64*	*56*	*49*	*44*	*39*	*35*	*24*	*0*	*47*

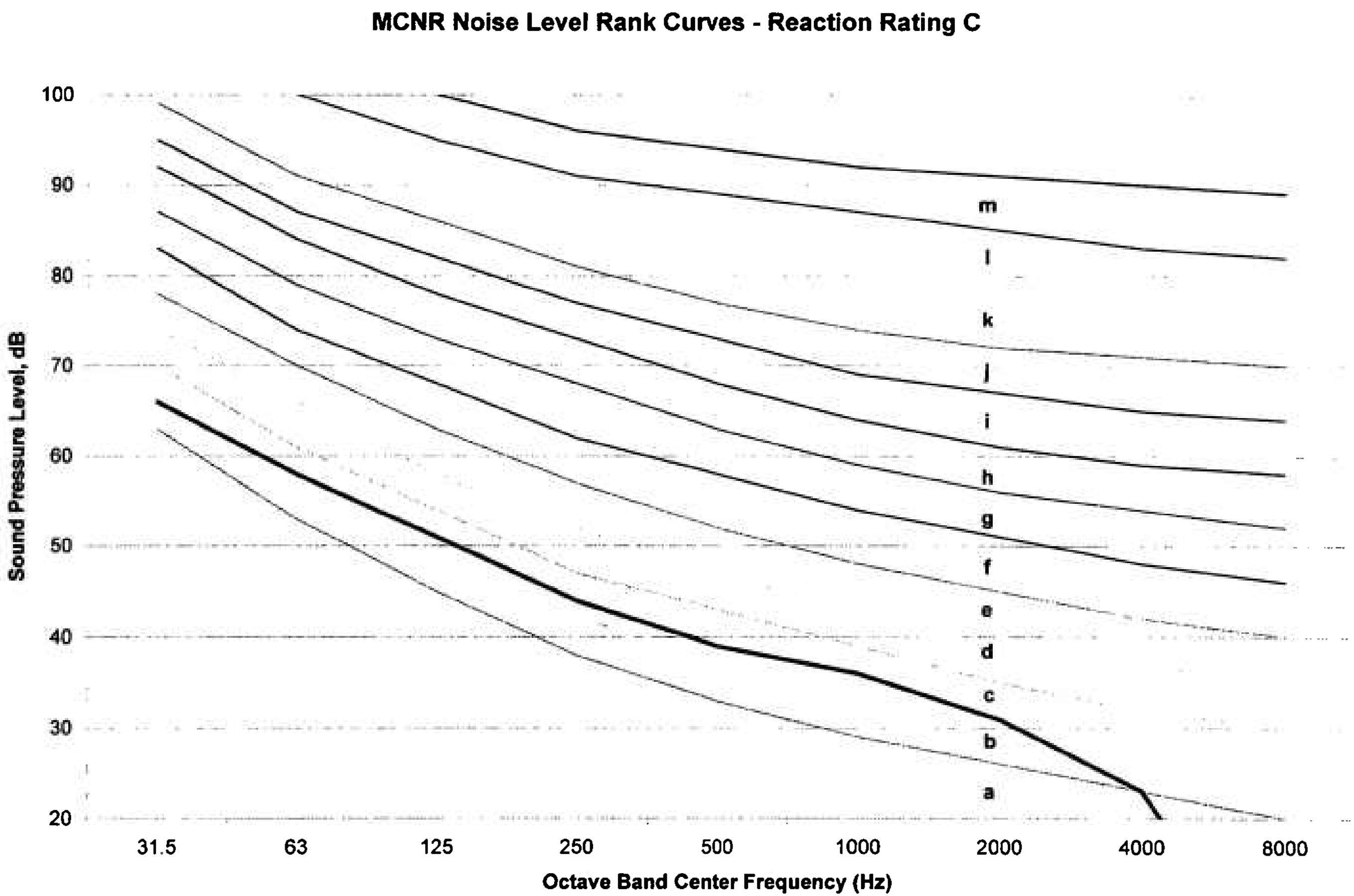
	Octave Band Center Frequency (Hertz)								
Background Curves	31.5	63	125	250	500	1000	2000	4000	8000
-4	78	76	68	62	57	52	47	42	37
-3	77	75	67	61	56	51	46	41	36
-2	72	70	62	56	51	46	41	36	31
-1	67	65	57	51	46	41	36	31	26
0	62	60	52	46	41	36	31	26	21
1	57	55	47	41	36	31	26	21	16
2	52	50	42	36	31	26	21	16	11

	Octave Band Center Frequency (Hertz)									
Noise Level Rank Curves	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
m			100	96	94	92	91	90	89	99
l		100	95	91	89	87	85	83	82	93
k		95	90	86	83	80	78	77	76	87
j	99	91	86	81	77	74	72	71	70	81
i	95	87	82	77	73	69	67	65	64	76
h	92	84	78	73	68	64	61	59	58	71
g	87	79	73	68	63	59	56	54	52	66
f	83	74	68	62	58	54	51	48	46	61
e	78	70	63	57	52	48	45	42	40	56
d	74	66	58	52	47	43	40	37	35	51
c	70	61	54	47	43	39	35	32	30	46
b	67	58	49	42	38	34	30	28	25	41
a	63	53	45	38	33	29	26	23	20	37

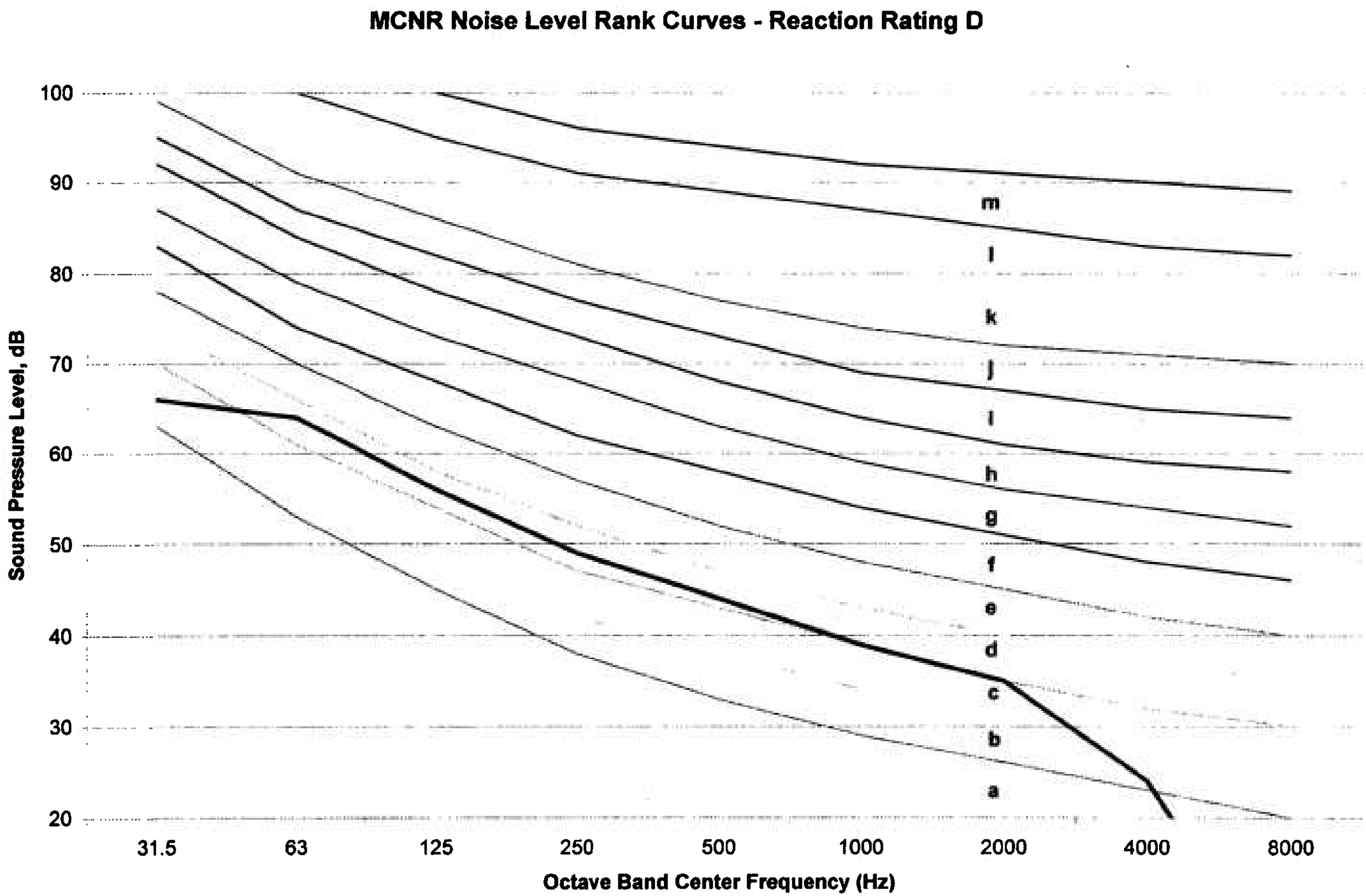
Dolstontown Road East



Dolstontown Road East



Dolstontown Road East



Dolstontown Road West - Winter Short Term Data

Location:	**Dolsontown Road - West**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/13/2000 05:22:07 PM
End Time:		12/13/2000 05:42:07 PM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/13/2000 05:22:07 PM - 05:42:07 PM

Hz	LLF90	
16	53.0	
20	54.1	
25	54.1	
31.50	55.0	**59**
40	53.7	
50	53.6	
63	53.2	**58**
80	53.4	
100	48.4	
125	45.0	**51**
160	43.1	
200	41.5	
250	40.8	**46**
315	40.4	
400	40.9	
500	43.9	**48**
630	43.7	
800	42.0	
1000	39.9	**45**
1250	36.5	
1600	31.9	
2000	26.0	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		48.4

Location:	**Dolsontown Road - West**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/14/2000 01:53:32 PM
End Time:		12/14/2000 02:13:32 PM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/14/2000 01:53:32 PM - 02:13:32 PM

Hz	LLF90	
16	52.2	
20	52.9	
25	53.0	
31.50	54.0	**58**
40	53.2	
50	53.0	
63	51.9	**58**
80	53.8	
100	51.5	
125	48.5	**54**
160	46.8	
200	43.8	
250	42.7	**48**
315	42.3	
400	42.6	
500	43.8	**48**
630	43.7	
800	46.8	
1000	46.6	**50**
1250	42.6	
1600	40.7	
2000	36.2	**42**
2500	31.3	
3150	26.6	
4000	22.8	**29**
5000	20.9	
6300	20.2	
8000	---	**20**
10000	---	
12500	---	
		52.6

Location:	**Dolsontown Road - West**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/15/2000 09:07:38 AM
End Time:		12/15/2000 09:27:38 AM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/15/2000 09:07:38 AM - 09:27:38 AM

Hz	LLF90	
16	53.1	
20	53.9	
25	53.3	
31.50	53.2	**58**
40	53.1	
50	53.4	
63	52.6	**58**
80	53.2	
100	49.3	
125	45.3	**51**
160	42.3	
200	40.0	
250	37.1	**43**
315	36.1	
400	36.6	
500	38.9	**44**
630	40.3	
800	41.0	
1000	39.0	**44**
1250	36.5	
1600	32.8	
2000	27.0	**34**
2500	20.6	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		46.7

Dolstontown Road West - Winter Short Term Data

Location: Dolsontown Road - West
Time: Evening
Season: Winter

Instrument:	2260
Application:	BZ7202 version 1.1
Start Time:	12/13/2000 08:24:16 PM
End Time:	12/13/2000 08:44:16 PM
Elapsed Time:	0:20:00
Bandwidth:	1/3 Octave
Peaks Over:	140.0 dB
Range:	19.6-99.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L

Instrument Serial Number:	
Microphone Serial Number:	1783679
Input:	Microphone
Pol. Voltage:	0 V
S. I. Correction:	Random
Calibration Level:	93.9 dB
Sensitivity:	-25.8 dB
ZF0023:	Not used

12/13/2000 08:24:16 PM - 08:44:16 PM

Hz	LLF90	
16	50.8	
20	52.3	
25	52.3	
31.50	53.6	**57**
40	51.5	
50	50.8	
63	50.3	**55**
80	50.8	
100	46.4	
125	42.5	**49**
160	41.3	
200	38.8	
250	38.2	**43**
315	38.2	
400	38.3	
500	40.2	**44**
630	39.3	
800	37.4	
1000	34.7	**40**
1250	29.8	
1600	23.8	
2000	---	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		44.4

Location: Dolsontown Road - West
Time: Evening
Season: Winter

Instrument:	2260
Application:	BZ7202 version 1.1
Start Time:	12/14/2000 08:50:14 PM
End Time:	12/14/2000 09:10:14 PM
Elapsed Time:	0:20:00
Bandwidth:	1/3 Octave
Peaks Over:	140.0 dB
Range:	19.6-99.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L

Instrument Serial Number:	
Microphone Serial Number:	1783679
Input:	Microphone
Pol. Voltage:	0 V
S. I. Correction:	Random
Calibration Level:	93.9 dB
Sensitivity:	-25.8 dB
ZF0023:	Not used

12/14/2000 08:50:14 PM - 09:10:14 PM

Hz	LLF90	
16	49.8	
20	51.1	
25	50.7	
31.50	51.5	**56**
40	49.8	
50	49.4	
63	48.2	**53**
80	47.6	
100	45.2	
125	42.7	**48**
160	40.7	
200	38.2	
250	36.4	**42**
315	35.6	
400	36.2	
500	39.3	**44**
630	39.9	
800	38.9	
1000	39.1	**43**
1250	37.3	
1600	32.9	
2000	26.8	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		45.6

Location: Dolsontown Road - West
Time: Early Morning
Season: Winter

Instrument:	2260
Application:	BZ7202 version 1.1
Start Time:	12/15/2000 02:03:33 AM
End Time:	12/15/2000 02:23:33 AM
Elapsed Time:	0:20:00
Bandwidth:	1/3 Octave
Peaks Over:	140.0 dB
Range:	19.6-99.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L

Instrument Serial Number:	
Microphone Serial Number:	1783679
Input:	Microphone
Pol. Voltage:	0 V
S. I. Correction:	Random
Calibration Level:	93.9 dB
Sensitivity:	-25.8 dB
ZF0023:	Not used

12/15/2000 02:03:33 AM - 02:23:33 AM

Hz	LLF90	
16	55.0	
20	53.8	
25	52.4	
31.50	52.1	**56**
40	48.6	
50	46.9	
63	44.6	**50**
80	44.2	
100	42.5	
125	39.0	**45**
160	37.0	
200	35.7	
250	35.7	**40**
315	33.0	
400	32.7	
500	34.3	**38**
630	33.5	
800	31.6	
1000	30.5	**35**
1250	28.2	
1600	23.3	
2000	20.0	**26**
2500	20.0	
3150	20.0	
4000	20.0	**25**
5000	20.0	
6300	20.0	
8000	20.0	**25**
10000	20.0	
12500	20.0	
		40.0

Dolstontown Road West - Summer Short Term Data

Location:	Dolsontown Road - West		Location:	Dolsontown Road - West	
Time:	Daytime		Time:	Nighttime	
Season:	Summer		Season:	Summer	
Sound Level Meter Model/SN:	B&K 2260/177216		Sound Level Meter Model/SN:	B&K 2260/177216	
Calibrator Model/SN:	B&K 4231/2115610		Calibrator Model/SN:	B&K 4231/2115610	
Date:	6/20/2000		Date:	6/21/2000	
Monitoring Time:	1240-1300		Monitoring Time:	0116-0136	
	Before	After		Before	After
Calibration Factor:	93.8	93.8	Calibration Factor:	93.8	93.8
Calibration Level:	93.8		Calibration Level:	93.8	
Derivation:	-0.02	-0.02	Derivation:	-0.04	0.05
Octave Band	Daytime L_{90}	Whole Octaves	Octave Band	Nighttime L_{90}	Whole Octaves
16	50		16	50	
20	51		20	52	
25	52		25	51	
32	56	59	32	51	55
40	53		40	48	
50	51		50	49	
63	51	57	63	48	54
80	53		80	51	
100	49		100	47	
125	47	52	125	46	51
160	44		160	46	
200	41		200	45	
250	39	44	250	42	47
315	38		315	39	
400	37		400	38	
500	39	43	500	42	46
630	38		630	43	
800	37		800	42	
1000	36	41	1000	42	46
1250	35		1250	39	
1600	32		1600	35	
2000	28	34	2000	30	37
2500	25		2500	25	
3150	21		3150	19	
4000	17	23	4000	13	20
5000	14		5000	8	
6300	11		6300	7	
8000	10	15	8000	8	12
10000	10		10000	8	
12500	10		12500	8	
Combined dBA		45.3	Combined dBA		48.9
Overall dBA		46.8	Overall dBA		50

Dolstontown Road West - MCNR Analysis

Location: Dolsontown Road - West
Time: Short Term
Season: Winter/Summer

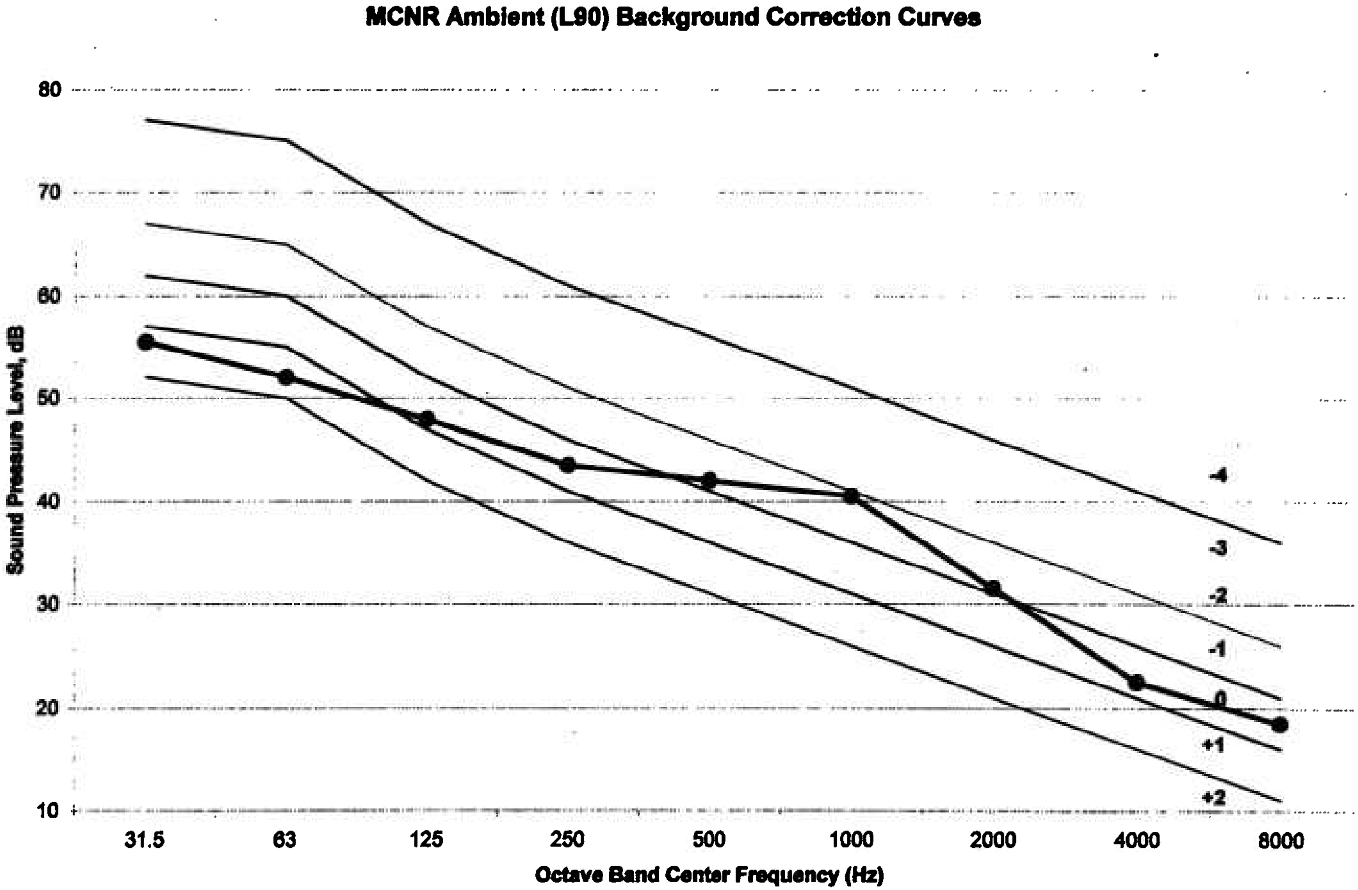
Location	Reaction Rating Goal	Previous Exposure	Spectrum	Intermittancy	Winter or Summer	Day or Night	Background Curve	Allowable Noise Level Rank
Dolsontown-West	C	0	0	0	0	0	0	c
	D	0	0	0	0	0	0	d

	Octave Band Center Frequency (Hertz) 31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
L90 Short Term Winter	56	50	45	40	38	35	26	25	25	40
L90 Short Term Summer	55	54	51	47	46	46	37	20	12	48.9
Average L90 Spectrum	***56***	***52***	***48***	***44***	***42***	***41***	***32***	***23***	***19***	***44***
Background Curve Selection	+1	+1	0	0	-1	-1	-1	0	0	0
Predicted Plant SPL for Reaction C	***66***	***60***	***53***	***46***	***42***	***38***	***35***	***29***	***3***	***45***
Predicted Plant SPL for Reaction D	***66***	***66***	***58***	***52***	***47***	***43***	***39***	***30***	***3***	***50***

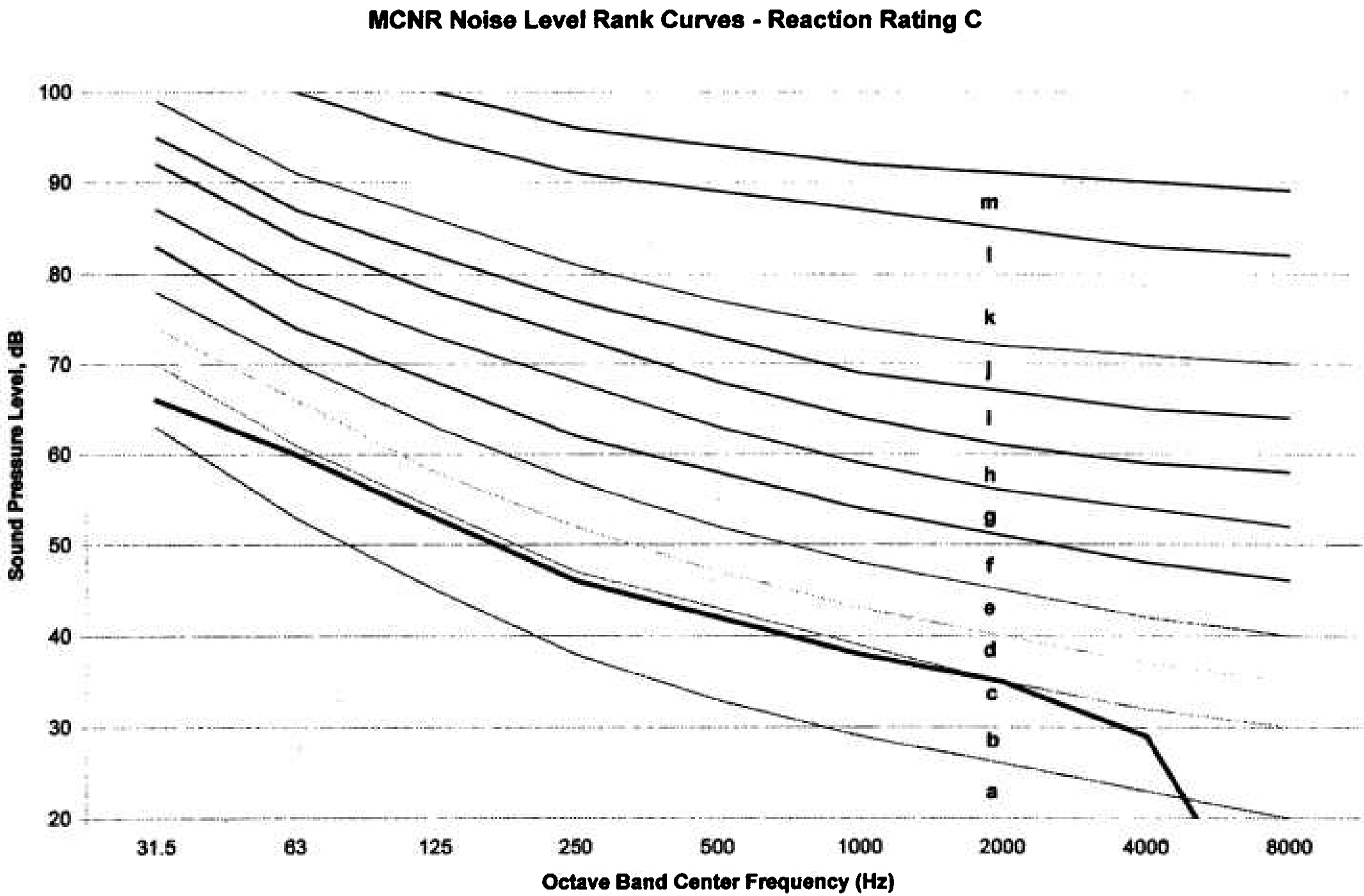
Background Curves	Octave Band Center Frequency (Hertz) 31.5	63	125	250	500	1000	2000	4000	8000
-4	78	76	68	62	57	52	47	42	37
-3	77	75	67	61	56	51	46	41	36
-2	72	70	62	56	51	46	41	36	31
-1	67	65	57	51	46	41	36	31	26
0	62	60	52	46	41	36	31	26	21
1	57	55	47	41	36	31	26	21	16
2	52	50	42	36	31	26	21	16	11

Noise Level Rank Curves	Octave Band Center Frequency (Hertz) 31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
m			100	96	94	92	91	90	89	99
l		100	95	91	89	87	85	83	82	93
k		95	90	86	83	80	78	77	76	87
j	99	91	86	81	77	74	72	71	70	81
i	95	87	82	77	73	69	67	65	64	76
h	92	84	78	73	68	64	61	59	58	71
g	87	79	73	68	63	59	56	54	52	66
f	83	74	68	62	58	54	51	48	46	61
e	78	70	63	57	52	48	45	42	40	56
d	74	66	58	52	47	43	40	37	35	51
c	70	61	54	47	43	39	35	32	30	46
b	67	58	49	42	38	34	30	28	25	41
a	63	53	45	38	33	29	26	23	20	37

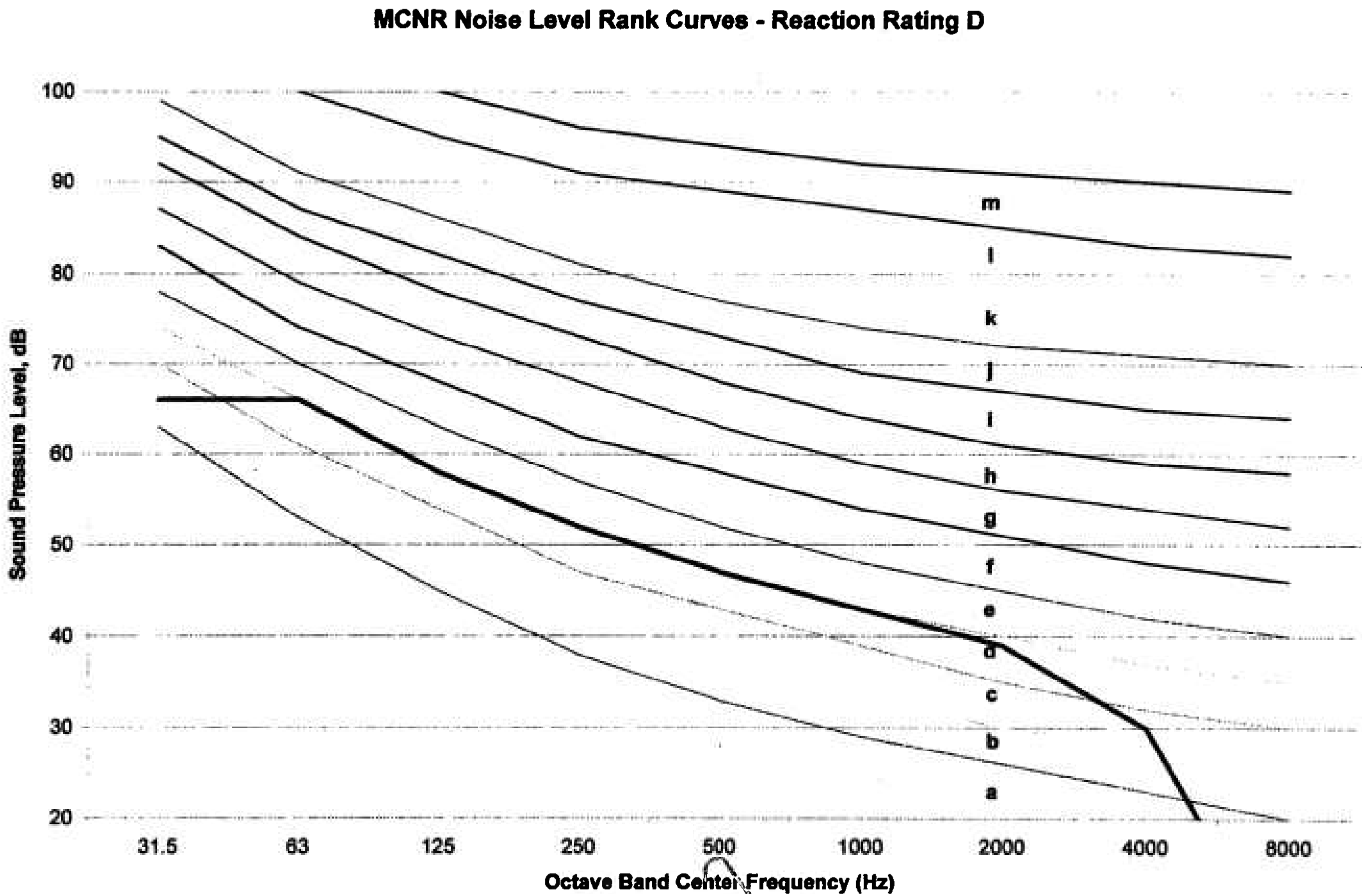
Dolstontown Road West



Dolstontown Road West



Dolstontown Road West



Dolsontown Road South - Winter Short Term Data

Location:	**Dolsontown Road - South**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/13/2000 15:53
End Time:		12/13/2000 16:13
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/13/2000 03:53:18 PM - 04:13:18 PM

Hz	LLF90	
16	52.2	
20	53.2	
25	52.4	
31.5	53.4	**58**
40	52.7	
50	52.3	
63	53.0	**58**
80	54.2	
100	50.4	
125	45.7	**52**
160	42.7	
200	39.8	
250	38.6	**43**
315	36.9	
400	36.8	
500	39.4	**44**
630	40.6	
800	41.0	
1000	41.6	**46**
1250	39.8	
1600	36.0	
2000	30.4	**37**
2500	22.6	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	49.3	**48.1**

Location:	**Dolsontown Road - South**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/14/2000 12:28
End Time:		12/14/2000 12:48
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/14/2000 12:28:22 PM - 12:48:22 PM

Hz	LLF90	
16	52.8	
20	53.2	
25	52.1	
31.5	52.5	**57**
40	52.1	
50	52.8	
63	52.3	**58**
80	53.7	
100	50.4	
125	47.4	**53**
160	45.8	
200	43.0	
250	40.2	**46**
315	38.9	
400	38.8	
500	41.4	**46**
630	43.6	
800	45.1	
1000	46.9	**51**
1250	46.2	
1600	42.8	
2000	38.5	**45**
2500	33.9	
3150	29.3	
4000	25.5	**31**
5000	21.7	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	54.0	**52.9**

Location:	**Dolsontown Road - South**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/15/2000 7:41
End Time:		12/15/2000 8:01
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/15/2000 07:41:04 AM - 08:01:04 AM

Hz	LLF90	
16	50.3	
20	51.1	
25	51.4	
31.5	52.3	**57**
40	52.1	
50	53.0	
63	52.8	**58**
80	53.0	
100	50.5	
125	47.6	**53**
160	44.1	
200	42.2	
250	39.3	**45**
315	38.1	
400	38.0	
500	39.4	**44**
630	39.8	
800	40.1	
1000	40.5	**45**
1250	40.2	
1600	38.4	
2000	33.2	**40**
2500	29.4	
3150	24.0	
4000	20.3	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	49.3	**48.3**

Dolsontown Road South - Winter Short Term Data

Location:	**Dolsontown Road - South**	
Time:	**Evening**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/13/2000 19:02
End Time:		12/13/2000 19:22
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/13/2000 07:02:01 PM - 07:22:01 PM

Hz	LLF90	
16	50.8	
20	51.8	
25	51.2	
31.5	51.7	**56**
40	50.4	
50	49.1	
63	48.5	**54**
80	50.4	
100	46.4	
125	44.6	**50**
160	42.7	
200	38.5	
250	37.3	**42**
315	34.8	
400	34.2	
500	37.0	**41**
630	37.3	
800	35.4	
1000	35.8	**40**
1250	33.7	
1600	29.9	
2000	23.2	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	44.9	**43.3**

Location:	**Dolsontown Road - South**	
Time:	**Evening**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/14/2000 19:22
End Time:		12/14/2000 19:42
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/14/2000 07:22:24 PM - 07:42:24 PM

Hz	LLF90	
16	51.0	
20	52.1	
25	51.6	
31.5	52.6	**56**
40	50.0	
50	50.8	
63	50.8	**56**
80	51.5	
100	49.5	
125	46.3	**52**
160	44.6	
200	42.8	
250	40.3	**46**
315	40.1	
400	39.9	
500	41.4	**46**
630	41.6	
800	42.6	
1000	44.2	**48**
1250	43.3	
1600	40.3	
2000	36.3	**42**
2500	31.4	
3150	25.9	
4000	20.1	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	51.6	**50.6**

Location:	**Dolsontown Road - South**	
Time:	**Early Morning**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/15/2000 0:47
End Time:		12/15/2000 1:07
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/15/2000 12:47:51 AM - 01:07:51 AM

Hz	LLF90	
16	57.9	
20	56.5	
25	54.8	
31.5	54.2	**59**
40	52.6	
50	49.5	
63	48.7	**54**
80	48.2	
100	46.0	
125	42.4	**48**
160	40.0	
200	37.1	
250	34.9	**41**
315	35.5	
400	34.5	
500	35.7	**40**
630	35.3	
800	34.2	
1000	33.5	**38**
1250	30.9	
1600	26.2	
2000	20.5	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	43.6	**41.8**

Dolsontown Road South - Winter Long Term Data

Location:	**Dolsontown Road - South**			
Time:	**24-hour Monitoring**			
Season:	**Winter**			
Instrument:		2238		
Application:		BZ7124 version 1.1		
Start Time:		12/13/2000 03:39:40 PM		
End Time:		12/15/2000 11:22:59 AM		
Elapsed Time:		43:43:19		
Bandwidth:		Broad band		
Detector 1/2	RMS	Peak		
Range:		20.0-100.0 dB		
	Time	Frequency		
Detector 1:	S F I	A		
Detector 2:	Peak	L		
Statistic	F	A		
Criterion Level:		100.0 dB		
Threshold:		0.0 dB		
Exchange Rate		3 and 260		
Exposure Time:		7:30:00		
Peaks Over:		140.0 dB		
Instrument Serial Number:		2246211		
Microphone Serial Number:		2231023		
Input:		Microphone		
Windscreen Correction:		Off		
S. I. Correction:		Random		
Calibration Level:		94.0 dB		
Sensitivity:		-30.8 dB		
Microphone:		2231023		

Start date	Start time	LAeq	LAF90	L90 10pm-7am
12/13/2000	03:39:40 PM	63.6	54.5	
12/13/2000	04:39:40 PM	57.1	53.5	
12/13/2000	05:39:40 PM	56.5	52.5	
12/13/2000	06:39:40 PM	55.7	51.0	
12/13/2000	07:39:40 PM	55.5	51.0	
12/13/2000	08:39:40 PM	55.4	50.0	
12/13/2000	09:39:40 PM	54.8	50.0	50.0
12/13/2000	10:39:40 PM	53.5	46.5	46.5
12/13/2000	11:39:40 PM	53.1	45.5	45.5
12/14/2000	12:39:40 AM	52.5	45.0	45.0
12/14/2000	01:39:40 AM	56.1	49.0	49.0
12/14/2000	02:39:40 AM	56.3	51.0	51.0
12/14/2000	03:39:40 AM	52.8	46.5	46.5
12/14/2000	04:39:40 AM	53.4	48.0	48.0
12/14/2000	05:39:40 AM	56.0	49.0	49.0
12/14/2000	06:39:40 AM	55.2	50.5	
12/14/2000	07:39:40 AM	54.5	50.0	
12/14/2000	08:39:40 AM	54.9	50.0	
12/14/2000	09:39:40 AM	57.2	52.0	
12/14/2000	10:39:40 AM	60.3	56.0	
12/14/2000	11:39:40 AM	60.0	56.0	
12/14/2000	12:39:40 PM	58.2	55.0	
12/14/2000	01:39:40 PM	59.0	55.5	
12/14/2000	02:39:40 PM	59.7	57.0	
12/14/2000	03:39:40 PM	59.9	57.0	
12/14/2000	04:39:40 PM	60.3	57.5	
12/14/2000	05:39:40 PM	60.4	58.0	
12/14/2000	06:39:40 PM	66.6	53.0	
12/14/2000	07:39:40 PM	62.2	50.5	
12/14/2000	08:39:40 PM	57.2	50.0	
12/14/2000	09:39:40 PM	53.5	48.5	48.5
12/14/2000	10:39:40 PM	50.8	46.5	46.5
12/14/2000	11:39:40 PM	49.5	45.0	45.0
12/15/2000	12:39:40 AM	47.8	43.5	43.5
12/15/2000	01:39:40 AM	47.8	43.0	43.0
12/15/2000	02:39:40 AM	50.0	43.5	43.5
12/15/2000	03:39:40 AM	49.3	44.0	44.0
12/15/2000	04:39:40 AM	48.9	44.0	44.0
12/15/2000	05:39:40 AM	49.7	45.5	45.5
12/15/2000	06:39:40 AM	53.5	49.0	
12/15/2000	07:39:40 AM	56.4	52.5	
12/15/2000	08:39:40 AM	56.1	51.5	
12/15/2000	09:39:40 AM	54.2	44.5	
12/15/2000	10:39:40 AM	72.5	19.9	
			L90 24 hour average=	**49.4**
			L90 nighttime average=	**46.3**

Dolsontown Road South - MCNR Analysis

Location:	**Dolsontown Road - South**
Time:	**Short Term/Long Term**
Season:	**Winter**

Location	Reaction Rating Goal	Previous Exposure	Spectrum	Intermittancy	Winter or Summer	Day or Night	Background	Allowable Noise Level Rank
Dolsontown-South	C	0	0	0	0	0	0	c
	D	0	0	0	0	0	0	d

Octave Band Center Frequency (Hertz)

	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
								est	*est*	
L90 Short Term Spectrum	59	54	48	41	40	38	20	15	10	41.8
L90 Long Term Average										46.3
Spectrum Adjust	5	5	5	5	5	5	5	5	5	
Average L90 Spectrum	***64***	***59***	***53***	***46***	***45***	***43***	***25***	***20***	***15***	***46***
Background Curve Selection	-1	0	-1	0	-1	-2	+1	+1	+1	0
Predicted Plant SPL for Reaction C	***69***	***61***	***53***	***47***	***43***	***39***	***33***	***27***	***14***	***46***
Predicted Plant SPL for Reaction D	***69***	***66***	***58***	***52***	***47***	***42***	***36***	***28***	***14***	***50***

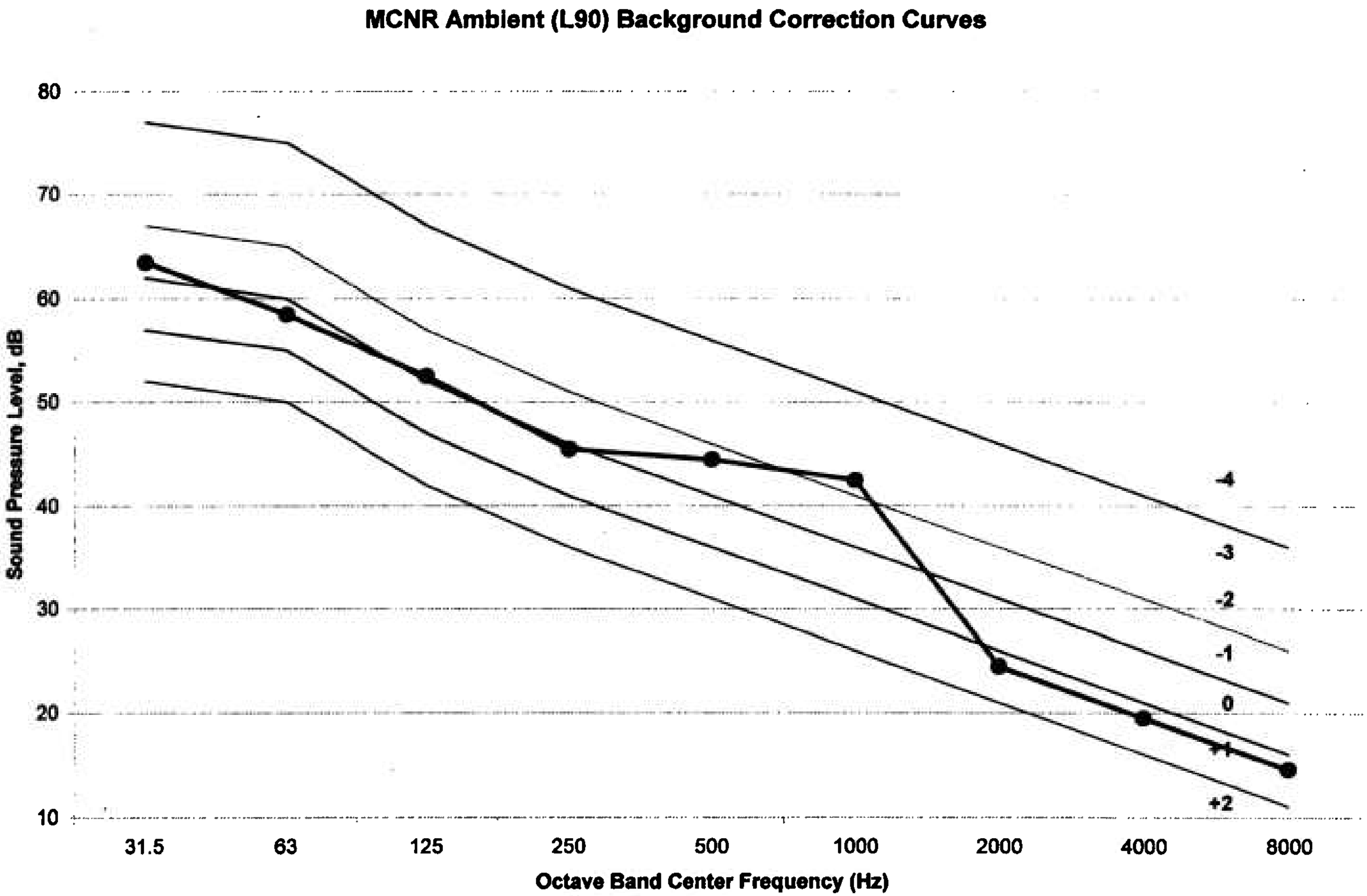
Octave Band Center Frequency (Hertz)

Background Curves	31.5	63	125	250	500	1000	2000	4000	8000
-4	78	76	68	62	57	52.	47	42	37
-3	77	75	67	61	56	51	46	41	36
-2	72	70	62	56	51	46	41	36	31
-1	67	65	57	51	46	41	36	31	26
0	62	60	52	46	41	36	31	26	21
1	57	55	47	41	36	31	26	21	16
2	52	50	42	36	31	26	21	16	11

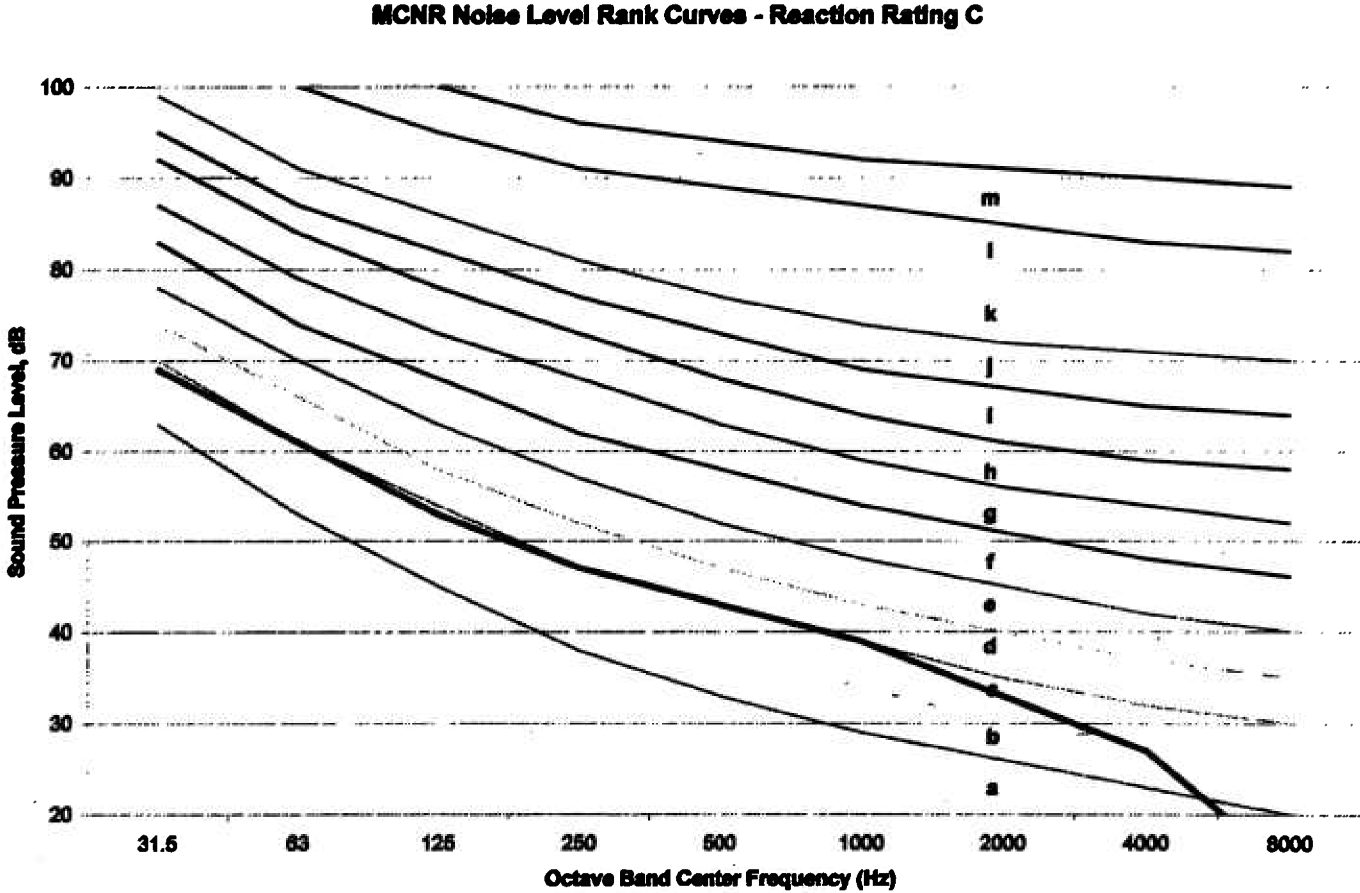
Octave Band Center Frequency (Hertz)

Noise Level Rank Curves	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
m			100	96	94	92	91	90	89	99
l		100	95	91	89	87	85	83	82	93
k		95	90	86	83	80	78	77	76	87
j	99	91	86	81	77	74	72	71	70	81
I	95	87	82	77	73	69	67	65	64	76
h	92	84	78	73	68	64	61	59	58	71
g	87	79	73	68	63	59	56	54	52	66
f	83	74	68	62	58	54	51	48	46	61
e	78	70	63	57	52	48	45	42	40	56
d	74	66	58	52	47	43	40	37	35	51
c	70	61	54	47	43	39	35	32	30	46
b	67	58	49	42	38	34	30	28	25	41
a	63	53	45	38	33	29	26	23	20	37

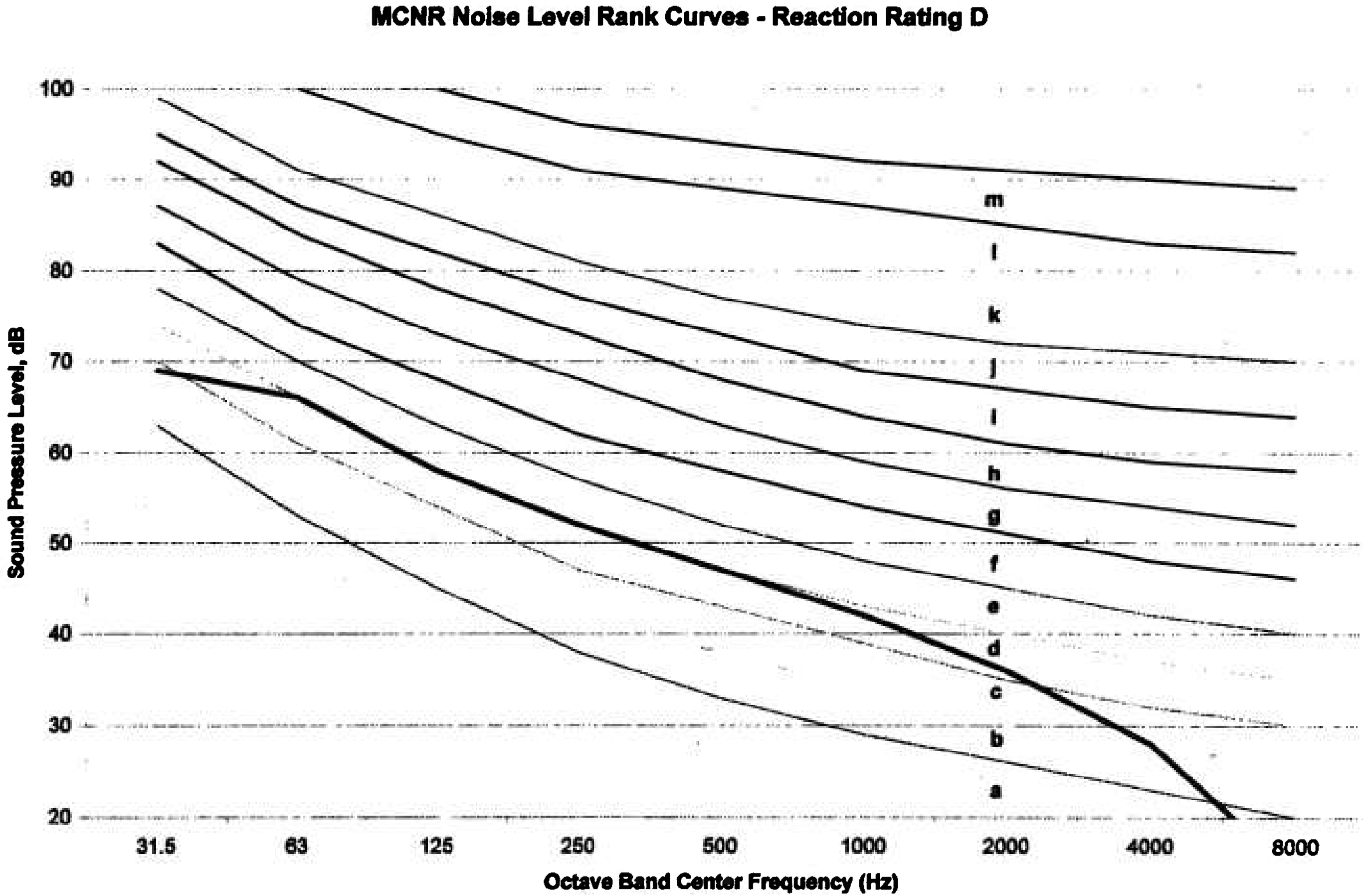
Dolsontown Road South



Dolsontown Road South



Dolsontown Road South



Genung Street - Winter Short Term Data

Location:	**Genung Street**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/13/2000 04:26:38 PM
End Time:		12/13/2000 04:46:38 PM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/13/2000 04:26:38 PM - 04:46:38 PM

Hz	LLF90	
16	49.2	
20	50.3	
25	49.9	
31.50	49.7	**54**
40	48.6	
50	47.9	
63	47.9	**53**
80	47.9	
100	44.4	
125	40.5	**46**
160	36.5	
200	33.0	
250	32.4	**38**
315	32.9	
400	32.8	
500	33.6	**38**
630	33.3	
800	31.2	
1000	30.2	**35**
1250	27.9	
1600	24.8	
2000	---	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		39.3826203

Location:	**Genung Street**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/14/2000 12:58:17 PM
End Time:		12/14/2000 01:18:17 PM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/14/2000 12:58:17 PM - 01:18:17 PM

Hz	LLF90	
16	51.1	
20	51.9	
25	51.1	
31.50	50.7	**56**
40	50.5	
50	50.3	
63	51.4	**55**
80	49.6	
100	46.4	
125	43.4	**49**
160	42.1	
200	42.1	
250	38.5	**45**
315	38.2	
400	39.0	
500	40.8	**45**
630	41.3	
800	40.4	
1000	40.7	**44**
1250	37.2	
1600	32.8	
2000	28.3	**35**
2500	24.0	
3150	20.6	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		47.4

Location:	**Genung Street**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/15/2000 08:19:24 AM
End Time:		12/15/2000 08:39:24 AM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/15/2000 08:19:24 AM - 08:39:24 AM

Hz	LLF90	
16	49.4	
20	49.4	
25	50.2	
31.50	50.1	**55**
40	49.5	
50	49.4	
63	49.3	**54**
80	48.3	
100	46.3	
125	42.9	**48**
160	38.6	
200	36.4	
250	36.9	**42**
315	37.5	
400	36.3	
500	35.0	**40**
630	33.7	
800	33.4	
1000	32.1	**37**
1250	29.3	
1600	24.3	
2000	---	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		41.5

Genung Street - Winter Short Term Data

Location: Genung Street
Time: Evening
Season: Winter

Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/14/2000 12:58:17 PM
End Time:		12/14/2000 01:18:17 PM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/14/2000 12:58:17 PM - 01:18:17 PM

Hz	LLF90	
16	51.1	
20	51.9	
25	51.1	
31.50	50.7	**56**
40	50.5	
50	50.3	
63	51.4	**55**
80	49.6	
100	46.4	
125	43.4	**49**
160	42.1	
200	42.1	
250	38.5	**45**
315	38.2	
400	39.0	
500	40.8	**45**
630	41.3	
800	40.4	
1000	40.7	**44**
1250	37.2	
1600	32.8	
2000	28.3	**35**
2500	24.0	
3150	20.6	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		47.4

Location: Genung Street
Time: Evening
Season: Winter

Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/14/2000 07:57:27 PM
End Time:		12/14/2000 08:17:27 PM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/14/2000 07:57:27 PM - 08:17:27 PM

Hz	LLF90	
16	55.0	
20	54.8	
25	53.2	
31.50	51.5	**57**
40	49.9	
50	49.6	
63	48.9	**54**
80	47.7	
100	45.9	
125	43.5	**49**
160	42.0	
200	40.6	
250	39.0	**44**
315	38.7	
400	36.8	
500	37.2	**42**
630	37.8	
800	37.2	
1000	34.9	**40**
1250	31.1	
1600	26.9	
2000	21.2	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		43.8

Location: Genung Street
Time: Early Morning
Season: Winter

Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/15/2000 01:13:09 AM
End Time:		12/15/2000 01:33:09 AM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/15/2000 01:13:09 AM - 01:33:09 AM

Hz	LLF90	
16	57.5	
20	56.0	
25	54.1	
31.50	51.3	**57**
40	48.5	
50	46.8	
63	45.0	**50**
80	42.8	
100	41.1	
125	38.4	**44**
160	38.4	
200	36.6	
250	34.9	**40**
315	34.4	
400	32.5	
500	32.1	**37**
630	32.0	
800	31.3	
1000	28.7	**34**
1250	25.1	
1600	21.2	
2000	20.0	**25**
2500	20.0	
3150	20.0	
4000	20.0	**25**
5000	20.0	
6300	20.0	
8000	20.0	**25**
10000	20.0	
12500	20.0	
		39.2

Genung Street - Summer Short Term Data

Location:	Genung Street		Location:	Genung Street	
Time:	Daytime		Time:	Nighttime	
Season:	Summer		Season:	Summer	
Sound Level Meter Model/SN:	B&K 2260/177216		Sound Level Meter Model/SN:	B&K 2260/177216	
Calibrator Model/SN:	B&K 4231/2115610		Calibrator Model/SN:	B&K 4231/2115610	
Date:	6/20/2000		6/21/2000	5/17/2000	
Monitoring Time:	1403-1423		Monitoring Time:	0259-0319	
	Before	After		Before	After
Calibration Factor:	93.8	93.8	Calibration Factor:	93.8	93.8
Calibration Level:	93.8		Calibration Level:	93.8	
Derivation:	0.01	-0.05	Derivation	-0.01	-0.02
Octave Band	Daytime L_{90}	Whole Octaves	Octave Band	Nighttime L_{90}	Whole Octaves
16	48		16	44	
20	49		20	44	
25	50		25	44	
32	50	55	32	46	49
40	50		40	43	
50	47		50	42	
63	48	53	63	42	50
80	50		80	49	
100	45		100	43	
125	43	48	125	44	50
160	42		160	48	
200	39		200	37	
250	38	42	250	36	41
315	35		315	34	
400	35		400	33	
500	35	39	500	36	40
630	34		630	35	
800	33		800	31	
1000	33	37	1000	28	34
1250	31		1250	29	
1600	30		1600	28	
2000	27	33	2000	25	30
2500	26		2500	20	
3150	26		3150	17	
4000	25	29	4000	11	18
5000	22		5000	8	
6300	17		6300	7	
8000	12	19	8000	8	12
10000	10		10000	8	
12500	9		12500	8	
Combined dBA		42.5	Combined dBA		41.2
Overall dBA		44	Overall dBA		42.8

Genung Street - MCNR Analysis

Location:	**Genung Street**
Time:	**Short Term**
Season:	**Winter/Summer**

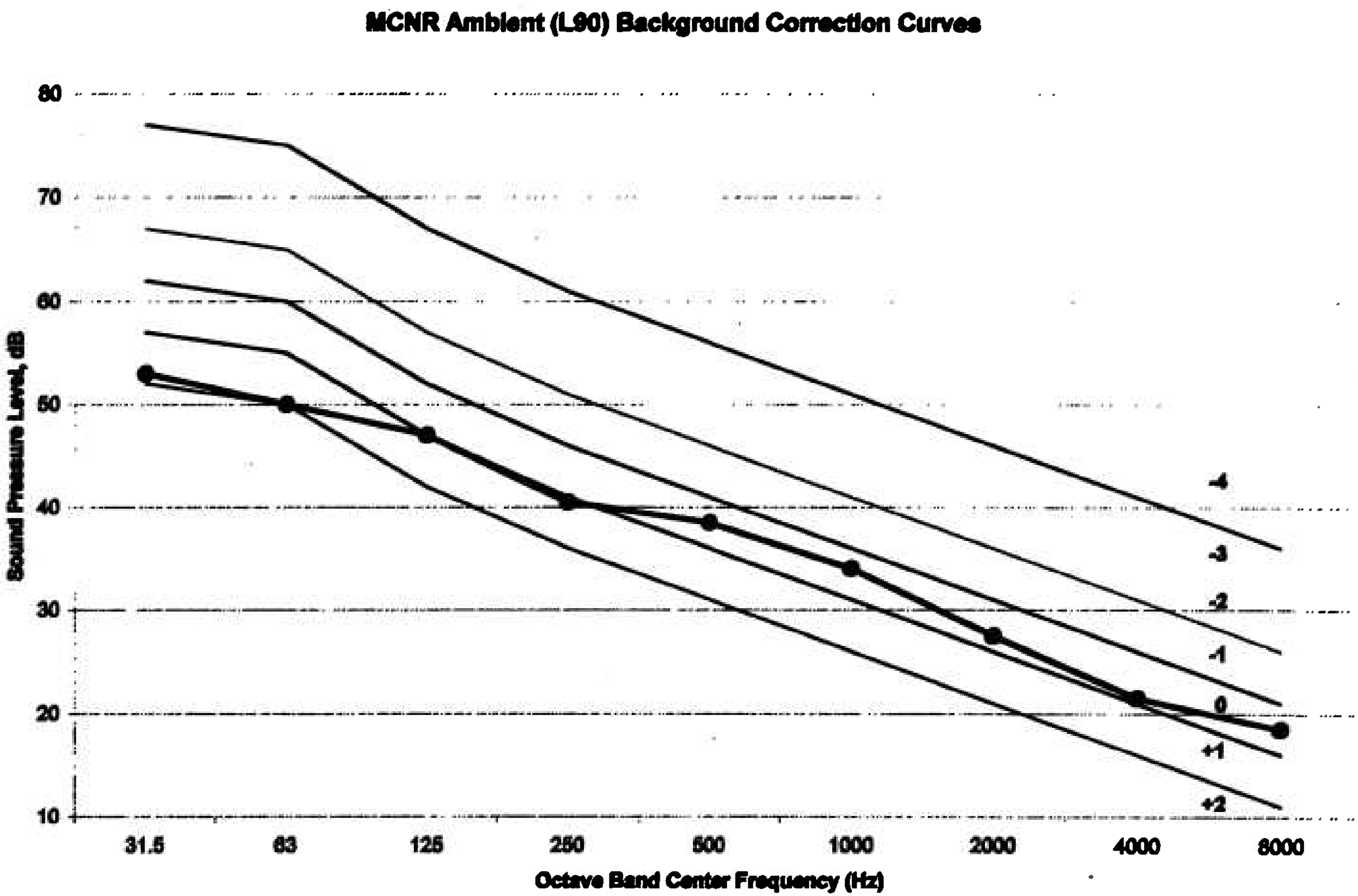
Location	**Reaction Rating Goal**	**Previous Exposure**	**Spectrum**	**Intermittancy**	**Winter or Summer**	**Day or Night**	**Background**	**Allowable Noise Level Rank**
Genung Street	C	0	0	0	0	0	0	c
	D	0	0	0	0	0	0	d

	Octave Band Center Frequency (Hertz)									
	31.5	63	125	250	500	1000	2000	4000	8000	**A-Weight**
L90 Short Term Winter	57	50	44	40	37	34	25	25	25	39.2
L90 Short Term Summer	49	50	50	41	40	34	30	18	12	41.2
Spectrum Adjust										
Average L90 Spectrum	***53***	***50***	***47***	***41***	***39***	***34***	***28***	***22***	***19***	***40***
Background Curve Selection	+1	+1	0	0	-1	-1	-1	0	0	0
Predicted Plant SPL for Reaction C	***56***	***48***	***41***	***33***	***28***	***24***	***16***	***0***	***0***	***31***
Predicted Plant SPL for Reaction D	***56***	***55***	***46***	***39***	***33***	***28***	***21***	***0***	***0***	***37***

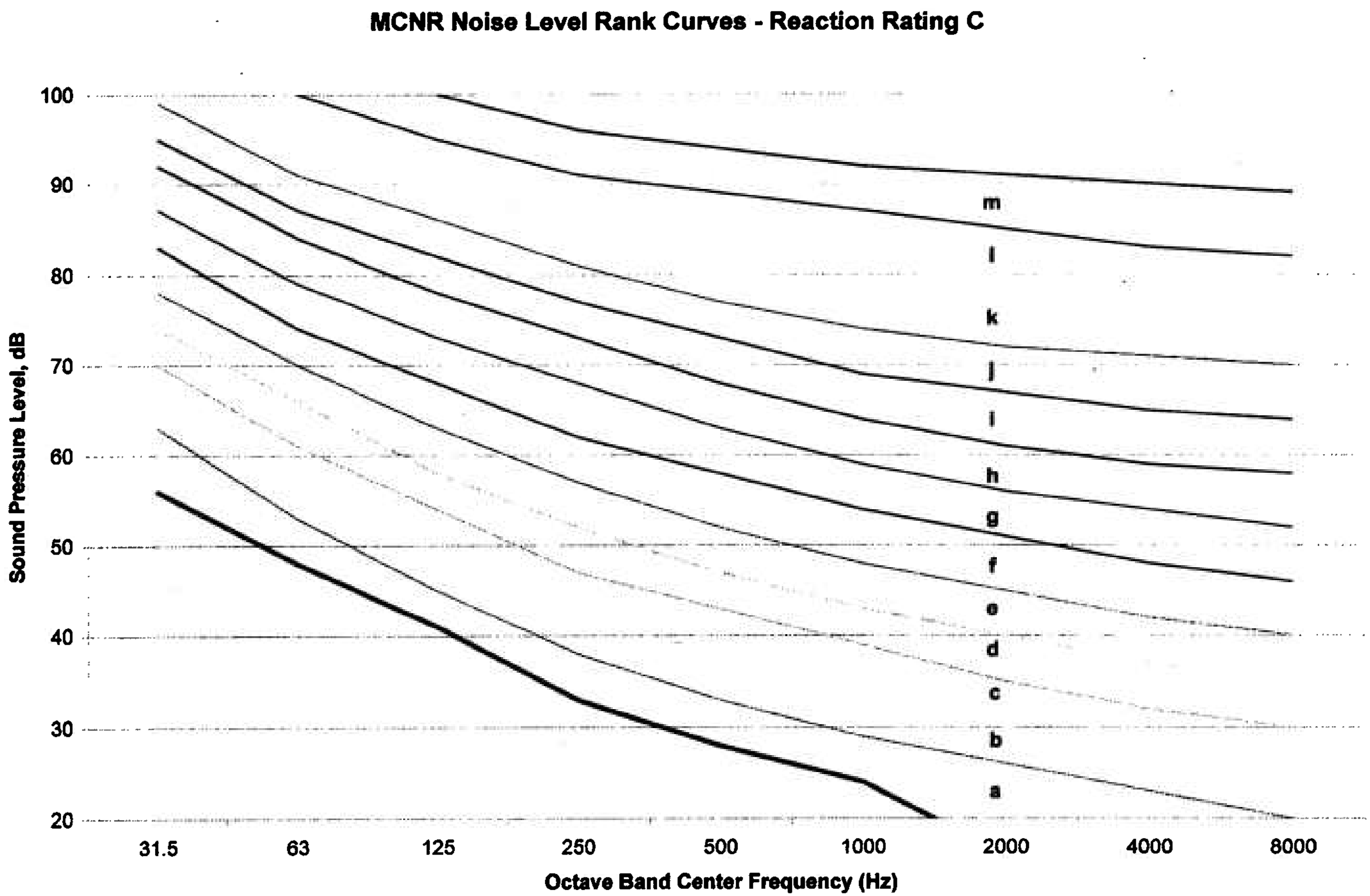
	Octave Band Center Frequency (Hertz)								
Background Curves	31.5	63	125	250	500	1000	2000	4000	8000
-4	78	76	68	62	57	52	47	42	37
-3	77	75	67	61	56	51	46	41	36
-2	72	70	62	56	51	46	41	36	31
-1	67	65	57	51	46	41	36	31	26
0	62	60	52	46	41	36	31	26	21
1	57	55	47	41	36	31	26	21	16
2	52	50	42	36	31	26	21	16	11

	Octave Band Center Frequency (Hertz)									
Noise Level Rank Curves	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
m			100	96	94	92	91	90	89	99
l		100	95	91	89	87	85	83	82	93
k		95	90	86	83	80	78	77	76	87
j	99	91	86	81	77	74	72	71	70	81
l	95	87	82	77	73	69	67	65	64	76
h	92	84	78	73	68	64	61	59	58	71
g	87	79	73	68	63	59	56	54	52	66
f	83	74	68	62	58	54	51	48	46	61
e	78	70	63	57	52	48	45	42	40	56
d	74	66	58	52	47	43	40	37	35	51
c	70	61	54	47	43	39	35	32	30	46
b	67	58	49	42	38	34	30	28	25	41
a	63	53	45	38	33	29	26	23	20	37

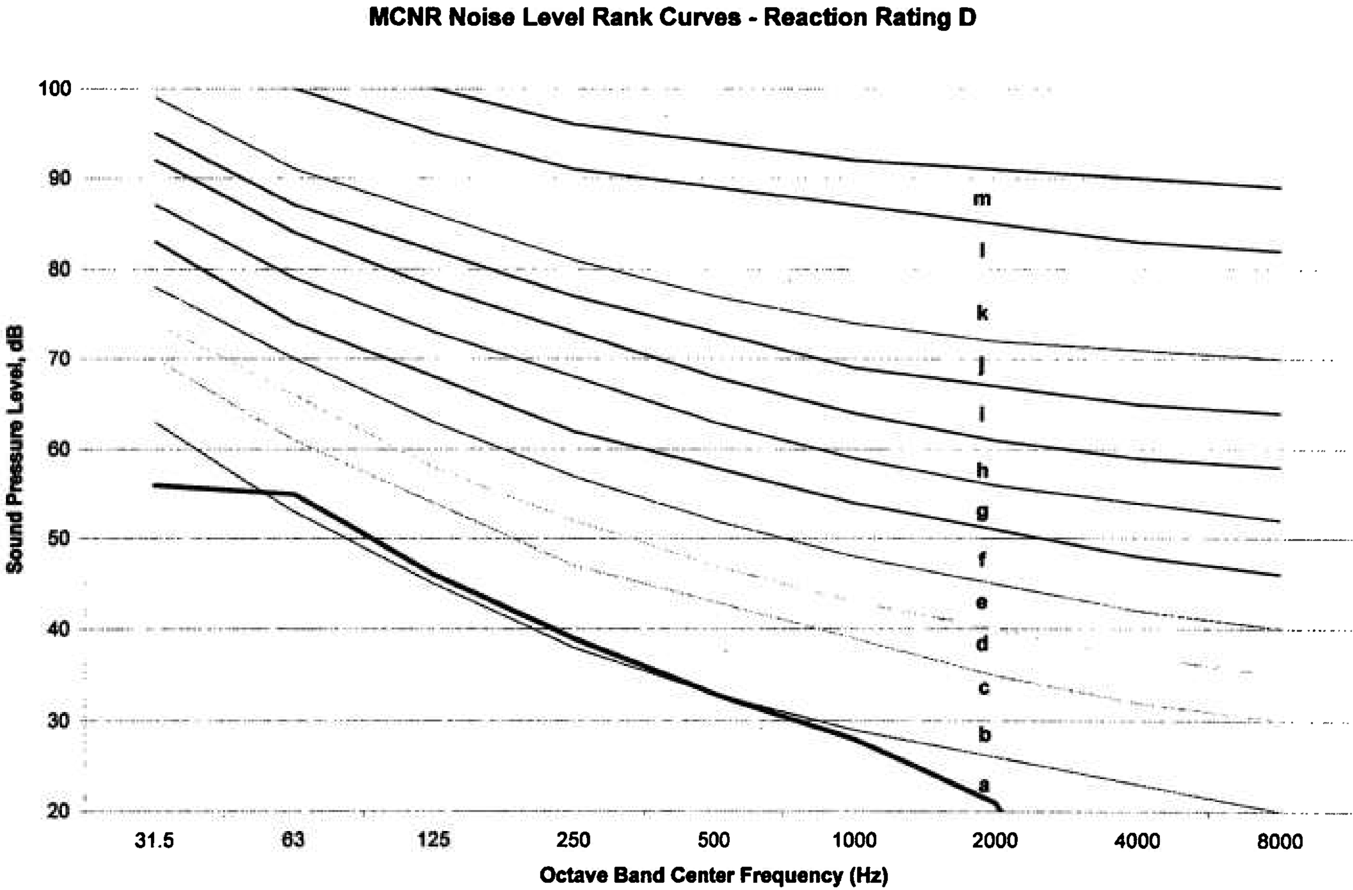
Genung Street



Genung Street



Genung Street



Country View Manor Apartments - Winter Short Term Data

Location:	**Country View Manor Apartments**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/13/2000 16:53
End Time:		12/13/2000 17:13
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/13/2000 04:53:30 PM - 05:13:30 PM

Hz	LLF90	
16	48.6	
20	49.3	
25	51.7	
31.5	53.4	**57**
40	49.6	
50	47.3	
63	47.9	**52**
80	45.8	
100	42.3	
125	39.4	**45**
160	36.2	
200	33.2	
250	31.0	**37**
315	31.5	
400	28.0	
500	28.7	**33**
630	27.9	
800	26.4	
1000	24.5	**29**
1250	22.5	
1600	---	
2000	---	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	37.1	**36.0**

Location:	**Country View Manor Apartments**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/14/2000 13:21
End Time:		12/14/2000 13:41
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/14/2000 01:21:53 PM - 01:41:53 PM

Hz	LLF90	
16	49.2	
20	50.4	
25	49.4	
31.5	52.6	**56**
40	52.3	
50	53.3	
63	55.9	**62**
80	59.9	
100	51.8	
125	49.4	**56**
160	51.2	
200	50.2	
250	41.9	**51**
315	40.1	
400	39.5	
500	42.0	**46**
630	42.8	
800	42.6	
1000	43.1	**47**
1250	40.4	
1600	37.5	
2000	35.1	**40**
2500	33.4	
3150	31.4	
4000	25.9	**33**
5000	21.5	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	52.4	**50.8**

Location:	**Country View Manor Apartments**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/15/2000 8:42
End Time:		12/15/2000 9:02
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/15/2000 08:42:39 AM - 09:02:39 AM

Hz	LLF90	
16	50.5	
20	50.2	
25	49.1	
31.5	52.0	**56**
40	53.0	
50	48.7	
63	49.6	**54**
80	48.3	
100	46.3	
125	42.5	**49**
160	41.8	
200	38.1	
250	33.6	**40**
315	33.0	
400	30.1	
500	30.8	**36**
630	31.7	
800	30.5	
1000	29.3	**34**
1250	27.9	
1600	24.2	
2000	21.1	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	40.7	**39.4**

Country View Manor Apartments - Winter Short Term Data

Location:	**Country View Manor Apartments**	
Time:	**Evening**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/13/2000 07:55:29 PM
End Time:		12/13/2000 08:15:29 PM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/13/2000 07:55:29 PM - 08:15:29 PM

Hz	LLF90	
16	48.0	
20	48.1	
25	48.4	
31.50	53.4	**55**
40	46.6	
50	46.1	
63	47.4	**51**
80	46.5	
100	43.8	
125	41.0	**47**
160	41.3	
200	35.0	
250	32.0	**38**
315	31.1	
400	28.5	
500	30.1	**34**
630	29.7	
800	27.6	
1000	24.7	**30**
1250	21.5	
1600	---	
2000	---	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		37.0

Location:	**Country View Manor Apartments**	
Time:	**Evening**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/14/2000 08:24:26 PM
End Time:		12/14/2000 08:44:26 PM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/14/2000 08:24:26 PM - 08:44:26 PM

Hz	LLF90	
16	49.4	
20	50.2	
25	49.9	
31.50	56.2	**58**
40	50.6	
50	47.7	
63	48.4	**52**
80	45.7	
100	45.9	
125	43.7	**49**
160	44.1	
200	39.6	
250	37.3	**44**
315	39.2	
400	36.1	
500	37.3	**42**
630	37.5	
800	36.8	
1000	35.5	**40**
1250	32.8	
1600	29.4	
2000	26.3	**32**
2500	23.5	
3150	20.0	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
		44.1

Location:	**Country View Manor Apartments**	
Time:	**Early Morning**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/15/2000 01:35:55 AM
End Time:		12/15/2000 01:55:55 AM
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/15/2000 01:35:55 AM - 01:55:55 AM

Hz	LLF90	
16	62.6	
20	61.1	
25	59.3	
31.50	57.3	**62**
40	55.5	
50	53.8	
63	51.9	**57**
80	49.2	
100	48.0	
125	43.7	**51**
160	45.4	
200	39.0	
250	33.8	**41**
315	35.1	
400	33.1	
500	34.2	**39**
630	35.4	
800	33.0	
1000	32.3	**37**
1250	29.8	
1600	26.2	
2000	23.8	**29**
2500	22.0	
3150	20.4	
4000	20.0	**25**
5000	20.0	
6300	20.0	
8000	20.0	**25**
10000	20.0	
12500	20.0	
		42.2

Country View Manor Apartments - Summer Short Term Data

Location:	**Country View Manor Apartments**		**Location:**	**Country View Manor Apartments**	
Time:	**Daytime**		**Time:**	**Nighttime**	
Season:	**Summer**		**Season:**	**Summer**	
Sound Level Meter Model/SN:	**B&K 2260/177216**		**Sound Level Meter Model/SN:**	**B&K 2260/177216**	
Calibrator Model/SN:	**B&K 4231/2115610**		**Calibrator Model/SN:**	**B&K 4231/2115610**	
Date:	**6/20/2000**		**Date:**	**6/21/2000**	
Monitoring Time:	**1336-1356**		**Monitoring Time:**	**0212-0232**	
	Before	After		Before	After
Calibration Factor:	**93.8**	**93.8**	**Calibration Factor:**	**93.8**	**93.8**
Calibration Level:	**93.8**		**Calibration Level:**	**93.8**	
Derivation:	**-0.02**	**0.01**	**Derivation**	**0.05**	**-0.01**
Octave Band	Daytime L_{90}	Whole Octaves	Octave Band	Nighttime L_{90}	Whole Octaves
16	47		16	47	
20	49		20	48	
25	49		25	48	
32	51	**55**	32	52	**54**
40	49		40	47	
50	51		50	49	
63	51	**55**	63	48	**59**
80	50		80	58	
100	45		100	47	
125	44	**49**	125	46	**51**
160	43		160	44	
200	40		200	41	
250	46	**48**	250	41	**46**
315	41		315	42	
400	36		400	40	
500	38	**42**	500	41	**45**
630	36		630	40	
800	36		800	39	
1000	34	**39**	1000	38	**42**
1250	33		1250	35	
1600	32		1600	32	
2000	30	**36**	2000	29	**34**
2500	30		2500	26	
3150	30		3150	23	
4000	28	**33**	4000	19	**25**
5000	26		5000	17	
6300	22		6300	14	
8000	19	**25**	8000	11	**17**
10000	17		10000	10	
12500	15		12500	9	
Combined dBA		**45.3**	**Combined dBA**		**46.8**
Overall dBA		**47.4**	**Overall dBA**		**48**

Country View Manor Apartments - Winter Long Term Data

Location:	Country View Manor Apartments	
Time:	24-hour Monitoring	
Season:	Winter	
Instrument:		2238
Application:		BZ7124 version 1.1
Start Time:		12/13/2000 04:52:35 PM
End Time:		12/15/2000 11:07:31 AM
Elapsed Time:		42:14:56
Bandwidth:		Broad band
Detector 1/2	RMS	Peak
Range:		20.0-100.0 dB
	Time	Frequency
Detector 1:	S F I	A
Detector 2:	Peak	L
Statistic	F	A
Criterion Level:		100.0 dB
Threshold:		0.0 dB
Exchange Rate		3 and 260
Exposure Time:		7:30:00
Peaks Over:		140.0 dB
Instrument Serial Number:		2255689
Microphone Serial Number:		2250456
Input:		Microphone
Windscreen Correction:		Off
S. I. Correction:		Random
Calibration Level:		94.0 dB
Sensitivity:		-30.6 dB
Microphone:		2250456

Start date	Start time	LAeq	LAF90	L90 10pm-7am
12/13/2000	04:52:35 PM	67.8	38.5	
12/13/2000	05:52:35 PM	44.2	38.0	
12/13/2000	06:52:35 PM	44.5	37.5	
12/13/2000	07:52:35 PM	45.4	38.0	
12/13/2000	08:52:35 PM	41.2	37.5	
12/13/2000	09:52:35 PM	41.2	37.5	37.5
12/13/2000	10:52:35 PM	74.6	36.5	36.5
12/13/2000	11:52:35 PM	46.6	37.0	37.0
12/14/2000	12:52:35 AM	80.2	42.5	42.5
12/14/2000	01:52:35 AM	59.5	53.0	53.0
12/14/2000	02:52:35 AM	59.0	55.0	55.0
12/14/2000	03:52:35 AM	55.6	49.5	49.5
12/14/2000	04:52:35 AM	57.5	52.5	52.5
12/14/2000	05:52:35 AM	53.7	42.5	42.5
12/14/2000	06:52:35 AM	53.7	42.0	
12/14/2000	07:52:35 AM	52.1	43.5	
12/14/2000	08:52:35 AM	47.0	42.5	
12/14/2000	09:52:35 AM	51.8	43.0	
12/14/2000	10:52:35 AM	52.8	45.0	
12/14/2000	11:52:35 AM	52.1	46.0	
12/14/2000	12:52:35 PM	63.7	46.0	
12/14/2000	01:52:35 PM	57.8	45.0	
12/14/2000	02:52:35 PM	48.2	43.5	
12/14/2000	03:52:35 PM	50.9	44.5	
12/14/2000	04:52:35 PM	47.8	44.0	
12/14/2000	05:52:35 PM	48.0	45.5	
12/14/2000	06:52:35 PM	46.8	43.5	
12/14/2000	07:52:35 PM	46.2	41.5	
12/14/2000	08:52:35 PM	54.2	41.5	
12/14/2000	09:52:35 PM	45.2	40.5	40.5
12/14/2000	10:52:35 PM	47.6	41.5	41.5
12/14/2000	11:52:35 PM	45.3	38.5	38.5
12/15/2000	12:52:35 AM	77.2	38.5	38.5
12/15/2000	01:52:35 AM	41.8	38.0	38.0
12/15/2000	02:52:35 AM	46.8	37.5	37.5
12/15/2000	03:52:35 AM	39.5	37.0	37.0
12/15/2000	04:52:35 AM	41.5	38.0	38.0
12/15/2000	05:52:35 AM	47.7	40.5	40.5
12/15/2000	06:52:35 AM	46.2	40.5	
12/15/2000	07:52:35 AM	46.7	39.5	
12/15/2000	08:52:35 AM	45.9	39.0	
12/15/2000	09:52:35 AM	60.4	38.5	
12/15/2000	10:52:35 AM	73.4	29.5	
			L90 24 hour average=	41.6
			L90 nighttime average=	42.0

Country View Manor Apartments - Summer Long Term Data

Location: Country View Manor Apartments
Time: 24-hour Monitoring
Season: Summer

Kings Park
Noise Monitoring June 20-21, 2000
B&K 2236D S/N 2100600
Calibrator: B&K 4231 S/N 2115610
Range 20-100 dBA
Slow response
RMS:A Peak:C
20-100 dB

Cal Factors	
Before	After
1.2	1.2

Time	L90	L90 10pm-7am
11:21:51	43.0	
11:31:51	42.0	
11:41:51	42.0	
11:51:51	41.5	
12:01:51	40.5	
12:11:51	42.5	
12:21:51	41.5	
12:31:51	42.5	
12:41:51	43.5	
12:51:51	43.5	
13:01:51	43.5	
13:11:51	42.5	
13:21:51	42.0	
13:31:51	42.0	
13:41:51	42.5	
13:51:51	42.5	
14:01:51	43.0	
14:11:51	44.5	
14:21:51	46.5	
14:31:51	46.0	
14:41:51	45.5	
14:51:51	45.5	
15:01:51	46.0	
15:11:51	45.5	
15:21:51	46.5	
15:31:51	47.0	
15:41:51	48.0	
15:51:51	47.0	
16:01:51	46.5	
16:11:51	46.5	
16:21:51	45.0	
16:31:51	45.5	
16:41:51	45.5	
16:51:51	46.0	
17:01:51	47.0	
17:11:51	45.5	
17:21:51	46.5	
17:31:51	46.5	
17:41:51	46.0	
17:51:51	45.5	
18:01:51	47.5	
18:11:51	44.5	
18:21:51	46.5	
18:31:51	45.5	
18:41:51	45.5	
18:51:51	44.5	
19:01:51	44.0	
19:11:51	43.0	
19:21:51	45.0	
19:31:51	44.0	
19:41:51	45.0	
19:51:51	44.0	
20:01:51	46.5	
20:11:51	45.5	
20:21:51	44.5	
20:31:51	44.5	
20:41:51	44.5	
20:51:51	43.5	
21:01:51	43.0	
21:11:51	44.5	
21:21:51	44.0	
21:31:51	45.0	
21:41:51	43.5	
21:51:51	44.0	
22:01:51	46.5	46.5
22:11:51	48.5	48.5
22:21:51	47.0	47.0
22:31:51	48.5	48.5
22:41:51	48.5	48.5
22:51:51	46.0	46.0

(Continued)
Location: Country View Manor Apartments
Time: 24-hour Monitoring
Season: Summer

Time	L90	L90 10pm-7am
23:01:51	45.5	45.5
23:11:51	46.5	46.5
23:21:51	47.0	47.0
23:31:51	47.0	47.0
23:41:51	45.5	45.5
23:51:51	44.5	44.5
0:01:51	46.5	46.5
0:11:51	46.5	46.5
0:21:51	46.0	46.0
0:31:51	46.0	46.0
0:41:51	48.5	48.5
0:51:51	46.5	46.5
1:01:51	48.0	48.0
1:11:51	48.5	48.5
1:21:51	47.0	47.0
1:31:51	46.0	46.0
1:41:51	45.5	45.5
1:51:51	44.5	44.5
2:01:51	44.0	44.0
2:11:51	44.5	44.5
2:21:51	44.5	44.5
2:31:51	44.0	44.0
2:41:51	44.5	44.5
2:51:51	43.5	43.5
3:01:51	39.0	39.0
3:11:51	41.5	41.5
3:21:51	42.0	42.0
3:31:51	43.0	43.0
3:41:51	42.0	42.0
3:51:51	43.0	43.0
4:01:51	44.5	44.5
4:11:51	46.0	46.0
4:21:51	47.0	47.0
4:31:51	46.0	46.0
4:41:51	46.5	46.5
4:51:51	49.0	49.0
5:01:51	49.0	49.0
5:11:51	50.0	50.0
5:21:51	48.5	48.5
5:31:51	47.0	47.0
5:41:51	49.5	49.5
5:51:51	50.5	50.5
6:01:51	48.5	48.5
6:11:51	48.5	48.5
6:21:51	48.5	48.5
6:31:51	48.5	48.5
6:41:51	48.5	48.5
6:51:51	48.0	48.0
7:01:51	48.0	48.0
7:11:51	46.0	
7:21:51	46.5	
7:31:51	45.5	
7:41:51	46.0	
7:51:51	45.0	
8:01:51	46.0	
8:11:51	46.5	
8:21:51	47.5	
8:31:51	47.0	
8:41:51	47.5	
8:51:51	48.0	
9:01:51	48.0	
9:11:51	48.5	
9:21:51	51.0	
9:31:51	55.5	
9:41:51	55.0	
9:51:51	51.0	
10:01:51	47.0	
10:11:51	48.0	
10:21:51	50.0	
10:31:51	48.0	
10:41:51	49.5	
10:51:51	50.5	
11:01:51	53.5	
11:11:51	54.5	

L90 24-hour average=	44.8
L90 nighttime average=	47.5

Country View Manor Apartments - MCNR Analysis

Location: Country View Manor Apartments
Time: Short Term/Long Term
Season: Winter/Summer

Location	Reaction Rating Goal	Previous Exposure	Spectrum	Intermittancy	Winter or Summer	Day or Night	Background	Allowable Noise Level Rank
Country View Manor	C	0	0	0	0	0	0	c
	D	0	0	0	0	0	0	d

Octave Band Center Frequency (Hertz)

	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
L90 Short Term Winter	62	57	51	41	39	37	29	25	25	42.2
L90 Short Term Summer	54	59	51	46	45	42	34	25	17	46.8
Average Short Term L90	58	58	51	44	42	40	32	25	21	*44.3*
Long Term Winter L90										*42*
Long Term Summer L90										*47.5*
Average Long Term L90										*44.8*
Spectrum Adjust	1	1	1	1	1	1	1	1	1	
Average L90 Spectrum	*59*	*59*	*52*	*44*	*43*	*40*	*32*	*26*	*22*	*45*
Background Curve Selection	0	0	0	0	-1	-1	-1	0	-1	0
Predicted Plant SPL for Reaction C	*59*	*52*	*45*	*37*	*33*	*28*	*22*	*8*	*0*	*36*
Predicted Plant SPL for Reaction D	*59*	*58*	*50*	*43*	*37*	*32*	*27*	*9*	*0*	*41*

Octave Band Center Frequency (Hertz)

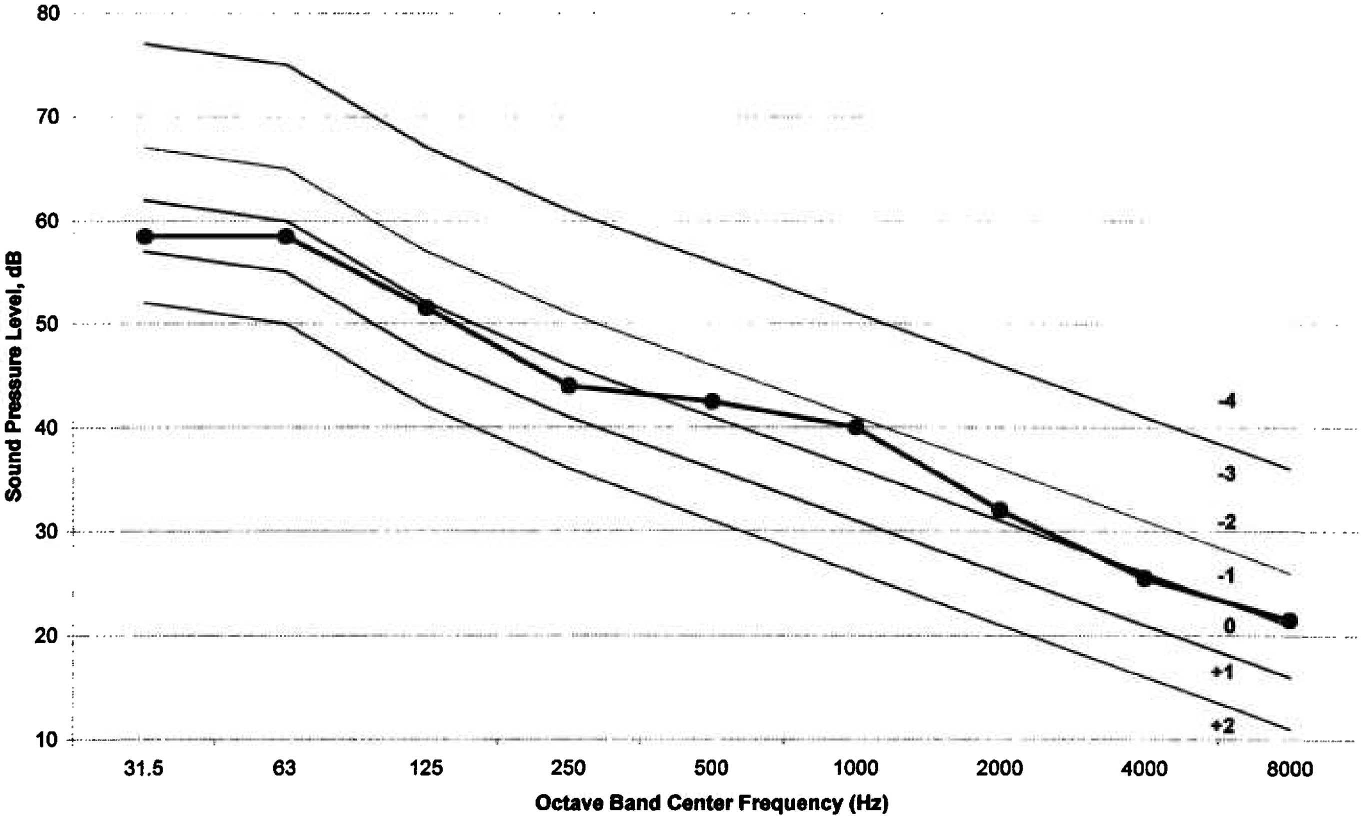
Background Curves	31.5	63	125	250	500	1000	2000	4000	8000
-4	78	76	68	62	57	52	47	42	37
-3	77	75	67	61	56	51	46	41	36
-2	72	70	62	56	51	46	41	36	31
-1	67	65	57	51	46	41	36	31	26
0	62	60	52	46	41	36	31	26	21
1	57	55	47	41	36	31	26	21	16
2	52	50	42	36	31	26	21	16	11

Octave Band Center Frequency (Hertz)

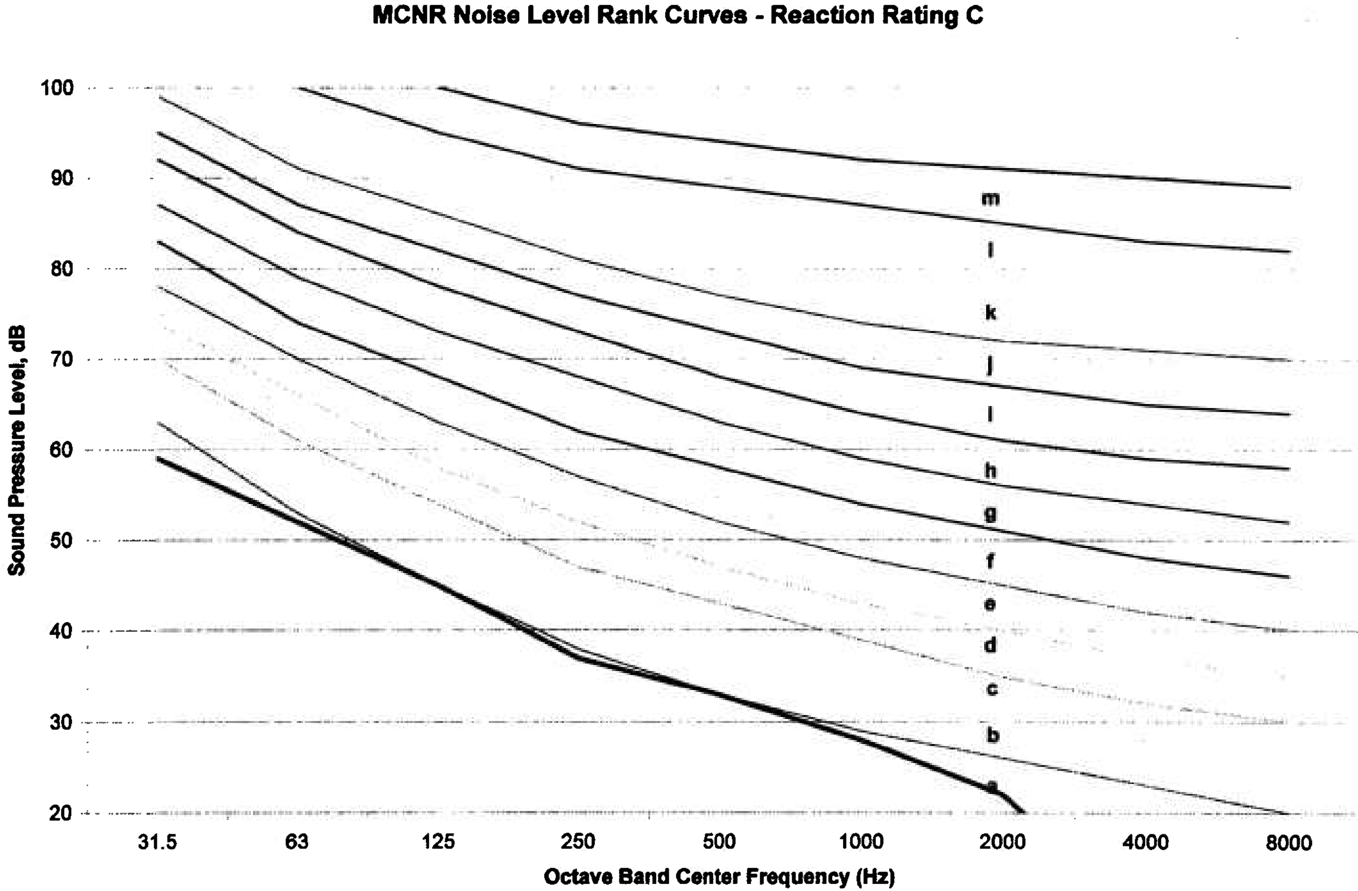
Noise Level Rank Curves	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
m			100	96	94	92	91	90	89	99
l		100	95	91	89	87	85	83	82	93
k		95	90	86	83	80	78	77	76	87
j	99	91	86	81	77	74	72	71	70	81
I	95	87	82	77	73	69	67	65	64	76
h	92	84	78	73	68	64	61	59	58	71
g	87	79	73	68	63	59	56	54	52	66
f	83	74	68	62	58	54	51	48	46	61
e	78	70	63	57	52	48	45	42	40	56
d	74	66	58	52	47	43	40	37	35	51
c	70	61	54	47	43	39	35	32	30	46
b	67	58	49	42	38	34	30	28	25	41
a	63	53	45	38	33	29	26	23	20	37

Country View Manor Apartments

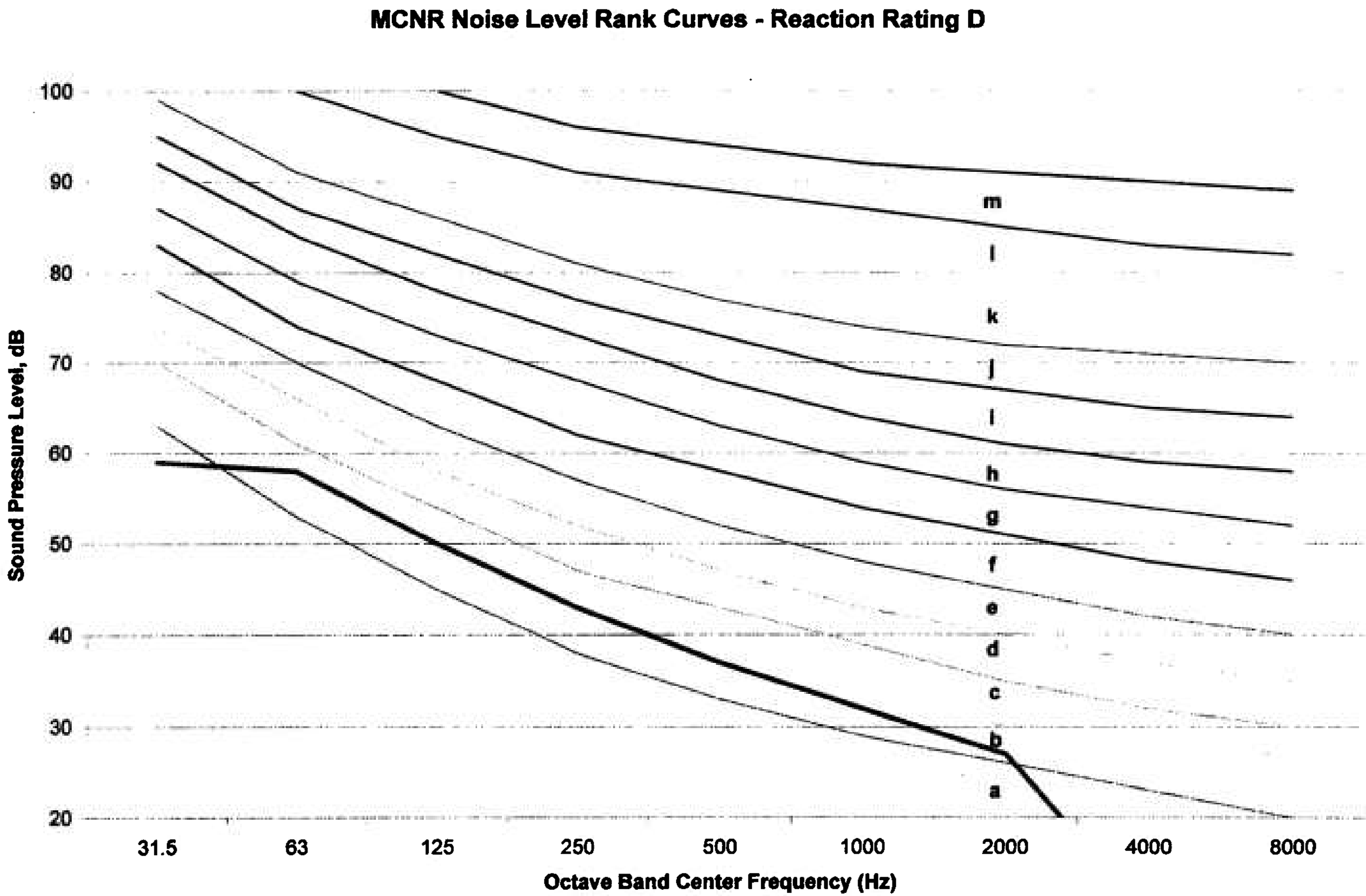
MCNR Ambient (L90) Background Correction Curves



Country View Manor Apartments



Country View Manor Apartments



Ruth Court - Summer Short Term Data

Location:	Ruth Court
Time:	Daytime
Season:	Summer
Sound Level Meter Model/SN:	B&K 2260/177216
Calibrator Model/SN:	B&K 4231/2115610

Date:	6/20/2000	
Monitoring Time:	1309-1329	
	Before	After
Calibration Factor:	93.8	93.8
Calibration Level:	93.8	
Derivation:	-0.02	-0.02

Octave Band	Daytime L_{90}	Whole Octaves
16	44	
20	47	
25	49	
32	50	53
40	46	
50	50	
63	49	54
80	48	
100	50	
125	47	52
160	43	
200	43	
250	41	46
315	39	
400	37	
500	36	41
630	35	
800	33	
1000	33	37
1250	32	
1600	30	
2000	29	34
2500	28	
3150	26	
4000	23	28
5000	20	
6300	16	
8000	12	18
10000	10	
12500	9	
Combined dBA		44.1
Overall dBA		45.4

Location:	Ruth Court
Time:	Nighttime
Season:	Summer
Sound Level Meter Model/SN:	B&K 2260/177216
Calibrator Model/SN:	B&K 4231/2115610

6/21/2000	5/17/2000	
Monitoring Time:	0145-0205	
	Before	After
Calibration Factor:	93.8	93.8
Calibration Level:	93.8	
Derivation	-0.04	0.05

Octave Band	Nighttime L_{90}	Whole Octaves
16	44	
20	45	
25	45	
32	49	51
40	43	
50	45	
63	45	51
80	48	
100	43	
125	40	46
160	39	
200	37	
250	35	41
315	36	
400	35	
500	38	42
630	39	
800	36	
1000	34	39
1250	31	
1600	27	
2000	23	30
2500	25	
3150	22	
4000	24	29
5000	26	
6300	23	
8000	23	26
10000	14	
12500	9	
Combined dBA		43.4
Overall dBA		44.6

Ruth Court - MCNR Analysis

Location: Ruth Court
Time: Short Term
Season: Summer

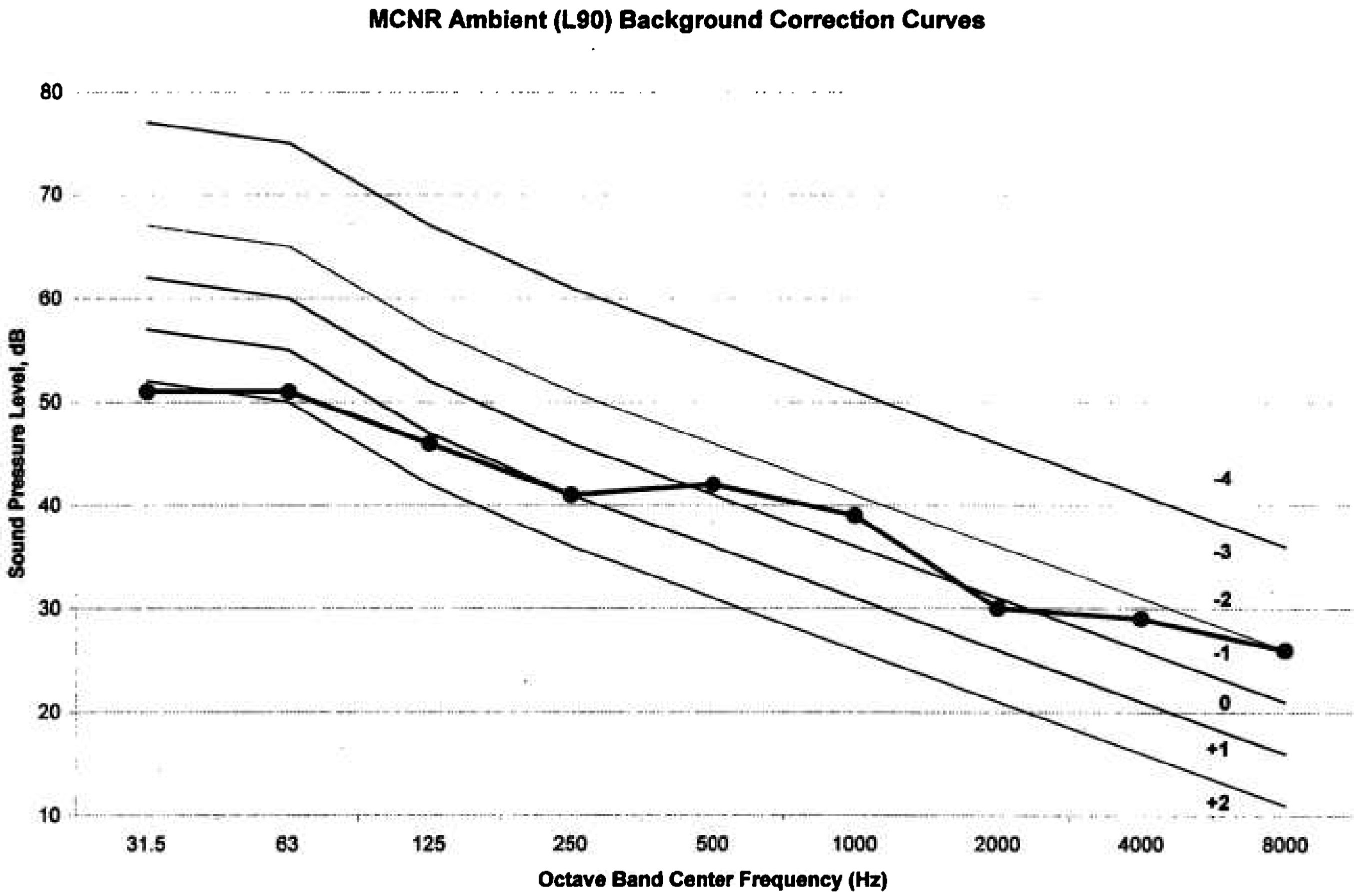
Location	Reaction Rating Goal	Previous Exposure	Spectrum	Intermittancy	Winter or Summer	Day or Night	Background	Allowable Noise Level Rank
Ruth Court	C	0	0	0	0	0	0	c
	D	0	0	0	0	0	0	d

	Octave Band Center Frequency (Hertz)									
	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
L90 Short Term Spectrum	51	51	46	41	42	39	30	29	26	43.3
Average L90 Spectrum	*51*	*51*	*46*	*41*	*42*	*39*	*30*	*29*	*26*	*43*
Background Curve Selection	+2	+1	+1	---	-1	-1	0	-1	---	0
Predicted Plant SPL for Reaction C	*55*	*49*	*41*	*33*	*29*	*23*	*16*	*0*	*0*	*32*
Predicted Plant SPL for Reaction D	*55*	*55*	*46*	*39*	*33*	*28*	*21*	*0*	*0*	*37*

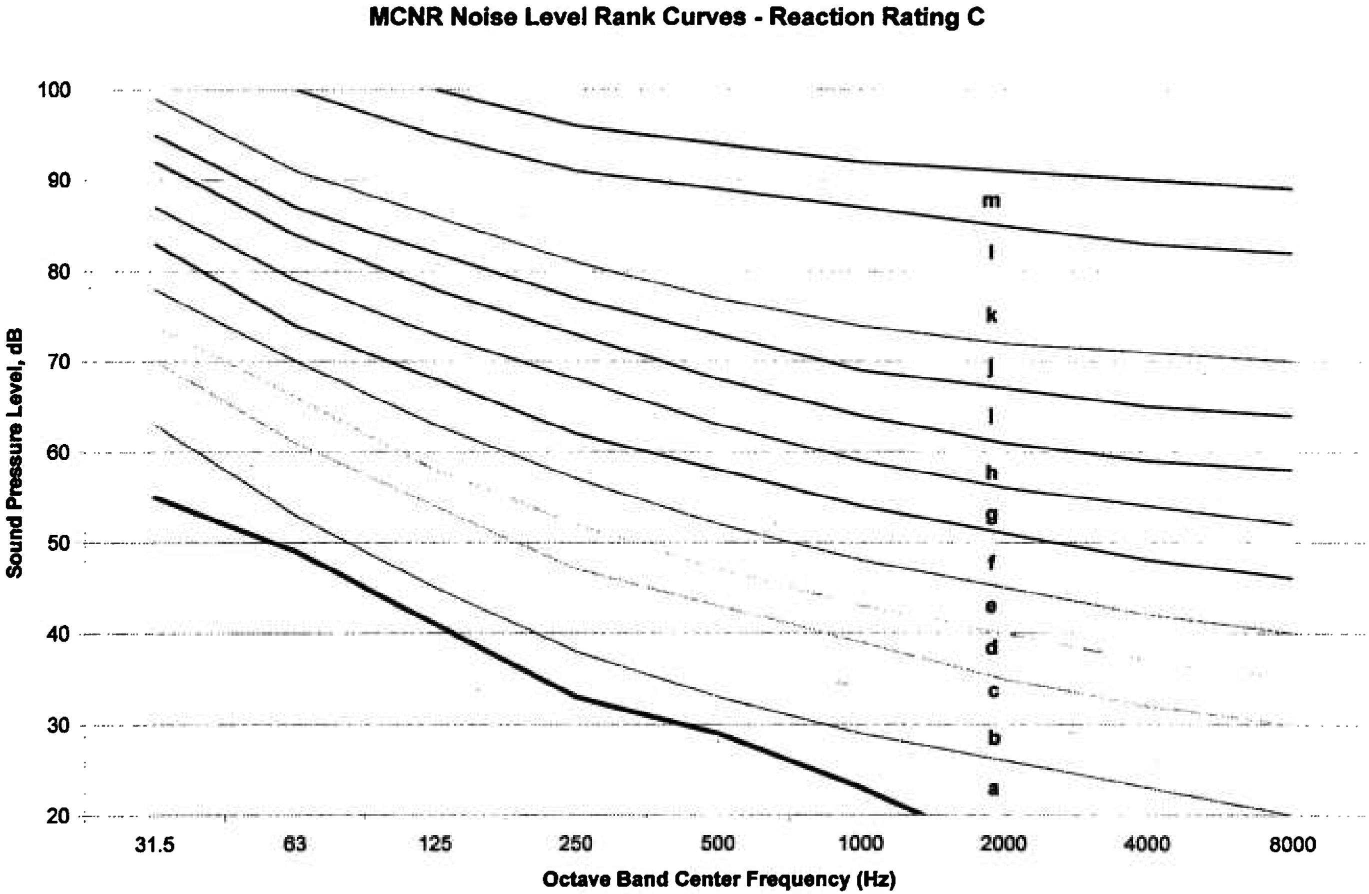
	Octave Band Center Frequency (Hertz)								
Background Curves	31.5	63	125	250	500	1000	2000	4000	8000
-4	78	76	68	62	57	52	47	42	37
-3	77	75	67	61	56	51	46	41	36
-2	72	70	62	56	51	46	41	36	31
-1	67	65	57	51	46	41	36	31	26
0	62	60	52	46	41	36	31	26	21
1	57	55	47	41	36	31	26	21	16
2	52	50	42	36	31	26	21	16	11

	Octave Band Center Frequency (Hertz)									
Noise Level Rank Curves	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
m			100	96	94	92	91	90	89	99
l		100	95	91	89	87	85	83	82	93
k		95	90	86	83	80	78	77	76	87
j	99	91	86	81	77	74	72	71	70	81
i	95	87	82	77	73	69	67	65	64	76
h	92	84	78	73	68	64	61	59	58	71
g	87	79	73	68	63	59	56	54	52	66
f	83	74	68	62	58	54	51	48	46	61
e	78	70	63	57	52	48	45	42	40	56
d	74	66	58	52	47	43	40	37	35	51
c	70	61	54	47	43	39	35	32	30	46
b	67	58	49	42	38	34	30	28	25	41
a	63	53	45	38	33	29	26	23	20	37

Ruth Court - MCNR - Background Graphic

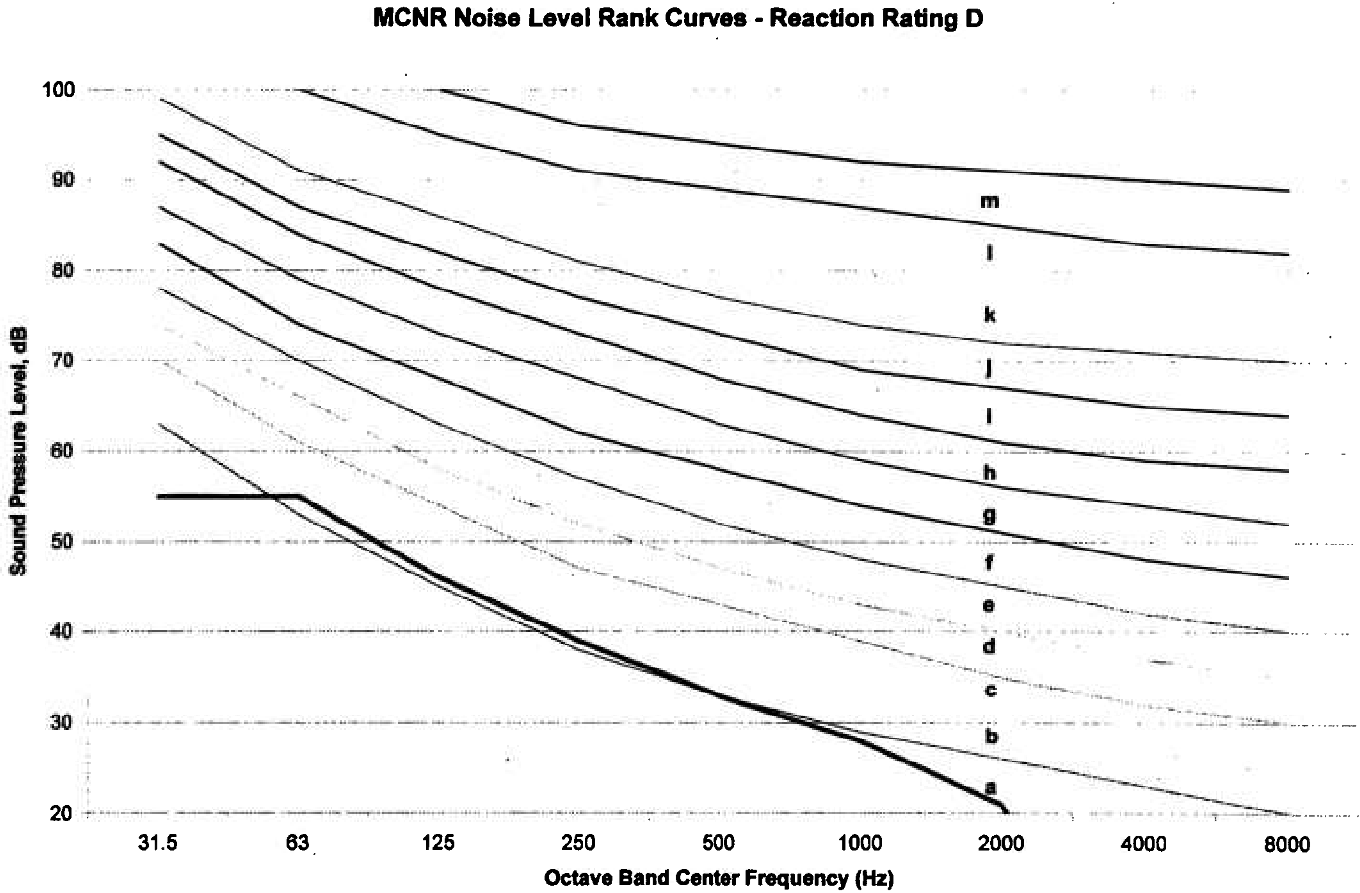


Ruth Court



MCNR Noise Level Rank Curves - Reaction Rating C
Sound Pressure Level, dB
100
90
80
70
60
50
40
30
20
m
l
k
j
i
h
g
f
e
d
c
b
a
31.5
63
125
250
500
1000
2000
4000
8000
Octave Band Center Frequency (Hz)

Ruth Court



MCNR Noise Level Rank Curves - Reaction Rating D
Sound Pressure Level, dB
100
90
80
70
60
50
40
30
20
31.5
63
125
250
500
1000
2000
4000
8000
Octave Band Center Frequency (Hz)
m
l
k
j
i
h
g
f
e
d
c
b
a

Moon School - Summer Short Term Data

Location:	Ruth Court		Location:	Ruth Court	
Time:	Daytime		Time:	Nighttime	
Season:	Summer		Season:	Summer	
Sound Level Meter Model/SN:	B&K 2260/177216		Sound Level Meter Model/SN:	B&K 2260/177216	
Calibrator Model/SN:	B&K 4231/2115610		Calibrator Model/SN:	B&K 4231/2115610	
Date:	6/20/2000		6/21/2000	5/17/2000	
Monitoring Time:	1309-1329		Monitoring Time:	0145-0205	
	Before	After		Before	After
Calibration Factor:	93.8	93.8	Calibration Factor:	93.8	93.8
Calibration Level:	93.8		Calibration Level:	93.8	
Derivation:	-0.02	-0.02	Derivation	-0.04	0.05
Octave Band	Daytime L_{90}	Whole Octaves	Octave Band	Nighttime L_{90}	Whole Octaves
16	44		16	44	
20	47		20	45	
25	49		25	45	
32	50	53	32	49	51
40	46		40	43	
50	50		50	45	
63	49	54	63	45	51
80	48		80	48	
100	50		100	43	
125	47	52	125	40	46
160	43		160	39	
200	43		200	37	
250	41	46	250	35	41
315	39		315	36	
400	37		400	35	
500	36	41	500	38	42
630	35		630	39	
800	33		800	36	
1000	33	37	1000	34	39
1250	32		1250	31	
1600	30		1600	27	
2000	29	34	2000	23	30
2500	28		2500	25	
3150	26		3150	22	
4000	23	28	4000	24	29
5000	20		5000	26	
6300	16		6300	23	
8000	12	18	8000	23	26
10000	10		10000	14	
12500	9		12500	9	
Combined dBA		44.1	Combined dBA		43.4
Overall dBA		45.4	Overall dBA		44.6

Moon School - MCNR Analysis

Location:	**Moon School**
Time:	**Short Term**
Season:	**Summer**

Location	Reaction Rating Goal	Previous Exposure	Spectrum	Intermittancy	Winter or Summer	Day or Night	Background	Allowable Noise Level Rank
Ruth Court	C	0	0	0	0	0	0	c
	D	0	0	0	0	0	0	d

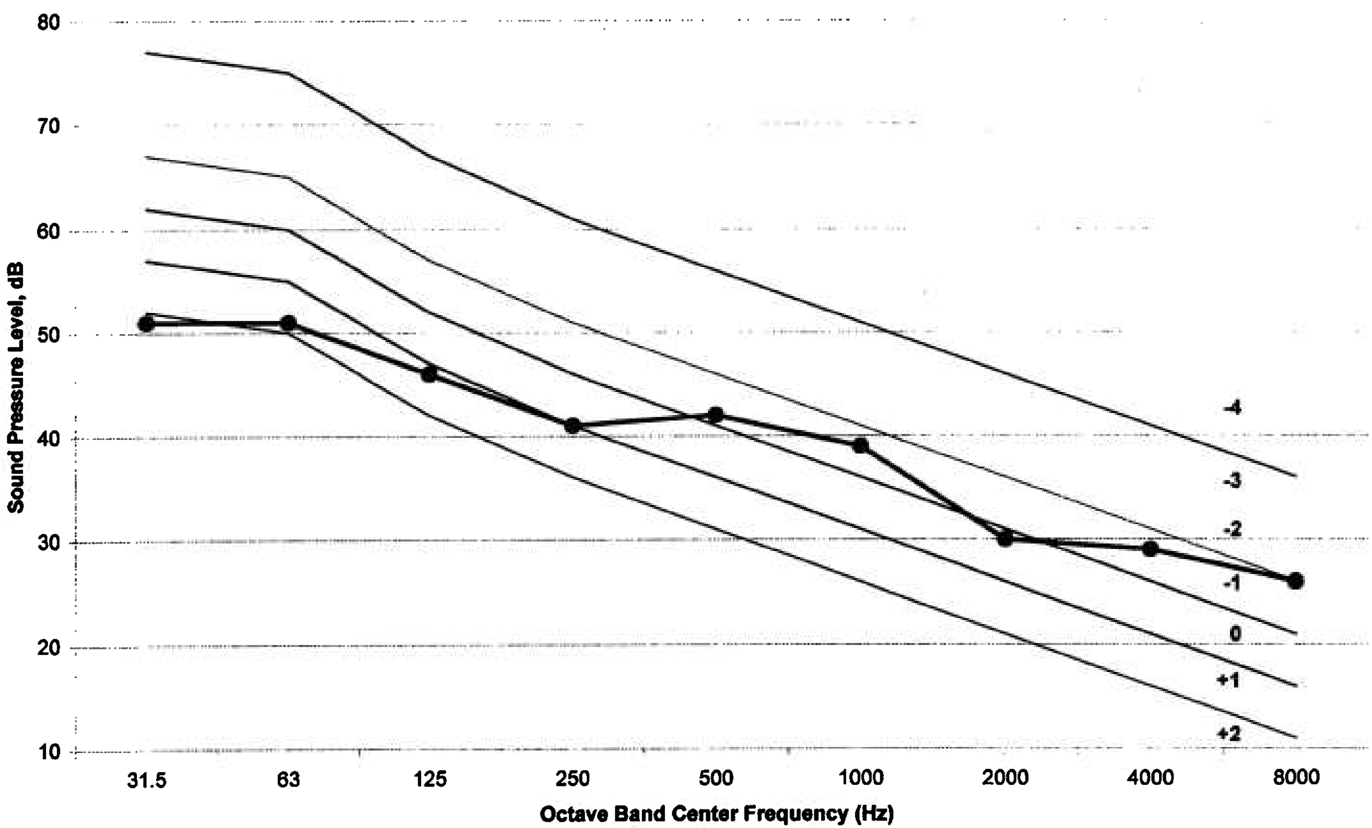
	Octave Band Center Frequency (Hertz) 31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
L90 Short Term Spectrum	51	51	46	41	42	39	30	29	26	43.3
Average L90 Spectrum	***51***	***51***	***46***	***41***	***42***	***39***	***30***	***29***	***26***	***43***
Background Curve Selection	+2	+1	+1	---	-1	-1	0	-1	---	0
Predicted Plant SPL for Reaction C	***53***	***47***	***39***	***31***	***27***	***21***	***13***	***0***	***0***	***30***
Predicted Plant SPL for Reaction D	***53***	***53***	***44***	***37***	***31***	***26***	***17***	***0***	***0***	***35***

Background Curves	Octave Band Center Frequency (Hertz) 31.5	63	125	250	500	1000	2000	4000	8000
-4	78	76	68	62	57	52	47	42	37
-3	77	75	67	61	56	51	46	41	36
-2	72	70	62	56	51	46	41	36	31
-1	67	65	57	51	46	41	36	31	26
0	62	60	52	46	41	36	31	26	21
1	57	55	47	41	36	31	26	21	16
2	52	50	42	36	31	26	21	16	11

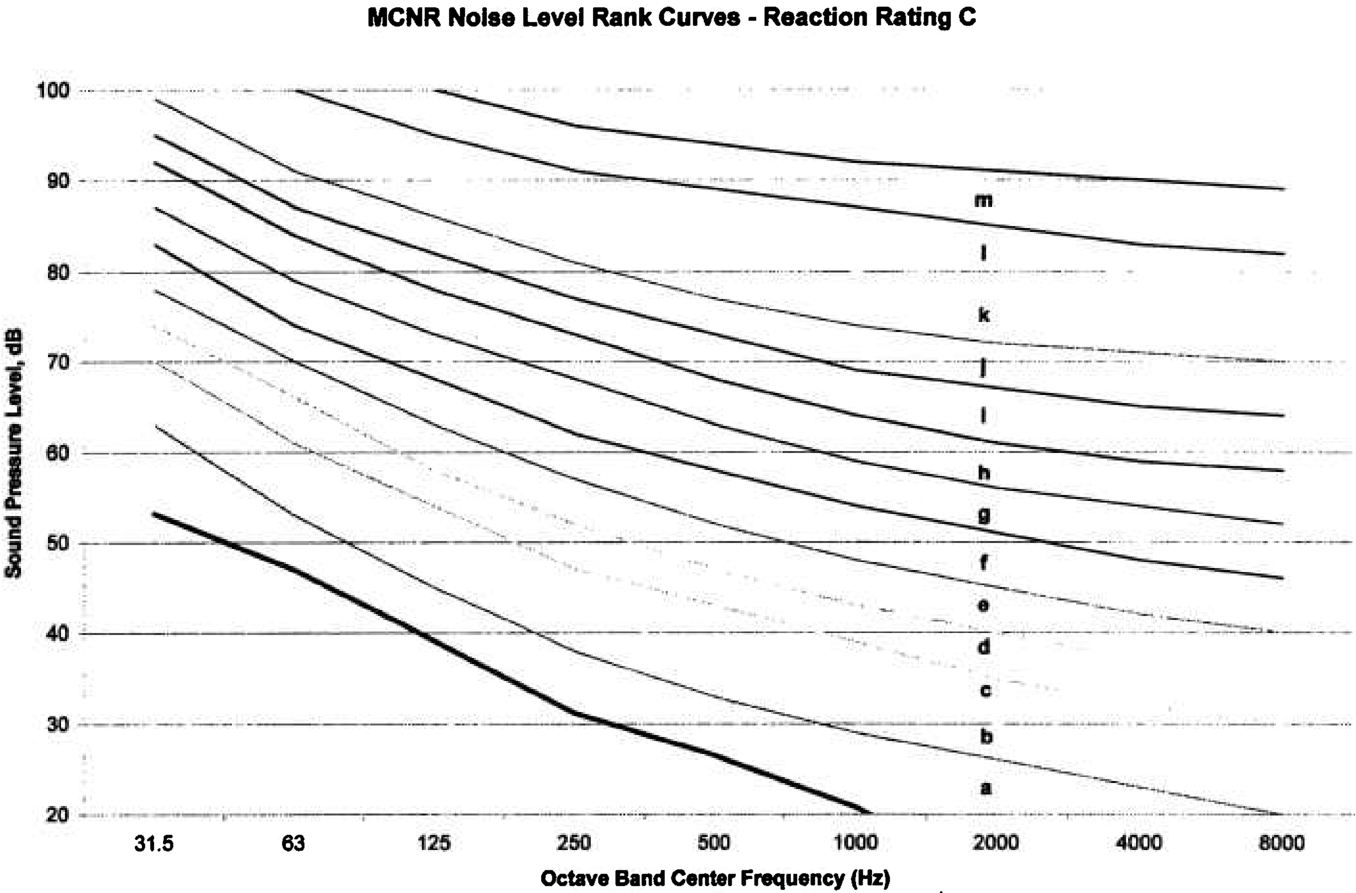
Noise Level Rank Curves	Octave Band Center Frequency (Hertz) 31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
m			100	96	94	92	91	90	89	99
l		100	95	91	89	87	85	83	82	93
k		95	90	86	83	80	78	77	76	87
j	99	91	86	81	77	74	72	71	70	81
i	95	87	82	77	73	69	67	65	64	76
h	92	84	78	73	68	64	61	59	58	71
g	87	79	73	68	63	59	56	54	52	66
f	83	74	68	62	58	54	51	48	46	61
e	78	70	63	57	52	48	45	42	40	56
d	74	66	58	52	47	43	40	37	35	51
c	70	61	54	47	43	39	35	32	30	46
b	67	58	49	42	38	34	30	28	25	41
a	63	53	45	38	33	29	26	23	20	37

Moon School - MCNR - Background Graphic

MCNR Ambient (L90) Background Correction Curves

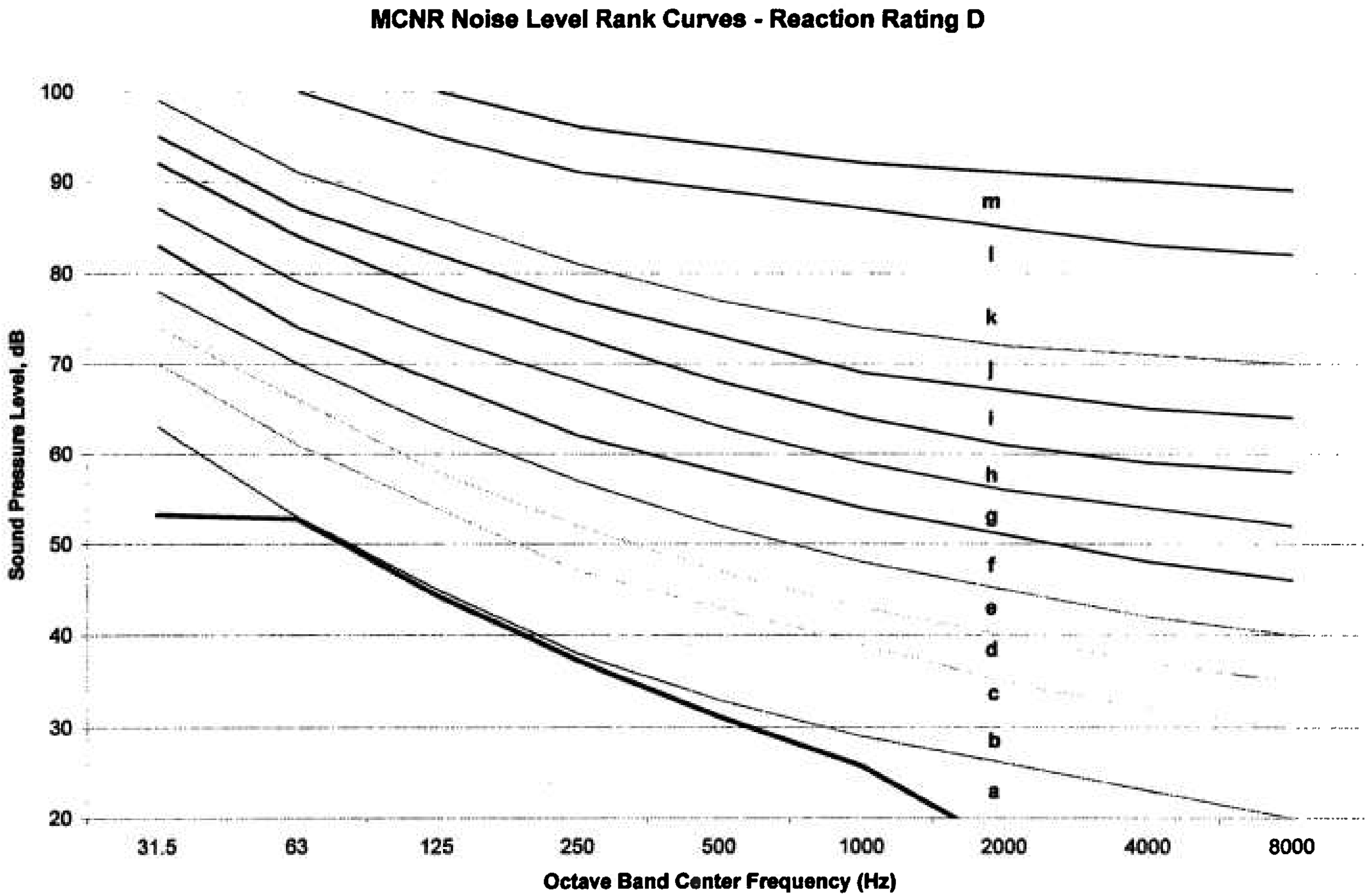


Moon School



MCNR Noise Level Rank Curves - Reaction Rating C
100
90
80
70
60
50
40
30
20
Sound Pressure Level, dB
m
l
k
j
i
h
g
f
e
d
c
b
a
31.5
63
125
250
500
1000
2000
4000
8000
Octave Band Center Frequency (Hz)

Moon School



MCNR Noise Level Rank Curves - Reaction Rating D
Sound Pressure Level, dB
100
90
80
70
60
50
40
30
20
m
l
k
j
i
h
g
f
e
d
c
b
a
31.5
63
125
250
500
1000
2000
4000
8000
Octave Band Center Frequency (Hz)

Nearest Public Space - Winter Short Term Data

Location:	**Dolsontown Road - South**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/13/2000 15:53
End Time:		12/13/2000 16:13
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/13/2000 03:53:18 PM - 04:13:18 PM

Hz	LLF90	
16	52.2	
20	53.2	
25	52.4	
31.5	53.4	**58**
40	52.7	
50	52.3	
63	53.0	**58**
80	54.2	
100	50.4	
125	45.7	**52**
160	42.7	
200	39.8	
250	38.6	**43**
315	36.9	
400	36.8	
500	39.4	**44**
630	40.6	
800	41.0	
1000	41.6	**46**
1250	39.8	
1600	36.0	
2000	30.4	**37**
2500	22.6	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	49.3	**48.1**

Location:	**Dolsontown Road - South**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/14/2000 12:28
End Time:		12/14/2000 12:48
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/14/2000 12:28:22 PM - 12:48:22 PM

Hz	LLF90	
16	52.8	
20	53.2	
25	52.1	
31.5	52.5	**57**
40	52.1	
50	52.8	
63	52.3	**58**
80	53.7	
100	50.4	
125	47.4	**53**
160	45.8	
200	43.0	
250	40.2	**46**
315	38.9	
400	38.8	
500	41.4	**46**
630	43.6	
800	45.1	
1000	46.9	**51**
1250	46.2	
1600	42.8	
2000	38.5	**45**
2500	33.9	
3150	29.3	
4000	25.5	**31**
5000	21.7	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	54.0	**52.9**

Location:	**Dolsontown Road - South**	
Time:	**Daytime**	
Season:	**Winter**	
Instrument:		2260
Application:		BZ7202 version 1.1
Start Time:		12/15/2000 7:41
End Time:		12/15/2000 8:01
Elapsed Time:		0:20:00
Bandwidth:		1/3 Octave
Peaks Over:		140.0 dB
Range:		19.6-99.6 dB
	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L
Instrument Serial Number:		
Microphone Serial Number:		1783679
Input:		Microphone
Pol. Voltage:		0 V
S. I. Correction:		Random
Calibration Level:		93.9 dB
Sensitivity:		-25.8 dB
ZF0023:		Not used

12/15/2000 07:41:04 AM - 08:01:04 AM

Hz	LLF90	
16	50.3	
20	51.1	
25	51.4	
31.5	52.3	**57**
40	52.1	
50	53.0	
63	52.8	**58**
80	53.0	
100	50.5	
125	47.6	**53**
160	44.1	
200	42.2	
250	39.3	**45**
315	38.1	
400	38.0	
500	39.4	**44**
630	39.8	
800	40.1	
1000	40.5	**45**
1250	40.2	
1600	38.4	
2000	33.2	**40**
2500	29.4	
3150	24.0	
4000	20.3	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	49.3	**48.3**

Nearest Public Space - Winter Short Term Data

Location: Dolsontown Road - South
Time: Evening
Season: Winter

Instrument: 2260
Application: BZ7202 version 1.1
Start Time: 12/13/2000 19:02
End Time: 12/13/2000 19:22
Elapsed Time: 0:20:00
Bandwidth: 1/3 Octave
Peaks Over: 140.0 dB
Range: 19.6-99.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L

Instrument Serial Number:
Microphone Serial Number: 1783679
Input: Microphone
Pol. Voltage: 0 V
S. I. Correction: Random

Calibration Level: 93.9 dB
Sensitivity: -25.8 dB
ZF0023: Not used

12/13/2000 07:02:01 PM - 07:22:01 PM

Hz	LLF90	
16	50.8	
20	51.8	
25	51.2	
31.5	51.7	**56**
40	50.4	
50	49.1	
63	48.5	**54**
80	50.4	
100	46.4	
125	44.6	**50**
160	42.7	
200	38.5	
250	37.3	**42**
315	34.8	
400	34.2	
500	37.0	**41**
630	37.3	
800	35.4	
1000	35.8	**40**
1250	33.7	
1600	29.9	
2000	23.2	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	44.9	**43.3**

Location: Dolsontown Road - South
Time: Evening
Season: Winter

Instrument: 2260
Application: BZ7202 version 1.1
Start Time: 12/14/2000 19:22
End Time: 12/14/2000 19:42
Elapsed Time: 0:20:00
Bandwidth: 1/3 Octave
Peaks Over: 140.0 dB
Range: 19.6-99.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L

Instrument Serial Number:
Microphone Serial Number: 1783679
Input: Microphone
Pol. Voltage: 0 V
S. I. Correction: Random

Calibration Level: 93.9 dB
Sensitivity: -25.8 dB
ZF0023: Not used

12/14/2000 07:22:24 PM - 07:42:24 PM

Hz	LLF90	
16	51.0	
20	52.1	
25	51.6	
31.5	52.6	**56**
40	50.0	
50	50.8	
63	50.8	**56**
80	51.5	
100	49.5	
125	46.3	**52**
160	44.6	
200	42.8	
250	40.3	**46**
315	40.1	
400	39.9	
500	41.4	**46**
630	41.6	
800	42.6	
1000	44.2	**48**
1250	43.3	
1600	40.3	
2000	36.3	**42**
2500	31.4	
3150	25.9	
4000	20.1	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	51.6	**50.6**

Location: Dolsontown Road - South
Time: Early Morning
Season: Winter

Instrument: 2260
Application: BZ7202 version 1.1
Start Time: 12/15/2000 0:47
End Time: 12/15/2000 1:07
Elapsed Time: 0:20:00
Bandwidth: 1/3 Octave
Peaks Over: 140.0 dB
Range: 19.6-99.6 dB

	Time	Frequency
Broad-band measurements:	S F I	A L
Broad-band statistics:	F	A
Octave measurements:	F	L

Instrument Serial Number:
Microphone Serial Number: 1783679
Input: Microphone
Pol. Voltage: 0 V
S. I. Correction: Random

Calibration Level: 93.9 dB
Sensitivity: -25.8 dB
ZF0023: Not used

12/15/2000 12:47:51 AM - 01:07:51 AM

Hz	LLF90	
16	57.9	
20	56.5	
25	54.8	
31.5	54.2	**59**
40	52.6	
50	49.5	
63	48.7	**54**
80	48.2	
100	46.0	
125	42.4	**48**
160	40.0	
200	37.1	
250	34.9	**41**
315	35.5	
400	34.5	
500	35.7	**40**
630	35.3	
800	34.2	
1000	33.5	**38**
1250	30.9	
1600	26.2	
2000	20.5	**20**
2500	---	
3150	---	
4000	---	**20**
5000	---	
6300	---	
8000	---	**20**
10000	---	
12500	---	
A	43.6	**41.8**

Nearest Public Space - Winter Long Term Data

Location:	Dolsontown Road - South	
Time:	24-hour Monitoring	
Season:	Winter	
Instrument:		2238
Application:		BZ7124 version 1.1
Start Time:		12/13/2000 03:39:40 PM
End Time:		12/15/2000 11:22:59 AM
Elapsed Time:		43:43:19
Bandwidth:		Broad band
Detector 1/2	RMS	Peak
Range:		20.0-100.0 dB
	Time	Frequency
Detector 1:	S F I	A
Detector 2:	Peak	L
Statistic	F	A
Criterion Level:		100.0 dB
Threshold:		0.0 dB
Exchange Rate		3 and 260
Exposure Time:		7:30:00
Peaks Over:		140.0 dB
Instrument Serial Number:		2246211
Microphone Serial Number:		2231023
Input:		Microphone
Windscreen Correction:		Off
S. I. Correction:		Random
Calibration Level:		94.0 dB
Sensitivity:		-30.8 dB
Microphone:		2231023

Start date	Start time	LAeq	LAF90	L90 10pm-7am
12/13/2000	03:39:40 PM	63.6	54.5	
12/13/2000	04:39:40 PM	57.1	53.5	
12/13/2000	05:39:40 PM	56.5	52.5	
12/13/2000	06:39:40 PM	55.7	51.0	
12/13/2000	07:39:40 PM	55.5	51.0	
12/13/2000	08:39:40 PM	55.4	50.0	
12/13/2000	09:39:40 PM	54.8	50.0	50.0
12/13/2000	10:39:40 PM	53.5	46.5	46.5
12/13/2000	11:39:40 PM	53.1	45.5	45.5
12/14/2000	12:39:40 AM	52.5	45.0	45.0
12/14/2000	01:39:40 AM	56.1	49.0	49.0
12/14/2000	02:39:40 AM	56.3	51.0	51.0
12/14/2000	03:39:40 AM	52.8	46.5	46.5
12/14/2000	04:39:40 AM	53.4	48.0	48.0
12/14/2000	05:39:40 AM	56.0	49.0	49.0
12/14/2000	06:39:40 AM	55.2	50.5	
12/14/2000	07:39:40 AM	54.5	50.0	
12/14/2000	08:39:40 AM	54.9	50.0	
12/14/2000	09:39:40 AM	57.2	52.0	
12/14/2000	10:39:40 AM	60.3	56.0	
12/14/2000	11:39:40 AM	60.0	56.0	
12/14/2000	12:39:40 PM	58.2	55.0	
12/14/2000	01:39:40 PM	59.0	55.5	
12/14/2000	02:39:40 PM	59.7	57.0	
12/14/2000	03:39:40 PM	59.9	57.0	
12/14/2000	04:39:40 PM	60.3	57.5	
12/14/2000	05:39:40 PM	60.4	58.0	
12/14/2000	06:39:40 PM	66.6	53.0	
12/14/2000	07:39:40 PM	62.2	50.5	
12/14/2000	08:39:40 PM	57.2	50.0	
12/14/2000	09:39:40 PM	53.5	48.5	48.5
12/14/2000	10:39:40 PM	50.8	46.5	46.5
12/14/2000	11:39:40 PM	49.5	45.0	45.0
12/15/2000	12:39:40 AM	47.8	43.5	43.5
12/15/2000	01:39:40 AM	47.8	43.0	43.0
12/15/2000	02:39:40 AM	50.0	43.5	43.5
12/15/2000	03:39:40 AM	49.3	44.0	44.0
12/15/2000	04:39:40 AM	48.9	44.0	44.0
12/15/2000	05:39:40 AM	49.7	45.5	45.5
12/15/2000	06:39:40 AM	53.5	49.0	
12/15/2000	07:39:40 AM	56.4	52.5	
12/15/2000	08:39:40 AM	56.1	51.5	
12/15/2000	09:39:40 AM	54.2	44.5	
12/15/2000	10:39:40 AM	72.5	19.9	
			L90 24 hour average=	49.4
			L90 nighttime average=	46.3

Nearest Public Space - MCNR Analysis

Location:	**Nearest Public Space**
Time:	**Short Term/Long Term**
Season:	**Winter**

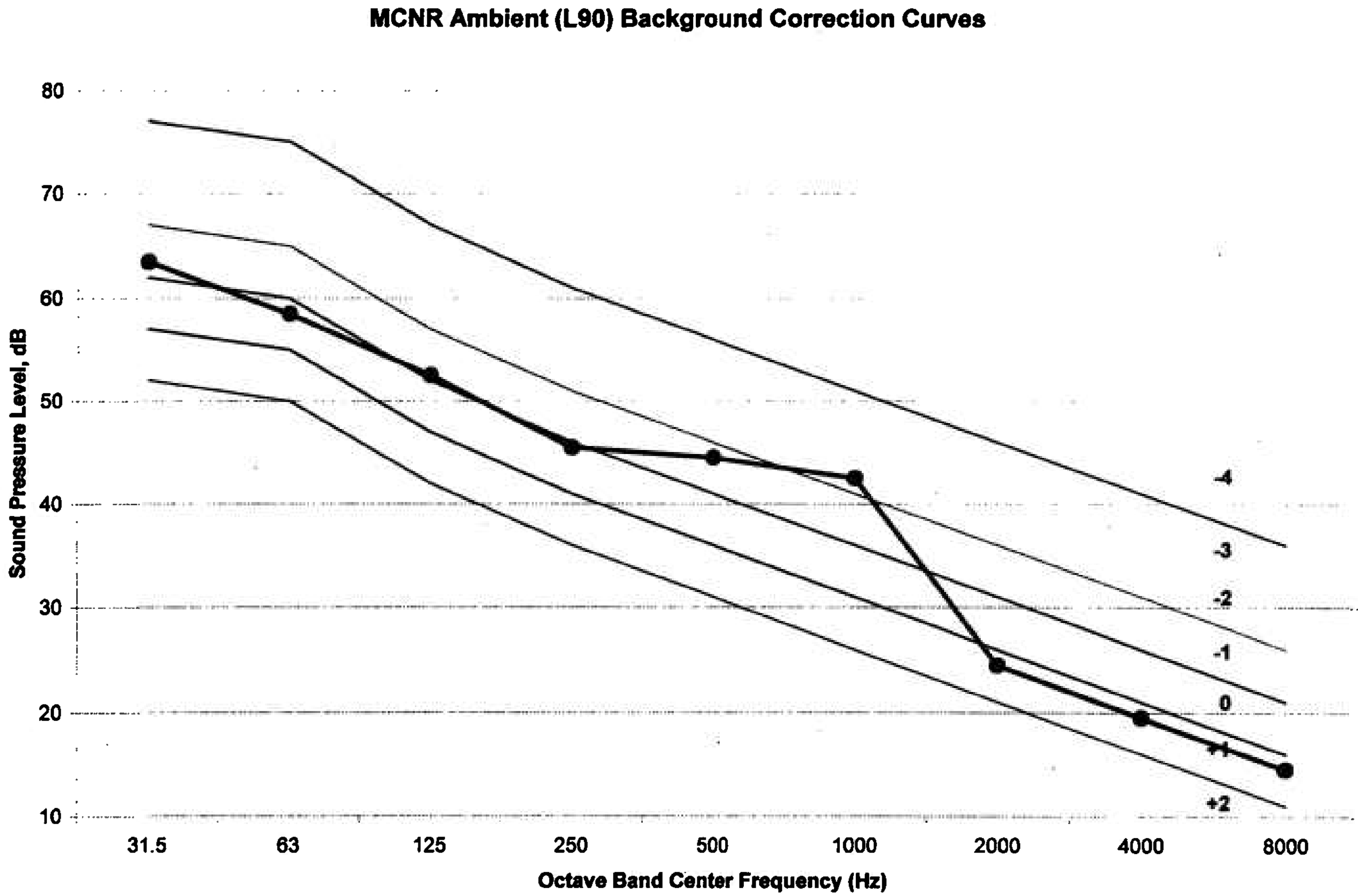
Location	Reaction Rating Goal	Previous Exposure	Spectrum	Intermittancy	Winter or Summer	Day or Night	Background	Allowable Noise Level Rank
Dolsontown-South	C	0	0	0	0	0	0	c
	D	0	0	0	0	0	0	d

	Octave Band Center Frequency (Hertz)									
	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
								est	*est*	
L90 Short Term Spectrum	59	54	48	41	40	38	20	15	10	41.8
L90 Long Term Average										46.3
Spectrum Adjust	5	5	5	5	5	5	5	5	5	
Average L90 Spectrum	***64***	***59***	***53***	***46***	***45***	***43***	***25***	***20***	***15***	***46***
Background Curve Selection	-1	0	-1	0	-1	-2	+1	+1	+1	0
Predicted Plant SPL for Reaction C	***62***	***55***	***48***	***41***	***37***	***33***	***26***	***16***	***0***	***39***
Predicted Plant SPL for Reaction D	***63***	***60***	***52***	***46***	***41***	***35***	***29***	***18***	***0***	***44***

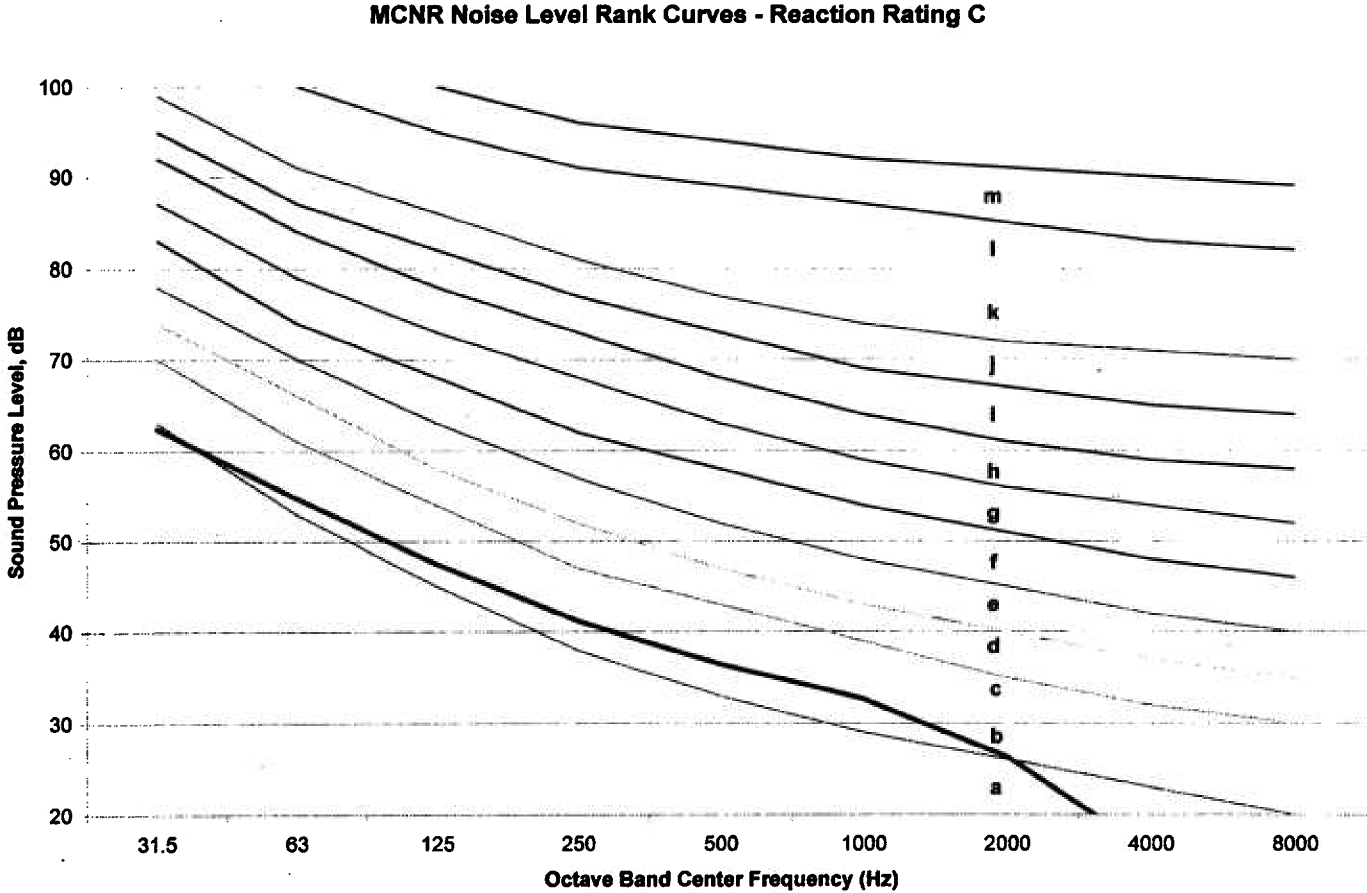
	Octave Band Center Frequency (Hertz)								
Background Curves	31.5	63	125	250	500	1000	2000	4000	8000
-4	78	76	68	62	57	52	47	42	37
-3	77	75	67	61	56	51	46	41	36
-2	72	70	62	56	51	46	41	36	31
-1	67	65	57	51	46	41	36	31	26
0	62	60	52	46	41	36	31	26	21
1	57	55	47	41	36	31	26	21	16
2	52	50	42	36	31	26	21	16	11

	Octave Band Center Frequency (Hertz)									
Noise Level Rank Curves	31.5	63	125	250	500	1000	2000	4000	8000	A-Weight
m			100	96	94	92	91	90	89	99
l		100	95	91	89	87	85	83	82	93
k		95	90	86	83	80	78	77	76	87
j	99	91	86	81	77	74	72	71	70	81
I	95	87	82	77	73	69	67	65	64	76
h	92	84	78	73	68	64	61	59	58	71
g	87	79	73	68	63	59	56	54	52	66
f	83	74	68	62	58	54	51	48	46	61
e	78	70	63	57	52	48	45	42	40	56
d	74	66	58	52	47	43	40	37	35	51
c	70	61	54	47	43	39	35	32	30	46
b	67	58	49	42	38	34	30	28	25	41
a	63	53	45	38	33	29	26	23	20	37

Nearest Public Space



Nearest Public Space



Nearest Public Space

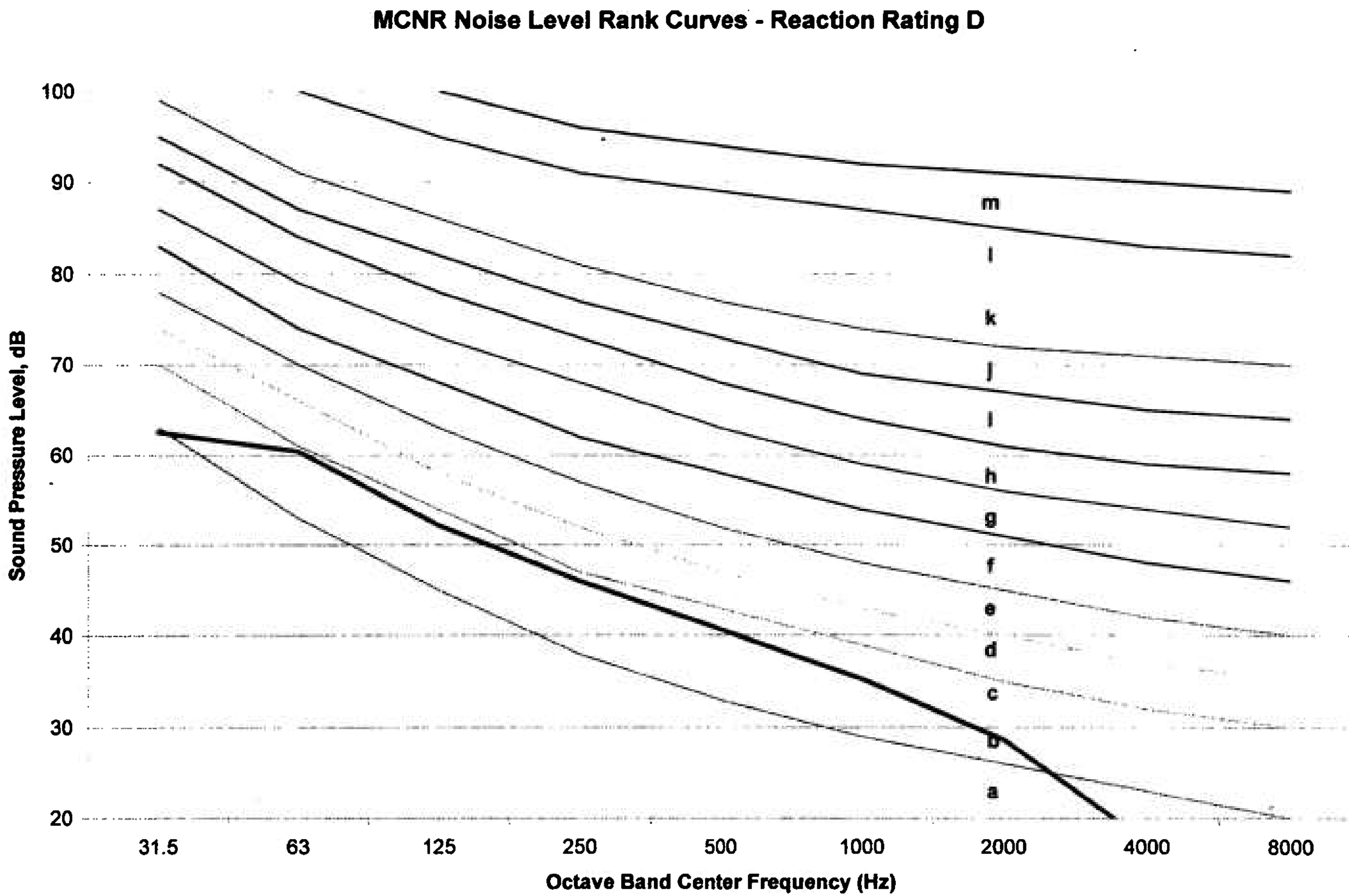


TABLE 2.5 PROCEDURE FOR DETERMINING THE MODIFIED COMPOSITE NOISE RATING (CNR)

1. Determine the noise level rank by plotting the octave band sound pressure levels of the noise on Figure 2.6. The highest zone into which the spectrum protrudes is designated as the noise level rank.

2. Find the correction for background noise by plotting the octave band sound pressure levels for background ambient on Figure 2.7. For nighttime noise problem, plot nighttime ambient levels.

3. Correct for temporal and seasonal factors. (For full time plant activity, the total correction here is 0.)

   a. Daytime only — -1
      Nighttime (2200 to 0700 hrs) — 0

   b. Winter only — -1
      Summer — 0

   c. Intermittency: ratio of source "on" time to reference time period

1.00	- 0.57	0
0.56	- 0.18	-1
0.17	- 0.06	-2
0.05	- 0.018	-3
0.017	- 0.0057	-4
0.0056	- 0.0018	-5

$$2 \log \frac{\text{source "on" time}}{\text{reference period}} = \quad n$$

4. Correct for character of noise.

   a. Noise is very low frequency — +1

   b. Noise contains tonal components — +1

   c. Impulsive sound — +1

5. Correct for previous exposure and community attitude.

   a. No prior exposure or some previous exposure but poor community relations — 0

   b. Some previous exposure and good community relations — -1

6. Adjust the noise level rank of Item 1 above by the total number of corrections of Items 2-5 to obtain CNR (for example, d + 2 = f, or e - 1 = D). Determine estimated range of community response from Figure 2.8.

Rev. 1984

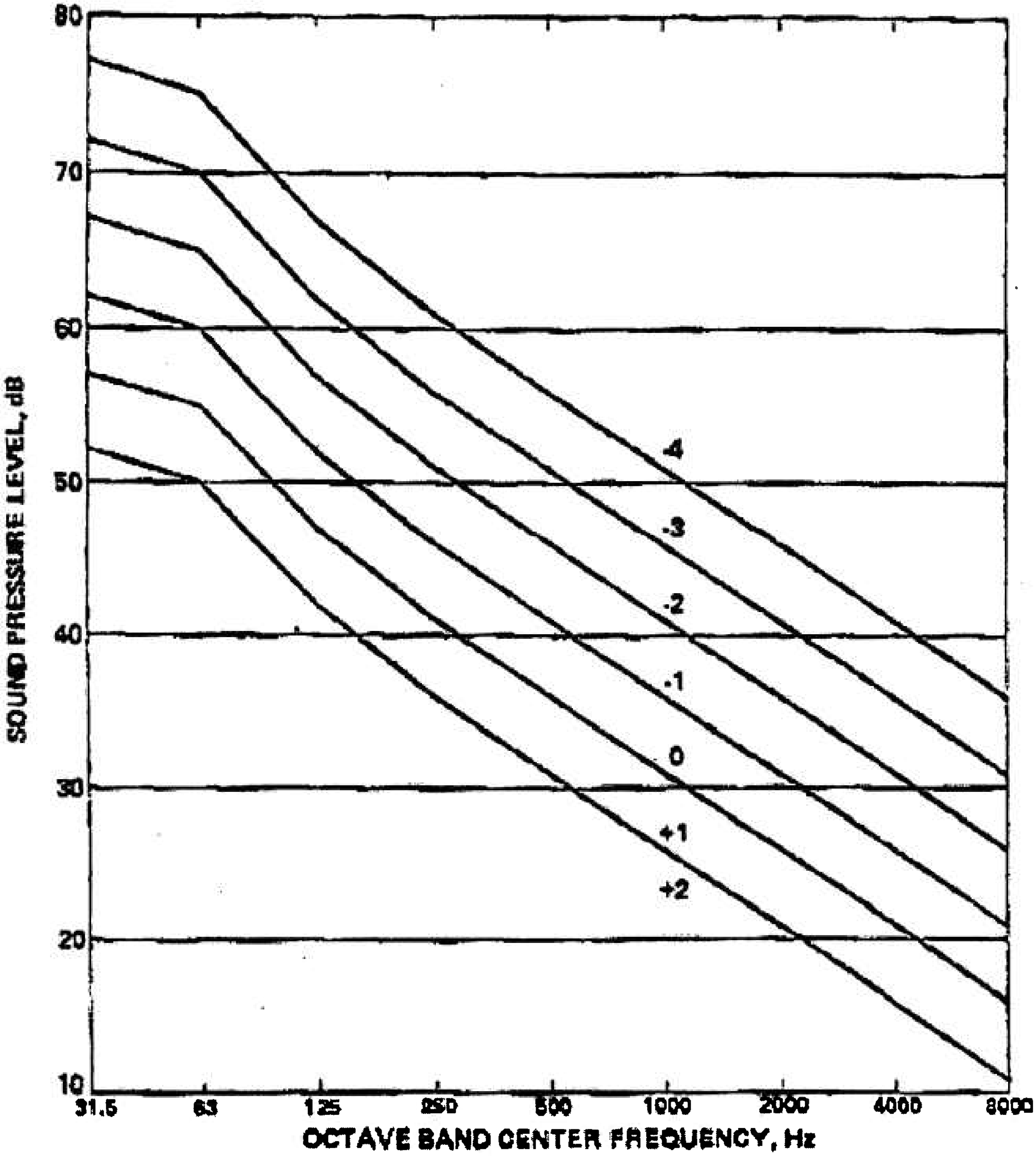


Figure 2.7. Background Noise Curves for Modified CNR Rating System. The measured octave band sound pressure levels of the average of the minimum ambient sounds (L_{90}) (in the absence of specific identifiable nearby events, such as auto or truck passes, bird chirps, or dog barks) are plotted on the grid. The zone into which the major portion of the spectrum falls designates the correction number to be applied for background noise.

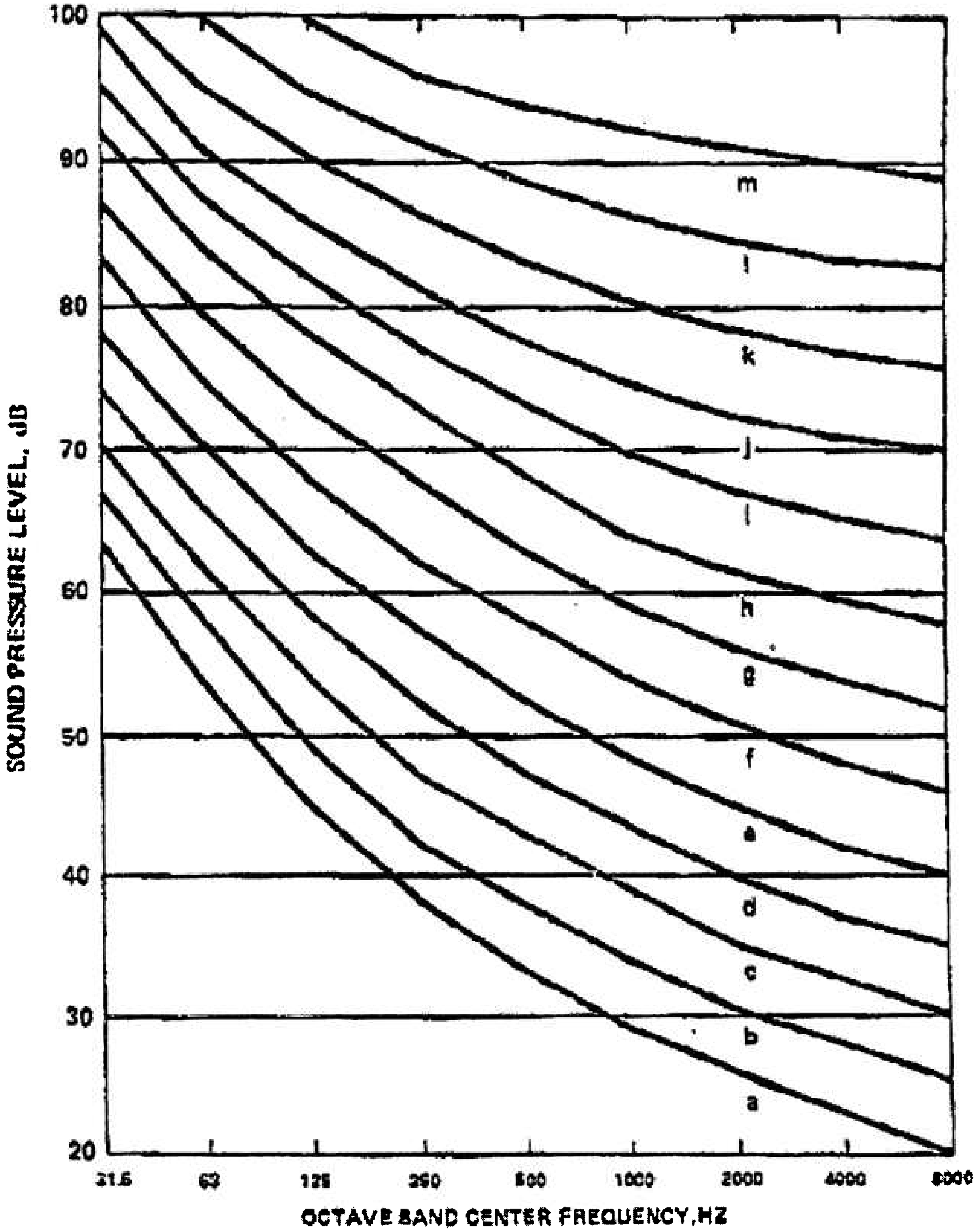


Figure 2.6 Noise Level Rank Curves for Modified CNR Rating System. The measured octave band sound pressure levels of the noise to be evaluated are plotted on the grid. The highest zone into which the spectrum protrudes is designated as the noise level rank.

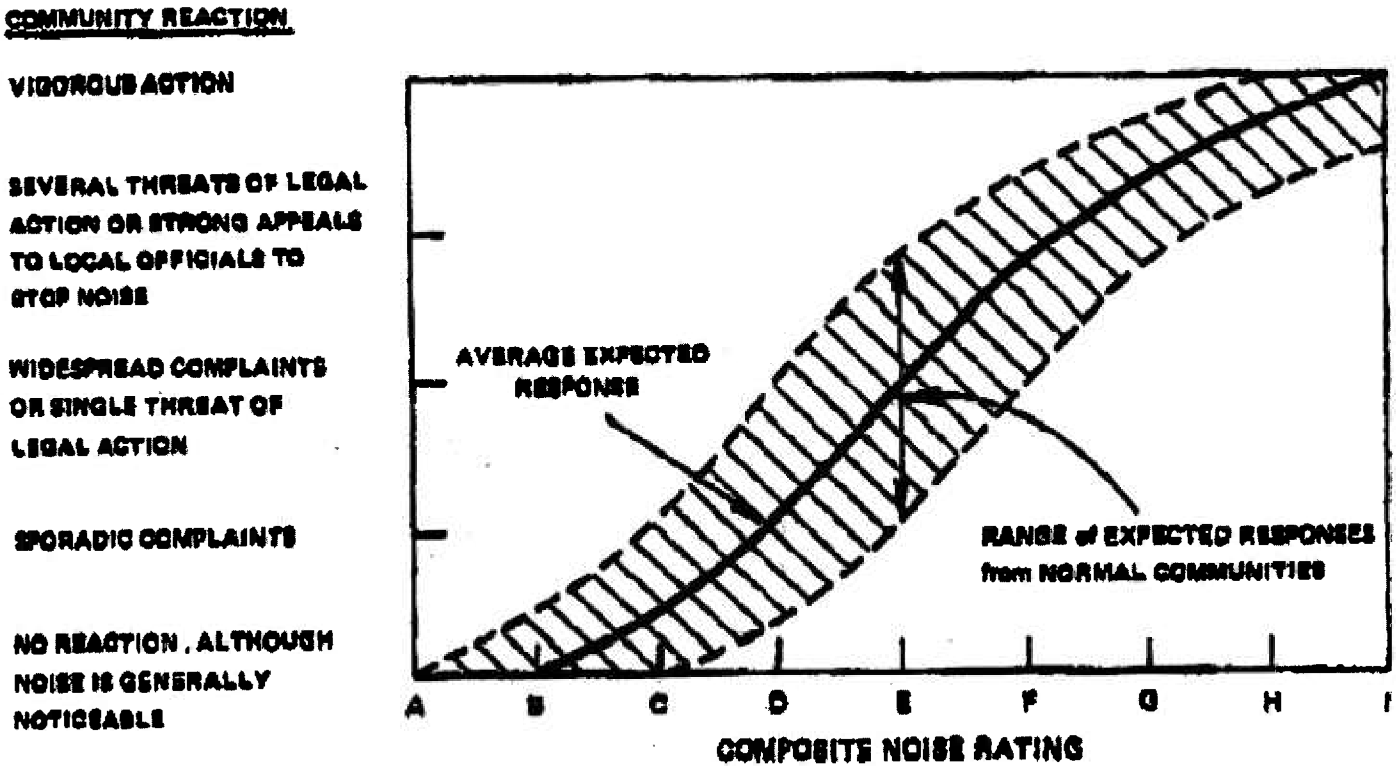


Figure 2.8 Estimated Community Response vs Composite Noise Rating

Operational Noise Modeling

MCNR Analysis - Reaction C

Wawayanda Energy Facility - Receiver Sound Levels
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

1. Floor	Country View Manor	35.4
2. Floor		35.5
1. Floor	Dolsontown Road - East	42.4
2. Floor		42.5
1. Floor	Dolsontown Road - South	45.3
2. Floor		45.6
1. Floor	Dolsontown Road - West	45.1
2. Floor		45.2
1. Floor	Genung Street	31.2
2. Floor		31.3
1. Floor	Moon School	29.5
2. Floor		29.6
1. Floor	Public Space	39.3
2. Floor		39.4
1. Floor	Ruth Court	31.4
2. Floor		31.5

Wawayanda Energy Facility - Receiver Sound Pressure Levels
Base Analysis/03-01 GA/Linear/MCNR Rating C

Time Slice	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Floor 1. Floor Name: Country View Manor Lr [illegible] dB(A)									
Day	58.5	51.9	44.5	36.8	32.4	27.7	22.3	7.6	-52.1
Night	58.5	51.9	44.5	36.8	32.4	27.7	22.3	7.6	-52.1
Floor 2. Floor Name: Country View Manor Lr [illegible] dB(A)									
Day	58.6	51.9	44.6	36.9	32.5	27.8	22.4	7.6	-52.0
Night	58.6	51.9	44.6	36.9	32.5	27.8	22.4	7.6	-52.0
Floor 1. Floor Name: Dolsontown Road - East Lr [illegible] dB(A)									
Day	65.7	57.8	50.6	43.5	39.3	35.8	31.0	22.6	-7.1
Night	65.7	57.8	50.6	43.5	39.3	35.8	31.0	22.6	-7.1
Floor 2. Floor Name: Dolsontown Road - East Lr [illegible] dB(A)									
Day	65.7	57.8	50.7	43.5	39.4	35.8	31.0	22.7	-7.1
Night	65.7	57.8	50.7	43.5	39.4	35.8	31.0	22.7	-7.1
Floor 1. Floor Name: Dolsontown Road - South Lr [illegible] dB(A)									
Day	68.5	60.5	53.2	47.1	42.2	38.7	32.8	26.4	13.5
Night	68.5	60.5	53.2	47.1	42.2	38.7	32.8	26.4	13.5
Floor 2. Floor Name: Dolsontown Road - South Lr [illegible] dB(A)									
Day	68.5	60.6	53.3	47.3	42.6	39.1	33.2	26.5	13.6
Night	68.5	60.6	53.3	47.3	42.6	39.1	33.2	26.5	13.6
Floor 1. Floor Name: Dolsontown Road - West Lr [illegible] dB(A)									
Day	66.2	59.9	53.0	46.3	42.1	37.8	34.8	29.0	3.2
Night	66.2	59.9	53.0	46.3	42.1	37.8	34.8	29.0	3.2
Floor 2. Floor Name: Dolsontown Road - West Lr [illegible] dB(A)									
Day	66.2	60.0	53.1	46.4	42.2	37.8	34.9	29.0	3.2
Night	66.2	60.0	53.1	46.4	42.2	37.8	34.9	29.0	3.2
Floor 1. Floor Name: [illegible] Lr [illegible] dB(A)									
Day	55.9	48.2	40.6	32.5	28.2	23.5	16.3	-4.3	

Wawayanda Energy Facility - Receiver Sound Pressure Levels
Base Analysis/03-01 GA/Linear/MCNR Rating C

Time Slice	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Night	55.9	48.2	40.6	32.5	28.2	23.5	16.3	-4.3	
Floor 2. Floor Name: [illegible] Lr,D [illegible] dB(A)									
Day	56.0	48.2	40.6	32.7	28.3	23.6	16.3	-4.2	
Night	56.0	48.2	40.6	32.7	28.3	23.6	16.3	-4.2	
Floor 1. Floor Name: Moon School Lr,D [illegible] dB(A)									
Day	53.2	47.0	39.2	31.2	26.5	20.8	12.8	-12.4	
Night	53.2	47.0	39.2	31.2	26.5	20.8	12.8	-12.4	
Floor 2. Floor Name: Moon School Lr,D [illegible] dB(A)									
Day	53.2	47.1	39.2	31.3	26.6	20.9	12.8	-12.3	
Night	53.2	47.1	39.2	31.3	26.6	20.9	12.8	-12.3	
Floor 1. Floor Name: Public Space Lr,D [illegible] dB(A)									
Day	62.4	54.8	47.4	41.1	36.4	32.7	26.2	16.0	-11.6
Night	62.4	54.8	47.4	41.1	36.4	32.7	26.2	16.0	-11.6
Floor 2. Floor Name: Public Space Lr,D [illegible] dB(A)									
Day	62.4	54.8	47.5	41.2	36.5	32.7	26.3	16.0	-11.5
Night	62.4	54.8	47.5	41.2	36.5	32.7	26.3	16.0	-11.5
Floor 1. Floor Name: Ruth Court Lr,D [illegible] dB(A)									
Day	55.1	48.6	41.0	33.0	28.4	23.2	16.2	-4.7	
Night	55.1	48.6	41.0	33.0	28.4	23.2	16.2	-4.7	
Floor 2. Floor Name: Ruth Court Lr,D [illegible] dB(A)									
Day	55.1	48.7	41.1	33.1	28.5	23.2	16.3	-4.6	
Night	55.1	48.7	41.1	33.1	28.5	23.2	16.3	-4.6	

Wawayanda Energy Facility Source List
Base Analysis/03-01 GA/Linear/MCNR Rating C

Source	Sourcetyp	l or S	Lw	Ko	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Air Cooled Condenser	Area	5077.9	125.2	0.0	124.	113.	107.	96.8	96.8	94.8	93.8	93.8	86.8
Air Intake 1	Area	127.38	108.2	3.0	102.	106.	99.0	94.0	86.2	78.1	74.0	82.0	77.0
Air Intake 2	Area	127.35	108.2	3.0	102.	106.	99.0	94.0	86.2	78.1	74.0	82.0	77.0
Exhaust Diffuser	Point		103.4	0.0	96.0	96.0	100.	94.0	91.0	82.0	86.0	74.0	65.0
Exhaust Diffuser	Point		103.4	0.0	96.0	96.0	100.	94.0	91.0	82.0	86.0	74.0	65.0
GT Building Ventilation 1	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
GT Building Ventilation 2	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
GT Building Ventilation 3	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
GT Building Ventilation 4	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
GT Building Ventilation 5	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
GT Building Ventilation 6	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
Gas Metering Station	Point		87.7	0.0	-20.0	-20.0	-20.0	68.0	70.0	75.0	85.0	83.0	75.0
Gas Preheater Building	Area	69.53	105.8	3.0	105.	94.4	76.4	65.4	61.4	61.4	60.4	58.4	59.4
Gas Preheater Building	Area	100.42	107.4	3.0	107.	96.0	78.0	67.0	63.0	63.0	62.0	60.0	61.0
Gas Preheater Building	Area	69.07	105.7	3.0	105.	94.4	76.4	65.4	61.4	61.4	60.4	58.4	59.4
Gas Preheater Building Roof	Area	188.57	110.1	0.0	109.	98.8	80.8	69.8	65.8	65.8	64.8	62.8	63.8
Gas Turbine Building	Area	2604.5	109.1	3.0	108.	97.3	91.1	83.8	79.3	71.6	68.5	62.2	64.6
Gas Turbine Building	Area	791.63	104.0	3.0	103.	92.1	85.9	78.6	74.1	66.4	63.3	57.0	59.4
Gas Turbine Building	Area	2607.9	109.1	3.0	108.	97.3	91.1	83.8	79.3	71.6	68.5	62.2	64.6
Gas Turbine Building	Area	775.23	103.9	3.0	103.	92.0	85.8	78.5	74.0	66.3	63.2	56.9	59.3
Gas Turbine Building Roof	Area	1943.3	107.9	0.0	107.	96.0	89.8	82.5	78.0	70.3	67.2	60.9	63.3
Gas Turbine Transformer 1	Point		107.8	0.0	100.	106.	98.0	94.0	90.0	85.0	85.0	85.0	80.0
Gas Turbine Transformer 2	Point		107.8	0.0	100.	106.	98.0	94.0	90.0	85.0	85.0	85.0	80.0
HRSG Building Facade 1	Area	2205.7	115.2	3.0	114.	102.	87.0	82.4	77.8	67.0	62.3	63.8	64.9
HRSG Building Facade 2	Area	1244.7	112.7	3.0	112.	99.7	84.6	80.0	75.4	64.6	59.9	61.4	62.5
HRSG Building Facade 3	Area	2212.0	115.2	3.0	114.	102.	87.0	82.4	77.8	67.0	62.3	63.8	64.9
HRSG Building Facade 4	Area	1244.6	112.7	3.0	112.	99.7	84.6	80.0	75.4	64.6	59.9	61.4	62.5
HRSG Building Roof	Area	3668.7	117.4	0.0	117.	104.	89.2	84.6	80.0	69.2	64.5	66.0	67.1

Wawayanda Energy Facility Source List
Base Analysis/03-01 GA/Linear/MCNR Rating C

Source	Source type	I or S	Lw	Ko	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
HRSG Building Ventilation 1	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Building Ventilation 2	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Building Ventilation 3	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Building Ventilation 4	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Building Ventilation 5	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Building Ventilation 6	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Stack Exhaust 1	Point		115.6	0.0	111.	112.	107.	101.	100.	99.0	80.0	60.0	43.0
HRSG Stack Exhaust 2	Point		115.6	0.0	111.	112.	107.	101.	100.	99.0	80.0	60.0	43.0
HRSG Stack Facade 1-1	Area	181.89	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-2	Area	175.63	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-3	Area	183.89	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-4	Area	187.37	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-5	Area	203.38	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-6	Area	177.98	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-7	Area	188.39	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-8	Area	185.09	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 2-1	Area	178.38	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 2-2	Area	186.66	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 3-2	Area	181.13	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 4-2	Area	207.67	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 5-2	Area	173.42	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 6-2	Area	194.01	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 7-2	Area	178.94	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 8-2	Area	182.82	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
ST Building Ventilation 1	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
ST Building Ventilation 2	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
ST Building Ventilation 3	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
ST Building Ventilation 4	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0

Wawayanda Energy Facility Source List
Base Analysis/03-01 GA/Linear/MCNR Rating C

Source	Src type	l or S	Lw	Ko	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
ST Building Ventilation 5	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
Steam Turbine Building	Area	1370.5	113.7	3.0	111.	109.	100.	92.4	85.4	74.4	67.4	57.4	54.4
Steam Turbine Building	Area	1266.2	113.4	3.0	111.	109.	100.	92.0	85.0	74.0	67.0	57.0	54.0
Steam Turbine Building	Area	1363.1	113.7	3.0	111.	109.	100.	92.3	85.3	74.3	67.3	57.3	54.3
Steam Turbine Building	Area	1288.5	113.5	3.0	111.	109.	100.	92.1	85.1	74.1	67.1	57.1	54.1
Steam Turbine Building Roof	Area	1676.3	114.6	0.0	112.	110.	101.	93.2	86.2	75.2	68.2	58.2	55.2
Steam Turbine Transformer	Point		107.8	0.0	100.	106.	98.0	94.0	90.0	85.0	85.0	85.0	80.0
Turbine Compartment Vent	Point		103.6	0.0	96.0	96.0	100.	94.0	91.0	82.0	87.0	85.0	81.0
Turbine Compartment Vent	Point		103.6	0.0	96.0	96.0	100.	94.0	91.0	82.0	87.0	85.0	81.0
WSAC	Area	219.48	102.2	0.0	57.0	96.0	98.0	95.0	91.0	86.0	86.0	86.0	88.0

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
[illegible] Name: Country View Manor [illegible] Daytime Level [illegible] dB(A) [illegible]											
Air Cooled Condenser	101.7	64.64	0.0	70.5	943.38	-2.6		3.4	0.0		30.5
Air Intake 1	90.7	69.65	3.0	71.9	1113.97	-2.0	0.1	2.2	0.0		21.4
Air Intake 2	90.7	69.65	3.0	71.6	1075.73	-2.1	0.1	2.2	0.0		21.8
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	72.0	1123.47	-2.4	0.2	2.7	7.0		13.4
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	71.7	1085.46	-2.5	0.6	2.8	7.3		12.8
GT Building Ventilation 1	86.6	86.58	0.0	71.9	1114.78	-2.5	0.1	3.5	0.0		13.5
GT Building Ventilation 2	86.6	86.58	0.0	71.8	1092.92	-2.5	0.2	3.6	0.0		13.6
GT Building Ventilation 3	86.6	86.58	0.0	71.6	1076.57	-2.5	0.4	3.7	0.0		13.4
GT Building Ventilation 4	86.6	86.58	0.0	71.6	1077.67	-2.5	0.4	3.7	0.0		13.4
GT Building Ventilation 5	86.6	86.58	0.0	71.8	1095.12	-2.5	0.2	3.5	0.0		13.6
GT Building Ventilation 6	86.6	86.58	0.0	71.9	1115.41	-2.5	0.1	3.5	0.0		13.5
Gas Metering Station	88.6	88.60	0.0	69.8	874.64	-2.2		7.5	0.0		13.5
Gas Preheater Building Facade 2	72.4	53.95	3.0	72.2	1142.30	-2.2	10.0	0.2	0.0		-4.8
Gas Preheater Building Facade 3	74.0	53.95	3.0	72.2	1147.31	-2.2	14.4	0.3	0.0		-7.8
Gas Preheater Building Facade 4	72.3	53.95	3.0	72.1	1140.92	-2.2	15.5	0.4	0.0		-10.5
Gas Preheater Building Roof	76.7	53.95	0.0	72.1	1141.54	-2.2	13.3	0.3	0.0		-6.8
Gas Turbine Building Facade 1	81.9	47.71	3.0	71.8	1092.20	-2.0	13.3	0.8	0.0		1.0
Gas Turbine Building Facade 2	76.7	47.71	3.0	72.1	1132.37	-2.0	16.2	0.7	0.0		-7.2
Gas Turbine Building Facade 3	81.9	47.71	3.0	71.8	1090.85	-2.0	1.5	1.3	0.0		12.3
Gas Turbine Building Facade 4	76.6	47.71	3.0	71.4	1051.73	-2.0	15.5	0.7	0.0		-6.0
Gas Turbine Building Roof	80.6	47.71	0.0	71.8	1091.53	-2.4	1.4	1.8	0.0		8.1
Gas Turbine Transformer 1	93.6	93.59	0.0	71.9	1103.34	-1.8		3.5	0.0		20.0
Gas Turbine Transformer 2	93.6	93.59	0.0	71.5	1065.28	-1.8		3.5	0.0		20.4
HRSG Building Facade 1	81.9	48.42	3.0	71.8	1095.86	-2.2	7.5	0.3	0.0		7.5
HRSG Building Facade 2	79.4	48.42	3.0	72.1	1134.53	-2.1	14.2	0.3	0.0		-2.1
HRSG Building Facade 3	81.9	48.42	3.0	71.8	1092.47	-2.2	13.7	0.2	0.0		1.3

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	79.4	48.42	3.0	71.5	1054.13	-2.2	5.9	0.8	0.0		6.4
HRSG Building Roof	84.1	48.42	0.0	71.8	1093.71	-2.5	4.5	1.0	0.0		9.2
HRSG Building Ventilation 1	86.6	86.58	0.0	72.0	1116.48	-2.4	7.3	2.1	0.0		7.7
HRSG Building Ventilation 2	86.6	86.58	0.0	71.8	1094.02	-2.5	8.5	1.8	0.0		7.0
HRSG Building Ventilation 3	86.6	86.58	0.0	71.7	1078.52	-2.5	9.8	1.6	0.0		6.0
HRSG Building Ventilation 4	86.6	86.58	0.0	71.7	1079.77	-2.5	0.0	3.4	0.0		14.0
HRSG Building Ventilation 5	86.6	86.58	0.0	71.8	1094.77	-2.5	0.0	3.4	0.0		13.8
HRSG Building Ventilation 6	86.6	86.58	0.0	72.0	1117.66	-2.4	0.0	3.5	0.0		13.6
HRSG Stack Exhaust 1	102.1	102.10	0.0	72.0	1120.10	-2.9	0.0	2.2	7.6		23.3
HRSG Stack Exhaust 2	102.1	102.10	0.0	71.7	1082.33	-2.9		2.1	7.5		23.8
HRSG Stack Facade 1-1	76.0	53.42	3.0	72.0	1117.73	-2.0	1.5	0.8	0.0		6.8
HRSG Stack Facade 1-2	76.0	53.58	3.0	72.0	1115.85	-2.0	1.6	0.8	0.0		6.7
HRSG Stack Facade 1-3	76.0	53.38	3.0	72.0	1116.16	-2.0	6.5	0.8	0.0		1.8
HRSG Stack Facade 1-4	76.0	53.29	3.0	72.0	1118.45	-2.0	5.9	0.8	0.0		2.4
HRSG Stack Facade 1-5	76.0	52.94	3.0	72.0	1121.55	-2.0	10.3	0.7	0.0		-2.0
HRSG Stack Facade 1-6	76.0	53.52	3.0	72.0	1123.45	-2.0	14.2	0.7	0.0		-5.9
HRSG Stack Facade 1-7	76.0	53.27	3.0	72.0	1123.10	-2.0	14.1	0.7	0.0		-5.8
HRSG Stack Facade 1-8	76.0	53.35	3.0	72.0	1120.77	-2.0	7.5	0.8	0.0		0.7
HRSG Stack Facade 2-1	76.0	53.51	3.0	71.7	1078.01	-2.1	0.3	0.8	0.0		8.4
HRSG Stack Facade 2-2	76.0	53.31	3.0	71.7	1078.35	-2.1	0.0	0.8	0.0		8.6
HRSG Stack Facade 3-2	76.0	53.44	3.0	71.7	1080.60	-2.1	0.2	0.8	0.0		8.4
HRSG Stack Facade 4-2	76.0	52.85	3.0	71.7	1083.73	-2.1	8.2	0.7	0.0		0.5
HRSG Stack Facade 5-2	76.0	53.63	3.0	71.7	1085.74	-2.1	12.9	0.7	0.0		-4.3
HRSG Stack Facade 6-2	76.0	53.14	3.0	71.7	1085.24	-2.1	13.6	0.7	0.0		-4.9
HRSG Stack Facade 7-2	76.0	53.49	3.0	71.7	1082.85	-2.1	7.8	0.8	0.0		0.8
HRSG Stack Facade 8-2	76.0	53.40	3.0	71.7	1079.88	-2.1	1.4	0.8	0.0		7.2
ST Building Ventilation 1	86.6	86.58	0.0	71.4	1045.56	-2.6	0.2	3.4	0.0		14.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	71.2	1019.55	-2.6	0.1	3.3	0.0		14.5
ST Building Ventilation 3	86.6	86.58	0.0	71.2	1019.97	-2.6	0.1	3.3	0.0		14.5
ST Building Ventilation 4	86.6	86.58	0.0	71.4	1046.00	-2.6	0.2	3.4	0.0		14.1
ST Building Ventilation 5	86.6	86.58	0.0	71.3	1032.71	-2.6	0.3	3.5	0.0		14.1
Steam Turbine Building Facade 1	89.7	58.31	3.0	71.3	1031.92	-2.1	6.5	0.5	0.0		16.5
Steam Turbine Building Facade 2	89.3	58.31	3.0	71.4	1051.87	-2.0	15.8	0.4	0.0		7.7
Steam Turbine Building Facade 3	89.7	58.31	3.0	71.3	1029.54	-2.0		0.7	0.0		22.8
Steam Turbine Building Facade 4	89.4	58.31	3.0	71.1	1009.54	-2.1	0.2	0.6	0.0		22.6
Steam Turbine Building Roof	90.6	58.31	0.0	71.3	1030.53	-2.5	3.1	0.9	0.0		19.0
Steam Turbine Transformer	93.6	93.59	0.0	71.3	1038.46	-1.9		3.4	0.0		22.9
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	71.9	1115.29	-2.5	0.2	3.9	7.1		13.4
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	71.6	1077.28	-2.5	0.5	4.2	7.5		12.7
WSAC	94.9	71.52	0.0	71.1	1014.38	-1.9		4.3	0.0		21.4
Floor 2. Floor Name Country View Manor				Daytime level	35.5	dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	70.5	943.36	-2.7		3.4	0.0		30.6
Air Intake 1	90.7	69.65	3.0	71.9	1113.97	-2.1	0.1	2.2	0.0		21.5
Air Intake 2	90.7	69.65	3.0	71.6	1075.74	-2.1	0.1	2.2	0.0		21.9
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	72.0	1123.44	-2.5	0.2	2.7	6.9		13.5
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	71.7	1085.43	-2.5	0.5	2.8	7.3		12.9
GT Building Ventilation 1	86.6	86.58	0.0	71.9	1114.74	-2.6	0.1	3.5	0.0		13.6
GT Building Ventilation 2	86.6	86.58	0.0	71.8	1092.88	-2.6	0.2	3.5	0.0		13.7
GT Building Ventilation 3	86.6	86.58	0.0	71.6	1076.54	-2.6	0.4	3.7	0.0		13.5
GT Building Ventilation 4	86.6	86.58	0.0	71.6	1077.63	-2.6	0.4	3.7	0.0		13.5
GT Building Ventilation 5	86.6	86.58	0.0	71.8	1095.08	-2.6	0.2	3.5	0.0		13.7
GT Building Ventilation 6	86.6	86.58	0.0	71.9	1115.38	-2.6	0.1	3.5	0.0		13.6
Gas Metering Station	88.6	88.60	0.0	69.8	874.70	-2.3		7.5	0.0		13.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL dB(A)	PWL/unit dB(A)	Non-Sphere dB	Spreading dB	Distance m	Grnd.Effct dB	Ins. dB	Air dB	Directivity dB	Mitigation dB	SPL dB(A)
Gas Preheater Building Facade 2	72.4	53.95	3.0	72.2	1142.34	-2.2	10.0	0.2	0.0		-4.8
Gas Preheater Building Facade 3	74.0	53.95	3.0	72.2	1147.36	-2.2	14.4	0.3	0.0		-7.8
Gas Preheater Building Facade 4	72.3	53.95	3.0	72.1	1140.97	-2.2	15.5	0.4	0.0		-10.5
Gas Preheater Building Roof	76.7	53.95	0.0	72.2	1141.58	-2.3	13.3	0.3	0.0		-6.7
Gas Turbine Building Facade 1	81.9	47.71	3.0	71.8	1092.20	-2.1	12.3	1.3	0.0		1.7
Gas Turbine Building Facade 2	76.7	47.71	3.0	72.1	1132.38	-2.1	16.2	0.7	0.0		-7.2
Gas Turbine Building Facade 3	81.9	47.71	3.0	71.8	1090.87	-2.1	1.5	1.3	0.0		12.4
Gas Turbine Building Facade 4	76.6	47.71	3.0	71.4	1051.74	-2.1	15.5	0.7	0.0		-5.9
Gas Turbine Building Roof	80.6	47.71	0.0	71.8	1091.49	-2.5	1.4	1.8	0.0		8.2
Gas Turbine Transformer 1	93.6	93.59	0.0	71.9	1103.37	-1.9		3.5	0.0		20.1
Gas Turbine Transformer 2	93.6	93.59	0.0	71.5	1065.31	-1.9		3.4	0.0		20.5
HRSG Building Facade 1	81.9	48.42	3.0	71.8	1095.85	-2.2	7.3	0.3	0.0		7.7
HRSG Building Facade 2	79.4	48.42	3.0	72.1	1134.55	-2.2	14.2	0.3	0.0		-2.0
HRSG Building Facade 3	81.9	48.42	3.0	71.8	1092.34	-2.2	13.0	0.2	0.0		2.2
HRSG Building Facade 4	79.4	48.42	3.0	71.5	1054.15	-2.3	5.9	0.8	0.0		6.5
HRSG Building Roof	84.1	48.42	0.0	71.8	1093.70	-2.5	4.5	1.0	0.0		9.3
HRSG Building Ventilation 1	86.6	86.58	0.0	72.0	1116.46	-2.5	6.9	2.1	0.0		8.1
HRSG Building Ventilation 2	86.6	86.58	0.0	71.8	1093.99	-2.5	8.4	1.8	0.0		7.2
HRSG Building Ventilation 3	86.6	86.58	0.0	71.7	1078.50	-2.5	9.7	1.6	0.0		6.1
HRSG Building Ventilation 4	86.6	86.58	0.0	71.7	1079.75	-2.5	0.0	3.3	0.0		14.1
HRSG Building Ventilation 5	86.6	86.58	0.0	71.8	1094.75	-2.5	0.0	3.4	0.0		13.9
HRSG Building Ventilation 6	86.6	86.58	0.0	72.0	1117.63	-2.5	0.0	3.4	0.0		13.6
HRSG Stack Exhaust 1	102.1	102.10	0.0	72.0	1120.00	-2.9	0.0	2.2	7.5		23.3
HRSG Stack Exhaust 2	102.1	102.10	0.0	71.7	1082.22	-3.0		2.1	7.5		23.8
HRSG Stack Facade 1-1	76.0	53.42	3.0	72.0	1117.71	-2.1	1.5	0.8	0.0		6.9
HRSG Stack Facade 1-2	76.0	53.58	3.0	72.0	1115.83	-2.1	1.6	0.8	0.0		6.7
HRSG Stack Facade 1-3	76.0	53.38	3.0	72.0	1116.15	-2.1	6.5	0.8	0.0		1.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	72.0	1118.43	-2.1	6.0	0.8	0.0		2.4
HRSG Stack Facade 1-5	76.0	52.94	3.0	72.0	1121.54	-2.1	10.3	0.7	0.0		-1.9
HRSG Stack Facade 1-6	76.0	53.52	3.0	72.0	1123.43	-2.1	14.2	0.7	0.0		-5.8
HRSG Stack Facade 1-7	76.0	53.27	3.0	72.0	1123.07	-2.1	13.4	0.7	0.0		-5.0
HRSG Stack Facade 1-8	76.0	53.35	3.0	72.0	1120.76	-2.1	7.5	0.8	0.0		0.9
HRSG Stack Facade 2-1	76.0	53.51	3.0	71.7	1077.99	-2.2	0.2	0.8	0.0		8.5
HRSG Stack Facade 2-2	76.0	53.31	3.0	71.7	1078.33	-2.2	0.0	0.8	0.0		8.7
HRSG Stack Facade 3-2	76.0	53.44	3.0	71.7	1080.58	-2.2	0.2	0.8	0.0		8.5
HRSG Stack Facade 4-2	76.0	52.85	3.0	71.7	1083.72	-2.1	8.2	0.7	0.0		0.5
HRSG Stack Facade 5-2	76.0	53.63	3.0	71.7	1085.72	-2.1	13.0	0.7	0.0		-4.2
HRSG Stack Facade 6-2	76.0	53.14	3.0	71.7	1085.22	-2.1	13.1	0.7	0.0		-4.4
HRSG Stack Facade 7-2	76.0	53.49	3.0	71.7	1082.84	-2.1	7.8	0.8	0.0		0.9
HRSG Stack Facade 8-2	76.0	53.40	3.0	71.7	1079.86	-2.2	1.3	0.8	0.0		7.4
ST Building Ventilation 1	86.6	86.58	0.0	71.4	1045.52	-2.6	0.2	3.4	0.0		14.2
ST Building Ventilation 2	86.6	86.58	0.0	71.2	1019.51	-2.6	0.1	3.3	0.0		14.6
ST Building Ventilation 3	86.6	86.58	0.0	71.2	1019.92	-2.6	0.1	3.3	0.0		14.6
ST Building Ventilation 4	86.6	86.58	0.0	71.4	1045.96	-2.6	0.2	3.4	0.0		14.2
ST Building Ventilation 5	86.6	86.58	0.0	71.3	1032.67	-2.6	0.3	3.5	0.0		14.2
Steam Turbine Building Facade 1	89.7	58.31	3.0	71.3	1031.90	-2.1	6.7	0.5	0.0		16.4
Steam Turbine Building Facade 2	89.3	58.31	3.0	71.4	1051.88	-2.1	15.8	0.4	0.0		7.8
Steam Turbine Building Facade 3	89.7	58.31	3.0	71.3	1029.55	-2.1		0.7	0.0		22.9
Steam Turbine Building Facade 4	89.4	58.31	3.0	71.1	1009.55	-2.2	0.2	0.6	0.0		22.7
Steam Turbine Building Roof	90.6	58.31	0.0	71.3	1030.49	-2.5	3.1	0.9	0.0		19.1
Steam Turbine Transformer	93.6	93.59	0.0	71.3	1038.50	-1.9		3.4	0.0		23.0
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	71.9	1115.25	-2.6	0.2	3.9	7.1		13.5
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	71.6	1077.25	-2.6	0.5	4.1	7.5		12.8
WSAC	94.9	71.52	0.0	71.1	1014.42	-2.0		4.3	0.0		21.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1. Floor	Name: Wolcottown Road - East			Daytime level 42.4		dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	65.0	501.85	-3.0	0.0	2.3	0.0		37.3
Air Intake 1	90.7	69.65	3.0	64.7	483.78	-2.7	18.9	1.1	0.0		11.7
Air Intake 2	90.7	69.65	3.0	64.6	479.30	-2.7	18.9	1.1	0.0		11.8
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	64.2	458.51	-3.0	5.7	0.8	6.4		18.7
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	64.1	452.97	-3.0	6.2	0.7	6.3		18.5
GT Building Ventilation 1	86.6	86.58	0.0	64.5	470.69	-3.0	0.9	2.2	0.0		22.1
GT Building Ventilation 2	86.6	86.58	0.0	64.4	466.68	-3.0	0.9	2.2	0.0		22.1
GT Building Ventilation 3	86.6	86.58	0.0	64.3	464.56	-3.0	0.9	2.2	0.0		22.2
GT Building Ventilation 4	86.6	86.58	0.0	64.0	447.39	-3.0	0.1	1.8	0.0		23.6
GT Building Ventilation 5	86.6	86.58	0.0	64.1	450.18	-3.0	0.2	1.9	0.0		23.4
GT Building Ventilation 6	86.6	86.58	0.0	64.1	452.73	-3.0	0.1	1.9	0.0		23.5
Gas Metering Station	88.6	88.60	0.0	65.1	507.33	-2.4		5.0	0.0		20.9
Gas Preheater Building Facade 2	72.4	53.95	3.0	63.2	408.49	-2.7		0.7	0.0		14.1
Gas Preheater Building Facade 3	74.0	53.95	3.0	63.4	417.87	-2.6	6.1	0.1	0.0		10.0
Gas Preheater Building Facade 4	72.3	53.95	3.0	63.6	424.62	-2.6	9.1	0.1	0.0		5.2
Gas Preheater Building Roof	76.7	53.95	0.0	63.4	416.49	-2.7	3.3	1.3	0.0		11.4
Gas Turbine Building Facade 1	81.9	47.71	3.0	64.0	445.99	-2.7	8.1	0.7	0.0		14.7
Gas Turbine Building Facade 2	76.7	47.71	3.0	64.3	464.04	-2.6	12.6	0.3	0.0		5.1
Gas Turbine Building Facade 3	81.9	47.71	3.0	64.4	470.22	-2.6	17.6	0.4	0.0		5.0
Gas Turbine Building Facade 4	76.6	47.71	3.0	64.2	454.56	-2.6	6.2	0.5	0.0		11.4
Gas Turbine Building Roof	80.6	47.71	0.0	64.2	458.61	-3.0	6.6	0.6	0.0		12.3
Gas Turbine Transformer 1	93.6	93.59	0.0	64.9	495.56	-2.2	19.5	1.9	0.0		9.4
Gas Turbine Transformer 2	93.6	93.59	0.0	64.8	492.11	-2.2	18.9	1.6	0.0		10.4
HRSG Building Facade 1	81.9	48.42	3.0	63.1	400.63	-2.8	1.0	0.4	0.0		23.3
HRSG Building Facade 2	79.4	48.42	3.0	63.7	429.21	-2.7	8.2	0.1	0.0		13.2
HRSG Building Facade 3	81.9	48.42	3.0	64.0	445.71	-2.7	15.6	0.2	0.0		9.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	79.4	48.42	3.0	63.4	419.03	-2.8	1.0	0.4	0.0		20.7
HRSG Building Roof	84.1	48.42	0.0	63.5	423.28	-3.0	6.2	0.4	0.0		19.0
HRSG Building Ventilation 1	86.6	86.58	0.0	63.8	434.90	-3.0	0.3	1.9	0.0		26.0
HRSG Building Ventilation 2	86.6	86.58	0.0	63.7	430.33	-3.0	0.3	1.9	0.0		26.1
HRSG Building Ventilation 3	86.6	86.58	0.0	63.7	429.80	-3.0	6.1	1.2	0.0		23.9
HRSG Building Ventilation 4	86.6	86.58	0.0	63.3	414.45	-3.0	10.0	0.8	0.0		22.7
HRSG Building Ventilation 5	86.6	86.58	0.0	63.4	415.44	-3.0	0.1	1.7	0.0		26.3
HRSG Building Ventilation 6	86.6	86.58	0.0	63.5	420.19	-3.0	5.4	1.4	0.0		23.7
HRSG Stack Exhaust 1	102.1	102.10	0.0	63.1	403.87	-3.0		0.8	7.9		33.2
HRSG Stack Exhaust 2	102.1	102.10	0.0	63.0	398.63	-3.0		0.8	7.9		33.4
HRSG Stack Facade 1-1	76.0	53.42	3.0	63.1	403.65	-2.8	11.6	0.3	0.0		12.7
HRSG Stack Facade 1-2	76.0	53.58	3.0	63.1	401.32	-2.8	5.4	0.3	0.0		15.0
HRSG Stack Facade 1-3	76.0	53.38	3.0	63.0	398.29	-2.9		0.3	0.0		18.7
HRSG Stack Facade 1-4	76.0	53.29	3.0	63.0	396.57	-2.9		0.3	0.0		18.7
HRSG Stack Facade 1-5	76.0	52.94	3.0	63.0	397.20	-2.9		0.3	0.0		18.7
HRSG Stack Facade 1-6	76.0	53.52	3.0	63.0	399.77	-2.9		0.3	0.0		18.6
HRSG Stack Facade 1-7	76.0	53.27	3.0	63.1	402.91	-2.8	8.2	0.3	0.0		13.8
HRSG Stack Facade 1-8	76.0	53.35	3.0	63.1	404.34	-2.9	13.5	0.3	0.0		6.8
HRSG Stack Facade 2-1	76.0	53.51	3.0	63.0	396.19	-2.8	6.1	0.3	0.0		17.1
HRSG Stack Facade 2-2	76.0	53.31	3.0	62.9	393.07	-2.9		0.3	0.0		18.8
HRSG Stack Facade 3-2	76.0	53.44	3.0	62.8	391.12	-2.9		0.3	0.0		18.8
HRSG Stack Facade 4-2	76.0	52.85	3.0	62.9	391.55	-2.9		0.3	0.0		18.8
HRSG Stack Facade 5-2	76.0	53.63	3.0	62.9	393.87	-2.9		0.3	0.0		18.8
HRSG Stack Facade 6-2	76.0	53.14	3.0	63.0	396.97	-2.8	8.1	0.3	0.0		14.2
HRSG Stack Facade 7-2	76.0	53.49	3.0	63.0	398.73	-2.9	13.3	0.3	0.0		12.4
HRSG Stack Facade 8-2	76.0	53.40	3.0	63.0	398.37	-2.8	12.1	0.3	0.0		12.6
ST Building Ventilation 1	86.6	86.58	0.0	64.3	460.69	-3.0	0.5	2.0	0.0		22.8

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	64.3	460.53	-3.0	0.5	2.0	0.0		22.9
ST Building Ventilation 3	86.6	86.58	0.0	64.0	448.36	-3.0	0.7	2.1	0.0		22.8
ST Building Ventilation 4	86.6	86.58	0.0	64.0	447.81	-3.0	0.7	2.1	0.0		22.8
ST Building Ventilation 5	86.6	86.58	0.0	64.2	454.91	-3.0	0.5	2.0	0.0		23.0
Steam Turbine Building Facade 1	89.7	58.31	3.0	63.6	427.34	-2.7	2.0	0.3	0.0		29.5
Steam Turbine Building Facade 2	89.3	58.31	3.0	64.0	446.79	-2.7	5.1	0.3	0.0		25.7
Steam Turbine Building Facade 3	89.7	58.31	3.0	64.4	466.90	-2.6	15.7	0.2	0.0		15.0
Steam Turbine Building Facade 4	89.4	58.31	3.0	64.0	447.62	-2.7	5.6	0.2	0.0		25.3
Steam Turbine Building Roof	90.6	58.31	0.0	64.0	447.49	-3.0	5.3	0.3	0.0		24.0
Steam Turbine Transformer	93.6	93.59	0.0	64.5	474.65	-2.2	19.1	1.7	0.0		10.5
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	64.2	455.00	-3.0	0.6	2.4	8.3		21.5
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	64.1	450.12	-3.0	0.6	2.4	8.3		21.6
WSAC	94.9	71.52	0.0	64.7	486.69	-2.3	16.7	1.5	0.0		14.3
Floor 2. Floor Name Dolsontown Road - East Daytime level 42.5 dB(A)											
Air Cooled Condenser	101.7	64.64	0.0	65.0	501.72	-3.0		2.3	0.0		37.3
Air Intake 1	90.7	69.65	3.0	64.7	483.70	-2.8	18.9	1.1	0.0		11.8
Air Intake 2	90.7	69.65	3.0	64.6	479.21	-2.8	18.9	1.1	0.0		11.8
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	64.2	458.31	-3.1	5.7	0.8	6.4		18.7
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	64.1	452.77	-3.1	6.1	0.7	6.3		18.6
GT Building Ventilation 1	86.6	86.58	0.0	64.5	470.49	-3.0	0.8	2.2	0.0		22.2
GT Building Ventilation 2	86.6	86.58	0.0	64.4	466.48	-3.1	0.8	2.2	0.0		22.3
GT Building Ventilation 3	86.6	86.58	0.0	64.3	464.37	-3.1	0.8	2.2	0.0		22.3
GT Building Ventilation 4	86.6	86.58	0.0	64.0	447.19	-3.1	0.1	1.8	0.0		23.7
GT Building Ventilation 5	86.6	86.58	0.0	64.1	449.97	-3.1	0.2	1.9	0.0		23.5
GT Building Ventilation 6	86.6	86.58	0.0	64.1	452.53	-3.1	0.1	1.9	0.0		23.5
Gas Metering Station	88.6	88.60	0.0	65.1	507.32	-2.5		4.9	0.0		21.0

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	72.4	53.95	3.0	63.2	408.50	-2.7		0.7	0.0		14.2
Gas Preheater Building Facade 3	74.0	53.95	3.0	63.4	417.88	-2.7	5.9	0.1	0.0		10.3
Gas Preheater Building Facade 4	72.3	53.95	3.0	63.6	424.63	-2.7	9.0	0.1	0.0		5.4
Gas Preheater Building Roof	76.7	53.95	0.0	63.4	416.48	-2.8	3.2	1.4	0.0		11.5
Gas Turbine Building Facade 1	81.9	47.71	3.0	64.0	445.89	-2.8	8.0	0.7	0.0		14.9
Gas Turbine Building Facade 2	76.7	47.71	3.0	64.3	463.95	-2.7	12.1	0.3	0.0		5.7
Gas Turbine Building Facade 3	81.9	47.71	3.0	64.4	470.13	-2.7	17.6	0.4	0.0		5.1
Gas Turbine Building Facade 4	76.6	47.71	3.0	64.1	454.46	-2.7	6.1	0.5	0.0		11.5
Gas Turbine Building Roof	80.6	47.71	0.0	64.2	458.44	-3.1	6.3	0.6	0.0		12.5
Gas Turbine Transformer 1	93.6	93.59	0.0	64.9	495.51	-2.4	19.5	1.9	0.0		9.6
Gas Turbine Transformer 2	93.6	93.59	0.0	64.8	492.07	-2.4	18.9	1.6	0.0		10.5
HRSG Building Facade 1	81.9	48.42	3.0	63.1	400.55	-2.8	1.0	0.4	0.0		23.3
HRSG Building Facade 2	79.4	48.42	3.0	63.7	429.08	-2.8	8.2	0.1	0.0		13.1
HRSG Building Facade 3	81.9	48.42	3.0	64.0	445.65	-2.8	15.6	0.2	0.0		10.1
HRSG Building Facade 4	79.4	48.42	3.0	63.4	418.97	-2.8	0.8	0.4	0.0		20.9
HRSG Building Roof	84.1	48.42	0.0	63.5	423.14	-3.0	5.7	0.7	0.0		19.5
HRSG Building Ventilation 1	86.6	86.58	0.0	63.8	434.73	-3.0	0.2	1.9	0.0		26.1
HRSG Building Ventilation 2	86.6	86.58	0.0	63.7	430.15	-3.0	0.2	1.8	0.0		26.2
HRSG Building Ventilation 3	86.6	86.58	0.0	63.7	429.62	-3.0	6.1	1.2	0.0		23.9
HRSG Building Ventilation 4	86.6	86.58	0.0	63.3	414.26	-3.1	10.0	0.8	0.0		22.9
HRSG Building Ventilation 5	86.6	86.58	0.0	63.4	415.25	-3.1	0.0	1.7	0.0		26.4
HRSG Building Ventilation 6	86.6	86.58	0.0	63.5	420.00	-3.0	5.4	1.4	0.0		23.8
HRSG Stack Exhaust 1	102.1	102.10	0.0	63.1	403.46	-3.0		0.8	7.9		33.3
HRSG Stack Exhaust 2	102.1	102.10	0.0	63.0	398.21	-3.0		0.8	7.9		33.4
HRSG Stack Facade 1-1	76.0	53.42	3.0	63.1	403.47	-2.9	11.6	0.3	0.0		12.7
HRSG Stack Facade 1-2	76.0	53.58	3.0	63.1	401.15	-2.9	5.4	0.3	0.0		14.4
HRSG Stack Facade 1-3	76.0	53.38	3.0	63.0	398.11	-3.0		0.3	0.0		18.7

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	63.0	396.39	-3.0		0.3	0.0		18.7
HRSG Stack Facade 1-5	76.0	52.94	3.0	63.0	397.02	-3.0		0.3	0.0		18.7
HRSG Stack Facade 1-6	76.0	53.52	3.0	63.0	399.59	-3.0		0.3	0.0		18.7
HRSG Stack Facade 1-7	76.0	53.27	3.0	63.1	402.70	-2.9	8.2	0.3	0.0		13.9
HRSG Stack Facade 1-8	76.0	53.35	3.0	63.1	404.17	-2.9	13.5	0.3	0.0		6.8
HRSG Stack Facade 2-1	76.0	53.51	3.0	63.0	396.01	-2.9	6.1	0.3	0.0		17.2
HRSG Stack Facade 2-2	76.0	53.31	3.0	62.9	392.89	-3.0		0.3	0.0		18.8
HRSG Stack Facade 3-2	76.0	53.44	3.0	62.8	390.94	-3.0		0.3	0.0		18.9
HRSG Stack Facade 4-2	76.0	52.85	3.0	62.9	391.37	-3.0		0.3	0.0		18.8
HRSG Stack Facade 5-2	76.0	53.63	3.0	62.9	393.69	-3.0		0.3	0.0		18.8
HRSG Stack Facade 6-2	76.0	53.14	3.0	63.0	396.78	-2.9	8.1	0.3	0.0		14.3
HRSG Stack Facade 7-2	76.0	53.49	3.0	63.0	398.56	-2.9	13.4	0.3	0.0		12.4
HRSG Stack Facade 8-2	76.0	53.40	3.0	63.0	398.20	-2.9	12.1	0.3	0.0		12.7
ST Building Ventilation 1	86.6	86.58	0.0	64.3	460.50	-3.1	0.4	2.0	0.0		22.9
ST Building Ventilation 2	86.6	86.58	0.0	64.3	460.33	-3.1	0.4	2.0	0.0		22.9
ST Building Ventilation 3	86.6	86.58	0.0	64.0	448.15	-3.1	0.7	2.1	0.0		22.8
ST Building Ventilation 4	86.6	86.58	0.0	64.0	447.60	-3.1	0.7	2.1	0.0		22.8
ST Building Ventilation 5	86.6	86.58	0.0	64.2	454.71	-3.1	0.5	2.0	0.0		23.0
Steam Turbine Building Facade 1	89.7	58.31	3.0	63.6	427.24	-2.8	2.0	0.3	0.0		29.6
Steam Turbine Building Facade 2	89.3	58.31	3.0	64.0	446.66	-2.8	5.3	0.3	0.0		25.5
Steam Turbine Building Facade 3	89.7	58.31	3.0	64.4	466.81	-2.7	15.7	0.2	0.0		15.1
Steam Turbine Building Facade 4	89.4	58.31	3.0	64.0	447.53	-2.8	5.6	0.2	0.0		25.3
Steam Turbine Building Roof	90.6	58.31	0.0	64.0	447.32	-3.1	5.0	0.3	0.0		24.3
Steam Turbine Transformer	93.6	93.59	0.0	64.5	474.61	-2.4	19.1	1.7	0.0		10.6
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	64.2	454.79	-3.1	0.6	2.4	8.2		21.7
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	64.1	449.92	-3.1	0.6	2.4	8.3		21.8
WSAC	94.9	71.52	0.0	64.7	486.67	-2.4	16.6	1.4	0.0		14.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1.Floor Name: Dolsontown Road South			Daytime Level: 45.3 [illegible] dB(A)								
Air Cooled Condenser	101.7	64.64	0.0	62.8	388.44	-3.0	14.8	0.6	0.0		26.5
Air Intake 1	90.7	69.65	3.0	58.3	231.44	-3.0	13.1	0.3	0.0		25.1
Air Intake 2	90.7	69.65	3.0	59.4	263.52	-3.0	17.0	0.5	0.0		19.8
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	57.5	210.84	-3.0	2.9	0.9	8.3		26.2
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	58.8	244.10	-3.0	4.9	0.7	7.4		24.1
GT Building Ventilation 1	86.6	86.58	0.0	58.0	224.85	-3.0	7.7	0.6	0.0		23.2
GT Building Ventilation 2	86.6	86.58	0.0	58.7	243.00	-3.0	11.1	0.5	0.0		19.3
GT Building Ventilation 3	86.6	86.58	0.0	59.2	257.06	-3.0	10.7	0.5	0.0		19.2
GT Building Ventilation 4	86.6	86.58	0.0	58.9	249.32	-3.0	1.6	1.6	0.0		27.5
GT Building Ventilation 5	86.6	86.58	0.0	58.4	233.96	-3.0	1.8	1.6	0.0		27.8
GT Building Ventilation 6	86.6	86.58	0.0	57.7	215.85	-3.0	1.9	1.6	0.0		28.4
Gas Metering Station	88.6	88.60	0.0	64.0	449.21	-2.4	20.0	4.5	0.0		2.5
Gas Preheater Building Facade 2	72.4	53.95	3.0	55.8	173.29	-2.9		0.5	0.0		22.0
Gas Preheater Building Facade 3	74.0	53.95	3.0	55.6	170.67	-2.9		0.5	0.0		23.9
Gas Preheater Building Facade 4	72.3	53.95	3.0	56.1	178.97	-2.9	6.1	0.0	0.0		16.9
Gas Preheater Building Roof	76.7	53.95	0.0	55.9	175.91	-3.0	3.1	0.8	0.0		21.8
Gas Turbine Building Facade 1	81.9	47.71	3.0	58.3	230.83	-2.9	7.4	0.4	0.0		21.7
Gas Turbine Building Facade 2	76.7	47.71	3.0	57.2	204.00	-3.0		0.4	0.0		25.1
Gas Turbine Building Facade 3	81.9	47.71	3.0	58.7	242.60	-2.9	15.2	0.2	0.0		14.3
Gas Turbine Building Facade 4	76.6	47.71	3.0	59.8	275.19	-2.9	18.1	0.3	0.0		4.3
Gas Turbine Building Roof	80.6	47.71	0.0	58.5	237.55	-3.0	7.2	0.2	0.0		17.7
Gas Turbine Transformer 1	93.6	93.59	0.0	58.9	247.70	-2.6	10.4	0.4	0.0		26.5
Gas Turbine Transformer 2	93.6	93.59	0.0	59.9	279.24	-2.5	18.6	1.1	0.0		16.6
HRSG Building Facade 1	81.9	48.42	3.0	57.6	214.50	-3.0	3.4	0.2	0.0		26.8
HRSG Building Facade 2	79.4	48.42	3.0	56.4	187.21	-3.0	0.3	0.2	0.0		28.3
HRSG Building Facade 3	81.9	48.42	3.0	58.3	230.49	-2.9	14.1	0.1	0.0		17.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL dB(A)	PWL/unit dB(A)	Non-Sphere dB	Spreading dB	Distance m	Grnd.Effct dB	Ins. dB	Air dB	Directivity dB	Mitigation dB	SPL dB(A)
HRSG Building Facade 4	79.4	48.42	3.0	59.4	262.94	-2.9	17.1	0.1	0.0		9.3
HRSG Building Roof	84.1	48.42	0.0	58.0	222.75	-3.0	7.2	0.1	0.0		22.9
HRSG Building Ventilation 1	86.6	86.58	0.0	57.3	207.38	-3.0	0.4	1.2	0.0		30.7
HRSG Building Ventilation 2	86.6	86.58	0.0	58.1	227.66	-3.0	0.6	1.3	0.0		31.9
HRSG Building Ventilation 3	86.6	86.58	0.0	58.7	242.43	-3.0	2.9	1.8	0.0		29.0
HRSG Building Ventilation 4	86.6	86.58	0.0	58.5	237.50	-3.0	1.1	1.5	0.0		30.5
HRSG Building Ventilation 5	86.6	86.58	0.0	58.0	223.06	-3.0	0.7	1.3	0.0		29.6
HRSG Building Ventilation 6	86.6	86.58	0.0	57.1	201.76	-3.0	0.4	1.1	0.0		30.9
HRSG Stack Exhaust 1	102.1	102.10	0.0	57.1	202.33	-3.0		0.4	8.1		39.5
HRSG Stack Exhaust 2	102.1	102.10	0.0	58.5	238.14	-3.0		0.5	8.1		38.0
HRSG Stack Facade 1-1	76.0	53.42	3.0	57.0	198.48	-3.0	8.9	0.1	0.0		16.1
HRSG Stack Facade 1-2	76.0	53.58	3.0	57.0	199.86	-3.0	13.4	0.1	0.0		11.5
HRSG Stack Facade 1-3	76.0	53.38	3.0	57.0	199.32	-3.0	11.0	0.1	0.0		13.8
HRSG Stack Facade 1-4	76.0	53.29	3.0	56.9	196.71	-3.0	5.3	0.1	0.0		19.6
HRSG Stack Facade 1-5	76.0	52.94	3.0	56.7	193.40	-3.0		0.1	0.0		25.2
HRSG Stack Facade 1-6	76.0	53.52	3.0	56.7	191.89	-3.0		0.1	0.0		25.2
HRSG Stack Facade 1-7	76.0	53.27	3.0	56.7	192.74	-3.0		0.1	0.0		26.5
HRSG Stack Facade 1-8	76.0	53.35	3.0	56.8	195.56	-3.0	4.7	0.1	0.0		21.7
HRSG Stack Facade 2-1	76.0	53.51	3.0	58.5	236.61	-3.0	13.4	0.2	0.0		10.0
HRSG Stack Facade 2-2	76.0	53.31	3.0	58.5	236.12	-2.9	11.5	0.2	0.0		11.9
HRSG Stack Facade 3-2	76.0	53.44	3.0	58.4	233.64	-2.9	5.3	0.2	0.0		18.1
HRSG Stack Facade 4-2	76.0	52.85	3.0	58.2	230.32	-3.0		0.2	0.0		23.6
HRSG Stack Facade 5-2	76.0	53.63	3.0	58.2	228.68	-3.0		0.2	0.0		23.7
HRSG Stack Facade 6-2	76.0	53.14	3.0	58.2	229.40	-3.0		0.2	0.0		23.6
HRSG Stack Facade 7-2	76.0	53.49	3.0	58.3	231.97	-3.0		0.2	0.0		23.6
HRSG Stack Facade 8-2	76.0	53.40	3.0	58.4	235.17	-2.9	8.2	0.2	0.0		15.1
ST Building Ventilation 1	86.6	86.58	0.0	60.1	283.89	-3.0	9.4	0.6	0.0		19.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	60.8	307.54	-3.0	8.7	0.7	0.0		19.3
ST Building Ventilation 3	86.6	86.58	0.0	60.6	303.35	-3.0	2.8	2.1	0.0		24.1
ST Building Ventilation 4	86.6	86.58	0.0	59.9	279.05	-3.0	1.3	1.7	0.0		26.7
ST Building Ventilation 5	86.6	86.58	0.0	60.4	293.63	-3.0	6.9	0.9	0.0		21.4
Steam Turbine Building Facade 1	89.7	58.31	3.0	60.1	285.04	-2.9	11.4	0.2	0.0		23.9
Steam Turbine Building Facade 2	89.3	58.31	3.0	59.7	272.55	-2.9	14.1	0.2	0.0		21.5
Steam Turbine Building Facade 3	89.7	58.31	3.0	60.5	299.27	-2.9	17.3	0.1	0.0		17.6
Steam Turbine Building Facade 4	89.4	58.31	3.0	60.9	312.16	-2.9	17.2	0.1	0.0		17.1
Steam Turbine Building Roof	90.6	58.31	0.0	60.3	292.68	-3.0	6.6	0.2	0.0		26.5
Steam Turbine Transformer	93.6	93.59	0.0	60.4	294.84	-2.5	19.6	1.4	0.0		14.7
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	57.7	216.95	-3.0	2.0	1.9	9.1		26.3
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	59.0	250.67	-3.0	1.6	2.0	9.0		25.3
WSAC	94.9	71.52	0.0	61.1	321.31	-2.5	19.8	2.2	0.0		14.3
Floor 2. Floor Name: Dolsontown Road - South Daytime Level 45.6 dB(A)											
Air Cooled Condenser	101.7	64.64	0.0	62.8	388.07	-3.0	14.5	0.6	0.0		26.9
Air Intake 1	90.7	69.65	3.0	58.3	231.33	-3.0	13.0	0.3	0.0		25.1
Air Intake 2	90.7	69.65	3.0	59.4	263.41	-3.0	17.0	0.5	0.0		19.8
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	57.5	210.48	-3.0	2.3	0.9	8.5		26.6
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	58.7	243.79	-3.0	2.6	1.0	8.4		25.1
GT Building Ventilation 1	86.6	86.58	0.0	58.0	224.51	-3.0	6.4	0.8	0.0		24.4
GT Building Ventilation 2	86.6	86.58	0.0	58.7	242.69	-3.0	10.0	0.5	0.0		20.3
GT Building Ventilation 3	86.6	86.58	0.0	59.2	256.77	-3.0	9.5	0.6	0.0		20.3
GT Building Ventilation 4	86.6	86.58	0.0	58.9	249.02	-3.0	1.1	1.5	0.0		28.0
GT Building Ventilation 5	86.6	86.58	0.0	58.4	233.63	-3.0	1.7	1.6	0.0		27.9
GT Building Ventilation 6	86.6	86.58	0.0	57.7	215.50	-3.0	1.7	1.5	0.0		28.7
Gas Metering Station	88.6	88.60	0.0	64.0	449.24	-2.5	20.0	4.5	0.0		2.6

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	72.4	53.95	3.0	55.8	173.41	-2.9		0.5	0.0		22.1
Gas Preheater Building Facade 3	74.0	53.95	3.0	55.6	170.79	-2.9		0.5	0.0		24.0
Gas Preheater Building Facade 4	72.3	53.95	3.0	56.1	179.08	-2.9	6.1	0.0	0.0		16.9
Gas Preheater Building Roof	76.7	53.95	0.0	55.9	175.97	-3.0	3.0	0.8	0.0		22.0
Gas Turbine Building Facade 1	81.9	47.71	3.0	58.3	230.70	-3.0	7.0	0.4	0.0		22.1
Gas Turbine Building Facade 2	76.7	47.71	3.0	57.2	203.87	-3.0		0.4	0.0		25.1
Gas Turbine Building Facade 3	81.9	47.71	3.0	58.7	242.49	-3.0	15.2	0.2	0.0		14.4
Gas Turbine Building Facade 4	76.6	47.71	3.0	59.8	275.09	-2.9	18.1	0.3	0.0		4.4
Gas Turbine Building Roof	80.6	47.71	0.0	58.5	237.24	-3.0	6.9	0.2	0.0		18.0
Gas Turbine Transformer 1	93.6	93.59	0.0	58.9	247.67	-2.8	10.1	0.4	0.0		27.0
Gas Turbine Transformer 2	93.6	93.59	0.0	59.9	279.22	-2.7	18.6	1.0	0.0		16.7
HRSG Building Facade 1	81.9	48.42	3.0	57.6	214.43	-3.0	3.4	0.2	0.0		26.8
HRSG Building Facade 2	79.4	48.42	3.0	56.4	187.13	-3.0	0.3	0.2	0.0		28.4
HRSG Building Facade 3	81.9	48.42	3.0	58.3	230.42	-3.0	14.1	0.1	0.0		17.2
HRSG Building Facade 4	79.4	48.42	3.0	59.4	262.89	-3.0	17.1	0.1	0.0		9.4
HRSG Building Roof	84.1	48.42	0.0	57.9	222.50	-3.0	6.8	0.1	0.0		23.4
HRSG Building Ventilation 1	86.6	86.58	0.0	57.3	207.09	-3.0	0.3	1.1	0.0		30.8
HRSG Building Ventilation 2	86.6	86.58	0.0	58.1	227.39	-3.0	0.4	1.2	0.0		32.1
HRSG Building Ventilation 3	86.6	86.58	0.0	58.7	242.18	-3.0	0.5	1.3	0.0		31.5
HRSG Building Ventilation 4	86.6	86.58	0.0	58.5	237.25	-3.0	0.4	1.3	0.0		31.5
HRSG Building Ventilation 5	86.6	86.58	0.0	58.0	222.79	-3.0	0.4	1.2	0.0		30.0
HRSG Building Ventilation 6	86.6	86.58	0.0	57.1	201.45	-3.0	0.3	1.1	0.0		31.1
HRSG Stack Exhaust 1	102.1	102.10	0.0	57.1	201.58	-3.0		0.4	8.1		39.5
HRSG Stack Exhaust 2	102.1	102.10	0.0	58.5	237.50	-3.0		0.5	8.1		38.0
HRSG Stack Facade 1-1	76.0	53.42	3.0	56.9	198.21	-3.0	8.7	0.1	0.0		16.3
HRSG Stack Facade 1-2	76.0	53.58	3.0	57.0	199.62	-3.0	13.4	0.1	0.0		11.5
HRSG Stack Facade 1-3	76.0	53.38	3.0	57.0	199.04	-3.0	11.0	0.1	0.0		13.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	56.9	196.53	-3.0	5.3	0.1	0.0		19.7
HRSG Stack Facade 1-5	76.0	52.94	3.0	56.7	193.11	-3.0		0.1	0.0		25.2
HRSG Stack Facade 1-6	76.0	53.52	3.0	56.6	191.60	-3.0		0.1	0.0		25.2
HRSG Stack Facade 1-7	76.0	53.27	3.0	56.7	192.45	-3.0		0.1	0.0		26.6
HRSG Stack Facade 1-8	76.0	53.35	3.0	56.8	195.31	-3.0	4.7	0.1	0.0		21.8
HRSG Stack Facade 2-1	76.0	53.51	3.0	58.5	236.38	-3.0	13.4	0.2	0.0		10.0
HRSG Stack Facade 2-2	76.0	53.31	3.0	58.5	235.92	-3.0	11.2	0.2	0.0		12.1
HRSG Stack Facade 3-2	76.0	53.44	3.0	58.4	233.45	-3.0	5.3	0.2	0.0		18.2
HRSG Stack Facade 4-2	76.0	52.85	3.0	58.2	230.08	-3.0		0.2	0.0		23.6
HRSG Stack Facade 5-2	76.0	53.63	3.0	58.2	228.44	-3.0		0.2	0.0		23.7
HRSG Stack Facade 6-2	76.0	53.14	3.0	58.2	229.15	-3.0		0.2	0.0		23.7
HRSG Stack Facade 7-2	76.0	53.49	3.0	58.3	231.73	-3.0		0.2	0.0		23.6
HRSG Stack Facade 8-2	76.0	53.40	3.0	58.4	234.94	-3.0	8.2	0.2	0.0		15.2
ST Building Ventilation 1	86.6	86.58	0.0	60.1	283.62	-3.0	8.1	0.7	0.0		20.7
ST Building Ventilation 2	86.6	86.58	0.0	60.8	307.29	-3.0	7.3	0.9	0.0		20.7
ST Building Ventilation 3	86.6	86.58	0.0	60.6	303.10	-3.0	1.0	1.7	0.0		26.2
ST Building Ventilation 4	86.6	86.58	0.0	59.9	278.77	-3.0	1.1	1.6	0.0		27.0
ST Building Ventilation 5	86.6	86.58	0.0	60.3	293.38	-3.0	4.8	1.3	0.0		23.1
Steam Turbine Building Facade 1	89.7	58.31	3.0	60.1	284.95	-2.9	9.9	0.2	0.0		25.4
Steam Turbine Building Facade 2	89.3	58.31	3.0	59.7	272.45	-2.9	13.2	0.2	0.0		22.4
Steam Turbine Building Facade 3	89.7	58.31	3.0	60.5	299.18	-2.9	17.3	0.1	0.0		17.7
Steam Turbine Building Facade 4	89.4	58.31	3.0	60.9	312.08	-2.9	17.2	0.1	0.0		17.1
Steam Turbine Building Roof	90.6	58.31	0.0	60.3	292.43	-3.0	6.2	0.2	0.0		26.9
Steam Turbine Transformer	93.6	93.59	0.0	60.4	294.84	-2.7	19.6	1.4	0.0		14.9
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	57.7	216.60	-3.0	1.6	1.8	9.2		26.7
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	59.0	250.37	-3.0	1.4	1.9	9.0		25.6
WSAC	94.9	71.52	0.0	61.1	321.32	-2.7	19.8	2.2	0.0		14.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor: 1. Floor Name: Dolsontown Road - West			Daytime level	45.1		dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	63.1	403.66	-3.0		2.0	0.0		39.6
Air Intake 1	90.7	69.65	3.0	62.7	384.13	-2.8	0.2	1.3	0.0		32.4
Air Intake 2	90.7	69.65	3.0	62.7	385.41	-2.8	0.2	1.3	0.0		32.3
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	63.3	412.43	-3.1	0.8	1.3	8.0		22.5
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	63.3	412.95	-3.1	0.8	1.3	8.0		22.4
GT Building Ventilation 1	86.6	86.58	0.0	63.0	398.41	-3.1	0.1	1.7	0.0		24.8
GT Building Ventilation 2	86.6	86.58	0.0	63.0	399.64	-3.1	0.1	1.7	0.0		24.8
GT Building Ventilation 3	86.6	86.58	0.0	63.1	401.11	-3.1	0.1	1.7	0.0		24.7
GT Building Ventilation 4	86.6	86.58	0.0	63.4	418.34	-3.1	0.5	1.9	0.0		23.9
GT Building Ventilation 5	86.6	86.58	0.0	63.4	416.41	-3.1	0.5	1.9	0.0		23.9
GT Building Ventilation 6	86.6	86.58	0.0	63.4	416.62	-3.1	0.5	1.9	0.0		23.9
Gas Metering Station	88.6	88.60	0.0	64.0	447.62	-2.4		4.5	0.0		22.5
Gas Preheater Building Facade 2	72.4	53.95	3.0	64.4	466.81	-2.6	10.5	0.1	0.0		3.0
Gas Preheater Building Facade 3	74.0	53.95	3.0	64.2	458.92	-2.6	4.3	0.3	0.0		10.8
Gas Preheater Building Facade 4	72.3	53.95	3.0	64.1	450.28	-2.6		0.7	0.0		13.2
Gas Preheater Building Roof	76.7	53.95	0.0	64.2	458.36	-2.7	3.6	1.1	0.0		10.5
Gas Turbine Building Facade 1	81.9	47.71	3.0	63.5	420.74	-2.7	17.2	0.4	0.0		6.5
Gas Turbine Building Facade 2	76.7	47.71	3.0	63.2	407.99	-2.7	5.5	0.4	0.0		13.2
Gas Turbine Building Facade 3	81.9	47.71	3.0	63.0	396.37	-2.7	2.3	0.6	0.0		21.7
Gas Turbine Building Facade 4	76.6	47.71	3.0	63.3	411.40	-2.7	8.1	0.3	0.0		10.6
Gas Turbine Building Roof	80.6	47.71	0.0	63.2	408.55	-3.1	3.0	0.9	0.0		16.5
Gas Turbine Transformer 1	93.6	93.59	0.0	62.4	370.67	-2.4		1.8	0.0		34.0
Gas Turbine Transformer 2	93.6	93.59	0.0	62.4	372.97	-2.4		1.8	0.0		33.8
HRSG Building Facade 1	81.9	48.42	3.0	64.4	466.31	-2.7	14.8	0.2	0.0		8.2
HRSG Building Facade 2	79.4	48.42	3.0	63.9	442.80	-2.7	5.9	0.2	0.0		15.0
HRSG Building Facade 3	81.9	48.42	3.0	63.5	420.91	-2.7	16.1	0.2	0.0		7.8

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	79.4	48.42	3.0	64.0	446.06	-2.7	9.5	0.1	0.0		11.5
HRSG Building Roof	84.1	48.42	0.0	63.9	442.89	-3.0	11.5	0.1	0.0		11.5
HRSG Building Ventilation 1	86.6	86.58	0.0	63.8	434.30	-3.0	15.3	0.8	0.0		9.8
HRSG Building Ventilation 2	86.6	86.58	0.0	63.8	435.77	-3.0	15.2	0.8	0.0		9.8
HRSG Building Ventilation 3	86.6	86.58	0.0	63.8	435.52	-3.0	15.4	0.8	0.0		9.6
HRSG Building Ventilation 4	86.6	86.58	0.0	64.1	450.93	-3.0	13.1	0.8	0.0		11.6
HRSG Building Ventilation 5	86.6	86.58	0.0	64.1	450.77	-3.0	13.1	0.8	0.0		11.6
HRSG Building Ventilation 6	86.6	86.58	0.0	64.1	449.29	-3.0	13.0	0.8	0.0		11.7
HRSG Stack Exhaust 1	102.1	102.10	0.0	64.5	471.00	-3.0		0.9	7.8		31.9
HRSG Stack Exhaust 2	102.1	102.10	0.0	64.5	471.91	-3.0		0.9	7.8		31.9
HRSG Stack Facade 1-1	76.0	53.42	3.0	64.4	466.30	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 1-2	76.0	53.58	3.0	64.4	468.25	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 1-3	76.0	53.38	3.0	64.5	471.13	-2.8	10.9	0.3	0.0		6.1
HRSG Stack Facade 1-4	76.0	53.29	3.0	64.5	473.32	-2.8	15.4	0.3	0.0		1.5
HRSG Stack Facade 1-5	76.0	52.94	3.0	64.5	473.32	-2.8	14.9	0.3	0.0		2.0
HRSG Stack Facade 1-6	76.0	53.52	3.0	64.5	471.14	-2.8	11.1	0.3	0.0		6.0
HRSG Stack Facade 1-7	76.0	53.27	3.0	64.4	468.16	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 1-8	76.0	53.35	3.0	64.4	466.18	-2.7	3.4	0.3	0.0		13.7
HRSG Stack Facade 2-1	76.0	53.51	3.0	64.4	469.65	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 2-2	76.0	53.31	3.0	64.5	472.58	-2.8	11.3	0.3	0.0		5.7
HRSG Stack Facade 3-2	76.0	53.44	3.0	64.5	474.54	-2.8	15.7	0.3	0.0		1.2
HRSG Stack Facade 4-2	76.0	52.85	3.0	64.5	474.22	-2.8	16.0	0.3	0.0		0.9
HRSG Stack Facade 5-2	76.0	53.63	3.0	64.5	471.96	-2.8	10.8	0.3	0.0		6.2
HRSG Stack Facade 6-2	76.0	53.14	3.0	64.4	469.04	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 7-2	76.0	53.49	3.0	64.4	467.17	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 8-2	76.0	53.40	3.0	64.4	467.47	-2.8	3.2	0.3	0.0		13.8
ST Building Ventilation 1	86.6	86.58	0.0	63.2	407.14	-3.1	0.1	1.7	0.0		24.6

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	63.3	412.50	-3.1	0.1	1.7	0.0		24.5
ST Building Ventilation 3	86.6	86.58	0.0	63.6	424.49	-3.1	0.4	1.9	0.0		23.8
ST Building Ventilation 4	86.6	86.58	0.0	63.5	419.94	-3.1	0.4	1.9	0.0		23.9
ST Building Ventilation 5	86.6	86.58	0.0	63.4	415.08	-3.1	0.2	1.8	0.0		24.2
Steam Turbine Building Facade 1	89.7	58.31	3.0	63.9	442.11	-2.7	16.4	0.2	0.0		16.4
Steam Turbine Building Facade 2	89.3	58.31	3.0	63.4	418.76	-2.7	6.8	0.2	0.0		24.6
Steam Turbine Building Facade 3	89.7	58.31	3.0	63.1	403.23	-2.7		0.3	0.0		32.0
Steam Turbine Building Facade 4	89.4	58.31	3.0	63.6	426.64	-2.7	9.1	0.2	0.0		22.2
Steam Turbine Building Roof	90.6	58.31	0.0	63.5	422.31	-3.0	3.3	0.4	0.0		26.4
Steam Turbine Transformer	93.6	93.59	0.0	62.9	393.49	-2.3		1.9	0.0		33.5
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	63.3	414.32	-3.1	0.6	2.3	8.2		22.6
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	63.4	415.60	-3.1	0.6	2.3	8.2		22.6
WSAC	94.9	71.52	0.0	62.8	387.24	-2.4		2.6	0.0		34.1
Floor 2. Floor	Name Dolsontown Road - West			Daytime Level 45.2		dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	63.1	403.66	-3.0		2.0	0.0		39.6
Air Intake 1	90.7	69.65	3.0	62.7	384.20	-2.9	0.2	1.3	0.0		32.4
Air Intake 2	90.7	69.65	3.0	62.7	385.48	-2.9	0.2	1.3	0.0		32.4
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	63.3	412.37	-3.0	0.8	1.3	7.9		22.5
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	63.3	412.89	-3.0	0.8	1.3	7.9		22.5
GT Building Ventilation 1	86.6	86.58	0.0	63.0	398.35	-3.0	0.1	1.7	0.0		24.8
GT Building Ventilation 2	86.6	86.58	0.0	63.0	399.58	-3.0	0.1	1.7	0.0		24.7
GT Building Ventilation 3	86.6	86.58	0.0	63.1	401.06	-3.0	0.1	1.7	0.0		24.6
GT Building Ventilation 4	86.6	86.58	0.0	63.4	418.28	-3.0	0.4	1.9	0.0		23.8
GT Building Ventilation 5	86.6	86.58	0.0	63.4	416.35	-3.0	0.4	1.9	0.0		23.9
GT Building Ventilation 6	86.6	86.58	0.0	63.4	416.57	-3.0	0.4	1.9	0.0		23.9
Gas Metering Station	88.6	88.60	0.0	64.0	447.77	-2.5		4.5	0.0		22.6

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	72.4	53.95	3.0	64.4	466.97	-2.7	10.5	0.1	0.0		3.1
Gas Preheater Building Facade 3	74.0	53.95	3.0	64.2	459.09	-2.6	4.3	0.3	0.0		10.8
Gas Preheater Building Facade 4	72.3	53.95	3.0	64.1	450.44	-2.7		0.7	0.0		13.2
Gas Preheater Building Roof	76.7	53.95	0.0	64.2	458.50	-2.8	3.6	1.1	0.0		10.5
Gas Turbine Building Facade 1	81.9	47.71	3.0	63.5	420.80	-2.8	17.2	0.4	0.0		6.6
Gas Turbine Building Facade 2	76.7	47.71	3.0	63.2	408.04	-2.8	5.6	0.4	0.0		13.3
Gas Turbine Building Facade 3	81.9	47.71	3.0	63.0	396.43	-2.8	2.3	0.6	0.0		21.7
Gas Turbine Building Facade 4	76.6	47.71	3.0	63.3	411.47	-2.8	8.0	0.3	0.0		10.8
Gas Turbine Building Roof	80.6	47.71	0.0	63.2	408.50	-3.0	2.9	0.9	0.0		16.5
Gas Turbine Transformer 1	93.6	93.59	0.0	62.4	370.80	-2.5		1.8	0.0		34.2
Gas Turbine Transformer 2	93.6	93.59	0.0	62.4	373.10	-2.5		1.8	0.0		34.0
HRSG Building Facade 1	81.9	48.42	3.0	64.4	466.40	-2.8	14.8	0.2	0.0		8.3
HRSG Building Facade 2	79.4	48.42	3.0	63.9	442.89	-2.8	6.0	0.2	0.0		15.1
HRSG Building Facade 3	81.9	48.42	3.0	63.5	421.00	-2.8	16.1	0.2	0.0		7.9
HRSG Building Facade 4	79.4	48.42	3.0	64.0	446.09	-2.8	8.9	0.1	0.0		12.1
HRSG Building Roof	84.1	48.42	0.0	63.9	442.87	-3.0	9.8	0.1	0.0		13.3
HRSG Building Ventilation 1	86.6	86.58	0.0	63.8	434.28	-3.0	15.1	0.8	0.0		9.9
HRSG Building Ventilation 2	86.6	86.58	0.0	63.8	435.75	-3.0	15.1	0.8	0.0		9.9
HRSG Building Ventilation 3	86.6	86.58	0.0	63.8	435.50	-3.0	15.3	0.8	0.0		9.7
HRSG Building Ventilation 4	86.6	86.58	0.0	64.1	450.91	-3.0	12.8	0.8	0.0		11.9
HRSG Building Ventilation 5	86.6	86.58	0.0	64.1	450.76	-3.0	12.8	0.8	0.0		12.0
HRSG Building Ventilation 6	86.6	86.58	0.0	64.1	449.27	-3.0	12.7	0.8	0.0		12.0
HRSG Stack Exhaust 1	102.1	102.10	0.0	64.5	470.79	-3.0		0.9	7.8		31.9
HRSG Stack Exhaust 2	102.1	102.10	0.0	64.5	471.70	-3.0		0.9	7.8		31.9
HRSG Stack Facade 1-1	76.0	53.42	3.0	64.4	466.29	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 1-2	76.0	53.58	3.0	64.4	468.24	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 1-3	76.0	53.38	3.0	64.5	471.12	-2.8	10.9	0.3	0.0		6.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	64.5	473.31	-2.8	15.5	0.3	0.0		1.6
HRSG Stack Facade 1-5	76.0	52.94	3.0	64.5	473.31	-2.8	14.8	0.3	0.0		2.2
HRSG Stack Facade 1-6	76.0	53.52	3.0	64.5	471.14	-2.8	11.1	0.3	0.0		5.9
HRSG Stack Facade 1-7	76.0	53.27	3.0	64.4	468.15	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 1-8	76.0	53.35	3.0	64.4	466.17	-2.8	3.4	0.3	0.0		13.7
HRSG Stack Facade 2-1	76.0	53.51	3.0	64.4	469.64	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 2-2	76.0	53.31	3.0	64.5	472.57	-2.8	11.3	0.3	0.0		5.7
HRSG Stack Facade 3-2	76.0	53.44	3.0	64.5	474.53	-2.8	15.8	0.3	0.0		1.2
HRSG Stack Facade 4-2	76.0	52.85	3.0	64.5	474.21	-2.8	16.1	0.3	0.0		0.9
HRSG Stack Facade 5-2	76.0	53.63	3.0	64.5	471.95	-2.8	10.9	0.3	0.0		6.1
HRSG Stack Facade 6-2	76.0	53.14	3.0	64.4	469.03	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 7-2	76.0	53.49	3.0	64.4	467.16	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 8-2	76.0	53.40	3.0	64.4	467.46	-2.8	3.2	0.3	0.0		13.8
ST Building Ventilation 1	86.6	86.58	0.0	63.2	407.09	-3.0	0.1	1.7	0.0		24.6
ST Building Ventilation 2	86.6	86.58	0.0	63.3	412.45	-3.0	0.1	1.7	0.0		24.4
ST Building Ventilation 3	86.6	86.58	0.0	63.6	424.43	-3.0	0.3	1.9	0.0		23.9
ST Building Ventilation 4	86.6	86.58	0.0	63.5	419.88	-3.0	0.3	1.8	0.0		24.0
ST Building Ventilation 5	86.6	86.58	0.0	63.4	415.03	-3.0	0.2	1.8	0.0		24.3
Steam Turbine Building Facade 1	89.7	58.31	3.0	63.9	442.17	-2.8	16.4	0.2	0.0		16.6
Steam Turbine Building Facade 2	89.3	58.31	3.0	63.4	418.84	-2.8	6.9	0.2	0.0		24.6
Steam Turbine Building Facade 3	89.7	58.31	3.0	63.1	403.30	-2.8		0.3	0.0		32.1
Steam Turbine Building Facade 4	89.4	58.31	3.0	63.6	426.71	-2.8	9.1	0.2	0.0		22.3
Steam Turbine Building Roof	90.6	58.31	0.0	63.5	422.26	-3.0	3.2	0.4	0.0		26.5
Steam Turbine Transformer	93.6	93.59	0.0	62.9	393.62	-2.5		1.9	0.0		33.7
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	63.3	414.26	-3.0	0.6	2.3	8.2		22.6
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	63.4	415.54	-3.0	0.6	2.3	8.2		22.6
WSAC	94.9	71.52	0.0	62.8	387.39	-2.5		2.6	0.0		34.2

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1. Floor Name Genung Street				Daytime level 31.2		dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	73.4	1318.34	-2.4		4.2	0.0		26.5
Air Intake 1	90.7	69.65	3.0	74.1	1434.19	-1.8	18.0	1.5	0.0		1.9
Air Intake 2	90.7	69.65	3.0	74.0	1405.06	-1.8	18.3	1.6	0.0		1.8
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	74.1	1423.05	-2.3	0.7	3.6	7.3		9.4
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	73.9	1393.52	-2.3	0.7	3.6	7.3		9.6
GT Building Ventilation 1	86.6	86.58	0.0	74.1	1425.47	-2.3	0.3	4.4	0.0		10.1
GT Building Ventilation 2	86.6	86.58	0.0	74.0	1407.98	-2.4	0.3	4.4	0.0		10.3
GT Building Ventilation 3	86.6	86.58	0.0	73.9	1395.14	-2.4	0.3	4.4	0.0		10.3
GT Building Ventilation 4	86.6	86.58	0.0	73.8	1384.21	-2.4	0.1	4.1	0.0		10.9
GT Building Ventilation 5	86.6	86.58	0.0	73.9	1398.33	-2.4	0.2	4.2	0.0		10.7
GT Building Ventilation 6	86.6	86.58	0.0	74.0	1413.83	-2.4	0.1	4.2	0.0		10.6
Gas Metering Station	88.6	88.60	0.0	73.0	1261.69	-2.0		9.8	0.0		7.8
Gas Preheater Building Facade 2	72.4	53.95	3.0	73.9	1402.26	-2.0		1.2	0.0		2.3
Gas Preheater Building Facade 3	74.0	53.95	3.0	74.0	1411.84	-2.0	9.8	0.2	0.0		-4.9
Gas Preheater Building Facade 4	72.3	53.95	3.0	74.0	1412.30	-2.0	17.2	0.6	0.0		-13.9
Gas Preheater Building Roof	76.7	53.95	0.0	74.0	1407.23	-2.1	5.7	1.6	0.0		-2.4
Gas Turbine Building Facade 1	81.9	47.71	3.0	73.9	1393.69	-1.9	6.1	1.8	0.0		5.0
Gas Turbine Building Facade 2	76.7	47.71	3.0	74.1	1433.10	-1.8	17.1	0.9	0.0		-10.7
Gas Turbine Building Facade 3	81.9	47.71	3.0	74.0	1409.32	-1.8	15.1	1.0	0.0		-3.4
Gas Turbine Building Facade 4	76.6	47.71	3.0	73.7	1370.89	-1.9	11.8	1.4	0.0		-5.5
Gas Turbine Building Roof	80.6	47.71	0.0	73.9	1401.50	-2.2	2.4	2.3	0.0		4.2
Gas Turbine Transformer 1	93.6	93.59	0.0	74.1	1435.02	-1.7	19.1	3.0	0.0		-1.0
Gas Turbine Transformer 2	93.6	93.59	0.0	74.0	1406.40	-1.7	18.1	2.3	0.0		1.0
HRSG Building Facade 1	81.9	48.42	3.0	73.7	1365.25	-2.0	0.0	0.9	0.0		12.3
HRSG Building Facade 2	79.4	48.42	3.0	74.0	1411.36	-2.0	13.4	0.3	0.0		-2.6
HRSG Building Facade 3	81.9	48.42	3.0	73.9	1393.64	-2.0	16.4	0.4	0.0		-0.3

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	79.4	48.42	3.0	73.6	1348.19	-2.0	5.5	0.9	0.0		6.7
HRSG Building Roof	84.1	48.42	0.0	73.8	1379.39	-2.3	2.9	1.5	0.0		8.7
HRSG Building Ventilation 1	86.6	86.58	0.0	73.9	1402.72	-2.3	0.1	4.1	0.0		10.8
HRSG Building Ventilation 2	86.6	86.58	0.0	73.8	1384.28	-2.3	0.1	4.0	0.0		10.9
HRSG Building Ventilation 3	86.6	86.58	0.0	73.8	1372.98	-2.3	0.0	4.0	0.0		11.1
HRSG Building Ventilation 4	86.6	86.58	0.0	73.7	1363.28	-2.3	0.0	3.9	0.0		11.2
HRSG Building Ventilation 5	86.6	86.58	0.0	73.8	1374.60	-2.3	0.0	4.0	0.0		11.1
HRSG Building Ventilation 6	86.6	86.58	0.0	73.9	1393.51	-2.3	0.0	4.0	0.0		11.0
HRSG Stack Exhaust 1	102.1	102.10	0.0	73.8	1381.80	-2.8		2.6	7.4		21.1
HRSG Stack Exhaust 2	102.1	102.10	0.0	73.6	1351.81	-2.8		2.6	7.4		21.4
HRSG Stack Facade 1-1	76.0	53.42	3.0	73.8	1382.16	-1.8	6.1	1.0	0.0		3.9
HRSG Stack Facade 1-2	76.0	53.58	3.0	73.8	1379.25	-1.8		1.0	0.0		7.4
HRSG Stack Facade 1-3	76.0	53.38	3.0	73.8	1377.50	-1.8		1.0	0.0		7.4
HRSG Stack Facade 1-4	76.0	53.29	3.0	73.8	1377.86	-1.8		1.0	0.0		6.0
HRSG Stack Facade 1-5	76.0	52.94	3.0	73.8	1380.38	-1.8		1.0	0.0		6.0
HRSG Stack Facade 1-6	76.0	53.52	3.0	73.8	1383.44	-1.8	8.4	0.9	0.0		-2.4
HRSG Stack Facade 1-7	76.0	53.27	3.0	73.8	1385.23	-1.8	13.1	0.9	0.0		-7.0
HRSG Stack Facade 1-8	76.0	53.35	3.0	73.8	1384.70	-1.8	11.2	0.9	0.0		2.5
HRSG Stack Facade 2-1	76.0	53.51	3.0	73.6	1349.13	-1.8		1.0	0.0		7.9
HRSG Stack Facade 2-2	76.0	53.31	3.0	73.6	1347.29	-1.8		1.0	0.0		7.9
HRSG Stack Facade 3-2	76.0	53.44	3.0	73.6	1347.63	-1.8		1.0	0.0		6.3
HRSG Stack Facade 4-2	76.0	52.85	3.0	73.6	1350.16	-1.8		1.0	0.0		6.3
HRSG Stack Facade 5-2	76.0	53.63	3.0	73.6	1353.27	-1.8	8.1	0.9	0.0		-1.8
HRSG Stack Facade 6-2	76.0	53.14	3.0	73.6	1354.97	-1.8	13.0	0.9	0.0		-6.6
HRSG Stack Facade 7-2	76.0	53.49	3.0	73.6	1354.49	-1.8	11.4	0.9	0.0		4.2
HRSG Stack Facade 8-2	76.0	53.40	3.0	73.6	1352.08	-1.8	6.2	0.9	0.0		5.3
ST Building Ventilation 1	86.6	86.58	0.0	73.7	1369.99	-2.4	0.1	4.1	0.0		11.0

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	73.6	1350.11	-2.4	0.2	4.1	0.0		11.0
ST Building Ventilation 3	86.6	86.58	0.0	73.6	1341.84	-2.4	0.2	4.1	0.0		11.1
ST Building Ventilation 4	86.6	86.58	0.0	73.7	1361.38	-2.4	0.3	4.2	0.0		10.8
ST Building Ventilation 5	86.6	86.58	0.0	73.6	1356.29	-2.4	0.3	4.2	0.0		10.9
Steam Turbine Building Facade 1	89.7	58.31	3.0	73.5	1336.78	-1.9	2.4	0.8	0.0		19.8
Steam Turbine Building Facade 2	89.3	58.31	3.0	73.7	1365.70	-1.8	16.1	0.5	0.0		6.3
Steam Turbine Building Facade 3	89.7	58.31	3.0	73.7	1362.68	-1.8	14.6	0.4	0.0		5.8
Steam Turbine Building Facade 4	89.4	58.31	3.0	73.5	1333.77	-1.8	1.0	0.9	0.0		18.9
Steam Turbine Building Roof	90.6	58.31	0.0	73.6	1349.76	-2.2	3.2	1.1	0.0		14.9
Steam Turbine Transformer	93.6	93.59	0.0	73.8	1375.01	-1.7	18.8	2.7	0.0		0.0
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	74.0	1415.27	-2.3	0.5	4.9	7.3		9.7
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	73.8	1385.80	-2.3	0.5	4.8	7.3		9.9
WSAC	94.9	71.52	0.0	73.7	1365.11	-1.8	0.2	5.3	0.0		17.5
Floor 2 Floor [illegible] Name Genung Street				Daytime Level 31.3		dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	73.4	1318.31	-2.4		4.1	0.0		26.6
Air Intake 1	90.7	69.65	3.0	74.1	1434.18	-1.9	18.0	1.5	0.0		2.0
Air Intake 2	90.7	69.65	3.0	74.0	1405.05	-1.9	18.2	1.6	0.0		1.8
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	74.1	1423.01	-2.3	0.7	3.6	7.3		9.5
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	73.9	1393.47	-2.3	0.7	3.6	7.3		9.7
GT Building Ventilation 1	86.6	86.58	0.0	74.1	1425.43	-2.4	0.3	4.4	0.0		10.2
GT Building Ventilation 2	86.6	86.58	0.0	74.0	1407.94	-2.4	0.3	4.4	0.0		10.3
GT Building Ventilation 3	86.6	86.58	0.0	73.9	1395.09	-2.4	0.3	4.4	0.0		10.4
GT Building Ventilation 4	86.6	86.58	0.0	73.8	1384.17	-2.4	0.1	4.1	0.0		10.9
GT Building Ventilation 5	86.6	86.58	0.0	73.9	1398.29	-2.4	0.2	4.2	0.0		10.8
GT Building Ventilation 6	86.6	86.58	0.0	74.0	1413.79	-2.4	0.1	4.2	0.0		10.6
Gas Metering Station	88.6	88.60	0.0	73.0	1261.72	-2.1		9.8	0.0		7.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	72.4	53.95	3.0	73.9	1402.28	-2.1		1.2	0.0		2.3
Gas Preheater Building Facade 3	74.0	53.95	3.0	74.0	1411.86	-2.0	9.8	0.2	0.0		-4.9
Gas Preheater Building Facade 4	72.3	53.95	3.0	74.0	1412.32	-2.1	17.2	0.6	0.0		-13.8
Gas Preheater Building Roof	76.7	53.95	0.0	74.0	1407.25	-2.1	5.7	1.6	0.0		-2.4
Gas Turbine Building Facade 1	81.9	47.71	3.0	73.9	1393.68	-1.9	6.1	1.8	0.0		5.1
Gas Turbine Building Facade 2	76.7	47.71	3.0	74.1	1433.09	-1.9	17.1	1.0	0.0		-10.6
Gas Turbine Building Facade 3	81.9	47.71	3.0	74.0	1409.31	-1.9	15.1	1.0	0.0		-3.3
Gas Turbine Building Facade 4	76.6	47.71	3.0	73.7	1370.89	-1.9	11.8	1.4	0.0		-5.4
Gas Turbine Building Roof	80.6	47.71	0.0	73.9	1401.46	-2.3	2.4	2.3	0.0		4.3
Gas Turbine Transformer 1	93.6	93.59	0.0	74.1	1435.03	-1.8	19.1	3.0	0.0		-0.9
Gas Turbine Transformer 2	93.6	93.59	0.0	74.0	1406.41	-1.8	18.1	2.3	0.0		1.0
HRSG Building Facade 1	81.9	48.42	3.0	73.7	1365.25	-2.1	0.0	0.9	0.0		12.3
HRSG Building Facade 2	79.4	48.42	3.0	74.0	1411.36	-2.0	13.4	0.3	0.0		-2.6
HRSG Building Facade 3	81.9	48.42	3.0	73.9	1393.64	-2.0	16.4	0.4	0.0		-0.2
HRSG Building Facade 4	79.4	48.42	3.0	73.6	1348.19	-2.1	5.5	0.9	0.0		6.8
HRSG Building Roof	84.1	48.42	0.0	73.8	1379.37	-2.3	2.9	1.5	0.0		8.8
HRSG Building Ventilation 1	86.6	86.58	0.0	73.9	1402.69	-2.3	0.1	4.1	0.0		10.9
HRSG Building Ventilation 2	86.6	86.58	0.0	73.8	1384.25	-2.4	0.1	4.0	0.0		11.0
HRSG Building Ventilation 3	86.6	86.58	0.0	73.8	1372.94	-2.4	0.0	4.0	0.0		11.2
HRSG Building Ventilation 4	86.6	86.58	0.0	73.7	1363.25	-2.4	0.0	3.9	0.0		11.3
HRSG Building Ventilation 5	86.6	86.58	0.0	73.8	1374.57	-2.4	0.0	4.0	0.0		11.2
HRSG Building Ventilation 6	86.6	86.58	0.0	73.9	1393.48	-2.3	0.0	4.0	0.0		11.0
HRSG Stack Exhaust 1	102.1	102.10	0.0	73.8	1381.70	-2.8		2.6	7.3		21.2
HRSG Stack Exhaust 2	102.1	102.10	0.0	73.6	1351.71	-2.8		2.5	7.4		21.4
HRSG Stack Facade 1-1	76.0	53.42	3.0	73.8	1382.13	-1.9	6.1	1.0	0.0		4.0
HRSG Stack Facade 1-2	76.0	53.58	3.0	73.8	1379.22	-1.9		1.0	0.0		7.5
HRSG Stack Facade 1-3	76.0	53.38	3.0	73.8	1377.47	-1.9		1.0	0.0		7.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	73.8	1377.83	-1.9		1.0	0.0		6.1
HRSG Stack Facade 1-5	76.0	52.94	3.0	73.8	1380.35	-1.9		1.0	0.0		6.1
HRSG Stack Facade 1-6	76.0	53.52	3.0	73.8	1383.41	-1.9	8.5	0.9	0.0		-2.3
HRSG Stack Facade 1-7	76.0	53.27	3.0	73.8	1385.21	-1.9	13.1	0.9	0.0		-6.9
HRSG Stack Facade 1-8	76.0	53.35	3.0	73.8	1384.67	-1.9	11.0	0.9	0.0		2.6
HRSG Stack Facade 2-1	76.0	53.51	3.0	73.6	1349.10	-1.9		1.0	0.0		8.0
HRSG Stack Facade 2-2	76.0	53.31	3.0	73.6	1347.26	-1.9		1.0	0.0		8.0
HRSG Stack Facade 3-2	76.0	53.44	3.0	73.6	1347.60	-1.9		1.0	0.0		6.4
HRSG Stack Facade 4-2	76.0	52.85	3.0	73.6	1350.14	-1.9		1.0	0.0		6.3
HRSG Stack Facade 5-2	76.0	53.63	3.0	73.6	1353.23	-1.9	8.1	0.9	0.0		-1.7
HRSG Stack Facade 6-2	76.0	53.14	3.0	73.6	1354.94	-1.9	13.0	0.9	0.0		-6.6
HRSG Stack Facade 7-2	76.0	53.49	3.0	73.6	1354.47	-1.9	11.3	0.9	0.0		4.3
HRSG Stack Facade 8-2	76.0	53.40	3.0	73.6	1352.04	-1.9	6.1	0.9	0.0		5.4
ST Building Ventilation 1	86.6	86.58	0.0	73.7	1369.94	-2.4	0.1	4.1	0.0		11.0
ST Building Ventilation 2	86.6	86.58	0.0	73.6	1350.07	-2.4	0.2	4.1	0.0		11.1
ST Building Ventilation 3	86.6	86.58	0.0	73.6	1341.79	-2.4	0.2	4.1	0.0		11.2
ST Building Ventilation 4	86.6	86.58	0.0	73.7	1361.33	-2.4	0.3	4.2	0.0		10.9
ST Building Ventilation 5	86.6	86.58	0.0	73.6	1356.24	-2.4	0.2	4.2	0.0		11.0
Steam Turbine Building Facade 1	89.7	58.31	3.0	73.5	1336.77	-1.9	2.4	0.8	0.0		19.9
Steam Turbine Building Facade 2	89.3	58.31	3.0	73.7	1365.69	-1.9	16.1	0.5	0.0		6.4
Steam Turbine Building Facade 3	89.7	58.31	3.0	73.7	1362.68	-1.9	14.6	0.4	0.0		5.8
Steam Turbine Building Facade 4	89.4	58.31	3.0	73.5	1333.77	-1.9	1.0	0.9	0.0		19.0
Steam Turbine Building Roof	90.6	58.31	0.0	73.6	1349.72	-2.3	3.2	1.1	0.0		14.9
Steam Turbine Transformer	93.6	93.59	0.0	73.8	1375.02	-1.8	18.8	2.7	0.0		0.1
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	74.0	1415.23	-2.4	0.5	4.8	7.3		9.8
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	73.8	1385.76	-2.4	0.4	4.8	7.3		10.1
WSAC	94.9	71.52	0.0	73.7	1365.13	-1.9	0.2	5.3	0.0		17.7

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1. Floor Name Moon School				Daytime Level 29.5		dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	75.3	1638.14	-2.2		4.7	0.0		24.0
Air Intake 1	90.7	69.65	3.0	76.0	1778.57	-1.7	0.2	2.8	0.0		16.5
Air Intake 2	90.7	69.65	3.0	75.9	1748.59	-1.7	0.1	2.8	0.0		16.7
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	76.1	1802.52	-2.1	0.5	4.2	7.0		7.1
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	76.0	1772.97	-2.1	0.5	4.1	7.0		7.2
GT Building Ventilation 1	86.6	86.58	0.0	76.0	1787.57	-2.2	0.1	4.9	0.0		7.7
GT Building Ventilation 2	86.6	86.58	0.0	76.0	1771.05	-2.2	0.1	4.9	0.0		7.8
GT Building Ventilation 3	86.6	86.58	0.0	75.9	1758.64	-2.2	0.2	4.9	0.0		7.7
GT Building Ventilation 4	86.6	86.58	0.0	76.0	1769.84	-2.2	0.2	5.0	0.0		7.5
GT Building Ventilation 5	86.6	86.58	0.0	76.0	1782.76	-2.2	0.2	5.1	0.0		7.4
GT Building Ventilation 6	86.6	86.58	0.0	76.1	1798.80	-2.2	0.2	5.1	0.0		7.4
Gas Metering Station	88.6	88.60	0.0	75.1	1595.05	-2.0		11.7	0.0		3.8
Gas Preheater Building Facade 2	72.4	53.95	3.0	76.3	1847.88	-1.9	19.3	1.2	0.0		-19.6
Gas Preheater Building Facade 3	74.0	53.95	3.0	76.3	1847.10	-1.9	18.7	1.0	0.0		-17.3
Gas Preheater Building Facade 4	72.3	53.95	3.0	76.3	1837.42	-1.9	19.3	1.2	0.0		-19.5
Gas Preheater Building Roof	76.7	53.95	0.0	76.3	1842.60	-1.9	19.0	1.1	0.0		-17.8
Gas Turbine Building Facade 1	81.9	47.71	3.0	76.0	1782.91	-1.7	15.4	1.1	0.0		-6.0
Gas Turbine Building Facade 2	76.7	47.71	3.0	76.1	1806.78	-1.7	15.8	1.0	0.0		-11.5
Gas Turbine Building Facade 3	81.9	47.71	3.0	75.9	1767.47	-1.7	1.9	2.0	0.0		6.8
Gas Turbine Building Facade 4	76.6	47.71	3.0	75.8	1744.19	-1.7	13.2	1.0	0.0		-8.7
Gas Turbine Building Roof	80.6	47.71	0.0	76.0	1775.23	-2.0	2.1	2.7	0.0		1.8
Gas Turbine Transformer 1	93.6	93.59	0.0	75.9	1762.04	-1.6		4.5	0.0		16.7
Gas Turbine Transformer 2	93.6	93.59	0.0	75.8	1732.07	-1.6		4.5	0.0		15.0
HRSG Building Facade 1	81.9	48.42	3.0	76.2	1812.24	-1.8	14.2	0.4	0.0		-4.1
HRSG Building Facade 2	79.4	48.42	3.0	76.2	1828.75	-1.8	15.0	0.4	0.0		-7.5
HRSG Building Facade 3	81.9	48.42	3.0	76.0	1783.04	-1.8	16.0	0.4	0.0		-5.8

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	79.4	48.42	3.0	75.9	1767.01	-1.8	12.7	0.3	0.0		-4.8
HRSG Building Roof	84.1	48.42	0.0	76.1	1797.42	-2.1	8.9	0.3	0.0		0.9
HRSG Building Ventilation 1	86.6	86.58	0.0	76.2	1810.01	-2.1	13.6	2.4	0.0		-3.4
HRSG Building Ventilation 2	86.6	86.58	0.0	76.1	1793.34	-2.1	13.5	2.5	0.0		-3.3
HRSG Building Ventilation 3	86.6	86.58	0.0	76.0	1780.76	-2.1	13.8	2.4	0.0		-3.5
HRSG Building Ventilation 4	86.6	86.58	0.0	76.1	1790.77	-2.1	11.1	2.6	0.0		-1.1
HRSG Building Ventilation 5	86.6	86.58	0.0	76.1	1802.64	-2.1	10.3	2.8	0.0		-0.6
HRSG Building Ventilation 6	86.6	86.58	0.0	76.2	1819.57	-2.1	10.5	2.8	0.0		-0.8
HRSG Stack Exhaust 1	102.1	102.10	0.0	76.3	1832.74	-2.6		3.4	7.1		17.9
HRSG Stack Exhaust 2	102.1	102.10	0.0	76.1	1803.77	-2.6		3.3	7.1		18.1
HRSG Stack Facade 1-1	76.0	53.42	3.0	76.2	1829.21	-1.5	2.6	1.3	0.0		0.3
HRSG Stack Facade 1-2	76.0	53.58	3.0	76.2	1828.87	-1.5	2.6	1.3	0.0		0.3
HRSG Stack Facade 1-3	76.0	53.38	3.0	76.3	1830.77	-1.5	2.6	1.3	0.0		0.3
HRSG Stack Facade 1-4	76.0	53.29	3.0	76.3	1833.75	-1.5	9.4	1.3	0.0		-6.5
HRSG Stack Facade 1-5	76.0	52.94	3.0	76.3	1836.10	-1.5	14.8	1.2	0.0		-11.8
HRSG Stack Facade 1-6	76.0	53.52	3.0	76.3	1836.32	-1.5	15.7	1.2	0.0		-12.6
HRSG Stack Facade 1-7	76.0	53.27	3.0	76.3	1834.34	-1.5	10.8	1.2	0.0		-7.9
HRSG Stack Facade 1-8	76.0	53.35	3.0	76.3	1831.45	-1.5	3.0	1.3	0.0		-0.1
HRSG Stack Facade 2-1	76.0	53.51	3.0	76.1	1800.01	-1.5	2.6	1.3	0.0		0.5
HRSG Stack Facade 2-2	76.0	53.31	3.0	76.1	1801.96	-1.5	3.0	1.3	0.0		0.1
HRSG Stack Facade 3-2	76.0	53.44	3.0	76.1	1804.90	-1.5	9.5	1.2	0.0		-6.4
HRSG Stack Facade 4-2	76.0	52.85	3.0	76.1	1807.22	-1.5	14.3	1.1	0.0		-11.1
HRSG Stack Facade 5-2	76.0	53.63	3.0	76.1	1807.48	-1.5	15.5	1.2	0.0		-12.3
HRSG Stack Facade 6-2	76.0	53.14	3.0	76.1	1805.44	-1.5	11.0	1.2	0.0		-7.8
HRSG Stack Facade 7-2	76.0	53.49	3.0	76.1	1802.46	-1.5	2.7	1.3	0.0		0.3
HRSG Stack Facade 8-2	76.0	53.40	3.0	76.1	1800.27	-1.5	2.7	1.3	0.0		0.4
ST Building Ventilation 1	86.6	86.58	0.0	75.8	1736.14	-2.2	0.1	4.8	0.0		8.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	75.7	1716.56	-2.2	0.1	4.8	0.0		8.2
ST Building Ventilation 3	86.6	86.58	0.0	75.7	1724.37	-2.2	0.1	4.8	0.0		8.1
ST Building Ventilation 4	86.6	86.58	0.0	75.8	1744.31	-2.2	0.1	4.9	0.0		8.0
ST Building Ventilation 5	86.6	86.58	0.0	75.8	1729.83	-2.2	0.1	4.8	0.0		8.1
Steam Turbine Building Facade 1	89.7	58.31	3.0	75.8	1745.66	-1.6	14.3	0.6	0.0		3.6
Steam Turbine Building Facade 2	89.3	58.31	3.0	75.9	1748.85	-1.6	14.9	0.6	0.0		5.2
Steam Turbine Building Facade 3	89.7	58.31	3.0	75.7	1719.75	-1.6	0.0	1.0	0.0		17.6
Steam Turbine Building Facade 4	89.4	58.31	3.0	75.7	1716.61	-1.7	0.0	1.0	0.0		17.4
Steam Turbine Building Roof	90.6	58.31	0.0	75.8	1732.54	-2.0	2.8	1.4	0.0		12.6
Steam Turbine Transformer	93.6	93.59	0.0	75.7	1721.54	-1.6	0.0	4.5	0.0		17.5
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	76.1	1797.35	-2.1	0.4	5.4	7.0		7.2
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	75.9	1767.89	-2.2	0.4	5.4	7.0		7.4
WSAC	94.9	71.52	0.0	75.6	1695.88	-1.7	0.0	5.5	0.0		16.0
(Floor 2 (Floor [illegible] Name Moon School				Daytime Level	29.6	dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	75.3	1638.15	-2.3		4.7	0.0		24.0
Air Intake 1	90.7	69.65	3.0	76.0	1778.59	-1.7	0.2	2.8	0.0		16.6
Air Intake 2	90.7	69.65	3.0	75.9	1748.61	-1.8	0.1	2.8	0.0		16.8
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	76.1	1802.51	-2.1	0.5	4.1	7.0		7.2
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	76.0	1772.96	-2.1	0.5	4.1	7.0		7.3
GT Building Ventilation 1	86.6	86.58	0.0	76.0	1787.56	-2.2	0.1	4.9	0.0		7.7
GT Building Ventilation 2	86.6	86.58	0.0	76.0	1771.05	-2.2	0.1	4.9	0.0		7.8
GT Building Ventilation 3	86.6	86.58	0.0	75.9	1758.64	-2.2	0.2	4.9	0.0		7.8
GT Building Ventilation 4	86.6	86.58	0.0	76.0	1769.83	-2.2	0.2	5.0	0.0		7.6
GT Building Ventilation 5	86.6	86.58	0.0	76.0	1782.76	-2.2	0.2	5.0	0.0		7.5
GT Building Ventilation 6	86.6	86.58	0.0	76.1	1798.79	-2.2	0.2	5.1	0.0		7.4
Gas Metering Station	88.6	88.60	0.0	75.1	1595.09	-2.0		11.7	0.0		3.8

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	72.4	53.95	3.0	76.3	1847.92	-1.9	19.3	1.2	0.0		-19.5
Gas Preheater Building Facade 3	74.0	53.95	3.0	76.3	1847.14	-1.9	18.7	1.0	0.0		-17.2
Gas Preheater Building Facade 4	72.3	53.95	3.0	76.3	1837.46	-1.9	19.3	1.2	0.0		-19.5
Gas Preheater Building Roof	76.7	53.95	0.0	76.3	1842.64	-2.0	19.0	1.1	0.0		-17.7
Gas Turbine Building Facade 1	81.9	47.71	3.0	76.0	1782.93	-1.8	15.4	1.1	0.0		-5.9
Gas Turbine Building Facade 2	76.7	47.71	3.0	76.1	1806.79	-1.7	15.8	1.0	0.0		-11.5
Gas Turbine Building Facade 3	81.9	47.71	3.0	75.9	1767.49	-1.7	1.8	2.0	0.0		6.8
Gas Turbine Building Facade 4	76.6	47.71	3.0	75.8	1744.21	-1.8	13.2	1.0	0.0		-8.6
Gas Turbine Building Roof	80.6	47.71	0.0	76.0	1775.22	-2.1	2.1	2.7	0.0		1.9
Gas Turbine Transformer 1	93.6	93.59	0.0	75.9	1762.07	-1.7		4.5	0.0		16.8
Gas Turbine Transformer 2	93.6	93.59	0.0	75.8	1732.11	-1.7		4.5	0.0		15.0
HRSG Building Facade 1	81.9	48.42	3.0	76.2	1812.27	-1.9	13.8	0.4	0.0		-3.6
HRSG Building Facade 2	79.4	48.42	3.0	76.2	1828.77	-1.8	15.0	0.4	0.0		-7.5
HRSG Building Facade 3	81.9	48.42	3.0	76.0	1783.07	-1.9	15.7	0.4	0.0		-5.4
HRSG Building Facade 4	79.4	48.42	3.0	75.9	1767.04	-1.9	12.7	0.3	0.0		-4.7
HRSG Building Roof	84.1	48.42	0.0	76.1	1797.42	-2.1	8.9	0.3	0.0		0.9
HRSG Building Ventilation 1	86.6	86.58	0.0	76.2	1810.01	-2.2	13.5	2.4	0.0		-3.3
HRSG Building Ventilation 2	86.6	86.58	0.0	76.1	1793.34	-2.2	13.4	2.5	0.0		-3.2
HRSG Building Ventilation 3	86.6	86.58	0.0	76.0	1780.76	-2.2	13.8	2.4	0.0		-3.4
HRSG Building Ventilation 4	86.6	86.58	0.0	76.1	1790.78	-2.2	11.0	2.6	0.0		-1.0
HRSG Building Ventilation 5	86.6	86.58	0.0	76.1	1802.64	-2.2	10.2	2.8	0.0		-0.4
HRSG Building Ventilation 6	86.6	86.58	0.0	76.2	1819.57	-2.2	10.4	2.8	0.0		-0.7
HRSG Stack Exhaust 1	102.1	102.10	0.0	76.3	1832.69	-2.6		3.4	7.1		17.9
HRSG Stack Exhaust 2	102.1	102.10	0.0	76.1	1803.72	-2.6		3.3	7.1		18.1
HRSG Stack Facade 1-1	76.0	53.42	3.0	76.2	1829.21	-1.5	2.6	1.3	0.0		0.3
HRSG Stack Facade 1-2	76.0	53.58	3.0	76.2	1828.88	-1.5	2.6	1.3	0.0		0.4
HRSG Stack Facade 1-3	76.0	53.38	3.0	76.3	1830.77	-1.5	2.6	1.3	0.0		0.4

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	76.3	1833.75	-1.5	9.4	1.3	0.0		-6.4
HRSG Stack Facade 1-5	76.0	52.94	3.0	76.3	1836.11	-1.5	14.8	1.2	0.0		-11.7
HRSG Stack Facade 1-6	76.0	53.52	3.0	76.3	1836.32	-1.5	15.7	1.2	0.0		-12.6
HRSG Stack Facade 1-7	76.0	53.27	3.0	76.3	1834.34	-1.5	10.8	1.3	0.0		-7.8
HRSG Stack Facade 1-8	76.0	53.35	3.0	76.3	1831.46	-1.5	3.0	1.3	0.0		-0.1
HRSG Stack Facade 2-1	76.0	53.51	3.0	76.1	1800.01	-1.6	2.6	1.3	0.0		0.5
HRSG Stack Facade 2-2	76.0	53.31	3.0	76.1	1801.96	-1.6	3.0	1.3	0.0		0.2
HRSG Stack Facade 3-2	76.0	53.44	3.0	76.1	1804.91	-1.5	9.5	1.2	0.0		-6.3
HRSG Stack Facade 4-2	76.0	52.85	3.0	76.1	1807.22	-1.5	14.3	1.2	0.0		-11.0
HRSG Stack Facade 5-2	76.0	53.63	3.0	76.1	1807.48	-1.5	15.5	1.1	0.0		-12.2
HRSG Stack Facade 6-2	76.0	53.14	3.0	76.1	1805.45	-1.5	10.8	1.2	0.0		-7.6
HRSG Stack Facade 7-2	76.0	53.49	3.0	76.1	1802.47	-1.5	2.7	1.3	0.0		0.4
HRSG Stack Facade 8-2	76.0	53.40	3.0	76.1	1800.27	-1.6	2.7	1.3	0.0		0.5
ST Building Ventilation 1	86.6	86.58	0.0	75.8	1736.14	-2.3	0.1	4.8	0.0		8.1
ST Building Ventilation 2	86.6	86.58	0.0	75.7	1716.56	-2.3	0.1	4.8	0.0		8.3
ST Building Ventilation 3	86.6	86.58	0.0	75.7	1724.36	-2.3	0.1	4.8	0.0		8.2
ST Building Ventilation 4	86.6	86.58	0.0	75.8	1744.30	-2.3	0.1	4.8	0.0		8.0
ST Building Ventilation 5	86.6	86.58	0.0	75.8	1729.82	-2.3	0.1	4.8	0.0		8.1
Steam Turbine Building Facade 1	89.7	58.31	3.0	75.8	1745.68	-1.7	14.3	0.6	0.0		3.7
Steam Turbine Building Facade 2	89.3	58.31	3.0	75.9	1748.87	-1.7	14.9	0.6	0.0		5.4
Steam Turbine Building Facade 3	89.7	58.31	3.0	75.7	1719.77	-1.7	0.0	1.0	0.0		17.7
Steam Turbine Building Facade 4	89.4	58.31	3.0	75.7	1716.63	-1.7	0.0	1.0	0.0		17.4
Steam Turbine Building Roof	90.6	58.31	0.0	75.8	1732.54	-2.0	2.8	1.4	0.0		12.6
Steam Turbine Transformer	93.6	93.59	0.0	75.7	1721.58	-1.7	0.0	4.5	0.0		17.6
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	76.1	1797.34	-2.2	0.4	5.4	7.0		7.3
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	75.9	1767.88	-2.2	0.4	5.4	7.0		7.5
WSAC	94.9	71.52	0.0	75.6	1695.91	-1.8		5.5	0.0		16.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1. Floor Name Public Space				Daytime level 39.3		dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	67.1	637.24	-2.8	13.2	0.7	0.0		23.5
Air Intake 1	90.7	69.65	3.0	64.5	474.69	-2.7	10.3	0.4	0.0		21.2
Air Intake 2	90.7	69.65	3.0	65.1	509.53	-2.7	14.4	0.5	0.0		16.3
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	64.2	456.66	-3.0	1.8	1.7	8.1		20.0
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	64.8	491.91	-3.0	1.4	1.7	8.0		19.9
GT Building Ventilation 1	86.6	86.58	0.0	64.4	469.51	-3.0	0.9	2.2	0.0		22.1
GT Building Ventilation 2	86.6	86.58	0.0	64.8	489.23	-3.0	1.0	2.4	0.0		21.4
GT Building Ventilation 3	86.6	86.58	0.0	65.1	504.17	-3.0	1.1	2.4	0.0		21.0
GT Building Ventilation 4	86.6	86.58	0.0	64.9	497.75	-3.0	0.9	2.3	0.0		21.4
GT Building Ventilation 5	86.6	86.58	0.0	64.7	481.70	-3.0	1.0	2.3	0.0		21.5
GT Building Ventilation 6	86.6	86.58	0.0	64.3	462.67	-3.0	1.0	2.3	0.0		22.0
Gas Metering Station	88.6	88.60	0.0	67.9	699.28	-2.3	20.0	6.3	0.0		-3.3
Gas Preheater Building Facade 2	72.4	53.95	3.0	63.5	423.35	-2.7		0.7	0.0		13.8
Gas Preheater Building Facade 3	74.0	53.95	3.0	63.5	420.32	-2.7	0.0	0.7	0.0		15.7
Gas Preheater Building Facade 4	72.3	53.95	3.0	63.6	428.32	-2.6	6.0	0.1	0.0		9.2
Gas Preheater Building Roof	76.7	53.95	0.0	63.6	425.78	-2.7	3.3	1.3	0.0		13.4
Gas Turbine Building Facade 1	81.9	47.71	3.0	64.6	480.66	-2.6	6.1	0.7	0.0		16.0
Gas Turbine Building Facade 2	76.7	47.71	3.0	64.0	449.19	-2.7		0.7	0.0		17.6
Gas Turbine Building Facade 3	81.9	47.71	3.0	64.8	489.79	-2.6	14.1	0.3	0.0		9.1
Gas Turbine Building Facade 4	76.6	47.71	3.0	65.4	524.10	-2.6	17.7	0.5	0.0		-1.4
Gas Turbine Building Roof	80.6	47.71	0.0	64.7	485.74	-3.0	5.1	0.6	0.0		13.2
Gas Turbine Transformer 1	93.6	93.59	0.0	64.8	489.83	-2.2	4.3	1.7	0.0		25.0
Gas Turbine Transformer 2	93.6	93.59	0.0	65.4	524.28	-2.2	16.8	1.1	0.0		12.4
HRSG Building Facade 1	81.9	48.42	3.0	64.4	466.49	-2.7	2.8	0.3	0.0		20.2
HRSG Building Facade 2	79.4	48.42	3.0	63.8	436.27	-2.7	0.3	0.4	0.0		20.6
HRSG Building Facade 3	81.9	48.42	3.0	64.6	480.44	-2.7	12.2	0.1	0.0		12.6

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	79.4	48.42	3.0	65.2	513.01	-2.6	14.6	0.2	0.0		5.8
HRSG Building Roof	84.1	48.42	0.0	64.5	473.82	-3.0	4.8	0.7	0.0		18.0
HRSG Building Ventilation 1	86.6	86.58	0.0	64.2	456.03	-3.0	0.1	1.9	0.0		23.4
HRSG Building Ventilation 2	86.6	86.58	0.0	64.6	476.96	-3.0	0.2	2.0	0.0		22.8
HRSG Building Ventilation 3	86.6	86.58	0.0	64.8	491.96	-3.0	0.1	2.0	0.0		25.0
HRSG Building Ventilation 4	86.6	86.58	0.0	64.8	487.36	-3.0	0.1	2.0	0.0		22.7
HRSG Building Ventilation 5	86.6	86.58	0.0	64.5	472.83	-3.0	0.2	2.0	0.0		22.8
HRSG Building Ventilation 6	86.6	86.58	0.0	64.1	451.20	-3.0	0.1	1.9	0.0		23.5
HRSG Stack Exhaust 1	102.1	102.10	0.0	64.0	448.86	-3.0		0.9	7.9		32.3
HRSG Stack Exhaust 2	102.1	102.10	0.0	64.7	485.33	-3.0		1.0	7.9		31.5
HRSG Stack Facade 1-1	76.0	53.42	3.0	64.0	448.01	-2.8	8.7	0.3	0.0		8.8
HRSG Stack Facade 1-2	76.0	53.58	3.0	64.1	449.47	-2.8	13.4	0.3	0.0		4.1
HRSG Stack Facade 1-3	76.0	53.38	3.0	64.0	448.72	-2.8	10.7	0.3	0.0		6.7
HRSG Stack Facade 1-4	76.0	53.29	3.0	64.0	446.13	-2.8	5.2	0.3	0.0		12.4
HRSG Stack Facade 1-5	76.0	52.94	3.0	63.9	443.00	-2.9		0.3	0.0		17.6
HRSG Stack Facade 1-6	76.0	53.52	3.0	63.9	441.49	-2.9		0.3	0.0		17.7
HRSG Stack Facade 1-7	76.0	53.27	3.0	63.9	442.35	-2.9		0.3	0.0		17.7
HRSG Stack Facade 1-8	76.0	53.35	3.0	64.0	445.07	-2.8	4.7	0.3	0.0		12.8
HRSG Stack Facade 2-1	76.0	53.51	3.0	64.7	486.09	-2.8	13.4	0.3	0.0		3.3
HRSG Stack Facade 2-2	76.0	53.31	3.0	64.7	485.46	-2.7	11.2	0.3	0.0		5.6
HRSG Stack Facade 3-2	76.0	53.44	3.0	64.7	482.94	-2.8	5.0	0.4	0.0		11.7
HRSG Stack Facade 4-2	76.0	52.85	3.0	64.6	479.77	-2.9		0.4	0.0		16.9
HRSG Stack Facade 5-2	76.0	53.63	3.0	64.6	478.18	-2.9		0.4	0.0		16.9
HRSG Stack Facade 6-2	76.0	53.14	3.0	64.6	479.01	-2.9		0.4	0.0		18.3
HRSG Stack Facade 7-2	76.0	53.49	3.0	64.7	481.64	-2.9		0.4	0.0		16.9
HRSG Stack Facade 8-2	76.0	53.40	3.0	64.7	484.67	-2.7	8.6	0.3	0.0		8.1
ST Building Ventilation 1	86.6	86.58	0.0	65.5	532.31	-3.0	0.8	2.4	0.0		20.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	65.9	556.60	-3.0	0.5	2.4	0.0		20.7
ST Building Ventilation 3	86.6	86.58	0.0	65.9	552.87	-3.0	0.4	2.3	0.0		21.0
ST Building Ventilation 4	86.6	86.58	0.0	65.5	528.16	-3.0	1.0	2.5	0.0		20.7
ST Building Ventilation 5	86.6	86.58	0.0	65.7	542.68	-3.0	0.7	2.4	0.0		20.7
Steam Turbine Building Facade 1	89.7	58.31	3.0	65.6	535.50	-2.6	6.7	0.4	0.0		22.8
Steam Turbine Building Facade 2	89.3	58.31	3.0	65.4	521.86	-2.6	9.6	0.4	0.0		21.0
Steam Turbine Building Facade 3	89.7	58.31	3.0	65.8	548.28	-2.5	16.4	0.2	0.0		12.7
Steam Turbine Building Facade 4	89.4	58.31	3.0	66.0	562.05	-2.5	16.9	0.2	0.0		11.8
Steam Turbine Building Roof	90.6	58.31	0.0	65.7	542.36	-3.0	5.1	0.4	0.0		22.9
Steam Turbine Transformer	93.6	93.59	0.0	65.7	542.77	-2.2	19.3	1.9	0.0		8.8
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	64.3	463.53	-3.0	1.2	2.8	8.4		20.3
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	65.0	498.93	-3.0	1.2	2.9	8.3		19.7
WSAC	94.9	71.52	0.0	66.1	569.16	-2.2	19.4	2.7	0.0		8.9
Floor 2. Floor Name Public Space			Daytime Level	39.4		dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	67.1	637.12	-2.9	12.9	0.8	0.0		23.8
Air Intake 1	90.7	69.65	3.0	64.5	474.61	-2.8	10.4	0.4	0.0		21.2
Air Intake 2	90.7	69.65	3.0	65.1	509.45	-2.7	14.4	0.5	0.0		16.4
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	64.2	456.46	-3.1	1.8	1.6	8.1		20.1
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	64.8	491.72	-3.0	1.3	1.6	8.0		20.1
GT Building Ventilation 1	86.6	86.58	0.0	64.4	469.32	-3.0	0.8	2.2	0.0		22.2
GT Building Ventilation 2	86.6	86.58	0.0	64.8	489.04	-3.0	0.7	2.2	0.0		21.9
GT Building Ventilation 3	86.6	86.58	0.0	65.0	503.99	-3.0	0.7	2.3	0.0		21.6
GT Building Ventilation 4	86.6	86.58	0.0	64.9	497.57	-3.0	0.8	2.3	0.0		21.5
GT Building Ventilation 5	86.6	86.58	0.0	64.7	481.51	-3.0	1.0	2.3	0.0		21.6
GT Building Ventilation 6	86.6	86.58	0.0	64.3	462.47	-3.1	1.0	2.2	0.0		22.1
Gas Metering Station	88.6	88.60	0.0	67.9	699.27	-2.3	20.0	6.3	0.0		-3.2

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	72.4	53.95	3.0	63.5	423.36	-2.7		0.7	0.0		13.9
Gas Preheater Building Facade 3	74.0	53.95	3.0	63.5	420.33	-2.7	0.0	0.7	0.0		15.7
Gas Preheater Building Facade 4	72.3	53.95	3.0	63.6	428.33	-2.7	6.0	0.1	0.0		9.2
Gas Preheater Building Roof	76.7	53.95	0.0	63.6	425.77	-2.8	3.3	1.3	0.0		13.5
Gas Turbine Building Facade 1	81.9	47.71	3.0	64.6	480.56	-2.7	6.1	0.7	0.0		16.2
Gas Turbine Building Facade 2	76.7	47.71	3.0	64.0	449.09	-2.8		0.7	0.0		17.7
Gas Turbine Building Facade 3	81.9	47.71	3.0	64.8	489.70	-2.7	14.1	0.3	0.0		9.1
Gas Turbine Building Facade 4	76.6	47.71	3.0	65.4	524.02	-2.7	17.6	0.5	0.0		-1.2
Gas Turbine Building Roof	80.6	47.71	0.0	64.7	485.63	-3.0	4.8	0.6	0.0		13.5
Gas Turbine Transformer 1	93.6	93.59	0.0	64.8	489.78	-2.4	4.3	1.7	0.0		25.2
Gas Turbine Transformer 2	93.6	93.59	0.0	65.4	524.24	-2.3	16.8	1.1	0.0		12.6
HRSG Building Facade 1	81.9	48.42	3.0	64.4	466.44	-2.8	3.1	0.3	0.0		19.9
HRSG Building Facade 2	79.4	48.42	3.0	63.8	436.20	-2.8	0.3	0.4	0.0		20.7
HRSG Building Facade 3	81.9	48.42	3.0	64.6	480.37	-2.7	12.2	0.1	0.0		12.8
HRSG Building Facade 4	79.4	48.42	3.0	65.2	512.95	-2.7	14.6	0.2	0.0		5.9
HRSG Building Roof	84.1	48.42	0.0	64.5	473.77	-3.0	4.3	0.8	0.0		18.5
HRSG Building Ventilation 1	86.6	86.58	0.0	64.2	455.86	-3.0	0.1	1.9	0.0		23.5
HRSG Building Ventilation 2	86.6	86.58	0.0	64.6	476.80	-3.0	0.2	2.0	0.0		22.9
HRSG Building Ventilation 3	86.6	86.58	0.0	64.8	491.81	-3.0	0.1	2.0	0.0		25.0
HRSG Building Ventilation 4	86.6	86.58	0.0	64.8	487.21	-3.0	0.1	2.0	0.0		22.7
HRSG Building Ventilation 5	86.6	86.58	0.0	64.5	472.66	-3.0	0.2	2.0	0.0		22.9
HRSG Building Ventilation 6	86.6	86.58	0.0	64.1	451.03	-3.0	0.1	1.8	0.0		23.6
HRSG Stack Exhaust 1	102.1	102.10	0.0	64.0	448.49	-3.0		0.9	7.9		32.3
HRSG Stack Exhaust 2	102.1	102.10	0.0	64.7	484.99	-3.0		1.0	7.9		31.6
HRSG Stack Facade 1-1	76.0	53.42	3.0	64.0	447.83	-2.8	8.7	0.3	0.0		8.8
HRSG Stack Facade 1-2	76.0	53.58	3.0	64.1	449.31	-2.8	13.4	0.3	0.0		4.2
HRSG Stack Facade 1-3	76.0	53.38	3.0	64.0	448.55	-2.8	10.8	0.3	0.0		6.7

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	64.0	446.00	-2.8	5.2	0.3	0.0		12.4
HRSG Stack Facade 1-5	76.0	52.94	3.0	63.9	442.84	-2.9		0.3	0.0		17.7
HRSG Stack Facade 1-6	76.0	53.52	3.0	63.9	441.33	-2.9		0.3	0.0		17.7
HRSG Stack Facade 1-7	76.0	53.27	3.0	63.9	442.19	-2.9		0.3	0.0		17.7
HRSG Stack Facade 1-8	76.0	53.35	3.0	64.0	444.92	-2.9	4.7	0.3	0.0		12.9
HRSG Stack Facade 2-1	76.0	53.51	3.0	64.7	485.96	-2.9	13.4	0.3	0.0		3.4
HRSG Stack Facade 2-2	76.0	53.31	3.0	64.7	485.31	-2.8	10.7	0.3	0.0		6.1
HRSG Stack Facade 3-2	76.0	53.44	3.0	64.7	482.81	-2.8	5.0	0.4	0.0		11.8
HRSG Stack Facade 4-2	76.0	52.85	3.0	64.6	479.62	-2.9		0.4	0.0		16.9
HRSG Stack Facade 5-2	76.0	53.63	3.0	64.6	478.03	-2.9		0.4	0.0		17.0
HRSG Stack Facade 6-2	76.0	53.14	3.0	64.6	478.86	-2.9		0.4	0.0		18.3
HRSG Stack Facade 7-2	76.0	53.49	3.0	64.7	481.49	-2.9		0.4	0.0		16.9
HRSG Stack Facade 8-2	76.0	53.40	3.0	64.7	484.50	-2.8	8.6	0.3	0.0		8.2
ST Building Ventilation 1	86.6	86.58	0.0	65.5	532.14	-3.0	0.5	2.3	0.0		21.3
ST Building Ventilation 2	86.6	86.58	0.0	65.9	556.44	-3.0	0.4	2.3	0.0		20.9
ST Building Ventilation 3	86.6	86.58	0.0	65.8	552.71	-3.0	0.4	2.3	0.0		21.1
ST Building Ventilation 4	86.6	86.58	0.0	65.5	527.98	-3.0	1.0	2.5	0.0		20.7
ST Building Ventilation 5	86.6	86.58	0.0	65.7	542.51	-3.0	0.7	2.4	0.0		20.8
Steam Turbine Building Facade 1	89.7	58.31	3.0	65.6	535.42	-2.7	6.6	0.4	0.0		22.9
Steam Turbine Building Facade 2	89.3	58.31	3.0	65.3	521.78	-2.7	9.6	0.4	0.0		21.2
Steam Turbine Building Facade 3	89.7	58.31	3.0	65.8	548.17	-2.6	16.3	0.2	0.0		12.9
Steam Turbine Building Facade 4	89.4	58.31	3.0	66.0	561.97	-2.6	16.9	0.2	0.0		11.9
Steam Turbine Building Roof	90.6	58.31	0.0	65.7	542.18	-3.0	4.8	0.4	0.0		23.1
Steam Turbine Transformer	93.6	93.59	0.0	65.7	542.74	-2.3	19.4	1.9	0.0		8.9
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	64.3	463.33	-3.1	1.2	2.8	8.4		20.3
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	65.0	498.74	-3.0	1.2	2.9	8.3		19.7
WSAC	94.9	71.52	0.0	66.1	569.14	-2.3	19.4	2.7	0.0		9.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1. Floor Name Ruth Court Daytime level 31.4 dB(A)											
Air Cooled Condenser	101.7	64.64	0.0	73.6	1353.53	-2.4		4.2	0.0		26.2
Air Intake 1	90.7	69.65	3.0	74.6	1521.80	-1.8	0.1	2.6	0.0		18.1
Air Intake 2	90.7	69.65	3.0	74.4	1484.76	-1.8	0.1	2.6	0.0		18.4
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	74.7	1537.21	-2.2	0.2	3.4	6.8		9.8
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	74.5	1500.54	-2.2	0.5	3.6	7.1		9.2
GT Building Ventilation 1	86.6	86.58	0.0	74.7	1525.79	-2.3	0.4	4.7	0.0		9.1
GT Building Ventilation 2	86.6	86.58	0.0	74.5	1504.87	-2.3	0.4	4.7	0.0		9.3
GT Building Ventilation 3	86.6	86.58	0.0	74.5	1489.20	-2.3	0.4	4.7	0.0		9.4
GT Building Ventilation 4	86.6	86.58	0.0	74.5	1494.10	-2.3	0.4	4.6	0.0		9.4
GT Building Ventilation 5	86.6	86.58	0.0	74.6	1510.71	-2.3	0.2	4.4	0.0		9.7
GT Building Ventilation 6	86.6	86.58	0.0	74.7	1530.37	-2.3	0.1	4.4	0.0		9.7
Gas Metering Station	88.6	88.60	0.0	73.2	1290.34	-2.0		10.0	0.0		7.4
Gas Preheater Building Facade 2	72.4	53.95	3.0	74.9	1566.26	-2.0	19.4	1.1	0.0		-18.1
Gas Preheater Building Facade 3	74.0	53.95	3.0	74.9	1569.41	-2.0	19.0	1.0	0.0		-16.0
Gas Preheater Building Facade 4	72.3	53.95	3.0	74.9	1561.57	-2.0	19.4	1.1	0.0		-18.1
Gas Preheater Building Roof	76.7	53.95	0.0	74.9	1563.88	-2.0	19.2	1.0	0.0		-16.4
Gas Turbine Building Facade 1	81.9	47.71	3.0	74.6	1508.70	-1.8	15.3	1.1	0.0		-4.3
Gas Turbine Building Facade 2	76.7	47.71	3.0	74.8	1544.73	-1.8	16.1	0.9	0.0		-10.3
Gas Turbine Building Facade 3	81.9	47.71	3.0	74.5	1502.14	-1.8	2.3	1.7	0.0		8.2
Gas Turbine Building Facade 4	76.6	47.71	3.0	74.3	1466.91	-1.8	14.5	0.9	0.0		-8.2
Gas Turbine Building Roof	80.6	47.71	0.0	74.6	1505.51	-2.2	1.7	2.3	0.0		4.2
Gas Turbine Transformer 1	93.6	93.59	0.0	74.6	1508.38	-1.7		4.2	0.0		19.1
Gas Turbine Transformer 2	93.6	93.59	0.0	74.4	1471.42	-1.7		4.1	0.0		16.8
HRSG Building Facade 1	81.9	48.42	3.0	74.6	1521.93	-1.9	10.8	0.2	0.0		1.1
HRSG Building Facade 2	79.4	48.42	3.0	74.8	1554.16	-1.9	14.8	0.4	0.0		-5.7
HRSG Building Facade 3	81.9	48.42	3.0	74.6	1508.78	-1.9	16.7	0.5	0.0		-5.0

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

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	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	79.4	48.42	3.0	74.4	1476.94	-2.0	9.2	0.7	0.0		0.0
HRSG Building Roof	84.1	48.42	0.0	74.6	1515.17	-2.2	9.0	0.3	0.0		2.3
HRSG Building Ventilation 1	86.6	86.58	0.0	74.7	1535.18	-2.2	10.7	2.4	0.0		1.0
HRSG Building Ventilation 2	86.6	86.58	0.0	74.6	1513.82	-2.2	10.7	2.3	0.0		1.2
HRSG Building Ventilation 3	86.6	86.58	0.0	74.5	1498.68	-2.2	12.4	2.1	0.0		-0.2
HRSG Building Ventilation 4	86.6	86.58	0.0	74.5	1503.18	-2.2	8.2	2.4	0.0		3.7
HRSG Building Ventilation 5	86.6	86.58	0.0	74.6	1517.71	-2.2	8.7	2.4	0.0		3.1
HRSG Building Ventilation 6	86.6	86.58	0.0	74.7	1539.45	-2.2	7.7	2.8	0.0		3.5
HRSG Stack Exhaust 1	102.1	102.10	0.0	74.8	1545.90	-2.7		2.9	7.3		19.9
HRSG Stack Exhaust 2	102.1	102.10	0.0	74.6	1509.66	-2.7		2.8	7.3		20.1
HRSG Stack Facade 1-1	76.0	53.42	3.0	74.8	1542.94	-1.6	2.5	1.1	0.0		2.3
HRSG Stack Facade 1-2	76.0	53.58	3.0	74.8	1541.52	-1.7	2.0	1.1	0.0		2.8
HRSG Stack Facade 1-3	76.0	53.38	3.0	74.8	1542.41	-1.6	2.0	1.1	0.0		2.8
HRSG Stack Facade 1-4	76.0	53.29	3.0	74.8	1545.04	-1.6	2.0	1.1	0.0		2.8
HRSG Stack Facade 1-5	76.0	52.94	3.0	74.8	1548.01	-1.6	11.2	1.0	0.0		-6.3
HRSG Stack Facade 1-6	76.0	53.52	3.0	74.8	1549.39	-1.6	15.0	1.0	0.0		-10.1
HRSG Stack Facade 1-7	76.0	53.27	3.0	74.8	1548.44	-1.6	14.6	1.0	0.0		-9.7
HRSG Stack Facade 1-8	76.0	53.35	3.0	74.8	1545.82	-1.6	2.5	1.1	0.0		2.2
HRSG Stack Facade 2-1	76.0	53.51	3.0	74.6	1505.28	-1.7	1.9	1.1	0.0		3.1
HRSG Stack Facade 2-2	76.0	53.31	3.0	74.6	1506.19	-1.7	1.7	1.1	0.0		3.3
HRSG Stack Facade 3-2	76.0	53.44	3.0	74.6	1508.81	-1.7	1.2	1.1	0.0		3.8
HRSG Stack Facade 4-2	76.0	52.85	3.0	74.6	1511.77	-1.7	10.2	1.0	0.0		-5.1
HRSG Stack Facade 5-2	76.0	53.63	3.0	74.6	1513.21	-1.7	14.9	1.0	0.0		-9.7
HRSG Stack Facade 6-2	76.0	53.14	3.0	74.6	1512.18	-1.7	12.8	1.0	0.0		-7.7
HRSG Stack Facade 7-2	76.0	53.49	3.0	74.6	1509.47	-1.7	1.7	1.1	0.0		3.4
HRSG Stack Facade 8-2	76.0	53.40	3.0	74.6	1506.65	-1.7	1.7	1.1	0.0		3.4
ST Building Ventilation 1	86.6	86.58	0.0	74.3	1459.82	-2.3	0.3	4.4	0.0		9.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	74.1	1434.88	-2.3	0.1	4.2	0.0		10.4
ST Building Ventilation 3	86.6	86.58	0.0	74.2	1438.10	-2.3	0.1	4.2	0.0		10.4
ST Building Ventilation 4	86.6	86.58	0.0	74.3	1463.17	-2.3	0.2	4.3	0.0		10.1
ST Building Ventilation 5	86.6	86.58	0.0	74.2	1448.77	-2.3	0.3	4.4	0.0		10.0
Steam Turbine Building Facade 1	89.7	58.31	3.0	74.3	1454.02	-1.8	11.0	0.5	0.0		8.8
Steam Turbine Building Facade 2	89.3	58.31	3.0	74.3	1468.74	-1.8	16.1	0.5	0.0		5.3
Steam Turbine Building Facade 3	89.7	58.31	3.0	74.2	1442.71	-1.8		0.9	0.0		19.3
Steam Turbine Building Facade 4	89.4	58.31	3.0	74.1	1428.03	-1.8	0.2	0.9	0.0		19.0
Steam Turbine Building Roof	90.6	58.31	0.0	74.2	1448.35	-2.2	3.0	1.2	0.0		15.5
Steam Turbine Transformer	93.6	93.59	0.0	74.2	1449.36	-1.7	0.0	4.1	0.0		17.0
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	74.7	1529.75	-2.3	0.2	4.6	6.9		9.9
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	74.5	1493.12	-2.3	0.5	5.0	7.3		9.0
WSAC	94.9	71.52	0.0	74.1	1423.36	-1.8		5.1	0.0		17.6
Floor 2. Floor Name Ruth Court			Daytime Level	31.5		dB(A)					
Air Cooled Condenser	101.7	64.64	0.0	73.6	1353.50	-2.4		4.2	0.0		26.3
Air Intake 1	90.7	69.65	3.0	74.6	1521.79	-1.9	0.1	2.6	0.0		18.2
Air Intake 2	90.7	69.65	3.0	74.4	1484.76	-1.9	0.1	2.6	0.0		18.5
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	74.7	1537.17	-2.2	0.2	3.4	6.8		9.8
Exhaust Diffuser Compartment Vent Fans	92.8	92.80	0.0	74.5	1500.50	-2.3	0.5	3.6	7.1		9.3
GT Building Ventilation 1	86.6	86.58	0.0	74.7	1525.76	-2.3	0.4	4.7	0.0		9.2
GT Building Ventilation 2	86.6	86.58	0.0	74.5	1504.83	-2.4	0.4	4.7	0.0		9.3
GT Building Ventilation 3	86.6	86.58	0.0	74.5	1489.16	-2.4	0.4	4.6	0.0		9.4
GT Building Ventilation 4	86.6	86.58	0.0	74.5	1494.06	-2.4	0.4	4.6	0.0		9.5
GT Building Ventilation 5	86.6	86.58	0.0	74.6	1510.67	-2.4	0.2	4.4	0.0		9.8
GT Building Ventilation 6	86.6	86.58	0.0	74.7	1530.34	-2.3	0.1	4.4	0.0		9.7
Gas Metering Station	88.6	88.60	0.0	73.2	1290.36	-2.1		10.0	0.0		7.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	72.4	53.95	3.0	74.9	1566.28	-2.0	19.4	1.1	0.0		-18.0
Gas Preheater Building Facade 3	74.0	53.95	3.0	74.9	1569.43	-2.0	19.0	1.0	0.0		-16.0
Gas Preheater Building Facade 4	72.3	53.95	3.0	74.9	1561.60	-2.0	19.4	1.1	0.0		-18.0
Gas Preheater Building Roof	76.7	53.95	0.0	74.9	1563.90	-2.1	14.9	0.4	0.0		-11.4
Gas Turbine Building Facade 1	81.9	47.71	3.0	74.6	1508.70	-1.9	15.2	1.1	0.0		-4.2
Gas Turbine Building Facade 2	76.7	47.71	3.0	74.8	1544.72	-1.8	16.0	0.8	0.0		-10.1
Gas Turbine Building Facade 3	81.9	47.71	3.0	74.5	1502.13	-1.8	2.3	1.7	0.0		8.3
Gas Turbine Building Facade 4	76.6	47.71	3.0	74.3	1466.91	-1.9	14.4	0.8	0.0		-8.1
Gas Turbine Building Roof	80.6	47.71	0.0	74.6	1505.48	-2.2	1.6	2.3	0.0		4.3
Gas Turbine Transformer 1	93.6	93.59	0.0	74.6	1508.39	-1.8		4.2	0.0		19.3
Gas Turbine Transformer 2	93.6	93.59	0.0	74.4	1471.43	-1.8		4.1	0.0		16.9
HRSG Building Facade 1	81.9	48.42	3.0	74.6	1521.93	-2.0	10.8	0.2	0.0		1.1
HRSG Building Facade 2	79.4	48.42	3.0	74.8	1554.17	-2.0	14.5	0.4	0.0		-5.4
HRSG Building Facade 3	81.9	48.42	3.0	74.6	1508.79	-2.0	16.2	0.4	0.0		-4.3
HRSG Building Facade 4	79.4	48.42	3.0	74.4	1476.94	-2.0	8.3	0.7	0.0		1.0
HRSG Building Roof	84.1	48.42	0.0	74.6	1515.14	-2.2	9.0	0.3	0.0		2.4
HRSG Building Ventilation 1	86.6	86.58	0.0	74.7	1535.16	-2.3	10.5	2.4	0.0		1.2
HRSG Building Ventilation 2	86.6	86.58	0.0	74.6	1513.79	-2.3	10.5	2.3	0.0		1.4
HRSG Building Ventilation 3	86.6	86.58	0.0	74.5	1498.65	-2.3	12.3	2.1	0.0		-0.1
HRSG Building Ventilation 4	86.6	86.58	0.0	74.5	1503.15	-2.3	8.1	2.4	0.0		3.8
HRSG Building Ventilation 5	86.6	86.58	0.0	74.6	1517.68	-2.3	8.5	2.5	0.0		3.3
HRSG Building Ventilation 6	86.6	86.58	0.0	74.7	1539.42	-2.3	7.4	2.9	0.0		3.8
HRSG Stack Exhaust 1	102.1	102.10	0.0	74.8	1545.81	-2.7		2.9	7.3		19.9
HRSG Stack Exhaust 2	102.1	102.10	0.0	74.6	1509.57	-2.7		2.8	7.3		20.2
HRSG Stack Facade 1-1	76.0	53.42	3.0	74.8	1542.91	-1.7	2.5	1.1	0.0		2.3
HRSG Stack Facade 1-2	76.0	53.58	3.0	74.8	1541.49	-1.7	2.0	1.1	0.0		2.8
HRSG Stack Facade 1-3	76.0	53.38	3.0	74.8	1542.38	-1.7	2.0	1.1	0.0		2.9

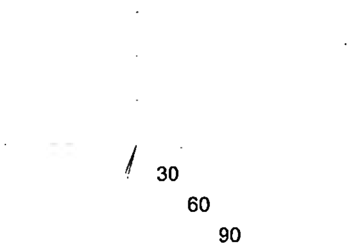
Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	74.8	1545.02	-1.7	2.0	1.1	0.0		2.9
HRSG Stack Facade 1-5	76.0	52.94	3.0	74.8	1547.98	-1.7	11.2	1.0	0.0		-6.3
HRSG Stack Facade 1-6	76.0	53.52	3.0	74.8	1549.37	-1.7	15.0	1.0	0.0		-10.0
HRSG Stack Facade 1-7	76.0	53.27	3.0	74.8	1548.41	-1.7	14.0	1.0	0.0		-9.0
HRSG Stack Facade 1-8	76.0	53.35	3.0	74.8	1545.79	-1.7	2.5	1.1	0.0		2.3
HRSG Stack Facade 2-1	76.0	53.51	3.0	74.6	1505.25	-1.8	1.9	1.1	0.0		3.3
HRSG Stack Facade 2-2	76.0	53.31	3.0	74.6	1506.16	-1.8	1.7	1.1	0.0		3.4
HRSG Stack Facade 3-2	76.0	53.44	3.0	74.6	1508.79	-1.8	1.2	1.1	0.0		3.9
HRSG Stack Facade 4-2	76.0	52.85	3.0	74.6	1511.75	-1.8	10.3	1.0	0.0		-5.1
HRSG Stack Facade 5-2	76.0	53.63	3.0	74.6	1513.19	-1.8	14.9	1.0	0.0		-9.7
HRSG Stack Facade 6-2	76.0	53.14	3.0	74.6	1512.16	-1.8	12.2	1.0	0.0		-7.0
HRSG Stack Facade 7-2	76.0	53.49	3.0	74.6	1509.44	-1.8	1.7	1.1	0.0		3.5
HRSG Stack Facade 8-2	76.0	53.40	3.0	74.6	1506.62	-1.8	1.6	1.1	0.0		3.5
ST Building Ventilation 1	86.6	86.58	0.0	74.3	1459.78	-2.4	0.3	4.4	0.0		10.0
ST Building Ventilation 2	86.6	86.58	0.0	74.1	1434.84	-2.4	0.1	4.2	0.0		10.5
ST Building Ventilation 3	86.6	86.58	0.0	74.2	1438.06	-2.4	0.1	4.2	0.0		10.4
ST Building Ventilation 4	86.6	86.58	0.0	74.3	1463.13	-2.4	0.2	4.3	0.0		10.2
ST Building Ventilation 5	86.6	86.58	0.0	74.2	1448.73	-2.4	0.3	4.4	0.0		10.1
Steam Turbine Building Facade 1	89.7	58.31	3.0	74.3	1454.02	-1.9	10.7	0.5	0.0		9.1
Steam Turbine Building Facade 2	89.3	58.31	3.0	74.3	1468.73	-1.8	16.0	0.5	0.0		5.5
Steam Turbine Building Facade 3	89.7	58.31	3.0	74.2	1442.71	-1.8		0.9	0.0		19.4
Steam Turbine Building Facade 4	89.4	58.31	3.0	74.1	1428.03	-1.9	0.2	0.9	0.0		19.1
Steam Turbine Building Roof	90.6	58.31	0.0	74.2	1448.31	-2.2	3.0	1.2	0.0		15.6
Steam Turbine Transformer	93.6	93.59	0.0	74.2	1449.37	-1.8		4.1	0.0		17.1
Turbine Compartment Vent Fans 1	94.0	94.00	0.0	74.7	1529.72	-2.3	0.2	4.6	6.9		10.0
Turbine Compartment Vent Fans 2	94.0	94.00	0.0	74.5	1493.08	-2.3	0.5	5.0	7.3		9.1
WSAC	94.9	71.52	0.0	74.1	1423.38	-1.8		5.0	0.0		17.7

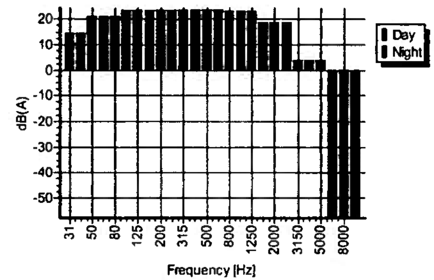
Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Floor 1. Floor Name Country View Manor Daytime Level 35.4 dB(A)

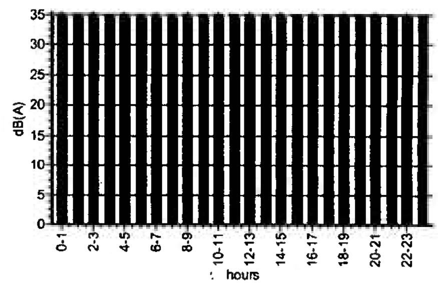
Day



Spectrum

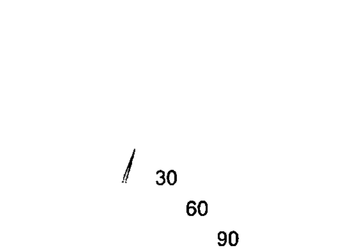


24h Distribution

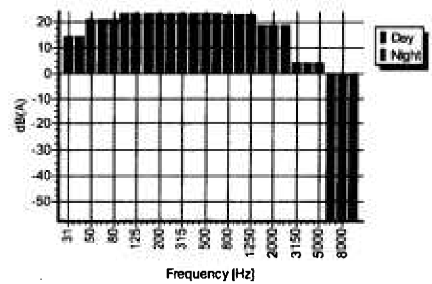


Floor 2. Floor Name Country View Manor Daytime Level 35.5 dB(A)

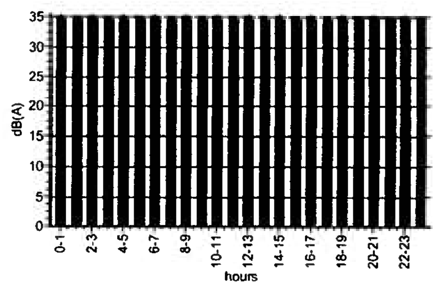
Day



Spectrum



24h Distribution

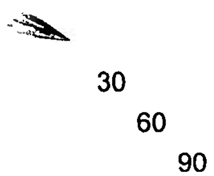


Floor 1. Floor Name Dolsontown Road - East Daytime Level 42.4 dB(A)

SoundPLAN 5.0 - 11/13/2000

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Day



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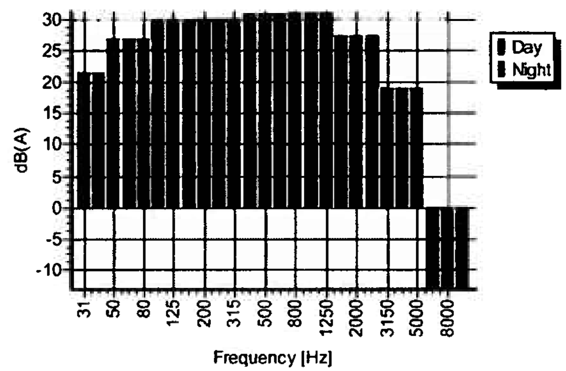
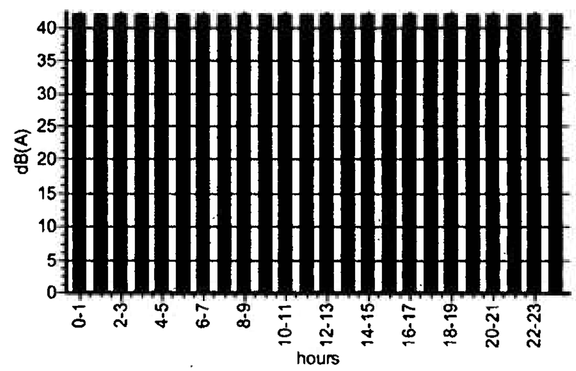
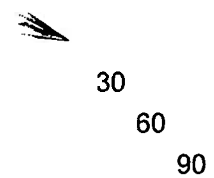


24h Distribution

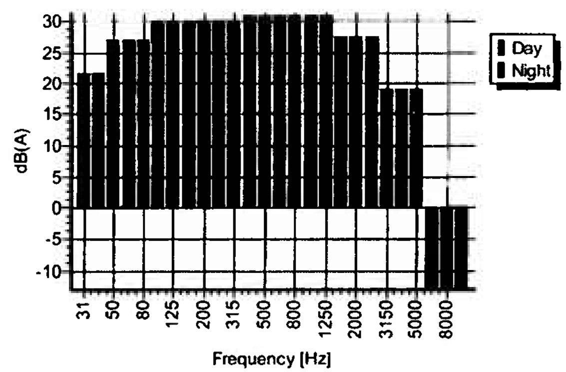


Floor 2. Floor Name Dolsontown Road - East Daytime Level 42.5 dB(A)

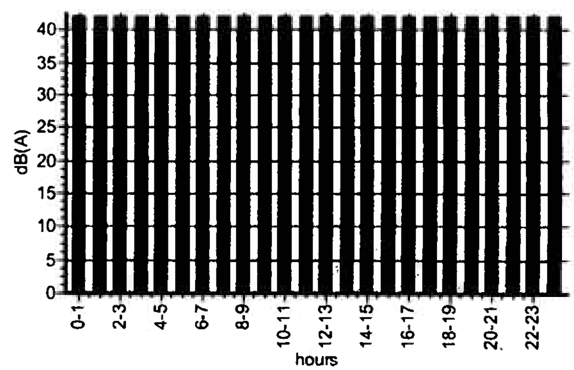
Day



Spectrum



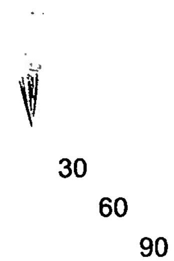
24h Distribution



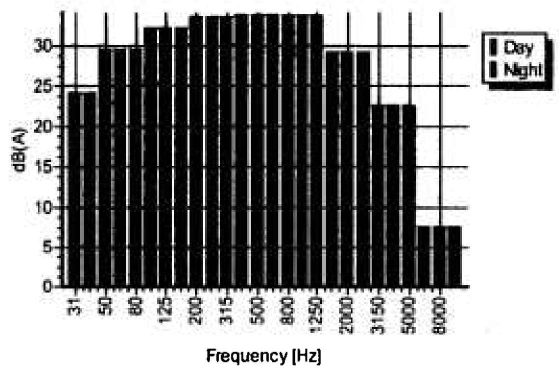
Floor 1. Floor Name Dolsontown Road - South Daytime Level 45.3 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

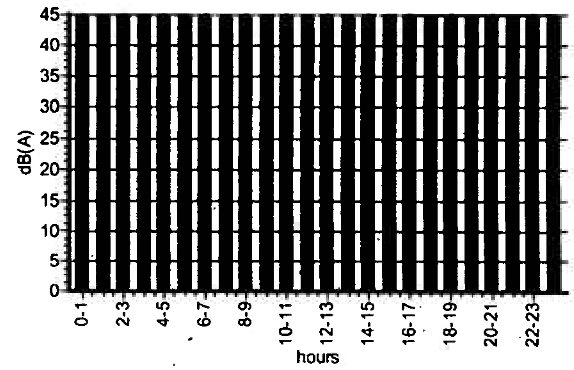
Day



Spectrum

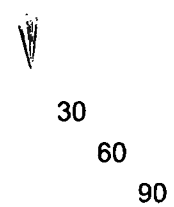


24h Distribution

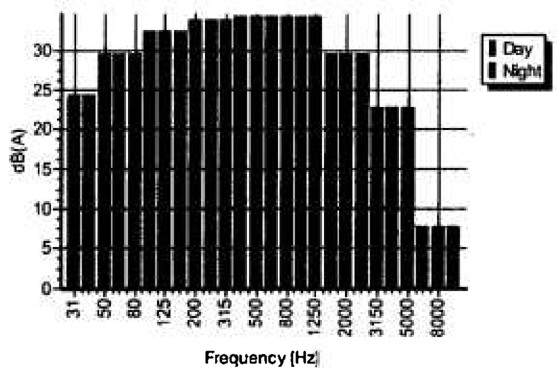


Floor 2. Floor Name Dolsontown Road - South Daytime Level 45.6 dB(A)

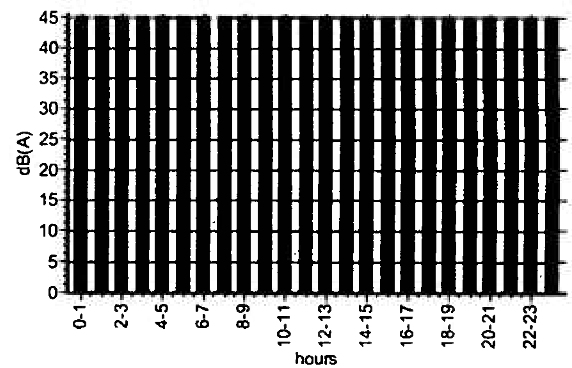
Day



Spectrum



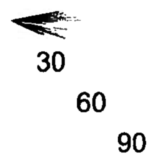
24h Distribution



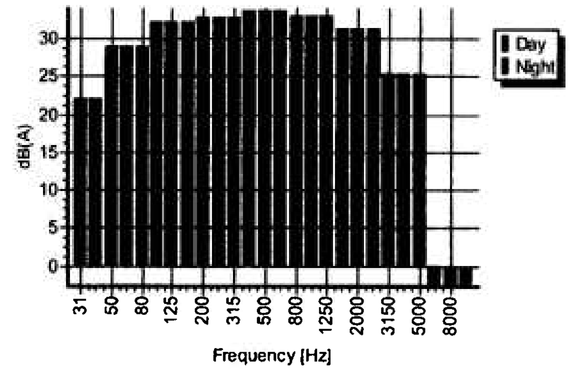
Floor 1. Floor Name Dolsontown Road - West Daytime Level 45.1 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

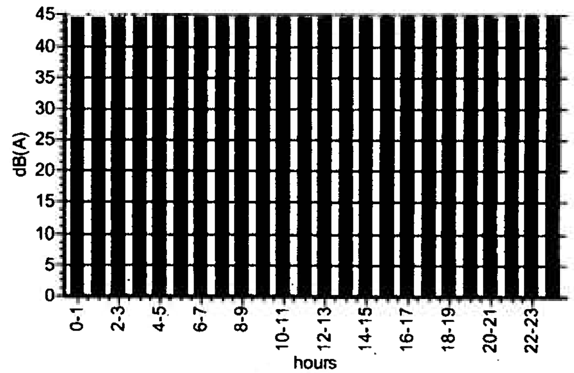
Day



Spectrum

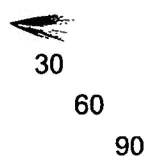


24h Distribution

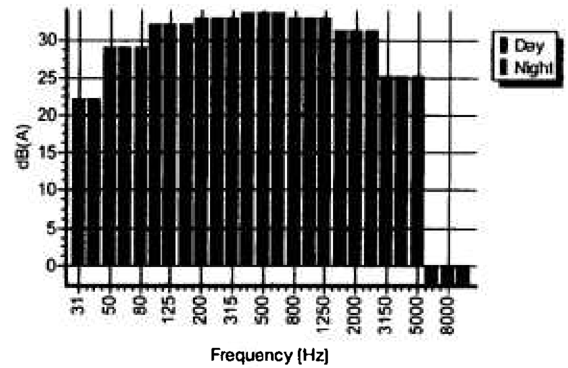


Floor 2. Floor Name Dolsontown Road - West Daytime Level 45.2 dB(A)

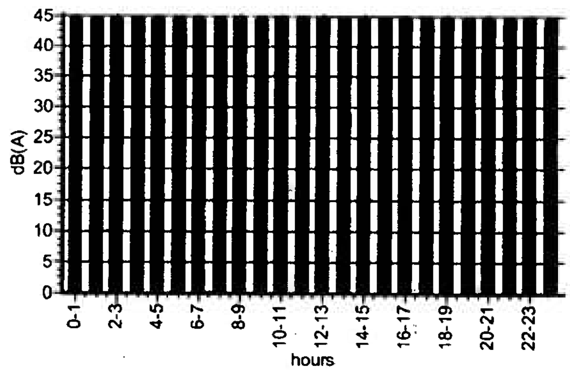
Day



Spectrum



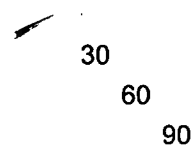
24h Distribution



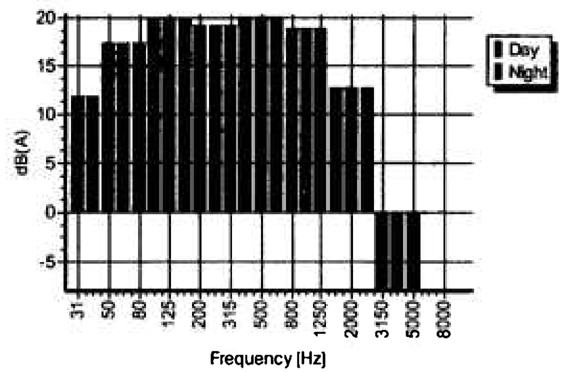
Floor 1. Floor Name Genung Street Daytime Level 31.2 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

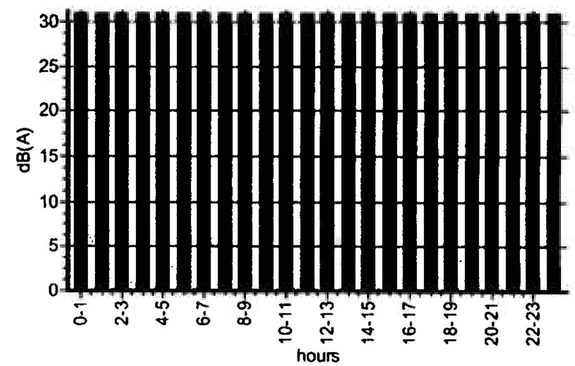
Day



Spectrum

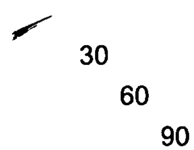


24h Distribution

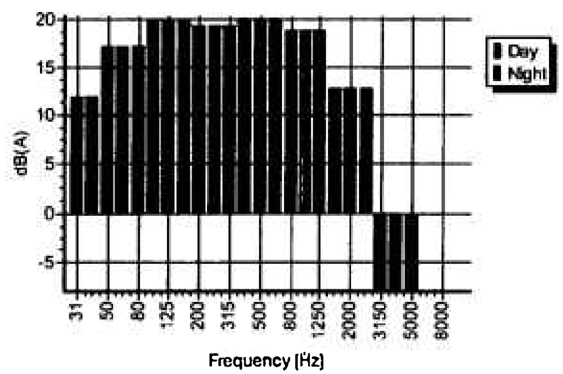


Floor 2. Floor Name Genung Street Daytime Level 31.3 dB(A)

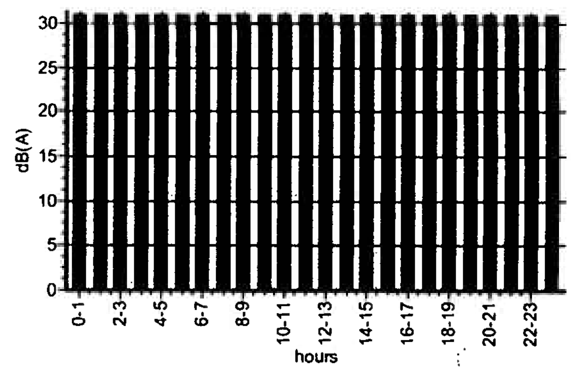
Day



Spectrum



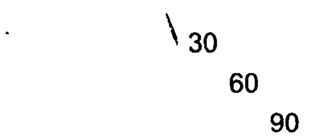
24h Distribution

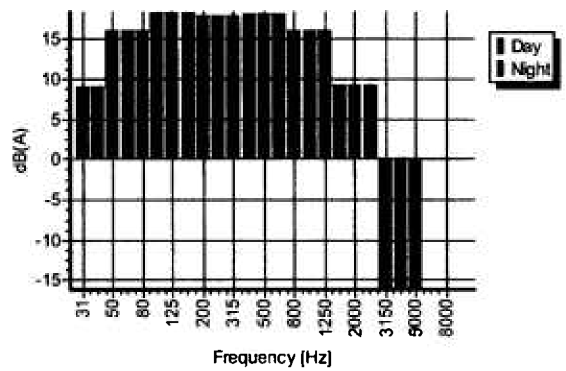


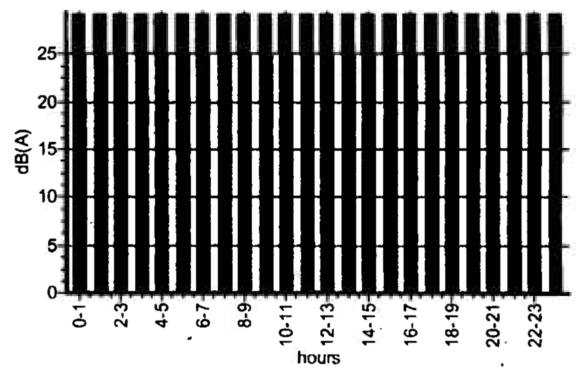
Floor 1. Floor Name Moon School Daytime Level 29.5 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

Day	Spectrum	24h Distribution

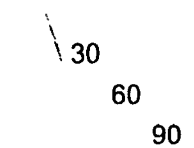


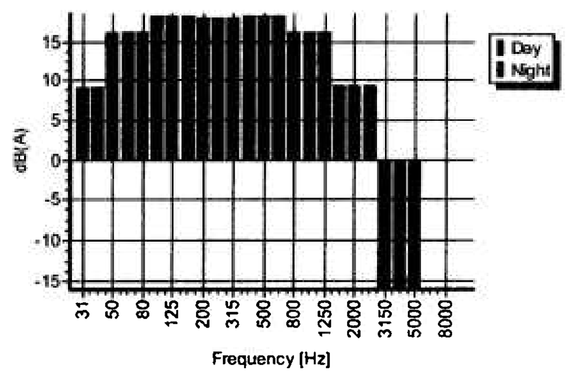


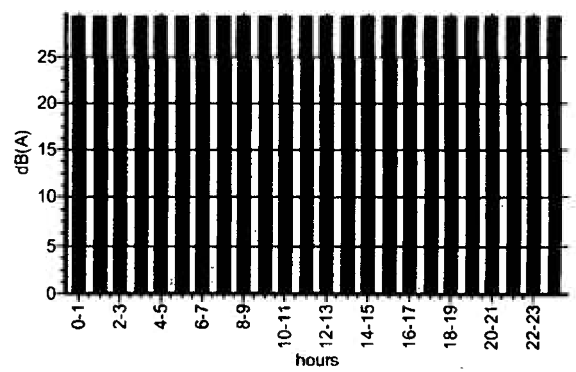


Floor 2. Floor Name Moon School Daytime Level 29.6 dB(A)

Day	Spectrum	24h Distribution



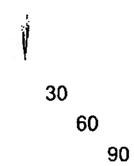




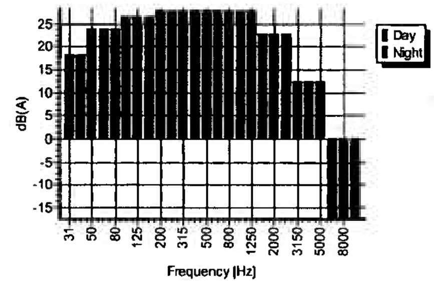
Floor 1. Floor Name Public Space Daytime Level 39.3 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

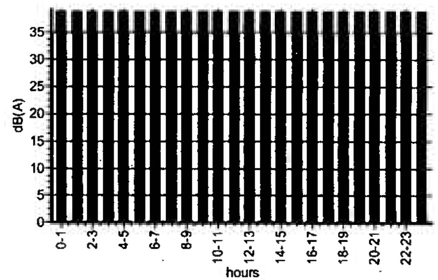
Day



Spectrum

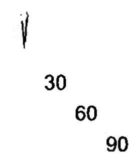


24h Distribution

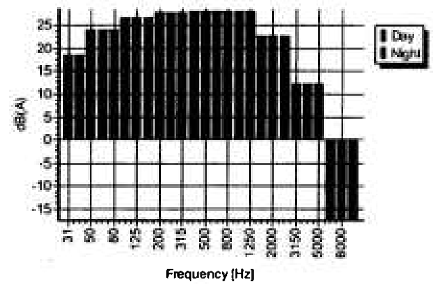


Floor: 2. Floor Name: Public Space Daytime Level 39.4 dB(A)

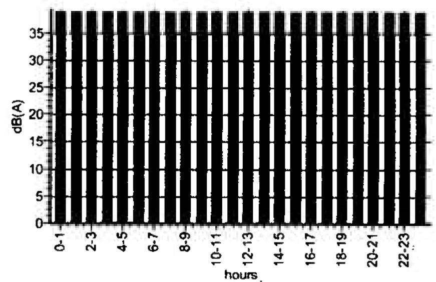
Day



Spectrum



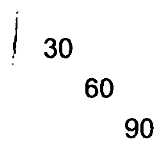
24h Distribution



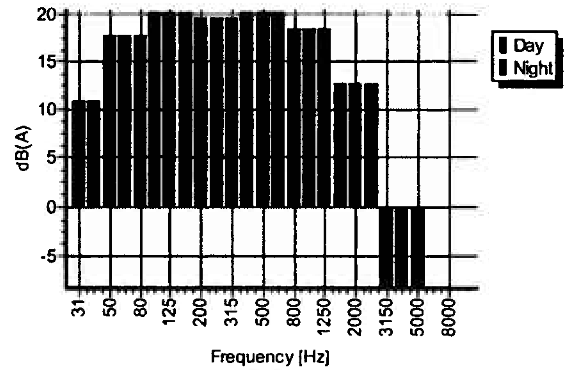
Floor: 1. Floor Name: Ruth Court Daytime Level 31.4 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating C

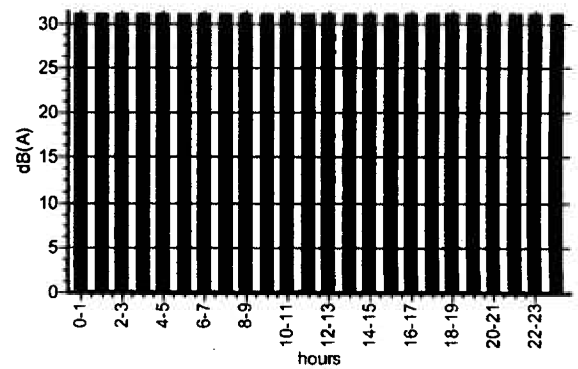
Day



Spectrum

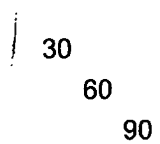


24h Distribution

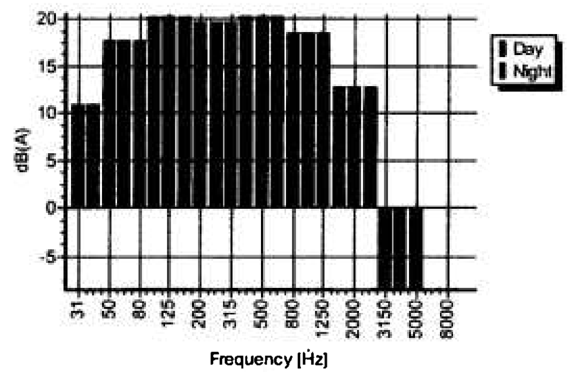


Floor 2. Floor Name Ruth Court Daytime Level 31.5 dB(A)

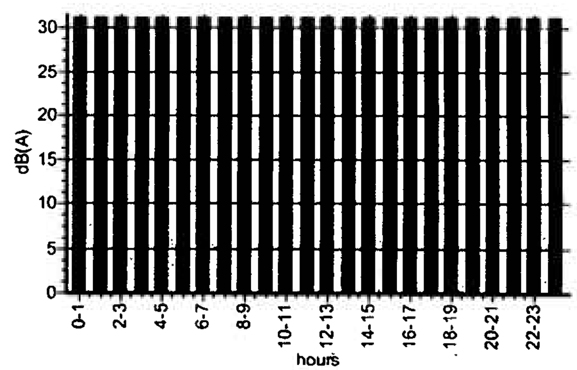
Day



Spectrum



24h Distribution



Wawayanda Energy Facility - Receiver Sound Levels
Base Analysis/03-01 GA/Linear/MCNR Rating C

Floor	Name	LrD dB(A)	LrN dB(A)
1. Floor	Country View Manor	59.6	59.6
2. Floor		59.6	59.6
1. Floor	Dolsontown Road - East	66.5	66.5
2. Floor		66.5	66.5
1. Floor	Dolsontown Road - South	69.3	69.3
2. Floor		69.3	69.3
1. Floor	Dolsontown Road - West	67.3	67.3
2. Floor		67.4	67.4
1. Floor	Genung Street	56.7	56.7
2. Floor		56.8	56.8
1. Floor	Moon School	54.3	54.3
2. Floor		54.4	54.4
1. Floor	Public Space	63.3	63.3
2. Floor		63.3	63.3
1. Floor	Ruth Court	56.1	56.1
2. Floor		56.2	56.2

MCNR Analysis - Reaction D

Wawayanda Energy Facility - Receiver Sound Levels
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Floor	Name	Daytime level dB(A)
1. Floor	Country View Manor	40.5
2. Floor		40.6
1. Floor	Dolsontown Road - East	47.1
2. Floor		47.2
1. Floor	Dolsontown Road - South	49.3
2. Floor		49.6
1. Floor	Dolsontown Road - West	50.0
2. Floor		50.0
1. Floor	Genung Street	36.4
2. Floor		36.5
1. Floor	Moon School	34.7
2. Floor		34.7
1. Floor	Public Space	43.4
2. Floor		43.5
1. Floor	Ruth Court	36.6
2. Floor		36.7

Wawayanda Energy Facility - Receiver Sound Pressure Levels
Base Analysis/03-01 GA/Linear/MCNR Rating D

Time Slice	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Floor 1. Floor Name Country View Manor LrD [illegible] dB(_)									
Day	58.6	57.9	49.7	42.8	37.1	32.3	26.7	8.6	-50.9
Night	58.6	57.9	49.7	42.8	37.1	32.3	26.7	8.6	-50.9
Floor 2. Floor Name Country View Manor LrD [illegible] dB(_)									
Day	58.6	57.9	49.8	42.9	37.1	32.4	26.7	8.6	-50.9
Night	58.6	57.9	49.8	42.9	37.1	32.4	26.7	8.6	-50.9
Floor 1. Floor Name Dolsontown Road - East LrD 68.4 dB(_)									
Day	65.7	64.3	55.7	49.1	43.9	39.2	35.0	23.4	-6.8
Night	65.7	64.3	55.7	49.1	43.9	39.2	35.0	23.4	-6.8
Floor 2. Floor Name Dolsontown Road - East LrD 68.4 dB(_)									
Day	65.8	64.3	55.8	49.2	43.9	39.3	35.0	23.5	-6.7
Night	65.8	64.3	55.8	49.2	43.9	39.3	35.0	23.5	-6.7
Floor 1. Floor Name Dolsontown Road - South LrD 70.8 dB(_)									
Day	68.5	66.1	57.5	51.7	46.6	41.3	35.3	28.0	14.0
Night	68.5	66.1	57.5	51.7	46.6	41.3	35.3	28.0	14.0
Floor 2. Floor Name Dolsontown Road - South LrD 70.9 dB(_)									
Day	68.6	66.2	57.7	51.9	46.8	41.6	35.9	28.1	14.0
Night	68.6	66.2	57.7	51.9	46.8	41.6	35.9	28.1	14.0
Floor 1. Floor Name Dolsontown Road - West LrD 69.3 dB(_)									
Day	66.2	65.5	57.9	52.0	46.8	42.8	38.9	30.0	3.3
Night	66.2	65.5	57.9	52.0	46.8	42.8	38.9	30.0	3.3
Floor 2. Floor Name Dolsontown Road - West LrD 69.4 dB(_)									
Day	66.3	65.5	58.0	52.1	46.8	42.9	38.9	30.0	3.3
Night	66.3	65.5	58.0	52.1	46.8	42.9	38.9	30.0	3.3
Floor 1. Floor Name Genung Street LrD 58.7 dB(_)									
Day	56.0	54.8	45.8	38.6	32.9	27.6	20.7	-3.4	

Wawayanda Energy Facility - Receiver Sound Pressure Levels
Base Analysis/03-01 GA/Linear/MCNR Rating D

Time Slice	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Night	56.0	54.8	45.8	38.6	32.9	27.6	20.7	-3.4	
Floor 2. Floor Name [illegible] Street LrD [illegible] dB(A)									
Day	56.0	54.8	45.9	38.7	33.0	27.6	20.8	-3.4	
Night	56.0	54.8	45.9	38.7	33.0	27.6	20.8	-3.4	
Floor 1. Floor Name Moon School LrD [illegible] dB(A)									
Day	53.3	52.8	44.3	37.2	31.2	25.7	17.0	-11.4	
Night	53.3	52.8	44.3	37.2	31.2	25.7	17.0	-11.4	
Floor 2. Floor Name Moon School LrD 58.4 dB(A)									
Day	53.3	52.8	44.4	37.3	31.2	25.7	17.1	-11.3	
Night	53.3	52.8	44.4	37.3	31.2	25.7	17.1	-11.3	
Floor 1. Floor Name Public Space LrD 64.9 dB(A)									
Day	62.5	60.3	52.1	45.9	40.6	35.3	28.7	17.5	-11.2
Night	62.5	60.3	52.1	45.9	40.6	35.3	28.7	17.5	-11.2
Floor 2. Floor Name Public Space LrD [illegible] dB(A)									
Day	62.5	60.4	52.2	46.0	40.7	35.3	28.7	17.5	-11.1
Night	62.5	60.4	52.2	46.0	40.7	35.3	28.7	17.5	-11.1
Floor 1. Floor Name Ruth Court LrD 58.2 dB(A)									
Day	55.1	54.5	46.2	39.0	33.1	27.9	20.5	-3.7	
Night	55.1	54.5	46.2	39.0	33.1	27.9	20.5	-3.7	
Floor 2. Floor Name Ruth Court LrD 58.3 dB(A)									
Day	55.2	54.6	46.2	39.1	33.2	28.0	20.6	-3.6	
Night	55.2	54.6	46.2	39.1	33.2	28.0	20.6	-3.6	

Wawayanda Energy Facility Source List
Base Analysis/03-01 GA/Linear/MCNR Rating D

Source	Src type	l or S	Lw	Ko	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz
Air Cooled Condenser	Area	5077.9	127.1	0.0	124.	122.	111.	106.	102.	99.8	98.8	93.8	86.8
Air Intake 1	Area	127.38	108.2	3.0	102.	106.	99.0	94.0	86.2	78.1	74.0	82.0	77.0
Air Intake 2	Area	127.35	108.2	3.0	102.	106.	99.0	94.0	86.2	78.1	74.0	82.0	77.0
Exhaust Diffuser	Point		113.5	0.0	106.	106.	110.	104.	101.	92.0	96.0	84.0	75.0
Exhaust Diffuser	Point		113.5	0.0	106.	106.	110.	104.	101.	92.0	96.0	84.0	75.0
GT Building Ventilation 1	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
GT Building Ventilation 2	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
GT Building Ventilation 3	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
GT Building Ventilation 4	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
GT Building Ventilation 5	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
GT Building Ventilation 6	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
Gas Metering Station	Point		92.7	0.0	-15.0	-15.0	-15.0	73.0	75.0	80.0	90.0	88.0	80.0
Gas Preheater Building	Area	69.53	106.2	3.0	105.	98.4	84.4	71.4	61.4	61.4	60.4	58.4	59.4
Gas Preheater Building	Area	100.42	107.8	3.0	107.	100.	86.0	73.0	63.0	63.0	62.0	60.0	61.0
Gas Preheater Building	Area	69.07	106.2	3.0	105.	98.4	84.4	71.4	61.4	61.4	60.4	58.4	59.4
Gas Preheater Building Roof	Area	188.57	110.6	0.0	109.	102.	88.8	75.8	65.8	65.8	64.8	62.8	63.8
Gas Turbine Building	Area	2604.5	109.9	3.0	108.	101.	99.1	89.8	79.3	71.6	68.5	62.2	64.6
Gas Turbine Building	Area	791.63	104.7	3.0	103.	96.1	93.9	84.6	74.1	66.4	63.3	57.0	59.4
Gas Turbine Building	Area	2607.9	109.9	3.0	108.	101.	99.1	89.8	79.3	71.6	68.5	62.2	64.6
Gas Turbine Building	Area	775.23	104.6	3.0	103.	96.0	93.8	84.5	74.0	66.3	63.2	56.9	59.3
Gas Turbine Building Roof	Area	1943.3	108.6	0.0	107.	100.	97.8	88.5	78.0	70.3	67.2	60.9	63.3
Gas Turbine Transformer 1	Point		109.3	0.0	100.	106.	103.	100.	95.0	92.0	87.0	87.0	80.0
Gas Turbine Transformer 2	Point		109.3	0.0	100.	106.	103.	100.	95.0	92.0	87.0	87.0	80.0
HRSG Building Facade 1	Area	2205.7	115.5	3.0	114.	106.	95.0	88.4	77.8	67.0	62.3	63.8	64.9
HRSG Building Facade 2	Area	1244.7	113.0	3.0	112.	103.	92.6	86.0	75.4	64.6	59.9	61.4	62.5
HRSG Building Facade 3	Area	2212.0	115.5	3.0	114.	106.	95.0	88.4	77.8	67.0	62.3	63.8	64.9
HRSG Building Facade 4	Area	1244.6	113.0	3.0	112.	103.	92.6	86.0	75.4	64.6	59.9	61.4	62.5
HRSG Building Roof	Area	3668.7	117.7	0.0	117.	108.	97.2	90.6	80.0	69.2	64.5	66.0	67.1

Wawayanda Energy Facility Source List
Base Analysis/03-01 GA/Linear/MCNR Rating D

Source	SrcType	l or S	Lw	Ko	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz
HRSG Building Ventilation 1	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Building Ventilation 2	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Building Ventilation 3	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Building Ventilation 4	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Building Ventilation 5	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Building Ventilation 6	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
HRSG Stack Exhaust 1	Point		120.4	0.0	111.	119.	109.	107.	105.	103.	80.0	60.0	43.0
HRSG Stack Exhaust 2	Point		120.4	0.0	111.	119.	109.	107.	105.	103.	80.0	60.0	43.0
HRSG Stack Facade 1-1	Area	181.89	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-2	Area	175.63	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-3	Area	183.89	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-4	Area	187.37	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-5	Area	203.38	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-6	Area	177.98	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-7	Area	188.39	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 1-8	Area	185.09	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 2-1	Area	178.38	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 2-2	Area	186.66	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 3-2	Area	181.13	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 4-2	Area	207.67	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 5-2	Area	173.42	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 6-2	Area	194.01	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 7-2	Area	178.94	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
HRSG Stack Facade 8-2	Area	182.82	92.6	3.0	90.0	86.0	82.0	84.0	55.0	53.0	43.0	19.0	0.0
ST Building Ventilation 1	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
ST Building Ventilation 2	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
ST Building Ventilation 3	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
ST Building Ventilation 4	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0

Wawayanda Energy Facility Source List
Base Analysis/03-01 GA/Linear/MCNR Rating D

Source	Src type	l or S	Lw	Ko	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
ST Building Ventilation 5	Point		98.4	0.0	94.0	94.0	90.0	86.0	83.0	81.0	78.0	75.0	75.0
Steam Turbine Building	Area	1370.5	116.3	3.0	111.	113.	108.	98.4	85.4	74.4	67.4	57.4	54.4
Steam Turbine Building	Area	1266.2	116.0	3.0	111.	113.	108.	98.0	85.0	74.0	67.0	57.0	54.0
Steam Turbine Building	Area	1363.1	116.3	3.0	111.	113.	108.	98.3	85.3	74.3	67.3	57.3	54.3
Steam Turbine Building	Area	1288.5	116.1	3.0	111.	113.	108.	98.1	85.1	74.1	67.1	57.1	54.1
Steam Turbine Building Roof	Area	1676.3	117.2	0.0	112.	114.	109.	99.2	86.2	75.2	68.2	58.2	55.2
Steam Turbine Transformer	Point		109.3	0.0	100.	106.	103.	100.	95.0	92.0	87.0	87.0	80.0
Turbine Compartment Vent	Point		113.6	0.0	106.	106.	110.	104.	101.	92.0	97.0	95.0	91.0
Turbine Compartment Vent	Point		113.6	0.0	106.	106.	110.	104.	101.	92.0	97.0	95.0	91.0
WSAC	Area	219.48	106.0	0.0	57.0	96.0	103.	100.	93.0	93.0	91.0	86.0	88.0

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1. Floor	Name Country View Manor		Lrn 40.5	dB(A)							
Air Cooled Condenser	106.8	69.69	0.0	70.5	943.38	-2.6		2.3	0.0		36.6
Air Intake 1	90.7	69.65	3.0	71.9	1113.97	-2.0	0.1	2.2	0.0		21.4
Air Intake 2	90.7	69.65	3.0	71.6	1075.73	-2.1	0.1	2.2	0.0		21.8
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	72.0	1123.47	-2.4	0.2	2.7	7.0		23.4
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	71.7	1085.46	-2.5	0.6	2.8	7.3		22.9
GT Building Ventilation 1	86.6	86.58	0.0	71.9	1114.78	-2.5	0.1	3.5	0.0		13.5
GT Building Ventilation 2	86.6	86.58	0.0	71.8	1092.92	-2.5	0.2	3.6	0.0		13.6
GT Building Ventilation 3	86.6	86.58	0.0	71.6	1076.57	-2.5	0.4	3.7	0.0		13.4
GT Building Ventilation 4	86.6	86.58	0.0	71.6	1077.67	-2.5	0.4	3.7	0.0		13.4
GT Building Ventilation 5	86.6	86.58	0.0	71.8	1095.12	-2.5	0.2	3.5	0.0		13.6
GT Building Ventilation 6	86.6	86.58	0.0	71.9	1115.41	-2.5	0.1	3.5	0.0		13.5
Gas Metering Station	93.6	93.60	0.0	69.8	874.64	-2.2		7.5	0.0		18.5
Gas Preheater Building Facade 2	75.4	56.95	3.0	72.2	1142.30	-2.1	10.1	0.2	0.0		-1.9
Gas Preheater Building Facade 3	77.0	56.95	3.0	72.2	1147.31	-2.1	14.8	0.2	0.0		-5.2
Gas Preheater Building Facade 4	75.3	56.95	3.0	72.1	1140.92	-2.1	15.9	0.3	0.0		-8.0
Gas Preheater Building Roof	79.7	56.95	0.0	72.1	1141.54	-2.1	13.6	0.2	0.0		-4.1
Gas Turbine Building Facade 1	86.4	52.25	3.0	71.8	1092.20	-1.9	13.0	0.5	0.0		6.1
Gas Turbine Building Facade 2	81.2	52.25	3.0	72.1	1132.37	-1.9	16.0	0.5	0.0		-2.5
Gas Turbine Building Facade 3	86.4	52.25	3.0	71.8	1090.85	-1.9	1.5	0.8	0.0		17.3
Gas Turbine Building Facade 4	81.1	52.25	3.0	71.4	1051.73	-1.9	15.3	0.5	0.0		-1.1
Gas Turbine Building Roof	85.1	52.25	0.0	71.8	1091.53	-2.4	2.1	1.0	0.0		12.6
Gas Turbine Transformer 1	98.1	98.09	0.0	71.9	1103.34	-1.7		2.7	0.0		25.2
Gas Turbine Transformer 2	98.1	98.09	0.0	71.5	1065.28	-1.7		2.7	0.0		25.6
HRSG Building Facade 1	85.4	52.01	3.0	71.8	1095.86	-2.0	7.5	0.3	0.0		10.8
HRSG Building Facade 2	83.0	52.01	3.0	72.1	1134.53	-2.0	15.0	0.3	0.0		0.6
HRSG Building Facade 3	85.5	52.01	3.0	71.8	1092.47	-2.0	14.5	0.2	0.0		4.0

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	83.0	52.01	3.0	71.5	1054.13	-2.1	6.0	0.6	0.0		10.0
HRSG Building Roof	87.7	52.01	0.0	71.8	1093.71	-2.4	4.8	0.7	0.0		12.7
HRSG Building Ventilation 1	86.6	86.58	0.0	72.0	1116.48	-2.4	7.3	2.1	0.0		7.7
HRSG Building Ventilation 2	86.6	86.58	0.0	71.8	1094.02	-2.5	8.5	1.8	0.0		7.0
HRSG Building Ventilation 3	86.6	86.58	0.0	71.7	1078.52	-2.5	9.8	1.6	0.0		6.0
HRSG Building Ventilation 4	86.6	86.58	0.0	71.7	1079.77	-2.5	0.0	3.4	0.0		14.0
HRSG Building Ventilation 5	86.6	86.58	0.0	71.8	1094.77	-2.5	0.0	3.4	0.0		13.8
HRSG Building Ventilation 6	86.6	86.58	0.0	72.0	1117.66	-2.4	0.0	3.5	0.0		13.6
HRSG Stack Exhaust 1	106.6	106.63	0.0	72.0	1120.10	-2.9	0.1	2.1	7.5		27.9
HRSG Stack Exhaust 2	106.6	106.63	0.0	71.7	1082.33	-2.9		2.0	7.4		28.6
HRSG Stack Facade 1-1	76.0	53.42	3.0	72.0	1117.73	-2.0	1.5	0.8	0.0		6.8
HRSG Stack Facade 1-2	76.0	53.58	3.0	72.0	1115.85	-2.0	1.6	0.8	0.0		6.7
HRSG Stack Facade 1-3	76.0	53.38	3.0	72.0	1116.16	-2.0	6.5	0.8	0.0		1.8
HRSG Stack Facade 1-4	76.0	53.29	3.0	72.0	1118.45	-2.0	5.9	0.8	0.0		2.4
HRSG Stack Facade 1-5	76.0	52.94	3.0	72.0	1121.55	-2.0	10.3	0.7	0.0		-2.0
HRSG Stack Facade 1-6	76.0	53.52	3.0	72.0	1123.45	-2.0	14.2	0.7	0.0		-5.9
HRSG Stack Facade 1-7	76.0	53.27	3.0	72.0	1123.10	-2.0	14.1	0.7	0.0		-5.8
HRSG Stack Facade 1-8	76.0	53.35	3.0	72.0	1120.77	-2.0	7.5	0.8	0.0		0.7
HRSG Stack Facade 2-1	76.0	53.51	3.0	71.7	1078.01	-2.1	0.3	0.8	0.0		8.4
HRSG Stack Facade 2-2	76.0	53.31	3.0	71.7	1078.35	-2.1	0.0	0.8	0.0		8.6
HRSG Stack Facade 3-2	76.0	53.44	3.0	71.7	1080.60	-2.1	0.2	0.8	0.0		8.4
HRSG Stack Facade 4-2	76.0	52.85	3.0	71.7	1083.73	-2.1	8.2	0.7	0.0		0.5
HRSG Stack Facade 5-2	76.0	53.63	3.0	71.7	1085.74	-2.1	12.9	0.7	0.0		-4.3
HRSG Stack Facade 6-2	76.0	53.14	3.0	71.7	1085.24	-2.1	13.6	0.7	0.0		-4.9
HRSG Stack Facade 7-2	76.0	53.49	3.0	71.7	1082.85	-2.1	7.8	0.8	0.0		0.8
HRSG Stack Facade 8-2	76.0	53.40	3.0	71.7	1079.88	-2.1	1.4	0.8	0.0		7.2
ST Building Ventilation 1	86.6	86.58	0.0	71.4	1045.56	-2.6	0.2	3.4	0.0		14.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	71.2	1019.55	-2.6	0.1	3.3	0.0		14.5
ST Building Ventilation 3	86.6	86.58	0.0	71.2	1019.97	-2.6	0.1	3.3	0.0		14.5
ST Building Ventilation 4	86.6	86.58	0.0	71.4	1046.00	-2.6	0.2	3.4	0.0		14.1
ST Building Ventilation 5	86.6	86.58	0.0	71.3	1032.71	-2.6	0.3	3.5	0.0		14.1
Steam Turbine Building Facade 1	95.3	63.91	3.0	71.3	1031.92	-2.0	6.2	0.4	0.0		22.4
Steam Turbine Building Facade 2	94.9	63.91	3.0	71.4	1051.87	-2.0	15.8	0.3	0.0		13.2
Steam Turbine Building Facade 3	95.3	63.91	3.0	71.3	1029.54	-2.0		0.5	0.0		28.5
Steam Turbine Building Facade 4	95.0	63.91	3.0	71.1	1009.54	-2.0	0.2	0.5	0.0		28.3
Steam Turbine Building Roof	96.2	63.91	0.0	71.3	1030.53	-2.4	3.6	0.6	0.0		24.4
Steam Turbine Transformer	98.1	98.09	0.0	71.3	1038.46	-1.7		2.6	0.0		28.2
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	71.9	1115.29	-2.5	0.2	3.9	7.1		23.4
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	71.6	1077.28	-2.5	0.5	4.2	7.5		22.7
WSAC	98.7	75.33	0.0	71.1	1014.38	-1.9		3.4	0.0		26.1
Floor 2. Floor | Name Country View Manor			LrD 40.6 dB(A)								
Air Cooled Condenser	106.8	69.69	0.0	70.5	943.36	-2.6		2.3	0.0		36.7
Air Intake 1	90.7	69.65	3.0	71.9	1113.97	-2.1	0.1	2.2	0.0		21.5
Air Intake 2	90.7	69.65	3.0	71.6	1075.74	-2.1	0.1	2.2	0.0		21.9
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	72.0	1123.44	-2.5	0.2	2.7	6.9		23.5
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	71.7	1085.43	-2.5	0.5	2.8	7.3		23.0
GT Building Ventilation 1	86.6	86.58	0.0	71.9	1114.74	-2.6	0.1	3.5	0.0		13.6
GT Building Ventilation 2	86.6	86.58	0.0	71.8	1092.88	-2.6	0.2	3.5	0.0		13.7
GT Building Ventilation 3	86.6	86.58	0.0	71.6	1076.54	-2.6	0.4	3.7	0.0		13.5
GT Building Ventilation 4	86.6	86.58	0.0	71.6	1077.63	-2.6	0.4	3.7	0.0		13.5
GT Building Ventilation 5	86.6	86.58	0.0	71.8	1095.08	-2.6	0.2	3.5	0.0		13.7
GT Building Ventilation 6	86.6	86.58	0.0	71.9	1115.38	-2.6	0.1	3.5	0.0		13.6
Gas Metering Station	93.6	93.60	0.0	69.8	874.70	-2.3		7.5	0.0		18.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL dB(A)	PWL/unit dB(A)	Non-Sphere dB	Spreading dB	Distance m	Grnd.Effct dB	Ins. dB	Air dB	Directivity dB	Mitigation dB	SPL dB(A)
Gas Preheater Building Facade 2	75.4	56.95	3.0	72.2	1142.34	-2.1	10.1	0.2	0.0		-1.9
Gas Preheater Building Facade 3	77.0	56.95	3.0	72.2	1147.36	-2.1	14.8	0.2	0.0		-5.2
Gas Preheater Building Facade 4	75.3	56.95	3.0	72.1	1140.97	-2.1	15.9	0.3	0.0		-7.9
Gas Preheater Building Roof	79.7	56.95	0.0	72.2	1141.58	-2.2	13.6	0.2	0.0		-4.1
Gas Turbine Building Facade 1	86.4	52.25	3.0	71.8	1092.20	-2.0	12.4	0.7	0.0		6.6
Gas Turbine Building Facade 2	81.2	52.25	3.0	72.1	1132.38	-1.9	16.0	0.5	0.0		-2.4
Gas Turbine Building Facade 3	86.4	52.25	3.0	71.8	1090.87	-2.0	1.4	0.7	0.0		17.5
Gas Turbine Building Facade 4	81.1	52.25	3.0	71.4	1051.74	-2.0	15.3	0.5	0.0		-1.0
Gas Turbine Building Roof	85.1	52.25	0.0	71.8	1091.49	-2.4	2.1	1.0	0.0		12.7
Gas Turbine Transformer 1	98.1	98.09	0.0	71.9	1103.37	-1.8		2.7	0.0		25.3
Gas Turbine Transformer 2	98.1	98.09	0.0	71.5	1065.31	-1.8		2.7	0.0		25.7
HRSG Building Facade 1	85.4	52.01	3.0	71.8	1095.85	-2.1	7.4	0.3	0.0		11.1
HRSG Building Facade 2	83.0	52.01	3.0	72.1	1134.55	-2.0	15.0	0.3	0.0		0.7
HRSG Building Facade 3	85.5	52.01	3.0	71.8	1092.34	-2.1	13.7	0.2	0.0		4.8
HRSG Building Facade 4	83.0	52.01	3.0	71.5	1054.15	-2.1	6.0	0.6	0.0		10.1
HRSG Building Roof	87.7	52.01	0.0	71.8	1093.70	-2.4	4.7	0.7	0.0		12.9
HRSG Building Ventilation 1	86.6	86.58	0.0	72.0	1116.46	-2.5	6.9	2.1	0.0		8.1
HRSG Building Ventilation 2	86.6	86.58	0.0	71.8	1093.99	-2.5	8.4	1.8	0.0		7.2
HRSG Building Ventilation 3	86.6	86.58	0.0	71.7	1078.50	-2.5	9.7	1.6	0.0		6.1
HRSG Building Ventilation 4	86.6	86.58	0.0	71.7	1079.75	-2.5	0.0	3.3	0.0		14.1
HRSG Building Ventilation 5	86.6	86.58	0.0	71.8	1094.75	-2.5	0.0	3.4	0.0		13.9
HRSG Building Ventilation 6	86.6	86.58	0.0	72.0	1117.63	-2.5	0.0	3.4	0.0		13.6
HRSG Stack Exhaust 1	106.6	106.63	0.0	72.0	1120.00	-2.9	0.1	2.1	7.5		28.0
HRSG Stack Exhaust 2	106.6	106.63	0.0	71.7	1082.22	-3.0		2.0	7.4		28.6
HRSG Stack Facade 1-1	76.0	53.42	3.0	72.0	1117.71	-2.1	1.5	0.8	0.0		6.9
HRSG Stack Facade 1-2	76.0	53.58	3.0	72.0	1115.83	-2.1	1.6	0.8	0.0		6.7
HRSG Stack Facade 1-3	76.0	53.38	3.0	72.0	1116.15	-2.1	6.5	0.8	0.0		1.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	72.0	1118.43	-2.1	6.0	0.8	0.0		2.4
HRSG Stack Facade 1-5	76.0	52.94	3.0	72.0	1121.54	-2.1	10.3	0.7	0.0		-1.9
HRSG Stack Facade 1-6	76.0	53.52	3.0	72.0	1123.43	-2.1	14.2	0.7	0.0		-5.8
HRSG Stack Facade 1-7	76.0	53.27	3.0	72.0	1123.07	-2.1	13.4	0.7	0.0		-5.0
HRSG Stack Facade 1-8	76.0	53.35	3.0	72.0	1120.76	-2.1	7.5	0.8	0.0		0.9
HRSG Stack Facade 2-1	76.0	53.51	3.0	71.7	1077.99	-2.2	0.2	0.8	0.0		8.5
HRSG Stack Facade 2-2	76.0	53.31	3.0	71.7	1078.33	-2.2	0.0	0.8	0.0		8.7
HRSG Stack Facade 3-2	76.0	53.44	3.0	71.7	1080.58	-2.2	0.2	0.8	0.0		8.5
HRSG Stack Facade 4-2	76.0	52.85	3.0	71.7	1083.72	-2.1	8.2	0.7	0.0		0.5
HRSG Stack Facade 5-2	76.0	53.63	3.0	71.7	1085.72	-2.1	13.0	0.7	0.0		-4.2
HRSG Stack Facade 6-2	76.0	53.14	3.0	71.7	1085.22	-2.1	13.1	0.7	0.0		-4.4
HRSG Stack Facade 7-2	76.0	53.49	3.0	71.7	1082.84	-2.1	7.8	0.8	0.0		0.9
HRSG Stack Facade 8-2	76.0	53.40	3.0	71.7	1079.86	-2.2	1.3	0.8	0.0		7.4
ST Building Ventilation 1	86.6	86.58	0.0	71.4	1045.52	-2.6	0.2	3.4	0.0		14.2
ST Building Ventilation 2	86.6	86.58	0.0	71.2	1019.51	-2.6	0.1	3.3	0.0		14.6
ST Building Ventilation 3	86.6	86.58	0.0	71.2	1019.92	-2.6	0.1	3.3	0.0		14.6
ST Building Ventilation 4	86.6	86.58	0.0	71.4	1045.96	-2.6	0.2	3.4	0.0		14.2
ST Building Ventilation 5	86.6	86.58	0.0	71.3	1032.67	-2.6	0.3	3.5	0.0		14.2
Steam Turbine Building Facade 1	95.3	63.91	3.0	71.3	1031.90	-2.1	6.5	0.4	0.0		22.2
Steam Turbine Building Facade 2	94.9	63.91	3.0	71.4	1051.88	-2.0	15.9	0.3	0.0		13.3
Steam Turbine Building Facade 3	95.3	63.91	3.0	71.3	1029.55	-2.1		0.5	0.0		28.6
Steam Turbine Building Facade 4	95.0	63.91	3.0	71.1	1009.55	-2.1	0.2	0.5	0.0		28.4
Steam Turbine Building Roof	96.2	63.91	0.0	71.3	1030.50	-2.5	3.5	0.6	0.0		24.4
Steam Turbine Transformer	98.1	98.09	0.0	71.3	1038.50	-1.8		2.6	0.0		28.3
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	71.9	1115.25	-2.6	0.2	3.9	7.1		23.5
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	71.6	1077.25	-2.6	0.5	4.1	7.5		22.8
WSAC	98.7	75.33	0.0	71.1	1014.42	-2.0		3.3	0.0		26.2

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1st Floor Name Dolsontown Road - East Lr,D [illegible] dB(A)											
Air Cooled Condenser	106.8	69.69	0.0	65.0	501.85	-3.0	0.0	1.5	0.0		43.2
Air Intake 1	90.7	69.65	3.0	64.7	483.78	-2.7	18.9	1.1	0.0		11.7
Air Intake 2	90.7	69.65	3.0	64.6	479.30	-2.7	18.9	1.1	0.0		11.8
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	64.2	458.51	-3.0	5.7	0.8	6.4		28.7
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	64.1	452.97	-3.0	6.2	0.7	6.3		28.6
GT Building Ventilation 1	86.6	86.58	0.0	64.5	470.69	-3.0	0.9	2.2	0.0		22.1
GT Building Ventilation 2	86.6	86.58	0.0	64.4	466.68	-3.0	0.9	2.2	0.0		22.1
GT Building Ventilation 3	86.6	86.58	0.0	64.3	464.56	-3.0	0.9	2.2	0.0		22.2
GT Building Ventilation 4	86.6	86.58	0.0	64.0	447.39	-3.0	0.1	1.8	0.0		23.6
GT Building Ventilation 5	86.6	86.58	0.0	64.1	450.18	-3.0	0.2	1.9	0.0		23.4
GT Building Ventilation 6	86.6	86.58	0.0	64.1	452.73	-3.0	0.1	1.9	0.0		23.5
Gas Metering Station	93.6	93.60	0.0	65.1	507.33	-2.4		5.0	0.0		25.9
Gas Preheater Building Facade 2	75.4	56.95	3.0	63.2	408.49	-2.6		0.4	0.0		17.4
Gas Preheater Building Facade 3	77.0	56.95	3.0	63.4	417.87	-2.6	6.1	0.1	0.0		13.0
Gas Preheater Building Facade 4	75.3	56.95	3.0	63.6	424.62	-2.6	9.6	0.1	0.0		7.7
Gas Preheater Building Roof	79.7	56.95	0.0	63.4	416.49	-2.7	3.9	0.8	0.0		14.3
Gas Turbine Building Facade 1	86.4	52.25	3.0	64.0	445.99	-2.7	8.4	0.4	0.0		19.3
Gas Turbine Building Facade 2	81.2	52.25	3.0	64.3	464.04	-2.6	12.0	0.2	0.0		10.3
Gas Turbine Building Facade 3	86.4	52.25	3.0	64.4	470.22	-2.6	17.6	0.3	0.0		9.7
Gas Turbine Building Facade 4	81.1	52.25	3.0	64.2	454.56	-2.6	5.9	0.3	0.0		16.4
Gas Turbine Building Roof	85.1	52.25	0.0	64.2	458.61	-3.0	6.3	0.3	0.0		17.3
Gas Turbine Transformer 1	98.1	98.09	0.0	64.9	495.56	-2.1	19.7	1.5	0.0		14.1
Gas Turbine Transformer 2	98.1	98.09	0.0	64.8	492.11	-2.1	19.2	1.3	0.0		14.8
HRSG Building Facade 1	85.4	52.01	3.0	63.1	400.63	-2.7	1.0	0.3	0.0		26.9
HRSG Building Facade 2	83.0	52.01	3.0	63.7	429.21	-2.7	8.4	0.1	0.0		16.5
HRSG Building Facade 3	85.5	52.01	3.0	64.0	445.71	-2.7	16.4	0.1	0.0		12.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	83.0	52.01	3.0	63.4	419.03	-2.7	0.9	0.3	0.0		24.4
HRSG Building Roof	87.7	52.01	0.0	63.5	423.28	-3.0	6.2	0.3	0.0		22.7
HRSG Building Ventilation 1	86.6	86.58	0.0	63.8	434.90	-3.0	0.3	1.9	0.0		26.0
HRSG Building Ventilation 2	86.6	86.58	0.0	63.7	430.33	-3.0	0.3	1.9	0.0		26.1
HRSG Building Ventilation 3	86.6	86.58	0.0	63.7	429.80	-3.0	6.1	1.2	0.0		23.9
HRSG Building Ventilation 4	86.6	86.58	0.0	63.3	414.45	-3.0	10.0	0.8	0.0		22.7
HRSG Building Ventilation 5	86.6	86.58	0.0	63.4	415.44	-3.0	0.1	1.7	0.0		26.3
HRSG Building Ventilation 6	86.6	86.58	0.0	63.5	420.19	-3.0	5.4	1.4	0.0		23.7
HRSG Stack Exhaust 1	106.6	106.63	0.0	63.1	403.87	-3.0		0.8	7.8		38.0
HRSG Stack Exhaust 2	106.6	106.63	0.0	63.0	398.63	-3.0		0.7	7.8		38.1
HRSG Stack Facade 1-1	76.0	53.42	3.0	63.1	403.65	-2.8	11.6	0.3	0.0		12.7
HRSG Stack Facade 1-2	76.0	53.58	3.0	63.1	401.32	-2.8	5.4	0.3	0.0		15.0
HRSG Stack Facade 1-3	76.0	53.38	3.0	63.0	398.29	-2.9		0.3	0.0		18.7
HRSG Stack Facade 1-4	76.0	53.29	3.0	63.0	396.57	-2.9		0.3	0.0		18.7
HRSG Stack Facade 1-5	76.0	52.94	3.0	63.0	397.20	-2.9		0.3	0.0		18.7
HRSG Stack Facade 1-6	76.0	53.52	3.0	63.0	399.77	-2.9		0.3	0.0		18.6
HRSG Stack Facade 1-7	76.0	53.27	3.0	63.1	402.91	-2.8	8.2	0.3	0.0		13.8
HRSG Stack Facade 1-8	76.0	53.35	3.0	63.1	404.34	-2.9	13.5	0.3	0.0		6.8
HRSG Stack Facade 2-1	76.0	53.51	3.0	63.0	396.19	-2.8	6.1	0.3	0.0		17.1
HRSG Stack Facade 2-2	76.0	53.31	3.0	62.9	393.07	-2.9		0.3	0.0		18.8
HRSG Stack Facade 3-2	76.0	53.44	3.0	62.8	391.12	-2.9		0.3	0.0		18.8
HRSG Stack Facade 4-2	76.0	52.85	3.0	62.9	391.55	-2.9		0.3	0.0		18.8
HRSG Stack Facade 5-2	76.0	53.63	3.0	62.9	393.87	-2.9		0.3	0.0		18.8
HRSG Stack Facade 6-2	76.0	53.14	3.0	63.0	396.97	-2.8	8.1	0.3	0.0		14.2
HRSG Stack Facade 7-2	76.0	53.49	3.0	63.0	398.73	-2.9	13.3	0.3	0.0		12.4
HRSG Stack Facade 8-2	76.0	53.40	3.0	63.0	398.37	-2.8	12.1	0.3	0.0		12.6
ST Building Ventilation 1	86.6	86.58	0.0	64.3	460.69	-3.0	0.5	2.0	0.0		22.8

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	64.3	460.53	-3.0	0.5	2.0	0.0		22.9
ST Building Ventilation 3	86.6	86.58	0.0	64.0	448.36	-3.0	0.7	2.1	0.0		22.8
ST Building Ventilation 4	86.6	86.58	0.0	64.0	447.81	-3.0	0.7	2.1	0.0		22.8
ST Building Ventilation 5	86.6	86.58	0.0	64.2	454.91	-3.0	0.5	2.0	0.0		23.0
Steam Turbine Building Facade 1	95.3	63.91	3.0	63.6	427.34	-2.7	2.0	0.2	0.0		35.1
Steam Turbine Building Facade 2	94.9	63.91	3.0	64.0	446.79	-2.7	4.9	0.2	0.0		31.4
Steam Turbine Building Facade 3	95.3	63.91	3.0	64.4	466.90	-2.6	15.8	0.2	0.0		20.6
Steam Turbine Building Facade 4	95.0	63.91	3.0	64.0	447.62	-2.7	5.4	0.2	0.0		31.1
Steam Turbine Building Roof	96.2	63.91	0.0	64.0	447.49	-3.0	5.1	0.2	0.0		29.8
Steam Turbine Transformer	98.1	98.09	0.0	64.5	474.65	-2.1	19.4	1.3	0.0		15.0
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	64.2	455.00	-3.0	0.6	2.4	8.3		31.5
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	64.1	450.12	-3.0	0.6	2.4	8.3		31.7
WSAC	98.7	75.33	0.0	64.7	486.69	-2.2	16.2	1.1	0.0		18.9
Floor 2. Floor Name Dolsontown Road - East LrD 47.2 dB(A)											
Air Cooled Condenser	106.8	69.69	0.0	65.0	501.72	-3.0		1.5	0.0		43.3
Air Intake 1	90.7	69.65	3.0	64.7	483.70	-2.8	18.9	1.1	0.0		11.8
Air Intake 2	90.7	69.65	3.0	64.6	479.21	-2.8	18.9	1.1	0.0		11.8
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	64.2	458.31	-3.1	5.7	0.8	6.4		28.8
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	64.1	452.77	-3.1	6.1	0.7	6.3		28.6
GT Building Ventilation 1	86.6	86.58	0.0	64.5	470.49	-3.0	0.8	2.2	0.0		22.2
GT Building Ventilation 2	86.6	86.58	0.0	64.4	466.48	-3.1	0.8	2.2	0.0		22.3
GT Building Ventilation 3	86.6	86.58	0.0	64.3	464.37	-3.1	0.8	2.2	0.0		22.3
GT Building Ventilation 4	86.6	86.58	0.0	64.0	447.19	-3.1	0.1	1.8	0.0		23.7
GT Building Ventilation 5	86.6	86.58	0.0	64.1	449.97	-3.1	0.2	1.9	0.0		23.5
GT Building Ventilation 6	86.6	86.58	0.0	64.1	452.53	-3.1	0.1	1.9	0.0		23.5
Gas Metering Station	93.6	93.60	0.0	65.1	507.32	-2.5		4.9	0.0		26.0

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL dB(A)	PWL/unit dB(A)	Non-Sphere dB	Spreading dB	Distance m	Grnd.Effct dB	Ins. dB	Air dB	Directivity dB	Mitigation dB	SPL dB(A)
Gas Preheater Building Facade 2	75.4	56.95	3.0	63.2	408.50	-2.7		0.4	0.0		17.5
Gas Preheater Building Facade 3	77.0	56.95	3.0	63.4	417.88	-2.6	5.9	0.1	0.0		13.2
Gas Preheater Building Facade 4	75.3	56.95	3.0	63.6	424.63	-2.6	9.5	0.1	0.0		7.8
Gas Preheater Building Roof	79.7	56.95	0.0	63.4	416.48	-2.8	3.9	0.8	0.0		14.4
Gas Turbine Building Facade 1	86.4	52.25	3.0	64.0	445.89	-2.7	8.2	0.4	0.0		19.6
Gas Turbine Building Facade 2	81.2	52.25	3.0	64.3	463.95	-2.7	11.5	0.2	0.0		10.9
Gas Turbine Building Facade 3	86.4	52.25	3.0	64.4	470.13	-2.7	17.6	0.3	0.0		9.8
Gas Turbine Building Facade 4	81.1	52.25	3.0	64.1	454.46	-2.7	5.9	0.3	0.0		16.6
Gas Turbine Building Roof	85.1	52.25	0.0	64.2	458.44	-3.1	6.2	0.3	0.0		17.4
Gas Turbine Transformer 1	98.1	98.09	0.0	64.9	495.51	-2.3	19.7	1.4	0.0		14.3
Gas Turbine Transformer 2	98.1	98.09	0.0	64.8	492.07	-2.3	19.2	1.3	0.0		15.0
HRSG Building Facade 1	85.4	52.01	3.0	63.1	400.55	-2.8	1.0	0.3	0.0		27.0
HRSG Building Facade 2	83.0	52.01	3.0	63.7	429.08	-2.7	8.4	0.1	0.0		16.5
HRSG Building Facade 3	85.5	52.01	3.0	64.0	445.65	-2.7	16.3	0.1	0.0		13.1
HRSG Building Facade 4	83.0	52.01	3.0	63.4	418.97	-2.8	0.8	0.3	0.0		24.6
HRSG Building Roof	87.7	52.01	0.0	63.5	423.14	-3.0	5.8	0.4	0.0		23.1
HRSG Building Ventilation 1	86.6	86.58	0.0	63.8	434.73	-3.0	0.2	1.9	0.0		26.1
HRSG Building Ventilation 2	86.6	86.58	0.0	63.7	430.15	-3.0	0.2	1.8	0.0		26.2
HRSG Building Ventilation 3	86.6	86.58	0.0	63.7	429.62	-3.0	6.1	1.2	0.0		23.9
HRSG Building Ventilation 4	86.6	86.58	0.0	63.3	414.26	-3.1	10.0	0.8	0.0		22.9
HRSG Building Ventilation 5	86.6	86.58	0.0	63.4	415.25	-3.1	0.0	1.7	0.0		26.4
HRSG Building Ventilation 6	86.6	86.58	0.0	63.5	420.00	-3.0	5.4	1.4	0.0		23.8
HRSG Stack Exhaust 1	106.6	106.63	0.0	63.1	403.46	-3.0		0.8	7.8		38.0
HRSG Stack Exhaust 2	106.6	106.63	0.0	63.0	398.21	-3.0		0.7	7.8		38.1
HRSG Stack Facade 1-1	76.0	53.42	3.0	63.1	403.47	-2.9	11.6	0.3	0.0		12.7
HRSG Stack Facade 1-2	76.0	53.58	3.0	63.1	401.15	-2.9	5.4	0.3	0.0		14.4
HRSG Stack Facade 1-3	76.0	53.38	3.0	63.0	398.11	-3.0		0.3	0.0		18.7

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	63.0	396.39	-3.0		0.3	0.0		18.7
HRSG Stack Facade 1-5	76.0	52.94	3.0	63.0	397.02	-3.0		0.3	0.0		18.7
HRSG Stack Facade 1-6	76.0	53.52	3.0	63.0	399.59	-3.0		0.3	0.0		18.7
HRSG Stack Facade 1-7	76.0	53.27	3.0	63.1	402.70	-2.9	8.2	0.3	0.0		13.9
HRSG Stack Facade 1-8	76.0	53.35	3.0	63.1	404.17	-2.9	13.5	0.3	0.0		6.8
HRSG Stack Facade 2-1	76.0	53.51	3.0	63.0	396.01	-2.9	6.1	0.3	0.0		17.2
HRSG Stack Facade 2-2	76.0	53.31	3.0	62.9	392.89	-3.0		0.3	0.0		18.8
HRSG Stack Facade 3-2	76.0	53.44	3.0	62.8	390.94	-3.0		0.3	0.0		18.9
HRSG Stack Facade 4-2	76.0	52.85	3.0	62.9	391.37	-3.0		0.3	0.0		18.8
HRSG Stack Facade 5-2	76.0	53.63	3.0	62.9	393.69	-3.0		0.3	0.0		18.8
HRSG Stack Facade 6-2	76.0	53.14	3.0	63.0	396.78	-2.9	8.1	0.3	0.0		14.3
HRSG Stack Facade 7-2	76.0	53.49	3.0	63.0	398.56	-2.9	13.4	0.3	0.0		12.4
HRSG Stack Facade 8-2	76.0	53.40	3.0	63.0	398.20	-2.9	12.1	0.3	0.0		12.7
ST Building Ventilation 1	86.6	86.58	0.0	64.3	460.50	-3.1	0.4	2.0	0.0		22.9
ST Building Ventilation 2	86.6	86.58	0.0	64.3	460.33	-3.1	0.4	2.0	0.0		22.9
ST Building Ventilation 3	86.6	86.58	0.0	64.0	448.15	-3.1	0.7	2.1	0.0		22.8
ST Building Ventilation 4	86.6	86.58	0.0	64.0	447.60	-3.1	0.7	2.1	0.0		22.8
ST Building Ventilation 5	86.6	86.58	0.0	64.2	454.71	-3.1	0.5	2.0	0.0		23.0
Steam Turbine Building Facade 1	95.3	63.91	3.0	63.6	427.24	-2.8	2.0	0.2	0.0		35.2
Steam Turbine Building Facade 2	94.9	63.91	3.0	64.0	446.66	-2.7	5.2	0.2	0.0		31.3
Steam Turbine Building Facade 3	95.3	63.91	3.0	64.4	466.81	-2.7	15.8	0.2	0.0		20.6
Steam Turbine Building Facade 4	95.0	63.91	3.0	64.0	447.53	-2.8	5.4	0.2	0.0		31.2
Steam Turbine Building Roof	96.2	63.91	0.0	64.0	447.32	-3.1	5.0	0.2	0.0		30.0
Steam Turbine Transformer	98.1	98.09	0.0	64.5	474.61	-2.3	19.4	1.3	0.0		15.1
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	64.2	454.79	-3.1	0.6	2.4	8.2		31.7
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	64.1	449.92	-3.1	0.6	2.4	8.3		31.8
WSAC	98.7	75.33	0.0	64.7	486.67	-2.4	16.2	1.1	0.0		19.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1 Floor [illegible] Name: Dolsontown Road - South LrD 49.8 [illegible] dB(A)											
Air Cooled Condenser	106.8	69.69	0.0	62.8	388.44	-3.0	14.0	0.4	0.0		32.6
Air Intake 1	90.7	69.65	3.0	58.3	231.44	-3.0	13.1	0.3	0.0		25.1
Air Intake 2	90.7	69.65	3.0	59.4	263.52	-3.0	17.0	0.5	0.0		19.8
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	57.5	210.84	-3.0	2.9	0.9	8.3		36.3
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	58.8	244.10	-3.0	4.9	0.7	7.4		34.1
GT Building Ventilation 1	86.6	86.58	0.0	58.0	224.85	-3.0	7.7	0.6	0.0		23.2
GT Building Ventilation 2	86.6	86.58	0.0	58.7	243.00	-3.0	11.1	0.5	0.0		19.3
GT Building Ventilation 3	86.6	86.58	0.0	59.2	257.06	-3.0	10.7	0.5	0.0		19.2
GT Building Ventilation 4	86.6	86.58	0.0	58.9	249.32	-3.0	1.6	1.6	0.0		27.5
GT Building Ventilation 5	86.6	86.58	0.0	58.4	233.96	-3.0	1.8	1.6	0.0		27.8
GT Building Ventilation 6	86.6	86.58	0.0	57.7	215.85	-3.0	1.9	1.6	0.0		28.4
Gas Metering Station	93.6	93.60	0.0	64.0	449.21	-2.4	20.0	4.5	0.0		7.5
Gas Preheater Building Facade 2	75.4	56.95	3.0	55.8	173.29	-2.9		0.2	0.0		25.3
Gas Preheater Building Facade 3	77.0	56.95	3.0	55.6	170.67	-2.9		0.2	0.0		27.1
Gas Preheater Building Facade 4	75.3	56.95	3.0	56.1	178.97	-2.9	6.2	0.0	0.0		19.8
Gas Preheater Building Roof	79.7	56.95	0.0	55.9	175.91	-3.0	3.7	0.5	0.0		24.6
Gas Turbine Building Facade 1	86.4	52.25	3.0	58.3	230.83	-2.9	7.6	0.2	0.0		26.3
Gas Turbine Building Facade 2	81.2	52.25	3.0	57.2	204.00	-3.0		0.2	0.0		29.8
Gas Turbine Building Facade 3	86.4	52.25	3.0	58.7	242.60	-2.9	14.8	0.1	0.0		19.3
Gas Turbine Building Facade 4	81.1	52.25	3.0	59.8	275.19	-2.9	18.1	0.2	0.0		8.9
Gas Turbine Building Roof	85.1	52.25	0.0	58.5	237.55	-3.0	6.6	0.1	0.0		22.9
Gas Turbine Transformer 1	98.1	98.09	0.0	58.9	247.70	-2.6	10.1	0.4	0.0		31.3
Gas Turbine Transformer 2	98.1	98.09	0.0	59.9	279.24	-2.5	18.9	0.8	0.0		21.0
HRSG Building Facade 1	85.4	52.01	3.0	57.6	214.50	-3.0	3.4	0.1	0.0		30.4
HRSG Building Facade 2	83.0	52.01	3.0	56.4	187.21	-3.0	0.3	0.1	0.0		32.0
HRSG Building Facade 3	85.5	52.01	3.0	58.3	230.49	-2.9	14.6	0.1	0.0		20.2

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	83.0	52.01	3.0	59.4	262.94	-2.9	17.8	0.1	0.0		12.2
HRSG Building Roof	87.7	52.01	0.0	58.0	222.75	-3.0	7.1	0.1	0.0		26.7
HRSG Building Ventilation 1	86.6	86.58	0.0	57.3	207.38	-3.0	0.4	1.2	0.0		30.7
HRSG Building Ventilation 2	86.6	86.58	0.0	58.1	227.66	-3.0	0.6	1.3	0.0		31.9
HRSG Building Ventilation 3	86.6	86.58	0.0	58.7	242.43	-3.0	2.9	1.8	0.0		29.0
HRSG Building Ventilation 4	86.6	86.58	0.0	58.5	237.50	-3.0	1.1	1.5	0.0		30.5
HRSG Building Ventilation 5	86.6	86.58	0.0	58.0	223.06	-3.0	0.7	1.3	0.0		29.6
HRSG Building Ventilation 6	86.6	86.58	0.0	57.1	201.76	-3.0	0.4	1.1	0.0		30.9
HRSG Stack Exhaust 1	106.6	106.63	0.0	57.1	202.33	-3.0		0.4	7.9		44.2
HRSG Stack Exhaust 2	106.6	106.63	0.0	58.5	238.14	-3.0		0.5	7.9		42.7
HRSG Stack Facade 1-1	76.0	53.42	3.0	57.0	198.48	-3.0	8.9	0.1	0.0		16.1
HRSG Stack Facade 1-2	76.0	53.58	3.0	57.0	199.86	-3.0	13.4	0.1	0.0		11.5
HRSG Stack Facade 1-3	76.0	53.38	3.0	57.0	199.32	-3.0	11.0	0.1	0.0		13.8
HRSG Stack Facade 1-4	76.0	53.29	3.0	56.9	196.71	-3.0	5.3	0.1	0.0		19.6
HRSG Stack Facade 1-5	76.0	52.94	3.0	56.7	193.40	-3.0		0.1	0.0		25.2
HRSG Stack Facade 1-6	76.0	53.52	3.0	56.7	191.89	-3.0		0.1	0.0		25.2
HRSG Stack Facade 1-7	76.0	53.27	3.0	56.7	192.74	-3.0		0.1	0.0		26.5
HRSG Stack Facade 1-8	76.0	53.35	3.0	56.8	195.56	-3.0	4.7	0.1	0.0		21.7
HRSG Stack Facade 2-1	76.0	53.51	3.0	58.5	236.61	-3.0	13.4	0.2	0.0		10.0
HRSG Stack Facade 2-2	76.0	53.31	3.0	58.5	236.12	-2.9	11.5	0.2	0.0		11.9
HRSG Stack Facade 3-2	76.0	53.44	3.0	58.4	233.64	-2.9	5.3	0.2	0.0		18.1
HRSG Stack Facade 4-2	76.0	52.85	3.0	58.2	230.32	-3.0		0.2	0.0		23.6
HRSG Stack Facade 5-2	76.0	53.63	3.0	58.2	228.68	-3.0		0.2	0.0		23.7
HRSG Stack Facade 6-2	76.0	53.14	3.0	58.2	229.40	-3.0		0.2	0.0		23.6
HRSG Stack Facade 7-2	76.0	53.49	3.0	58.3	231.97	-3.0		0.2	0.0		23.6
HRSG Stack Facade 8-2	76.0	53.40	3.0	58.4	235.17	-2.9	8.2	0.2	0.0		15.1
ST Building Ventilation 1	86.6	86.58	0.0	60.1	283.89	-3.0	9.4	0.6	0.0		19.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	60.8	307.54	-3.0	8.7	0.7	0.0		19.3
ST Building Ventilation 3	86.6	86.58	0.0	60.6	303.35	-3.0	2.8	2.1	0.0		24.1
ST Building Ventilation 4	86.6	86.58	0.0	59.9	279.05	-3.0	1.3	1.7	0.0		26.7
ST Building Ventilation 5	86.6	86.58	0.0	60.4	293.63	-3.0	6.9	0.9	0.0		21.4
Steam Turbine Building Facade 1	95.3	63.91	3.0	60.1	285.04	-2.9	11.5	0.1	0.0		29.5
Steam Turbine Building Facade 2	94.9	63.91	3.0	59.7	272.55	-2.9	14.2	0.1	0.0		27.0
Steam Turbine Building Facade 3	95.3	63.91	3.0	60.5	299.27	-2.9	17.4	0.1	0.0		23.1
Steam Turbine Building Facade 4	95.0	63.91	3.0	60.9	312.16	-2.9	17.3	0.1	0.0		22.6
Steam Turbine Building Roof	96.2	63.91	0.0	60.3	292.68	-3.0	6.4	0.1	0.0		32.4
Steam Turbine Transformer	98.1	98.09	0.0	60.4	294.84	-2.4	19.8	1.0	0.0		19.3
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	57.7	216.95	-3.0	2.0	1.9	9.1		36.4
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	59.0	250.67	-3.0	1.6	2.0	9.0		35.4
WSAC	98.7	75.33	0.0	61.1	321.31	-2.5	19.7	1.4	0.0		19.0
Floor 2.Floor Name Dolsontown Road - South			LrD 49.6	dB(A)							
Air Cooled Condenser	106.8	69.69	0.0	62.8	388.07	-3.0	13.6	0.4	0.0		33.0
Air Intake 1	90.7	69.65	3.0	58.3	231.33	-3.0	13.0	0.3	0.0		25.1
Air Intake 2	90.7	69.65	3.0	59.4	263.41	-3.0	17.0	0.5	0.0		19.8
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	57.5	210.48	-3.0	2.3	0.9	8.5		36.7
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	58.7	243.79	-3.0	2.6	1.0	8.4		35.1
GT Building Ventilation 1	86.6	86.58	0.0	58.0	224.51	-3.0	6.4	0.8	0.0		24.4
GT Building Ventilation 2	86.6	86.58	0.0	58.7	242.69	-3.0	10.0	0.5	0.0		20.3
GT Building Ventilation 3	86.6	86.58	0.0	59.2	256.77	-3.0	9.5	0.6	0.0		20.3
GT Building Ventilation 4	86.6	86.58	0.0	58.9	249.02	-3.0	1.1	1.5	0.0		28.0
GT Building Ventilation 5	86.6	86.58	0.0	58.4	233.63	-3.0	1.7	1.6	0.0		27.9
GT Building Ventilation 6	86.6	86.58	0.0	57.7	215.50	-3.0	1.7	1.5	0.0		28.7
Gas Metering Station	93.6	93.60	0.0	64.0	449.24	-2.5	20.0	4.5	0.0		7.6

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	75.4	56.95	3.0	55.8	173.41	-2.9		0.2	0.0		25.3
Gas Preheater Building Facade 3	77.0	56.95	3.0	55.6	170.79	-2.9		0.2	0.0		27.2
Gas Preheater Building Facade 4	75.3	56.95	3.0	56.1	179.08	-2.9	6.2	0.0	0.0		19.8
Gas Preheater Building Roof	79.7	56.95	0.0	55.9	175.97	-3.0	3.6	0.5	0.0		24.7
Gas Turbine Building Facade 1	86.4	52.25	3.0	58.3	230.70	-3.0	7.2	0.2	0.0		26.7
Gas Turbine Building Facade 2	81.2	52.25	3.0	57.2	203.87	-3.0		0.2	0.0		29.8
Gas Turbine Building Facade 3	86.4	52.25	3.0	58.7	242.49	-3.0	14.7	0.1	0.0		19.4
Gas Turbine Building Facade 4	81.1	52.25	3.0	59.8	275.09	-2.9	18.1	0.2	0.0		9.0
Gas Turbine Building Roof	85.1	52.25	0.0	58.5	237.24	-3.0	6.3	0.1	0.0		23.2
Gas Turbine Transformer 1	98.1	98.09	0.0	58.9	247.67	-2.7	9.8	0.4	0.0		31.8
Gas Turbine Transformer 2	98.1	98.09	0.0	59.9	279.22	-2.6	18.9	0.8	0.0		21.2
HRSG Building Facade 1	85.4	52.01	3.0	57.6	214.43	-3.0	3.5	0.1	0.0		30.4
HRSG Building Facade 2	83.0	52.01	3.0	56.4	187.13	-3.0	0.3	0.1	0.0		32.0
HRSG Building Facade 3	85.5	52.01	3.0	58.3	230.42	-3.0	14.6	0.1	0.0		20.3
HRSG Building Facade 4	83.0	52.01	3.0	59.4	262.89	-3.0	17.8	0.1	0.0		12.4
HRSG Building Roof	87.7	52.01	0.0	57.9	222.50	-3.0	6.6	0.1	0.0		27.1
HRSG Building Ventilation 1	86.6	86.58	0.0	57.3	207.09	-3.0	0.3	1.1	0.0		30.8
HRSG Building Ventilation 2	86.6	86.58	0.0	58.1	227.39	-3.0	0.4	1.2	0.0		32.1
HRSG Building Ventilation 3	86.6	86.58	0.0	58.7	242.18	-3.0	0.5	1.3	0.0		31.5
HRSG Building Ventilation 4	86.6	86.58	0.0	58.5	237.25	-3.0	0.4	1.3	0.0		31.5
HRSG Building Ventilation 5	86.6	86.58	0.0	58.0	222.79	-3.0	0.4	1.2	0.0		30.0
HRSG Building Ventilation 6	86.6	86.58	0.0	57.1	201.45	-3.0	0.3	1.1	0.0		31.1
HRSG Stack Exhaust 1	106.6	106.63	0.0	57.1	201.58	-3.0		0.4	7.9		44.2
HRSG Stack Exhaust 2	106.6	106.63	0.0	58.5	237.50	-3.0		0.5	7.9		42.8
HRSG Stack Facade 1-1	76.0	53.42	3.0	56.9	198.21	-3.0	8.7	0.1	0.0		16.3
HRSG Stack Facade 1-2	76.0	53.58	3.0	57.0	199.62	-3.0	13.4	0.1	0.0		11.5
HRSG Stack Facade 1-3	76.0	53.38	3.0	57.0	199.04	-3.0	11.0	0.1	0.0		13.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	56.9	196.53	-3.0	5.3	0.1	0.0		19.7
HRSG Stack Facade 1-5	76.0	52.94	3.0	56.7	193.11	-3.0		0.1	0.0		25.2
HRSG Stack Facade 1-6	76.0	53.52	3.0	56.6	191.60	-3.0		0.1	0.0		25.2
HRSG Stack Facade 1-7	76.0	53.27	3.0	56.7	192.45	-3.0		0.1	0.0		26.6
HRSG Stack Facade 1-8	76.0	53.35	3.0	56.8	195.31	-3.0	4.7	0.1	0.0		21.8
HRSG Stack Facade 2-1	76.0	53.51	3.0	58.5	236.38	-3.0	13.4	0.2	0.0		10.0
HRSG Stack Facade 2-2	76.0	53.31	3.0	58.5	235.92	-3.0	11.2	0.2	0.0		12.1
HRSG Stack Facade 3-2	76.0	53.44	3.0	58.4	233.45	-3.0	5.3	0.2	0.0		18.2
HRSG Stack Facade 4-2	76.0	52.85	3.0	58.2	230.08	-3.0		0.2	0.0		23.6
HRSG Stack Facade 5-2	76.0	53.63	3.0	58.2	228.44	-3.0		0.2	0.0		23.7
HRSG Stack Facade 6-2	76.0	53.14	3.0	58.2	229.15	-3.0		0.2	0.0		23.7
HRSG Stack Facade 7-2	76.0	53.49	3.0	58.3	231.73	-3.0		0.2	0.0		23.6
HRSG Stack Facade 8-2	76.0	53.40	3.0	58.4	234.94	-3.0	8.2	0.2	0.0		15.2
ST Building Ventilation 1	86.6	86.58	0.0	60.1	283.62	-3.0	8.1	0.7	0.0		20.7
ST Building Ventilation 2	86.6	86.58	0.0	60.8	307.29	-3.0	7.3	0.9	0.0		20.7
ST Building Ventilation 3	86.6	86.58	0.0	60.6	303.10	-3.0	1.0	1.7	0.0		26.2
ST Building Ventilation 4	86.6	86.58	0.0	59.9	278.77	-3.0	1.1	1.6	0.0		27.0
ST Building Ventilation 5	86.6	86.58	0.0	60.3	293.38	-3.0	4.8	1.3	0.0		23.1
Steam Turbine Building Facade 1	95.3	63.91	3.0	60.1	284.95	-2.9	10.2	0.1	0.0		30.8
Steam Turbine Building Facade 2	94.9	63.91	3.0	59.7	272.45	-2.9	13.4	0.1	0.0		27.9
Steam Turbine Building Facade 3	95.3	63.91	3.0	60.5	299.18	-2.9	17.4	0.1	0.0		23.1
Steam Turbine Building Facade 4	95.0	63.91	3.0	60.9	312.08	-2.9	17.3	0.1	0.0		22.6
Steam Turbine Building Roof	96.2	63.91	0.0	60.3	292.43	-3.0	6.0	0.1	0.0		32.7
Steam Turbine Transformer	98.1	98.09	0.0	60.4	294.84	-2.6	19.8	1.0	0.0		19.5
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	57.7	216.60	-3.0	1.6	1.8	9.2		36.8
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	59.0	250.37	-3.0	1.4	1.9	9.0		35.7
WSAC	98.7	75.33	0.0	61.1	321.32	-2.6	19.7	1.4	0.0		19.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1. Floor [illegible] Name: Colsontown Road - West [illegible] 0.0				dB(A) [illegible]							
Air Cooled Condenser	106.8	69.69	0.0	63.1	403.66	-3.0		1.2	0.0		45.4
Air Intake 1	90.7	69.65	3.0	62.7	384.13	-2.8	0.2	1.3	0.0		32.4
Air Intake 2	90.7	69.65	3.0	62.7	385.41	-2.8	0.2	1.3	0.0		32.3
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	63.3	412.43	-3.1	0.8	1.3	8.0		32.5
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	63.3	412.95	-3.1	0.8	1.3	8.0		32.5
GT Building Ventilation 1	86.6	86.58	0.0	63.0	398.41	-3.1	0.1	1.7	0.0		24.8
GT Building Ventilation 2	86.6	86.58	0.0	63.0	399.64	-3.1	0.1	1.7	0.0		24.8
GT Building Ventilation 3	86.6	86.58	0.0	63.1	401.11	-3.1	0.1	1.7	0.0		24.7
GT Building Ventilation 4	86.6	86.58	0.0	63.4	418.34	-3.1	0.5	1.9	0.0		23.9
GT Building Ventilation 5	86.6	86.58	0.0	63.4	416.41	-3.1	0.5	1.9	0.0		23.9
GT Building Ventilation 6	86.6	86.58	0.0	63.4	416.62	-3.1	0.5	1.9	0.0		23.9
Gas Metering Station	93.6	93.60	0.0	64.0	447.62	-2.4		4.5	0.0		27.5
Gas Preheater Building Facade 2	75.4	56.95	3.0	64.4	466.81	-2.6	10.9	0.1	0.0		5.6
Gas Preheater Building Facade 3	77.0	56.95	3.0	64.2	458.92	-2.6	4.2	0.2	0.0		13.9
Gas Preheater Building Facade 4	75.3	56.95	3.0	64.1	450.28	-2.6		0.4	0.0		16.5
Gas Preheater Building Roof	79.7	56.95	0.0	64.2	458.36	-2.7	4.0	0.6	0.0		13.5
Gas Turbine Building Facade 1	86.4	52.25	3.0	63.5	420.74	-2.7	17.1	0.2	0.0		11.2
Gas Turbine Building Facade 2	81.2	52.25	3.0	63.2	407.99	-2.7	5.2	0.3	0.0		18.3
Gas Turbine Building Facade 3	86.4	52.25	3.0	63.0	396.37	-2.7	2.3	0.3	0.0		26.5
Gas Turbine Building Facade 4	81.1	52.25	3.0	63.3	411.40	-2.7	7.4	0.2	0.0		15.9
Gas Turbine Building Roof	85.1	52.25	0.0	63.2	408.55	-3.1	3.8	0.5	0.0		20.7
Gas Turbine Transformer 1	98.1	98.09	0.0	62.4	370.67	-2.3		1.3	0.0		39.1
Gas Turbine Transformer 2	98.1	98.09	0.0	62.4	372.97	-2.3		1.3	0.0		38.9
HRSG Building Facade 1	85.4	52.01	3.0	64.4	466.31	-2.6	15.5	0.1	0.0		11.0
HRSG Building Facade 2	83.0	52.01	3.0	63.9	442.80	-2.7	5.9	0.2	0.0		18.7
HRSG Building Facade 3	85.5	52.01	3.0	63.5	420.91	-2.7	16.9	0.2	0.0		10.6

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	83.0	52.01	3.0	64.0	446.06	-2.7	9.8	0.1	0.0		14.8
HRSG Building Roof	87.7	52.01	0.0	63.9	442.89	-3.0	11.9	0.1	0.0		14.6
HRSG Building Ventilation 1	86.6	86.58	0.0	63.8	434.30	-3.0	15.3	0.8	0.0		9.8
HRSG Building Ventilation 2	86.6	86.58	0.0	63.8	435.77	-3.0	15.2	0.8	0.0		9.8
HRSG Building Ventilation 3	86.6	86.58	0.0	63.8	435.52	-3.0	15.4	0.8	0.0		9.6
HRSG Building Ventilation 4	86.6	86.58	0.0	64.1	450.93	-3.0	13.1	0.8	0.0		11.6
HRSG Building Ventilation 5	86.6	86.58	0.0	64.1	450.77	-3.0	13.1	0.8	0.0		11.6
HRSG Building Ventilation 6	86.6	86.58	0.0	64.1	449.29	-3.0	13.0	0.8	0.0		11.7
HRSG Stack Exhaust 1	106.6	106.63	0.0	64.5	471.00	-3.0		0.9	7.7		36.6
HRSG Stack Exhaust 2	106.6	106.63	0.0	64.5	471.91	-3.0		0.9	7.6		36.6
HRSG Stack Facade 1-1	76.0	53.42	3.0	64.4	466.30	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 1-2	76.0	53.58	3.0	64.4	468.25	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 1-3	76.0	53.38	3.0	64.5	471.13	-2.8	10.9	0.3	0.0		6.1
HRSG Stack Facade 1-4	76.0	53.29	3.0	64.5	473.32	-2.8	15.4	0.3	0.0		1.5
HRSG Stack Facade 1-5	76.0	52.94	3.0	64.5	473.32	-2.8	14.9	0.3	0.0		2.0
HRSG Stack Facade 1-6	76.0	53.52	3.0	64.5	471.14	-2.8	11.1	0.3	0.0		6.0
HRSG Stack Facade 1-7	76.0	53.27	3.0	64.4	468.16	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 1-8	76.0	53.35	3.0	64.4	466.18	-2.7	3.4	0.3	0.0		13.7
HRSG Stack Facade 2-1	76.0	53.51	3.0	64.4	469.65	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 2-2	76.0	53.31	3.0	64.5	472.58	-2.8	11.3	0.3	0.0		5.7
HRSG Stack Facade 3-2	76.0	53.44	3.0	64.5	474.54	-2.8	15.7	0.3	0.0		1.2
HRSG Stack Facade 4-2	76.0	52.85	3.0	64.5	474.22	-2.8	16.0	0.3	0.0		0.9
HRSG Stack Facade 5-2	76.0	53.63	3.0	64.5	471.96	-2.8	10.8	0.3	0.0		6.2
HRSG Stack Facade 6-2	76.0	53.14	3.0	64.4	469.04	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 7-2	76.0	53.49	3.0	64.4	467.17	-2.7	3.3	0.3	0.0		13.7
HRSG Stack Facade 8-2	76.0	53.40	3.0	64.4	467.47	-2.8	3.2	0.3	0.0		13.8
ST Building Ventilation 1	86.6	86.58	0.0	63.2	407.14	-3.1	0.1	1.7	0.0		24.6

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	63.3	412.50	-3.1	0.1	1.7	0.0		24.5
ST Building Ventilation 3	86.6	86.58	0.0	63.6	424.49	-3.1	0.4	1.9	0.0		23.8
ST Building Ventilation 4	86.6	86.58	0.0	63.5	419.94	-3.1	0.4	1.9	0.0		23.9
ST Building Ventilation 5	86.6	86.58	0.0	63.4	415.08	-3.1	0.2	1.8	0.0		24.2
Steam Turbine Building Facade 1	95.3	63.91	3.0	63.9	442.11	-2.7	16.5	0.2	0.0		22.0
Steam Turbine Building Facade 2	94.9	63.91	3.0	63.4	418.76	-2.7	6.6	0.2	0.0		30.5
Steam Turbine Building Facade 3	95.3	63.91	3.0	63.1	403.23	-2.7		0.2	0.0		37.7
Steam Turbine Building Facade 4	95.0	63.91	3.0	63.6	426.64	-2.7	8.9	0.1	0.0		28.0
Steam Turbine Building Roof	96.2	63.91	0.0	63.5	422.31	-3.0	3.8	0.2	0.0		31.7
Steam Turbine Transformer	98.1	98.09	0.0	62.9	393.49	-2.2		1.3	0.0		38.5
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	63.3	414.32	-3.1	0.6	2.3	8.2		32.6
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	63.4	415.60	-3.1	0.6	2.3	8.2		32.6
WSAC	98.7	75.33	0.0	62.8	387.24	-2.4		1.7	0.0		38.7
Floor 2 Floor	Name Dolsontown Road - West		LrD 50.0	dB(A)							
Air Cooled Condenser	106.8	69.69	0.0	63.1	403.66	-3.0		1.2	0.0		45.4
Air Intake 1	90.7	69.65	3.0	62.7	384.20	-2.9	0.2	1.3	0.0		32.4
Air Intake 2	90.7	69.65	3.0	62.7	385.48	-2.9	0.2	1.3	0.0		32.4
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	63.3	412.37	-3.0	0.8	1.3	7.9		32.5
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	63.3	412.89	-3.0	0.8	1.3	7.9		32.5
GT Building Ventilation 1	86.6	86.58	0.0	63.0	398.35	-3.0	0.1	1.7	0.0		24.8
GT Building Ventilation 2	86.6	86.58	0.0	63.0	399.58	-3.0	0.1	1.7	0.0		24.7
GT Building Ventilation 3	86.6	86.58	0.0	63.1	401.06	-3.0	0.1	1.7	0.0		24.6
GT Building Ventilation 4	86.6	86.58	0.0	63.4	418.28	-3.0	0.4	1.9	0.0		23.8
GT Building Ventilation 5	86.6	86.58	0.0	63.4	416.35	-3.0	0.4	1.9	0.0		23.9
GT Building Ventilation 6	86.6	86.58	0.0	63.4	416.57	-3.0	0.4	1.9	0.0		23.9
Gas Metering Station	93.6	93.60	0.0	64.0	447.77	-2.5		4.5	0.0		27.6

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	75.4	56.95	3.0	64.4	466.97	-2.6	10.9	0.1	0.0		5.6
Gas Preheater Building Facade 3	77.0	56.95	3.0	64.2	459.09	-2.6	4.2	0.2	0.0		14.0
Gas Preheater Building Facade 4	75.3	56.95	3.0	64.1	450.44	-2.7		0.4	0.0		16.5
Gas Preheater Building Roof	79.7	56.95	0.0	64.2	458.50	-2.7	4.0	0.6	0.0		13.6
Gas Turbine Building Facade 1	86.4	52.25	3.0	63.5	420.80	-2.8	17.1	0.2	0.0		11.3
Gas Turbine Building Facade 2	81.2	52.25	3.0	63.2	408.04	-2.8	5.2	0.3	0.0		18.3
Gas Turbine Building Facade 3	86.4	52.25	3.0	63.0	396.43	-2.8	2.4	0.3	0.0		26.6
Gas Turbine Building Facade 4	81.1	52.25	3.0	63.3	411.47	-2.8	7.3	0.2	0.0		16.1
Gas Turbine Building Roof	85.1	52.25	0.0	63.2	408.50	-3.0	3.7	0.5	0.0		20.7
Gas Turbine Transformer 1	98.1	98.09	0.0	62.4	370.80	-2.5		1.2	0.0		39.2
Gas Turbine Transformer 2	98.1	98.09	0.0	62.4	373.10	-2.5		1.2	0.0		39.1
HRSG Building Facade 1	85.4	52.01	3.0	64.4	466.40	-2.7	15.5	0.1	0.0		11.1
HRSG Building Facade 2	83.0	52.01	3.0	63.9	442.89	-2.7	5.9	0.2	0.0		18.7
HRSG Building Facade 3	85.5	52.01	3.0	63.5	421.00	-2.8	16.9	0.2	0.0		10.7
HRSG Building Facade 4	83.0	52.01	3.0	64.0	446.09	-2.7	9.2	0.1	0.0		15.4
HRSG Building Roof	87.7	52.01	0.0	63.9	442.87	-3.0	10.2	0.1	0.0		16.4
HRSG Building Ventilation 1	86.6	86.58	0.0	63.8	434.28	-3.0	15.1	0.8	0.0		9.9
HRSG Building Ventilation 2	86.6	86.58	0.0	63.8	435.75	-3.0	15.1	0.8	0.0		9.9
HRSG Building Ventilation 3	86.6	86.58	0.0	63.8	435.50	-3.0	15.3	0.8	0.0		9.7
HRSG Building Ventilation 4	86.6	86.58	0.0	64.1	450.91	-3.0	12.8	0.8	0.0		11.9
HRSG Building Ventilation 5	86.6	86.58	0.0	64.1	450.76	-3.0	12.8	0.8	0.0		12.0
HRSG Building Ventilation 6	86.6	86.58	0.0	64.1	449.27	-3.0	12.7	0.8	0.0		12.0
HRSG Stack Exhaust 1	106.6	106.63	0.0	64.5	470.79	-3.0		0.9	7.6		36.6
HRSG Stack Exhaust 2	106.6	106.63	0.0	64.5	471.70	-3.0		0.9	7.6		36.6
HRSG Stack Facade 1-1	76.0	53.42	3.0	64.4	466.29	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 1-2	76.0	53.58	3.0	64.4	468.24	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 1-3	76.0	53.38	3.0	64.5	471.12	-2.8	10.9	0.3	0.0		6.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL dB(A)	PWL/unit dB(A)	Non-Sphere dB	Spreading dB	Distance m	Grnd.Effct dB	Ins. dB	Air dB	Directivity dB	Mitigation dB	SPL dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	64.5	473.31	-2.8	15.5	0.3	0.0		1.6
HRSG Stack Facade 1-5	76.0	52.94	3.0	64.5	473.31	-2.8	14.8	0.3	0.0		2.2
HRSG Stack Facade 1-6	76.0	53.52	3.0	64.5	471.14	-2.8	11.1	0.3	0.0		5.9
HRSG Stack Facade 1-7	76.0	53.27	3.0	64.4	468.15	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 1-8	76.0	53.35	3.0	64.4	466.17	-2.8	3.4	0.3	0.0		13.7
HRSG Stack Facade 2-1	76.0	53.51	3.0	64.4	469.64	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 2-2	76.0	53.31	3.0	64.5	472.57	-2.8	11.3	0.3	0.0		5.7
HRSG Stack Facade 3-2	76.0	53.44	3.0	64.5	474.53	-2.8	15.8	0.3	0.0		1.2
HRSG Stack Facade 4-2	76.0	52.85	3.0	64.5	474.21	-2.8	16.1	0.3	0.0		0.9
HRSG Stack Facade 5-2	76.0	53.63	3.0	64.5	471.95	-2.8	10.9	0.3	0.0		6.1
HRSG Stack Facade 6-2	76.0	53.14	3.0	64.4	469.03	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 7-2	76.0	53.49	3.0	64.4	467.16	-2.8	3.3	0.3	0.0		13.8
HRSG Stack Facade 8-2	76.0	53.40	3.0	64.4	467.46	-2.8	3.2	0.3	0.0		13.8
ST Building Ventilation 1	86.6	86.58	0.0	63.2	407.09	-3.0	0.1	1.7	0.0		24.6
ST Building Ventilation 2	86.6	86.58	0.0	63.3	412.45	-3.0	0.1	1.7	0.0		24.4
ST Building Ventilation 3	86.6	86.58	0.0	63.6	424.43	-3.0	0.3	1.9	0.0		23.9
ST Building Ventilation 4	86.6	86.58	0.0	63.5	419.88	-3.0	0.3	1.8	0.0		24.0
ST Building Ventilation 5	86.6	86.58	0.0	63.4	415.03	-3.0	0.2	1.8	0.0		24.3
Steam Turbine Building Facade 1	95.3	63.91	3.0	63.9	442.17	-2.8	16.5	0.2	0.0		22.1
Steam Turbine Building Facade 2	94.9	63.91	3.0	63.4	418.84	-2.8	6.7	0.2	0.0		30.4
Steam Turbine Building Facade 3	95.3	63.91	3.0	63.1	403.30	-2.8		0.2	0.0		37.8
Steam Turbine Building Facade 4	95.0	63.91	3.0	63.6	426.71	-2.8	8.9	0.1	0.0		28.1
Steam Turbine Building Roof	96.2	63.91	0.0	63.5	422.26	-3.0	3.7	0.2	0.0		31.7
Steam Turbine Transformer	98.1	98.09	0.0	62.9	393.62	-2.4		1.3	0.0		38.7
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	63.3	414.26	-3.0	0.6	2.3	8.2		32.6
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	63.4	415.54	-3.0	0.6	2.3	8.2		32.6
WSAC	98.7	75.33	0.0	62.8	387.39	-2.5		1.7	0.0		38.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1. Floor Name: Genung Street			LrD 36.4	dB(A)							
Air Cooled Condenser	106.8	69.69	0.0	73.4	1318.34	-2.3		3.0	0.0		32.7
Air Intake 1	90.7	69.65	3.0	74.1	1434.19	-1.8	18.0	1.5	0.0		1.9
Air Intake 2	90.7	69.65	3.0	74.0	1405.06	-1.8	18.3	1.6	0.0		1.8
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	74.1	1423.05	-2.3	0.7	3.6	7.3		19.4
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	73.9	1393.52	-2.3	0.7	3.6	7.3		19.7
GT Building Ventilation 1	86.6	86.58	0.0	74.1	1425.47	-2.3	0.3	4.4	0.0		10.1
GT Building Ventilation 2	86.6	86.58	0.0	74.0	1407.98	-2.4	0.3	4.4	0.0		10.3
GT Building Ventilation 3	86.6	86.58	0.0	73.9	1395.14	-2.4	0.3	4.4	0.0		10.3
GT Building Ventilation 4	86.6	86.58	0.0	73.8	1384.21	-2.4	0.1	4.1	0.0		10.9
GT Building Ventilation 5	86.6	86.58	0.0	73.9	1398.33	-2.4	0.2	4.2	0.0		10.7
GT Building Ventilation 6	86.6	86.58	0.0	74.0	1413.83	-2.4	0.1	4.2	0.0		10.6
Gas Metering Station	93.6	93.60	0.0	73.0	1261.69	-2.0		9.8	0.0		12.8
Gas Preheater Building Facade 2	75.4	56.95	3.0	73.9	1402.26	-1.9		0.7	0.0		5.6
Gas Preheater Building Facade 3	77.0	56.95	3.0	74.0	1411.83	-1.9	10.1	0.2	0.0		-2.4
Gas Preheater Building Facade 4	75.3	56.95	3.0	74.0	1412.30	-1.9	17.7	0.4	0.0		-11.3
Gas Preheater Building Roof	79.7	56.95	0.0	74.0	1407.23	-2.0	6.0	0.9	0.0		0.8
Gas Turbine Building Facade 1	86.4	52.25	3.0	73.9	1393.69	-1.7	6.2	1.0	0.0		10.0
Gas Turbine Building Facade 2	81.2	52.25	3.0	74.1	1433.10	-1.7	17.0	0.7	0.0		-5.9
Gas Turbine Building Facade 3	86.4	52.25	3.0	74.0	1409.32	-1.7	14.8	0.7	0.0		1.7
Gas Turbine Building Facade 4	81.1	52.25	3.0	73.7	1370.89	-1.7	11.9	0.9	0.0		-0.7
Gas Turbine Building Roof	85.1	52.25	0.0	73.9	1401.50	-2.1	3.3	1.3	0.0		8.7
Gas Turbine Transformer 1	98.1	98.09	0.0	74.1	1435.02	-1.6	19.4	2.8	0.0		3.4
Gas Turbine Transformer 2	98.1	98.09	0.0	74.0	1406.40	-1.6	18.4	2.2	0.0		5.1
HRSG Building Facade 1	85.4	52.01	3.0	73.7	1365.25	-1.8	0.0	0.7	0.0		15.9
HRSG Building Facade 2	83.0	52.01	3.0	74.0	1411.36	-1.8	14.1	0.3	0.0		0.1
HRSG Building Facade 3	85.5	52.01	3.0	73.9	1393.64	-1.8	17.1	0.4	0.0		2.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	83.0	52.01	3.0	73.6	1348.19	-1.9	5.6	0.7	0.0		10.5
HRSG Building Roof	87.7	52.01	0.0	73.8	1379.39	-2.1	3.2	1.0	0.0		12.4
HRSG Building Ventilation 1	86.6	86.58	0.0	73.9	1402.72	-2.3	0.1	4.1	0.0		10.8
HRSG Building Ventilation 2	86.6	86.58	0.0	73.8	1384.28	-2.3	0.1	4.0	0.0		10.9
HRSG Building Ventilation 3	86.6	86.58	0.0	73.8	1372.98	-2.3	0.0	4.0	0.0		11.1
HRSG Building Ventilation 4	86.6	86.58	0.0	73.7	1363.28	-2.3	0.0	3.9	0.0		11.2
HRSG Building Ventilation 5	86.6	86.58	0.0	73.8	1374.60	-2.3	0.0	4.0	0.0		11.1
HRSG Building Ventilation 6	86.6	86.58	0.0	73.9	1393.51	-2.3	0.0	4.0	0.0		11.0
HRSG Stack Exhaust 1	106.6	106.63	0.0	73.8	1381.80	-2.8		2.5	7.2		25.9
HRSG Stack Exhaust 2	106.6	106.63	0.0	73.6	1351.81	-2.8		2.4	7.3		26.1
HRSG Stack Facade 1-1	76.0	53.42	3.0	73.8	1382.16	-1.8	6.1	1.0	0.0		3.9
HRSG Stack Facade 1-2	76.0	53.58	3.0	73.8	1379.25	-1.8		1.0	0.0		7.4
HRSG Stack Facade 1-3	76.0	53.38	3.0	73.8	1377.50	-1.8		1.0	0.0		7.4
HRSG Stack Facade 1-4	76.0	53.29	3.0	73.8	1377.86	-1.8		1.0	0.0		6.0
HRSG Stack Facade 1-5	76.0	52.94	3.0	73.8	1380.38	-1.8		1.0	0.0		6.0
HRSG Stack Facade 1-6	76.0	53.52	3.0	73.8	1383.44	-1.8	8.4	0.9	0.0		-2.4
HRSG Stack Facade 1-7	76.0	53.27	3.0	73.8	1385.23	-1.8	13.1	0.9	0.0		-7.0
HRSG Stack Facade 1-8	76.0	53.35	3.0	73.8	1384.70	-1.8	11.2	0.9	0.0		2.5
HRSG Stack Facade 2-1	76.0	53.51	3.0	73.6	1349.13	-1.8		1.0	0.0		7.9
HRSG Stack Facade 2-2	76.0	53.31	3.0	73.6	1347.29	-1.8		1.0	0.0		7.9
HRSG Stack Facade 3-2	76.0	53.44	3.0	73.6	1347.63	-1.8		1.0	0.0		6.3
HRSG Stack Facade 4-2	76.0	52.85	3.0	73.6	1350.16	-1.8		1.0	0.0		6.3
HRSG Stack Facade 5-2	76.0	53.63	3.0	73.6	1353.27	-1.8	8.1	0.9	0.0		-1.8
HRSG Stack Facade 6-2	76.0	53.14	3.0	73.6	1354.97	-1.8	13.0	0.9	0.0		-6.6
HRSG Stack Facade 7-2	76.0	53.49	3.0	73.6	1354.49	-1.8	11.4	0.9	0.0		4.2
HRSG Stack Facade 8-2	76.0	53.40	3.0	73.6	1352.08	-1.8	6.2	0.9	0.0		5.3
ST Building Ventilation 1	86.6	86.58	0.0	73.7	1369.99	-2.4	0.1	4.1	0.0		11.0

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	73.6	1350.11	-2.4	0.2	4.1	0.0		11.0
ST Building Ventilation 3	86.6	86.58	0.0	73.6	1341.84	-2.4	0.2	4.1	0.0		11.1
ST Building Ventilation 4	86.6	86.58	0.0	73.7	1361.38	-2.4	0.3	4.2	0.0		10.8
ST Building Ventilation 5	86.6	86.58	0.0	73.6	1356.29	-2.4	0.3	4.2	0.0		10.9
Steam Turbine Building Facade 1	95.3	63.91	3.0	73.5	1336.78	-1.8	2.4	0.6	0.0		25.6
Steam Turbine Building Facade 2	94.9	63.91	3.0	73.7	1365.70	-1.7	16.1	0.4	0.0		11.9
Steam Turbine Building Facade 3	95.3	63.91	3.0	73.7	1362.69	-1.7	14.6	0.4	0.0		11.3
Steam Turbine Building Facade 4	95.0	63.91	3.0	73.5	1333.77	-1.7	1.0	0.6	0.0		24.6
Steam Turbine Building Roof	96.2	63.91	0.0	73.6	1349.76	-2.2	3.7	0.7	0.0		20.3
Steam Turbine Transformer	98.1	98.09	0.0	73.8	1375.01	-1.6	19.1	2.5	0.0		4.4
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	74.0	1415.27	-2.3	0.5	4.9	7.3		19.7
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	73.8	1385.80	-2.3	0.5	4.8	7.3		20.0
WSAC	98.7	75.33	0.0	73.7	1365.11	-1.7	0.3	4.4	0.0		22.1
Floor 2 Floor Name Genung Street			LrD 36.5	dB(A)							
Air Cooled Condenser	106.8	69.69	0.0	73.4	1318.31	-2.4		3.0	0.0		32.8
Air Intake 1	90.7	69.65	3.0	74.1	1434.18	-1.9	18.0	1.5	0.0		2.0
Air Intake 2	90.7	69.65	3.0	74.0	1405.05	-1.9	18.2	1.6	0.0		1.8
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	74.1	1423.01	-2.3	0.7	3.6	7.3		19.5
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	73.9	1393.47	-2.3	0.7	3.6	7.3		19.8
GT Building Ventilation 1	86.6	86.58	0.0	74.1	1425.43	-2.4	0.3	4.4	0.0		10.2
GT Building Ventilation 2	86.6	86.58	0.0	74.0	1407.94	-2.4	0.3	4.4	0.0		10.3
GT Building Ventilation 3	86.6	86.58	0.0	73.9	1395.09	-2.4	0.3	4.4	0.0		10.4
GT Building Ventilation 4	86.6	86.58	0.0	73.8	1384.17	-2.4	0.1	4.1	0.0		10.9
GT Building Ventilation 5	86.6	86.58	0.0	73.9	1398.29	-2.4	0.2	4.2	0.0		10.8
GT Building Ventilation 6	86.6	86.58	0.0	74.0	1413.79	-2.4	0.1	4.2	0.0		10.6
Gas Metering Station	93.6	93.60	0.0	73.0	1261.72	-2.1		9.8	0.0		12.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	75.4	56.95	3.0	73.9	1402.28	-2.0		0.7	0.0		5.7
Gas Preheater Building Facade 3	77.0	56.95	3.0	74.0	1411.86	-1.9	10.1	0.2	0.0		-2.3
Gas Preheater Building Facade 4	75.3	56.95	3.0	74.0	1412.32	-2.0	17.7	0.4	0.0		-11.2
Gas Preheater Building Roof	79.7	56.95	0.0	74.0	1407.25	-2.0	6.0	0.9	0.0		0.8
Gas Turbine Building Facade 1	86.4	52.25	3.0	73.9	1393.68	-1.8	6.2	1.0	0.0		10.1
Gas Turbine Building Facade 2	81.2	52.25	3.0	74.1	1433.09	-1.7	17.1	0.7	0.0		-5.9
Gas Turbine Building Facade 3	86.4	52.25	3.0	74.0	1409.31	-1.8	14.7	0.7	0.0		1.8
Gas Turbine Building Facade 4	81.1	52.25	3.0	73.7	1370.89	-1.8	11.9	0.9	0.0		-0.6
Gas Turbine Building Roof	85.1	52.25	0.0	73.9	1401.46	-2.2	3.3	1.3	0.0		8.8
Gas Turbine Transformer 1	98.1	98.09	0.0	74.1	1435.03	-1.7	19.4	2.8	0.0		3.5
Gas Turbine Transformer 2	98.1	98.09	0.0	74.0	1406.41	-1.7	18.4	2.2	0.0		5.2
HRSG Building Facade 1	85.4	52.01	3.0	73.7	1365.25	-1.9	0.0	0.7	0.0		16.0
HRSG Building Facade 2	83.0	52.01	3.0	74.0	1411.36	-1.9	14.1	0.3	0.0		0.2
HRSG Building Facade 3	85.5	52.01	3.0	73.9	1393.64	-1.9	17.1	0.4	0.0		3.0
HRSG Building Facade 4	83.0	52.01	3.0	73.6	1348.19	-1.9	5.6	0.7	0.0		10.6
HRSG Building Roof	87.7	52.01	0.0	73.8	1379.37	-2.2	3.2	1.0	0.0		12.4
HRSG Building Ventilation 1	86.6	86.58	0.0	73.9	1402.69	-2.3	0.1	4.1	0.0		10.9
HRSG Building Ventilation 2	86.6	86.58	0.0	73.8	1384.25	-2.4	0.1	4.0	0.0		11.0
HRSG Building Ventilation 3	86.6	86.58	0.0	73.8	1372.94	-2.4	0.0	4.0	0.0		11.2
HRSG Building Ventilation 4	86.6	86.58	0.0	73.7	1363.25	-2.4	0.0	3.9	0.0		11.3
HRSG Building Ventilation 5	86.6	86.58	0.0	73.8	1374.57	-2.4	0.0	4.0	0.0		11.2
HRSG Building Ventilation 6	86.6	86.58	0.0	73.9	1393.48	-2.3	0.0	4.0	0.0		11.0
HRSG Stack Exhaust 1	106.6	106.63	0.0	73.8	1381.70	-2.8		2.5	7.2		25.9
HRSG Stack Exhaust 2	106.6	106.63	0.0	73.6	1351.71	-2.8		2.4	7.2		26.2
HRSG Stack Facade 1-1	76.0	53.42	3.0	73.8	1382.13	-1.9	6.1	1.0	0.0		4.0
HRSG Stack Facade 1-2	76.0	53.58	3.0	73.8	1379.22	-1.9		1.0	0.0		7.5
HRSG Stack Facade 1-3	76.0	53.38	3.0	73.8	1377.47	-1.9		1.0	0.0		7.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	73.8	1377.83	-1.9		1.0	0.0		6.1
HRSG Stack Facade 1-5	76.0	52.94	3.0	73.8	1380.35	-1.9		1.0	0.0		6.1
HRSG Stack Facade 1-6	76.0	53.52	3.0	73.8	1383.41	-1.9	8.5	0.9	0.0		-2.3
HRSG Stack Facade 1-7	76.0	53.27	3.0	73.8	1385.21	-1.9	13.1	0.9	0.0		-6.9
HRSG Stack Facade 1-8	76.0	53.35	3.0	73.8	1384.67	-1.9	11.0	0.9	0.0		2.6
HRSG Stack Facade 2-1	76.0	53.51	3.0	73.6	1349.10	-1.9		1.0	0.0		8.0
HRSG Stack Facade 2-2	76.0	53.31	3.0	73.6	1347.26	-1.9		1.0	0.0		8.0
HRSG Stack Facade 3-2	76.0	53.44	3.0	73.6	1347.60	-1.9		1.0	0.0		6.4
HRSG Stack Facade 4-2	76.0	52.85	3.0	73.6	1350.14	-1.9		1.0	0.0		6.3
HRSG Stack Facade 5-2	76.0	53.63	3.0	73.6	1353.23	-1.9	8.1	0.9	0.0		-1.7
HRSG Stack Facade 6-2	76.0	53.14	3.0	73.6	1354.94	-1.9	13.0	0.9	0.0		-6.6
HRSG Stack Facade 7-2	76.0	53.49	3.0	73.6	1354.47	-1.9	11.3	0.9	0.0		4.3
HRSG Stack Facade 8-2	76.0	53.40	3.0	73.6	1352.04	-1.9	6.1	0.9	0.0		5.4
ST Building Ventilation 1	86.6	86.58	0.0	73.7	1369.94	-2.4	0.1	4.1	0.0		11.0
ST Building Ventilation 2	86.6	86.58	0.0	73.6	1350.07	-2.4	0.2	4.1	0.0		11.1
ST Building Ventilation 3	86.6	86.58	0.0	73.6	1341.79	-2.4	0.2	4.1	0.0		11.2
ST Building Ventilation 4	86.6	86.58	0.0	73.7	1361.33	-2.4	0.3	4.2	0.0		10.9
ST Building Ventilation 5	86.6	86.58	0.0	73.6	1356.24	-2.4	0.2	4.2	0.0		11.0
Steam Turbine Building Facade 1	95.3	63.91	3.0	73.5	1336.77	-1.8	2.3	0.6	0.0		25.7
Steam Turbine Building Facade 2	94.9	63.91	3.0	73.7	1365.69	-1.8	16.1	0.4	0.0		12.0
Steam Turbine Building Facade 3	95.3	63.91	3.0	73.7	1362.68	-1.8	14.6	0.4	0.0		11.4
Steam Turbine Building Facade 4	95.0	63.91	3.0	73.5	1333.77	-1.8	1.0	0.6	0.0		24.7
Steam Turbine Building Roof	96.2	63.91	0.0	73.6	1349.72	-2.2	3.7	0.7	0.0		20.4
Steam Turbine Transformer	98.1	98.09	0.0	73.8	1375.02	-1.7	19.1	2.5	0.0		4.5
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	74.0	1415.23	-2.4	0.5	4.8	7.3		19.8
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	73.8	1385.76	-2.4	0.4	4.8	7.3		20.1
WSAC	98.7	75.33	0.0	73.7	1365.13	-1.8	0.2	4.4	0.0		22.3

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1. Floor Name Moon School 1			LrD [illegible]	dB(A)							
Air Cooled Condenser	106.8	69.69	0.0	75.3	1638.14	-2.2		3.4	0.0		30.2
Air Intake 1	90.7	69.65	3.0	76.0	1778.57	-1.7	0.2	2.8	0.0		16.5
Air Intake 2	90.7	69.65	3.0	75.9	1748.59	-1.7	0.1	2.8	0.0		16.7
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	76.1	1802.52	-2.1	0.5	4.2	7.0		17.1
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	76.0	1772.97	-2.1	0.5	4.1	7.0		17.3
GT Building Ventilation 1	86.6	86.58	0.0	76.0	1787.57	-2.2	0.1	4.9	0.0		7.7
GT Building Ventilation 2	86.6	86.58	0.0	76.0	1771.05	-2.2	0.1	4.9	0.0		7.8
GT Building Ventilation 3	86.6	86.58	0.0	75.9	1758.64	-2.2	0.2	4.9	0.0		7.7
GT Building Ventilation 4	86.6	86.58	0.0	76.0	1769.84	-2.2	0.2	5.0	0.0		7.5
GT Building Ventilation 5	86.6	86.58	0.0	76.0	1782.76	-2.2	0.2	5.1	0.0		7.4
GT Building Ventilation 6	86.6	86.58	0.0	76.1	1798.80	-2.2	0.2	5.1	0.0		7.4
Gas Metering Station	93.6	93.60	0.0	75.1	1595.05	-2.0		11.7	0.0		8.8
Gas Preheater Building Facade 2	75.4	56.95	3.0	76.3	1847.88	-1.7	19.6	0.8	0.0		-16.6
Gas Preheater Building Facade 3	77.0	56.95	3.0	76.3	1847.09	-1.7	19.2	0.7	0.0		-14.5
Gas Preheater Building Facade 4	75.3	56.95	3.0	76.3	1837.42	-1.7	19.6	0.8	0.0		-16.6
Gas Preheater Building Roof	79.7	56.95	0.0	76.3	1842.60	-1.8	19.4	0.7	0.0		-14.9
Gas Turbine Building Facade 1	86.4	52.25	3.0	76.0	1782.91	-1.5	15.1	0.8	0.0		-1.0
Gas Turbine Building Facade 2	81.2	52.25	3.0	76.1	1806.77	-1.5	15.5	0.7	0.0		-6.6
Gas Turbine Building Facade 3	86.4	52.25	3.0	75.9	1767.47	-1.5	1.9	1.1	0.0		11.9
Gas Turbine Building Facade 4	81.1	52.25	3.0	75.8	1744.19	-1.5	12.7	0.7	0.0		-3.6
Gas Turbine Building Roof	85.1	52.25	0.0	76.0	1775.23	-1.9	3.0	1.5	0.0		6.5
Gas Turbine Transformer 1	98.1	98.09	0.0	75.9	1762.04	-1.5		3.8	0.0		22.1
Gas Turbine Transformer 2	98.1	98.09	0.0	75.8	1732.07	-1.5		3.7	0.0		20.1
HRSG Building Facade 1	85.4	52.01	3.0	76.2	1812.24	-1.6	14.8	0.4	0.0		-1.3
HRSG Building Facade 2	83.0	52.01	3.0	76.2	1828.75	-1.6	15.7	0.4	0.0		-4.8
HRSG Building Facade 3	85.5	52.01	3.0	76.0	1783.04	-1.6	16.8	0.4	0.0		-3.2

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	83.0	52.01	3.0	75.9	1767.01	-1.6	13.3	0.4	0.0		-2.0
HRSG Building Roof	87.7	52.01	0.0	76.1	1797.42	-1.9	9.3	0.4	0.0		3.8
HRSG Building Ventilation 1	86.6	86.58	0.0	76.2	1810.01	-2.1	13.6	2.4	0.0		-3.4
HRSG Building Ventilation 2	86.6	86.58	0.0	76.1	1793.34	-2.1	13.5	2.5	0.0		-3.3
HRSG Building Ventilation 3	86.6	86.58	0.0	76.0	1780.76	-2.1	13.8	2.4	0.0		-3.5
HRSG Building Ventilation 4	86.6	86.58	0.0	76.1	1790.77	-2.1	11.1	2.6	0.0		-1.1
HRSG Building Ventilation 5	86.6	86.58	0.0	76.1	1802.64	-2.1	10.3	2.8	0.0		-0.6
HRSG Building Ventilation 6	86.6	86.58	0.0	76.2	1819.57	-2.1	10.5	2.8	0.0		-0.8
HRSG Stack Exhaust 1	106.6	106.63	0.0	76.3	1832.74	-2.6		3.2	7.0		22.7
HRSG Stack Exhaust 2	106.6	106.63	0.0	76.1	1803.77	-2.6		3.2	7.0		22.9
HRSG Stack Facade 1-1	76.0	53.42	3.0	76.2	1829.21	-1.5	2.6	1.3	0.0		0.3
HRSG Stack Facade 1-2	76.0	53.58	3.0	76.2	1828.87	-1.5	2.6	1.3	0.0		0.3
HRSG Stack Facade 1-3	76.0	53.38	3.0	76.3	1830.77	-1.5	2.6	1.3	0.0		0.3
HRSG Stack Facade 1-4	76.0	53.29	3.0	76.3	1833.75	-1.5	9.4	1.3	0.0		-6.5
HRSG Stack Facade 1-5	76.0	52.94	3.0	76.3	1836.10	-1.5	14.8	1.2	0.0		-11.8
HRSG Stack Facade 1-6	76.0	53.52	3.0	76.3	1836.32	-1.5	15.7	1.2	0.0		-12.6
HRSG Stack Facade 1-7	76.0	53.27	3.0	76.3	1834.34	-1.5	10.8	1.2	0.0		-7.9
HRSG Stack Facade 1-8	76.0	53.35	3.0	76.3	1831.45	-1.5	3.0	1.3	0.0		-0.1
HRSG Stack Facade 2-1	76.0	53.51	3.0	76.1	1800.01	-1.5	2.6	1.3	0.0		0.5
HRSG Stack Facade 2-2	76.0	53.31	3.0	76.1	1801.96	-1.5	3.0	1.3	0.0		0.1
HRSG Stack Facade 3-2	76.0	53.44	3.0	76.1	1804.90	-1.5	9.5	1.2	0.0		-6.4
HRSG Stack Facade 4-2	76.0	52.85	3.0	76.1	1807.22	-1.5	14.3	1.1	0.0		-11.1
HRSG Stack Facade 5-2	76.0	53.63	3.0	76.1	1807.48	-1.5	15.5	1.2	0.0		-12.3
HRSG Stack Facade 6-2	76.0	53.14	3.0	76.1	1805.44	-1.5	11.0	1.2	0.0		-7.8
HRSG Stack Facade 7-2	76.0	53.49	3.0	76.1	1802.46	-1.5	2.7	1.3	0.0		0.3
HRSG Stack Facade 8-2	76.0	53.40	3.0	76.1	1800.27	-1.5	2.7	1.3	0.0		0.4
ST Building Ventilation 1	86.6	86.58	0.0	75.8	1736.14	-2.2	0.1	4.8	0.0		8.1

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	75.7	1716.56	-2.2	0.1	4.8	0.0		8.2
ST Building Ventilation 3	86.6	86.58	0.0	75.7	1724.37	-2.2	0.1	4.8	0.0		8.1
ST Building Ventilation 4	86.6	86.58	0.0	75.8	1744.31	-2.2	0.1	4.9	0.0		8.0
ST Building Ventilation 5	86.6	86.58	0.0	75.8	1729.83	-2.2	0.1	4.8	0.0		8.1
Steam Turbine Building Facade 1	95.3	63.91	3.0	75.8	1745.66	-1.5	14.3	0.5	0.0		9.2
Steam Turbine Building Facade 2	94.9	63.91	3.0	75.9	1748.85	-1.5	14.8	0.6	0.0		10.8
Steam Turbine Building Facade 3	95.3	63.91	3.0	75.7	1719.75	-1.5	0.0	0.7	0.0		23.4
Steam Turbine Building Facade 4	95.0	63.91	3.0	75.7	1716.61	-1.5	0.0	0.7	0.0		23.1
Steam Turbine Building Roof	96.2	63.91	0.0	75.8	1732.54	-1.9	3.3	0.9	0.0		18.1
Steam Turbine Transformer	98.1	98.09	0.0	75.7	1721.54	-1.5	0.0	3.7	0.0		22.7
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	76.1	1797.35	-2.1	0.4	5.4	7.0		17.3
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	75.9	1767.89	-2.2	0.4	5.4	7.0		17.4
WSAC	98.7	75.33	0.0	75.6	1695.88	-1.7	0.0	4.7	0.0		20.6
Floor 2.Floor Name Moon School			**LrD 34.7**	**dB(A)**							
Air Cooled Condenser	106.8	69.69	0.0	75.3	1638.15	-2.2		3.4	0.0		30.3
Air Intake 1	90.7	69.65	3.0	76.0	1778.59	-1.7	0.2	2.8	0.0		16.6
Air Intake 2	90.7	69.65	3.0	75.9	1748.61	-1.8	0.1	2.8	0.0		16.8
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	76.1	1802.51	-2.1	0.5	4.1	7.0		17.2
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	76.0	1772.96	-2.1	0.5	4.1	7.0		17.4
GT Building Ventilation 1	86.6	86.58	0.0	76.0	1787.56	-2.2	0.1	4.9	0.0		7.7
GT Building Ventilation 2	86.6	86.58	0.0	76.0	1771.05	-2.2	0.1	4.9	0.0		7.8
GT Building Ventilation 3	86.6	86.58	0.0	75.9	1758.64	-2.2	0.2	4.9	0.0		7.8
GT Building Ventilation 4	86.6	86.58	0.0	76.0	1769.83	-2.2	0.2	5.0	0.0		7.6
GT Building Ventilation 5	86.6	86.58	0.0	76.0	1782.76	-2.2	0.2	5.0	0.0		7.5
GT Building Ventilation 6	86.6	86.58	0.0	76.1	1798.79	-2.2	0.2	5.1	0.0		7.4
Gas Metering Station	93.6	93.60	0.0	75.1	1595.09	-2.0		11.7	0.0		8.8

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	75.4	56.95	3.0	76.3	1847.92	-1.8	19.6	0.8	0.0		-16.6
Gas Preheater Building Facade 3	77.0	56.95	3.0	76.3	1847.14	-1.8	19.2	0.7	0.0		-14.4
Gas Preheater Building Facade 4	75.3	56.95	3.0	76.3	1837.46	-1.8	19.6	0.8	0.0		-16.6
Gas Preheater Building Roof	79.7	56.95	0.0	76.3	1842.64	-1.8	19.4	0.7	0.0		-14.9
Gas Turbine Building Facade 1	86.4	52.25	3.0	76.0	1782.93	-1.6	15.0	0.8	0.0		-0.9
Gas Turbine Building Facade 2	81.2	52.25	3.0	76.1	1806.79	-1.5	15.5	0.7	0.0		-6.6
Gas Turbine Building Facade 3	86.4	52.25	3.0	75.9	1767.49	-1.6	1.9	1.1	0.0		12.0
Gas Turbine Building Facade 4	81.1	52.25	3.0	75.8	1744.21	-1.6	12.7	0.7	0.0		-3.5
Gas Turbine Building Roof	85.1	52.25	0.0	76.0	1775.22	-1.9	3.0	1.5	0.0		6.5
Gas Turbine Transformer 1	98.1	98.09	0.0	75.9	1762.07	-1.6		3.8	0.0		22.1
Gas Turbine Transformer 2	98.1	98.09	0.0	75.8	1732.11	-1.6		3.7	0.0		20.2
HRSG Building Facade 1	85.4	52.01	3.0	76.2	1812.27	-1.7	14.5	0.4	0.0		-0.9
HRSG Building Facade 2	83.0	52.01	3.0	76.2	1828.77	-1.7	15.7	0.4	0.0		-4.8
HRSG Building Facade 3	85.5	52.01	3.0	76.0	1783.07	-1.7	16.5	0.4	0.0		-2.8
HRSG Building Facade 4	83.0	52.01	3.0	75.9	1767.04	-1.7	13.3	0.4	0.0		-1.9
HRSG Building Roof	87.7	52.01	0.0	76.1	1797.42	-2.0	9.2	0.4	0.0		3.9
HRSG Building Ventilation 1	86.6	86.58	0.0	76.2	1810.01	-2.2	13.5	2.4	0.0		-3.3
HRSG Building Ventilation 2	86.6	86.58	0.0	76.1	1793.34	-2.2	13.4	2.5	0.0		-3.2
HRSG Building Ventilation 3	86.6	86.58	0.0	76.0	1780.76	-2.2	13.8	2.4	0.0		-3.4
HRSG Building Ventilation 4	86.6	86.58	0.0	76.1	1790.78	-2.2	11.0	2.6	0.0		-1.0
HRSG Building Ventilation 5	86.6	86.58	0.0	76.1	1802.64	-2.2	10.2	2.8	0.0		-0.4
HRSG Building Ventilation 6	86.6	86.58	0.0	76.2	1819.57	-2.2	10.4	2.8	0.0		-0.7
HRSG Stack Exhaust 1	106.6	106.63	0.0	76.3	1832.69	-2.6		3.2	7.0		22.7
HRSG Stack Exhaust 2	106.6	106.63	0.0	76.1	1803.72	-2.6		3.2	7.0		22.9
HRSG Stack Facade 1-1	76.0	53.42	3.0	76.2	1829.21	-1.5	2.6	1.3	0.0		0.3
HRSG Stack Facade 1-2	76.0	53.58	3.0	76.2	1828.88	-1.5	2.6	1.3	0.0		0.4
HRSG Stack Facade 1-3	76.0	53.38	3.0	76.3	1830.77	-1.5	2.6	1.3	0.0		0.4

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL dB(A)	PWL/unit dB(A)	Non-Sphere dB	Spreading dB	Distance m	Grnd.Effct dB	Ins. dB	Air dB	Directivity dB	Mitigation dB	SPL dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	76.3	1833.75	-1.5	9.4	1.3	0.0		-6.4
HRSG Stack Facade 1-5	76.0	52.94	3.0	76.3	1836.11	-1.5	14.8	1.2	0.0		-11.7
HRSG Stack Facade 1-6	76.0	53.52	3.0	76.3	1836.32	-1.5	15.7	1.2	0.0		-12.6
HRSG Stack Facade 1-7	76.0	53.27	3.0	76.3	1834.34	-1.5	10.8	1.3	0.0		-7.8
HRSG Stack Facade 1-8	76.0	53.35	3.0	76.3	1831.46	-1.5	3.0	1.3	0.0		-0.1
HRSG Stack Facade 2-1	76.0	53.51	3.0	76.1	1800.01	-1.6	2.6	1.3	0.0		0.5
HRSG Stack Facade 2-2	76.0	53.31	3.0	76.1	1801.96	-1.6	3.0	1.3	0.0		0.2
HRSG Stack Facade 3-2	76.0	53.44	3.0	76.1	1804.91	-1.5	9.5	1.2	0.0		-6.3
HRSG Stack Facade 4-2	76.0	52.85	3.0	76.1	1807.22	-1.5	14.3	1.2	0.0		-11.0
HRSG Stack Facade 5-2	76.0	53.63	3.0	76.1	1807.48	-1.5	15.5	1.1	0.0		-12.2
HRSG Stack Facade 6-2	76.0	53.14	3.0	76.1	1805.45	-1.5	10.8	1.2	0.0		-7.6
HRSG Stack Facade 7-2	76.0	53.49	3.0	76.1	1802.47	-1.5	2.7	1.3	0.0		0.4
HRSG Stack Facade 8-2	76.0	53.40	3.0	76.1	1800.27	-1.6	2.7	1.3	0.0		0.5
ST Building Ventilation 1	86.6	86.58	0.0	75.8	1736.14	-2.3	0.1	4.8	0.0		8.1
ST Building Ventilation 2	86.6	86.58	0.0	75.7	1716.56	-2.3	0.1	4.8	0.0		8.3
ST Building Ventilation 3	86.6	86.58	0.0	75.7	1724.36	-2.3	0.1	4.8	0.0		8.2
ST Building Ventilation 4	86.6	86.58	0.0	75.8	1744.30	-2.3	0.1	4.8	0.0		8.0
ST Building Ventilation 5	86.6	86.58	0.0	75.8	1729.82	-2.3	0.1	4.8	0.0		8.1
Steam Turbine Building Facade 1	95.3	63.91	3.0	75.8	1745.68	-1.6	14.3	0.5	0.0		9.2
Steam Turbine Building Facade 2	94.9	63.91	3.0	75.9	1748.87	-1.6	14.8	0.6	0.0		10.9
Steam Turbine Building Facade 3	95.3	63.91	3.0	75.7	1719.78	-1.6	0.0	0.7	0.0		23.5
Steam Turbine Building Facade 4	95.0	63.91	3.0	75.7	1716.63	-1.6	0.0	0.7	0.0		23.2
Steam Turbine Building Roof	96.2	63.91	0.0	75.8	1732.54	-2.0	3.3	0.9	0.0		18.2
Steam Turbine Transformer	98.1	98.09	0.0	75.7	1721.58	-1.6	0.0	3.7	0.0		22.8
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	76.1	1797.34	-2.2	0.4	5.4	7.0		17.4
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	75.9	1767.88	-2.2	0.4	5.4	7.0		17.5
WSAC	98.7	75.33	0.0	75.6	1695.91	-1.7		4.7	0.0		20.6

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1 [illegible] Public Space [illegible] dB(A) [illegible]											
Air Cooled Condenser	106.8	69.69	0.0	67.1	637.24	-2.8	12.2	0.6	0.0		29.7
Air Intake 1	90.7	69.65	3.0	64.5	474.69	-2.7	10.3	0.4	0.0		21.2
Air Intake 2	90.7	69.65	3.0	65.1	509.53	-2.7	14.4	0.5	0.0		16.3
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	64.2	456.66	-3.0	1.8	1.7	8.1		30.1
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	64.8	491.91	-3.0	1.4	1.7	8.0		30.0
GT Building Ventilation 1	86.6	86.58	0.0	64.4	469.51	-3.0	0.9	2.2	0.0		22.1
GT Building Ventilation 2	86.6	86.58	0.0	64.8	489.23	-3.0	1.0	2.4	0.0		21.4
GT Building Ventilation 3	86.6	86.58	0.0	65.1	504.17	-3.0	1.1	2.4	0.0		21.0
GT Building Ventilation 4	86.6	86.58	0.0	64.9	497.75	-3.0	0.9	2.3	0.0		21.4
GT Building Ventilation 5	86.6	86.58	0.0	64.7	481.70	-3.0	1.0	2.3	0.0		21.5
GT Building Ventilation 6	86.6	86.58	0.0	64.3	462.67	-3.0	1.0	2.3	0.0		22.0
Gas Metering Station	93.6	93.60	0.0	67.9	699.28	-2.3	20.0	6.3	0.0		1.7
Gas Preheater Building Facade 2	75.4	56.95	3.0	63.5	423.35	-2.6		0.4	0.0		17.1
Gas Preheater Building Facade 3	77.0	56.95	3.0	63.5	420.32	-2.6	0.0	0.4	0.0		18.9
Gas Preheater Building Facade 4	75.3	56.95	3.0	63.6	428.32	-2.6	6.1	0.1	0.0		12.0
Gas Preheater Building Roof	79.7	56.95	0.0	63.6	425.78	-2.7	3.9	0.7	0.0		16.4
Gas Turbine Building Facade 1	86.4	52.25	3.0	64.6	480.66	-2.6	6.3	0.4	0.0		20.7
Gas Turbine Building Facade 2	81.2	52.25	3.0	64.0	449.19	-2.7		0.4	0.0		22.5
Gas Turbine Building Facade 3	86.4	52.25	3.0	64.8	489.79	-2.6	13.6	0.2	0.0		14.2
Gas Turbine Building Facade 4	81.1	52.25	3.0	65.4	524.10	-2.5	17.7	0.3	0.0		3.3
Gas Turbine Building Roof	85.1	52.25	0.0	64.7	485.75	-3.0	4.9	0.3	0.0		18.2
Gas Turbine Transformer 1	98.1	98.09	0.0	64.8	489.83	-2.1	4.1	1.3	0.0		30.0
Gas Turbine Transformer 2	98.1	98.09	0.0	65.4	524.28	-2.1	17.1	0.9	0.0		16.8
HRSG Building Facade 1	85.4	52.01	3.0	64.4	466.49	-2.6	2.8	0.2	0.0		23.7
HRSG Building Facade 2	83.0	52.01	3.0	63.8	436.27	-2.7	0.3	0.3	0.0		24.3
HRSG Building Facade 3	85.5	52.01	3.0	64.6	480.44	-2.6	12.7	0.1	0.0		15.7

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	83.0	52.01	3.0	65.2	513.01	-2.6	15.2	0.2	0.0		8.9
HRSG Building Roof	87.7	52.01	0.0	64.5	473.82	-3.0	5.0	0.4	0.0		21.7
HRSG Building Ventilation 1	86.6	86.58	0.0	64.2	456.03	-3.0	0.1	1.9	0.0		23.4
HRSG Building Ventilation 2	86.6	86.58	0.0	64.6	476.96	-3.0	0.2	2.0	0.0		22.8
HRSG Building Ventilation 3	86.6	86.58	0.0	64.8	491.96	-3.0	0.1	2.0	0.0		25.0
HRSG Building Ventilation 4	86.6	86.58	0.0	64.8	487.36	-3.0	0.1	2.0	0.0		22.7
HRSG Building Ventilation 5	86.6	86.58	0.0	64.5	472.83	-3.0	0.2	2.0	0.0		22.8
HRSG Building Ventilation 6	86.6	86.58	0.0	64.1	451.20	-3.0	0.1	1.9	0.0		23.5
HRSG Stack Exhaust 1	106.6	106.63	0.0	64.0	448.86	-3.0		0.8	7.7		37.0
HRSG Stack Exhaust 2	106.6	106.63	0.0	64.7	485.33	-3.0		0.9	7.7		36.3
HRSG Stack Facade 1-1	76.0	53.42	3.0	64.0	448.01	-2.8	8.7	0.3	0.0		8.8
HRSG Stack Facade 1-2	76.0	53.58	3.0	64.1	449.47	-2.8	13.4	0.3	0.0		4.1
HRSG Stack Facade 1-3	76.0	53.38	3.0	64.0	448.72	-2.8	10.7	0.3	0.0		6.7
HRSG Stack Facade 1-4	76.0	53.29	3.0	64.0	446.13	-2.8	5.2	0.3	0.0		12.4
HRSG Stack Facade 1-5	76.0	52.94	3.0	63.9	443.00	-2.9		0.3	0.0		17.6
HRSG Stack Facade 1-6	76.0	53.52	3.0	63.9	441.49	-2.9		0.3	0.0		17.7
HRSG Stack Facade 1-7	76.0	53.27	3.0	63.9	442.35	-2.9		0.3	0.0		17.7
HRSG Stack Facade 1-8	76.0	53.35	3.0	64.0	445.07	-2.8	4.7	0.3	0.0		12.8
HRSG Stack Facade 2-1	76.0	53.51	3.0	64.7	486.09	-2.8	13.4	0.3	0.0		3.3
HRSG Stack Facade 2-2	76.0	53.31	3.0	64.7	485.46	-2.7	11.2	0.3	0.0		5.6
HRSG Stack Facade 3-2	76.0	53.44	3.0	64.7	482.94	-2.8	5.0	0.4	0.0		11.7
HRSG Stack Facade 4-2	76.0	52.85	3.0	64.6	479.77	-2.9		0.4	0.0		16.9
HRSG Stack Facade 5-2	76.0	53.63	3.0	64.6	478.18	-2.9		0.4	0.0		16.9
HRSG Stack Facade 6-2	76.0	53.14	3.0	64.6	479.01	-2.9		0.4	0.0		18.3
HRSG Stack Facade 7-2	76.0	53.49	3.0	64.7	481.64	-2.9		0.4	0.0		16.9
HRSG Stack Facade 8-2	76.0	53.40	3.0	64.7	484.67	-2.7	8.6	0.3	0.0		8.1
ST Building Ventilation 1	86.6	86.58	0.0	65.5	532.31	-3.0	0.8	2.4	0.0		20.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	65.9	556.60	-3.0	0.5	2.4	0.0		20.7
ST Building Ventilation 3	86.6	86.58	0.0	65.9	552.87	-3.0	0.4	2.3	0.0		21.0
ST Building Ventilation 4	86.6	86.58	0.0	65.5	528.16	-3.0	1.0	2.5	0.0		20.7
ST Building Ventilation 5	86.6	86.58	0.0	65.7	542.68	-3.0	0.7	2.4	0.0		20.7
Steam Turbine Building Facade 1	95.3	63.91	3.0	65.6	535.50	-2.6	7.1	0.3	0.0		28.2
Steam Turbine Building Facade 2	94.9	63.91	3.0	65.4	521.86	-2.6	9.7	0.3	0.0		26.6
Steam Turbine Building Facade 3	95.3	63.91	3.0	65.8	548.28	-2.5	16.6	0.2	0.0		18.2
Steam Turbine Building Facade 4	95.0	63.91	3.0	66.0	562.05	-2.5	17.1	0.2	0.0		17.3
Steam Turbine Building Roof	96.2	63.91	0.0	65.7	542.36	-3.0	5.0	0.2	0.0		28.6
Steam Turbine Transformer	98.1	98.09	0.0	65.7	542.77	-2.1	19.6	1.5	0.0		13.3
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	64.3	463.53	-3.0	1.2	2.8	8.4		30.3
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	65.0	498.93	-3.0	1.2	2.9	8.3		29.7
WSAC	98.7	75.33	0.0	66.1	569.16	-2.1	19.2	1.9	0.0		13.7
Floor 2 Floor Name Public Space			LrD 43.5	dB(A)							
Air Cooled Condenser	106.8	69.69	0.0	67.1	637.12	-2.9	11.9	0.6	0.0		30.0
Air Intake 1	90.7	69.65	3.0	64.5	474.61	-2.8	10.4	0.4	0.0		21.2
Air Intake 2	90.7	69.65	3.0	65.1	509.45	-2.7	14.4	0.5	0.0		16.4
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	64.2	456.46	-3.1	1.8	1.6	8.1		30.2
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	64.8	491.72	-3.0	1.3	1.6	8.0		30.2
GT Building Ventilation 1	86.6	86.58	0.0	64.4	469.32	-3.0	0.8	2.2	0.0		22.2
GT Building Ventilation 2	86.6	86.58	0.0	64.8	489.04	-3.0	0.7	2.2	0.0		21.9
GT Building Ventilation 3	86.6	86.58	0.0	65.0	503.99	-3.0	0.7	2.3	0.0		21.6
GT Building Ventilation 4	86.6	86.58	0.0	64.9	497.57	-3.0	0.8	2.3	0.0		21.5
GT Building Ventilation 5	86.6	86.58	0.0	64.7	481.51	-3.0	1.0	2.3	0.0		21.6
GT Building Ventilation 6	86.6	86.58	0.0	64.3	462.47	-3.1	1.0	2.2	0.0		22.1
Gas Metering Station	93.6	93.60	0.0	67.9	699.27	-2.3	20.0	6.3	0.0		1.8

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	75.4	56.95	3.0	63.5	423.36	-2.7		0.4	0.0		17.2
Gas Preheater Building Facade 3	77.0	56.95	3.0	63.5	420.33	-2.7	0.0	0.4	0.0		19.0
Gas Preheater Building Facade 4	75.3	56.95	3.0	63.6	428.33	-2.6	6.1	0.1	0.0		12.0
Gas Preheater Building Roof	79.7	56.95	0.0	63.6	425.77	-2.8	3.9	0.8	0.0		16.4
Gas Turbine Building Facade 1	86.4	52.25	3.0	64.6	480.56	-2.7	6.1	0.4	0.0		21.0
Gas Turbine Building Facade 2	81.2	52.25	3.0	64.0	449.09	-2.8		0.4	0.0		22.6
Gas Turbine Building Facade 3	86.4	52.25	3.0	64.8	489.70	-2.7	13.6	0.2	0.0		14.3
Gas Turbine Building Facade 4	81.1	52.25	3.0	65.4	524.02	-2.6	17.7	0.3	0.0		3.4
Gas Turbine Building Roof	85.1	52.25	0.0	64.7	485.63	-3.0	4.7	0.4	0.0		18.5
Gas Turbine Transformer 1	98.1	98.09	0.0	64.8	489.78	-2.3	4.1	1.2	0.0		30.2
Gas Turbine Transformer 2	98.1	98.09	0.0	65.4	524.24	-2.2	17.0	0.9	0.0		17.0
HRSG Building Facade 1	85.4	52.01	3.0	64.4	466.44	-2.7	3.2	0.2	0.0		23.5
HRSG Building Facade 2	83.0	52.01	3.0	63.8	436.20	-2.7	0.3	0.3	0.0		24.4
HRSG Building Facade 3	85.5	52.01	3.0	64.6	480.37	-2.7	12.7	0.1	0.0		16.0
HRSG Building Facade 4	83.0	52.01	3.0	65.2	512.95	-2.7	15.3	0.2	0.0		8.9
HRSG Building Roof	87.7	52.01	0.0	64.5	473.77	-3.0	4.6	0.5	0.0		22.1
HRSG Building Ventilation 1	86.6	86.58	0.0	64.2	455.86	-3.0	0.1	1.9	0.0		23.5
HRSG Building Ventilation 2	86.6	86.58	0.0	64.6	476.80	-3.0	0.2	2.0	0.0		22.9
HRSG Building Ventilation 3	86.6	86.58	0.0	64.8	491.81	-3.0	0.1	2.0	0.0		25.0
HRSG Building Ventilation 4	86.6	86.58	0.0	64.8	487.21	-3.0	0.1	2.0	0.0		22.7
HRSG Building Ventilation 5	86.6	86.58	0.0	64.5	472.66	-3.0	0.2	2.0	0.0		22.9
HRSG Building Ventilation 6	86.6	86.58	0.0	64.1	451.03	-3.0	0.1	1.8	0.0		23.6
HRSG Stack Exhaust 1	106.6	106.63	0.0	64.0	448.49	-3.0		0.8	7.7		37.0
HRSG Stack Exhaust 2	106.6	106.63	0.0	64.7	484.99	-3.0		0.9	7.7		36.3
HRSG Stack Facade 1-1	76.0	53.42	3.0	64.0	447.83	-2.8	8.7	0.3	0.0		8.8
HRSG Stack Facade 1-2	76.0	53.58	3.0	64.1	449.31	-2.8	13.4	0.3	0.0		4.2
HRSG Stack Facade 1-3	76.0	53.38	3.0	64.0	448.55	-2.8	10.8	0.3	0.0		6.7

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	64.0	446.00	-2.8	5.2	0.3	0.0		12.4
HRSG Stack Facade 1-5	76.0	52.94	3.0	63.9	442.84	-2.9		0.3	0.0		17.7
HRSG Stack Facade 1-6	76.0	53.52	3.0	63.9	441.33	-2.9		0.3	0.0		17.7
HRSG Stack Facade 1-7	76.0	53.27	3.0	63.9	442.19	-2.9		0.3	0.0		17.7
HRSG Stack Facade 1-8	76.0	53.35	3.0	64.0	444.92	-2.9	4.7	0.3	0.0		12.9
HRSG Stack Facade 2-1	76.0	53.51	3.0	64.7	485.96	-2.9	13.4	0.3	0.0		3.4
HRSG Stack Facade 2-2	76.0	53.31	3.0	64.7	485.31	-2.8	10.7	0.3	0.0		6.1
HRSG Stack Facade 3-2	76.0	53.44	3.0	64.7	482.81	-2.8	5.0	0.4	0.0		11.8
HRSG Stack Facade 4-2	76.0	52.85	3.0	64.6	479.62	-2.9		0.4	0.0		16.9
HRSG Stack Facade 5-2	76.0	53.63	3.0	64.6	478.03	-2.9		0.4	0.0		17.0
HRSG Stack Facade 6-2	76.0	53.14	3.0	64.6	478.86	-2.9		0.4	0.0		18.3
HRSG Stack Facade 7-2	76.0	53.49	3.0	64.7	481.49	-2.9		0.4	0.0		16.9
HRSG Stack Facade 8-2	76.0	53.40	3.0	64.7	484.50	-2.8	8.6	0.3	0.0		8.2
ST Building Ventilation 1	86.6	86.58	0.0	65.5	532.14	-3.0	0.5	2.3	0.0		21.3
ST Building Ventilation 2	86.6	86.58	0.0	65.9	556.44	-3.0	0.4	2.3	0.0		20.9
ST Building Ventilation 3	86.6	86.58	0.0	65.8	552.71	-3.0	0.4	2.3	0.0		21.1
ST Building Ventilation 4	86.6	86.58	0.0	65.5	527.98	-3.0	1.0	2.5	0.0		20.7
ST Building Ventilation 5	86.6	86.58	0.0	65.7	542.51	-3.0	0.7	2.4	0.0		20.8
Steam Turbine Building Facade 1	95.3	63.91	3.0	65.6	535.42	-2.6	7.0	0.3	0.0		28.3
Steam Turbine Building Facade 2	94.9	63.91	3.0	65.3	521.78	-2.7	9.6	0.3	0.0		26.8
Steam Turbine Building Facade 3	95.3	63.91	3.0	65.8	548.17	-2.6	16.4	0.2	0.0		18.4
Steam Turbine Building Facade 4	95.0	63.91	3.0	66.0	561.97	-2.6	17.0	0.2	0.0		17.4
Steam Turbine Building Roof	96.2	63.91	0.0	65.7	542.18	-3.0	4.8	0.3	0.0		28.9
Steam Turbine Transformer	98.1	98.09	0.0	65.7	542.74	-2.2	19.6	1.5	0.0		13.5
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	64.3	463.33	-3.1	1.2	2.8	8.4		30.3
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	65.0	498.74	-3.0	1.2	2.9	8.3		29.7
WSAC	98.7	75.33	0.0	66.1	569.14	-2.3	19.2	1.8	0.0		13.8

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Floor 1. Floor [illegible] Name Ruth Court			L [illegible]	dB(A)							
Air Cooled Condenser	106.8	69.69	0.0	73.6	1353.53	-2.3		3.0	0.0		32.4
Air Intake 1	90.7	69.65	3.0	74.6	1521.80	-1.8	0.1	2.6	0.0		18.1
Air Intake 2	90.7	69.65	3.0	74.4	1484.76	-1.8	0.1	2.6	0.0		18.4
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	74.7	1537.21	-2.2	0.2	3.4	6.8		19.8
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	74.5	1500.54	-2.2	0.5	3.6	7.1		19.3
GT Building Ventilation 1	86.6	86.58	0.0	74.7	1525.79	-2.3	0.4	4.7	0.0		9.1
GT Building Ventilation 2	86.6	86.58	0.0	74.5	1504.87	-2.3	0.4	4.7	0.0		9.3
GT Building Ventilation 3	86.6	86.58	0.0	74.5	1489.20	-2.3	0.4	4.7	0.0		9.4
GT Building Ventilation 4	86.6	86.58	0.0	74.5	1494.10	-2.3	0.4	4.6	0.0		9.4
GT Building Ventilation 5	86.6	86.58	0.0	74.6	1510.71	-2.3	0.2	4.4	0.0		9.7
GT Building Ventilation 6	86.6	86.58	0.0	74.7	1530.37	-2.3	0.1	4.4	0.0		9.7
Gas Metering Station	93.6	93.60	0.0	73.2	1290.34	-2.0		10.0	0.0		12.4
Gas Preheater Building Facade 2	75.4	56.95	3.0	74.9	1566.25	-1.9	19.7	0.7	0.0		-15.1
Gas Preheater Building Facade 3	77.0	56.95	3.0	74.9	1569.41	-1.8	19.4	0.7	0.0		-13.2
Gas Preheater Building Facade 4	75.3	56.95	3.0	74.9	1561.57	-1.8	19.7	0.7	0.0		-15.1
Gas Preheater Building Roof	79.7	56.95	0.0	74.9	1563.88	-1.9	19.5	0.7	0.0		-13.5
Gas Turbine Building Facade 1	86.4	52.25	3.0	74.6	1508.70	-1.6	15.1	0.7	0.0		0.6
Gas Turbine Building Facade 2	81.2	52.25	3.0	74.8	1544.73	-1.6	15.9	0.6	0.0		-5.5
Gas Turbine Building Facade 3	86.4	52.25	3.0	74.5	1502.14	-1.6	2.2	1.0	0.0		13.3
Gas Turbine Building Facade 4	81.1	52.25	3.0	74.3	1466.91	-1.7	14.1	0.6	0.0		-3.2
Gas Turbine Building Roof	85.1	52.25	0.0	74.6	1505.51	-2.0	2.4	1.3	0.0		8.9
Gas Turbine Transformer 1	98.1	98.09	0.0	74.6	1508.38	-1.6		3.4	0.0		24.5
Gas Turbine Transformer 2	98.1	98.09	0.0	74.4	1471.42	-1.6		3.3	0.0		22.0
HRSG Building Facade 1	85.4	52.01	3.0	74.6	1521.93	-1.8	11.3	0.3	0.0		3.9
HRSG Building Facade 2	83.0	52.01	3.0	74.8	1554.16	-1.7	15.4	0.4	0.0		-2.9
HRSG Building Facade 3	85.5	52.01	3.0	74.6	1508.78	-1.8	17.5	0.4	0.0		-2.3

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Building Facade 4	83.0	52.01	3.0	74.4	1476.94	-1.8	9.5	0.6	0.0		3.3
HRSG Building Roof	87.7	52.01	0.0	74.6	1515.17	-2.1	9.2	0.4	0.0		5.6
HRSG Building Ventilation 1	86.6	86.58	0.0	74.7	1535.18	-2.2	10.7	2.4	0.0		1.0
HRSG Building Ventilation 2	86.6	86.58	0.0	74.6	1513.82	-2.2	10.7	2.3	0.0		1.2
HRSG Building Ventilation 3	86.6	86.58	0.0	74.5	1498.68	-2.2	12.4	2.1	0.0		-0.2
HRSG Building Ventilation 4	86.6	86.58	0.0	74.5	1503.18	-2.2	8.2	2.4	0.0		3.7
HRSG Building Ventilation 5	86.6	86.58	0.0	74.6	1517.71	-2.2	8.7	2.4	0.0		3.1
HRSG Building Ventilation 6	86.6	86.58	0.0	74.7	1539.45	-2.2	7.7	2.8	0.0		3.5
HRSG Stack Exhaust 1	106.6	106.63	0.0	74.8	1545.90	-2.7		2.7	7.2		24.6
HRSG Stack Exhaust 2	106.6	106.63	0.0	74.6	1509.66	-2.7		2.7	7.2		24.9
HRSG Stack Facade 1-1	76.0	53.42	3.0	74.8	1542.94	-1.6	2.5	1.1	0.0		2.3
HRSG Stack Facade 1-2	76.0	53.58	3.0	74.8	1541.52	-1.7	2.0	1.1	0.0		2.8
HRSG Stack Facade 1-3	76.0	53.38	3.0	74.8	1542.41	-1.6	2.0	1.1	0.0		2.8
HRSG Stack Facade 1-4	76.0	53.29	3.0	74.8	1545.04	-1.6	2.0	1.1	0.0		2.8
HRSG Stack Facade 1-5	76.0	52.94	3.0	74.8	1548.01	-1.6	11.2	1.0	0.0		-6.3
HRSG Stack Facade 1-6	76.0	53.52	3.0	74.8	1549.39	-1.6	15.0	1.0	0.0		-10.1
HRSG Stack Facade 1-7	76.0	53.27	3.0	74.8	1548.44	-1.6	14.6	1.0	0.0		-9.7
HRSG Stack Facade 1-8	76.0	53.35	3.0	74.8	1545.82	-1.6	2.5	1.1	0.0		2.2
HRSG Stack Facade 2-1	76.0	53.51	3.0	74.6	1505.28	-1.7	1.9	1.1	0.0		3.1
HRSG Stack Facade 2-2	76.0	53.31	3.0	74.6	1506.19	-1.7	1.7	1.1	0.0		3.3
HRSG Stack Facade 3-2	76.0	53.44	3.0	74.6	1508.81	-1.7	1.2	1.1	0.0		3.8
HRSG Stack Facade 4-2	76.0	52.85	3.0	74.6	1511.77	-1.7	10.2	1.0	0.0		-5.1
HRSG Stack Facade 5-2	76.0	53.63	3.0	74.6	1513.21	-1.7	14.9	1.0	0.0		-9.7
HRSG Stack Facade 6-2	76.0	53.14	3.0	74.6	1512.18	-1.7	12.8	1.0	0.0		-7.7
HRSG Stack Facade 7-2	76.0	53.49	3.0	74.6	1509.47	-1.7	1.7	1.1	0.0		3.4
HRSG Stack Facade 8-2	76.0	53.40	3.0	74.6	1506.65	-1.7	1.7	1.1	0.0		3.4
ST Building Ventilation 1	86.6	86.58	0.0	74.3	1459.82	-2.3	0.3	4.4	0.0		9.9

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
ST Building Ventilation 2	86.6	86.58	0.0	74.1	1434.88	-2.3	0.1	4.2	0.0		10.4
ST Building Ventilation 3	86.6	86.58	0.0	74.2	1438.10	-2.3	0.1	4.2	0.0		10.4
ST Building Ventilation 4	86.6	86.58	0.0	74.3	1463.17	-2.3	0.2	4.3	0.0		10.1
ST Building Ventilation 5	86.6	86.58	0.0	74.2	1448.77	-2.3	0.3	4.4	0.0		10.0
Steam Turbine Building Facade 1	95.3	63.91	3.0	74.3	1454.02	-1.7	10.8	0.5	0.0		14.5
Steam Turbine Building Facade 2	94.9	63.91	3.0	74.3	1468.74	-1.7	16.1	0.5	0.0		10.9
Steam Turbine Building Facade 3	95.3	63.91	3.0	74.2	1442.71	-1.7		0.6	0.0		25.1
Steam Turbine Building Facade 4	95.0	63.91	3.0	74.1	1428.03	-1.7	0.2	0.6	0.0		24.8
Steam Turbine Building Roof	96.2	63.91	0.0	74.2	1448.35	-2.1	3.6	0.8	0.0		20.9
Steam Turbine Transformer	98.1	98.09	0.0	74.2	1449.36	-1.6	0.0	3.3	0.0		22.2
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	74.7	1529.75	-2.3	0.2	4.6	6.9		19.9
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	74.5	1493.12	-2.3	0.5	5.0	7.3		19.0
WSAC	98.7	75.33	0.0	74.1	1423.36	-1.7		4.2	0.0		22.2
Floor 2. Floor Name Ruth Court			LrD 36.7	dB(A)							
Air Cooled Condenser	106.8	69.69	0.0	73.6	1353.50	-2.3		3.0	0.0		32.5
Air Intake 1	90.7	69.65	3.0	74.6	1521.79	-1.9	0.1	2.6	0.0		18.2
Air Intake 2	90.7	69.65	3.0	74.4	1484.76	-1.9	0.1	2.6	0.0		18.5
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	74.7	1537.17	-2.2	0.2	3.4	6.8		19.9
Exhaust Diffuser Compartment Vent Fans	102.8	102.84	0.0	74.5	1500.50	-2.3	0.5	3.6	7.1		19.4
GT Building Ventilation 1	86.6	86.58	0.0	74.7	1525.76	-2.3	0.4	4.7	0.0		9.2
GT Building Ventilation 2	86.6	86.58	0.0	74.5	1504.83	-2.4	0.4	4.7	0.0		9.3
GT Building Ventilation 3	86.6	86.58	0.0	74.5	1489.16	-2.4	0.4	4.6	0.0		9.4
GT Building Ventilation 4	86.6	86.58	0.0	74.5	1494.06	-2.4	0.4	4.6	0.0		9.5
GT Building Ventilation 5	86.6	86.58	0.0	74.6	1510.67	-2.4	0.2	4.4	0.0		9.8
GT Building Ventilation 6	86.6	86.58	0.0	74.7	1530.34	-2.3	0.1	4.4	0.0		9.7
Gas Metering Station	93.6	93.60	0.0	73.2	1290.36	-2.1		10.0	0.0		12.5

Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
Gas Preheater Building Facade 2	75.4	56.95	3.0	74.9	1566.28	-1.9	19.7	0.7	0.0		-15.0
Gas Preheater Building Facade 3	77.0	56.95	3.0	74.9	1569.43	-1.9	19.4	0.7	0.0		-13.2
Gas Preheater Building Facade 4	75.3	56.95	3.0	74.9	1561.60	-1.9	19.7	0.7	0.0		-15.0
Gas Preheater Building Roof	79.7	56.95	0.0	74.9	1563.90	-2.0	15.3	0.3	0.0		-8.8
Gas Turbine Building Facade 1	86.4	52.25	3.0	74.6	1508.70	-1.7	15.0	0.8	0.0		0.7
Gas Turbine Building Facade 2	81.2	52.25	3.0	74.8	1544.72	-1.7	15.8	0.6	0.0		-5.3
Gas Turbine Building Facade 3	86.4	52.25	3.0	74.5	1502.13	-1.7	2.2	1.0	0.0		13.4
Gas Turbine Building Facade 4	81.1	52.25	3.0	74.3	1466.91	-1.7	14.0	0.6	0.0		-3.1
Gas Turbine Building Roof	85.1	52.25	0.0	74.6	1505.48	-2.1	2.4	1.3	0.0		9.0
Gas Turbine Transformer 1	98.1	98.09	0.0	74.6	1508.39	-1.7		3.4	0.0		24.6
Gas Turbine Transformer 2	98.1	98.09	0.0	74.4	1471.43	-1.7		3.3	0.0		22.1
HRSG Building Facade 1	85.4	52.01	3.0	74.6	1521.93	-1.8	11.4	0.3	0.0		4.0
HRSG Building Facade 2	83.0	52.01	3.0	74.8	1554.17	-1.8	15.2	0.4	0.0		-2.6
HRSG Building Facade 3	85.5	52.01	3.0	74.6	1508.79	-1.8	17.0	0.4	0.0		-1.7
HRSG Building Facade 4	83.0	52.01	3.0	74.4	1476.94	-1.9	8.5	0.6	0.0		4.3
HRSG Building Roof	87.7	52.01	0.0	74.6	1515.14	-2.1	9.1	0.4	0.0		5.7
HRSG Building Ventilation 1	86.6	86.58	0.0	74.7	1535.16	-2.3	10.5	2.4	0.0		1.2
HRSG Building Ventilation 2	86.6	86.58	0.0	74.6	1513.79	-2.3	10.5	2.3	0.0		1.4
HRSG Building Ventilation 3	86.6	86.58	0.0	74.5	1498.65	-2.3	12.3	2.1	0.0		-0.1
HRSG Building Ventilation 4	86.6	86.58	0.0	74.5	1503.15	-2.3	8.1	2.4	0.0		3.8
HRSG Building Ventilation 5	86.6	86.58	0.0	74.6	1517.68	-2.3	8.5	2.5	0.0		3.3
HRSG Building Ventilation 6	86.6	86.58	0.0	74.7	1539.42	-2.3	7.4	2.9	0.0		3.8
HRSG Stack Exhaust 1	106.6	106.63	0.0	74.8	1545.81	-2.7		2.7	7.2		24.7
HRSG Stack Exhaust 2	106.6	106.63	0.0	74.6	1509.57	-2.7		2.7	7.2		24.9
HRSG Stack Facade 1-1	76.0	53.42	3.0	74.8	1542.91	-1.7	2.5	1.1	0.0		2.3
HRSG Stack Facade 1-2	76.0	53.58	3.0	74.8	1541.49	-1.7	2.0	1.1	0.0		2.8
HRSG Stack Facade 1-3	76.0	53.38	3.0	74.8	1542.38	-1.7	2.0	1.1	0.0		2.9

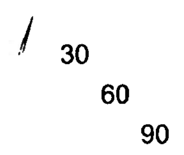
Wawayanda Energy Facility - Mean Propagation
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Name	PWL	PWL/unit	Non-Sphere	Spreading	Distance	Grnd.Effct	Ins.	Air	Directivity	Mitigation	SPL
	dB(A)	dB(A)	dB	dB	m	dB	dB	dB	dB	dB	dB(A)
HRSG Stack Facade 1-4	76.0	53.29	3.0	74.8	1545.02	-1.7	2.0	1.1	0.0		2.9
HRSG Stack Facade 1-5	76.0	52.94	3.0	74.8	1547.98	-1.7	11.2	1.0	0.0		-6.3
HRSG Stack Facade 1-6	76.0	53.52	3.0	74.8	1549.37	-1.7	15.0	1.0	0.0		-10.0
HRSG Stack Facade 1-7	76.0	53.27	3.0	74.8	1548.41	-1.7	14.0	1.0	0.0		-9.0
HRSG Stack Facade 1-8	76.0	53.35	3.0	74.8	1545.79	-1.7	2.5	1.1	0.0		2.3
HRSG Stack Facade 2-1	76.0	53.51	3.0	74.6	1505.25	-1.8	1.9	1.1	0.0		3.3
HRSG Stack Facade 2-2	76.0	53.31	3.0	74.6	1506.16	-1.8	1.7	1.1	0.0		3.4
HRSG Stack Facade 3-2	76.0	53.44	3.0	74.6	1508.79	-1.8	1.2	1.1	0.0		3.9
HRSG Stack Facade 4-2	76.0	52.85	3.0	74.6	1511.75	-1.8	10.3	1.0	0.0		-5.1
HRSG Stack Facade 5-2	76.0	53.63	3.0	74.6	1513.19	-1.8	14.9	1.0	0.0		-9.7
HRSG Stack Facade 6-2	76.0	53.14	3.0	74.6	1512.16	-1.8	12.2	1.0	0.0		-7.0
HRSG Stack Facade 7-2	76.0	53.49	3.0	74.6	1509.44	-1.8	1.7	1.1	0.0		3.5
HRSG Stack Facade 8-2	76.0	53.40	3.0	74.6	1506.62	-1.8	1.6	1.1	0.0		3.5
ST Building Ventilation 1	86.6	86.58	0.0	74.3	1459.78	-2.4	0.3	4.4	0.0		10.0
ST Building Ventilation 2	86.6	86.58	0.0	74.1	1434.84	-2.4	0.1	4.2	0.0		10.5
ST Building Ventilation 3	86.6	86.58	0.0	74.2	1438.06	-2.4	0.1	4.2	0.0		10.4
ST Building Ventilation 4	86.6	86.58	0.0	74.3	1463.13	-2.4	0.2	4.3	0.0		10.2
ST Building Ventilation 5	86.6	86.58	0.0	74.2	1448.73	-2.4	0.3	4.4	0.0		10.1
Steam Turbine Building Facade 1	95.3	63.91	3.0	74.3	1454.02	-1.8	10.5	0.4	0.0		14.8
Steam Turbine Building Facade 2	94.9	63.91	3.0	74.3	1468.73	-1.7	16.0	0.5	0.0		11.0
Steam Turbine Building Facade 3	95.3	63.91	3.0	74.2	1442.71	-1.7		0.6	0.0		25.2
Steam Turbine Building Facade 4	95.0	63.91	3.0	74.1	1428.03	-1.8	0.2	0.6	0.0		24.9
Steam Turbine Building Roof	96.2	63.91	0.0	74.2	1448.31	-2.2	3.5	0.8	0.0		21.0
Steam Turbine Transformer	98.1	98.09	0.0	74.2	1449.37	-1.7		3.3	0.0		22.2
Turbine Compartment Vent Fans 1	104.0	104.01	0.0	74.7	1529.72	-2.3	0.2	4.6	6.9		20.0
Turbine Compartment Vent Fans 2	104.0	104.01	0.0	74.5	1493.08	-2.3	0.5	5.0	7.3		19.1
WSAC	98.7	75.33	0.0	74.1	1423.38	-1.8		4.2	0.0		22.3

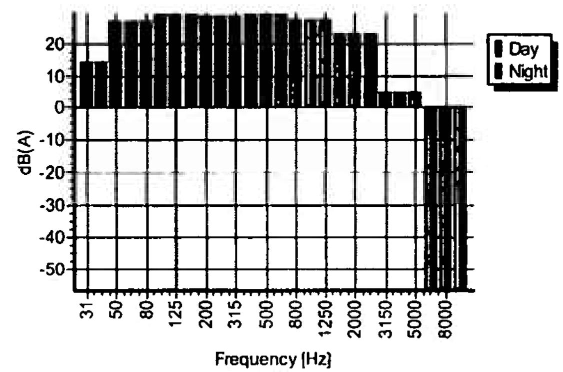
Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Floor 1. Floor Name Country View Manor LrD [illegible] dB(A)

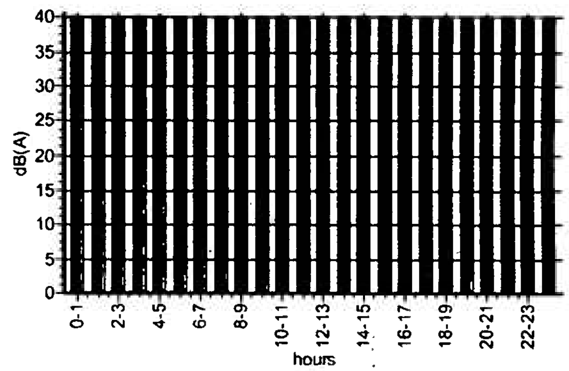
Day



Spectrum

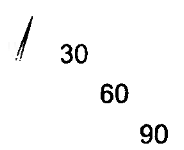


24h Distribution

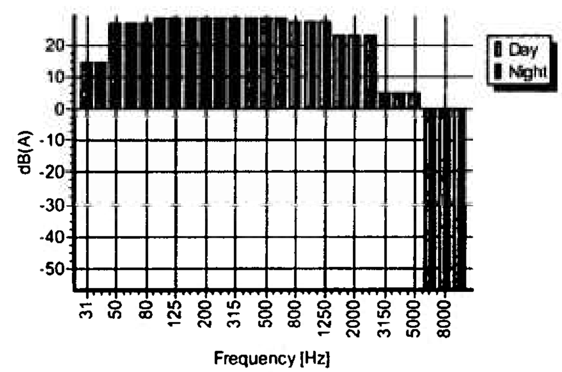


Floor 2. Floor Name Country View Manor LrD 40.6 dB(A)

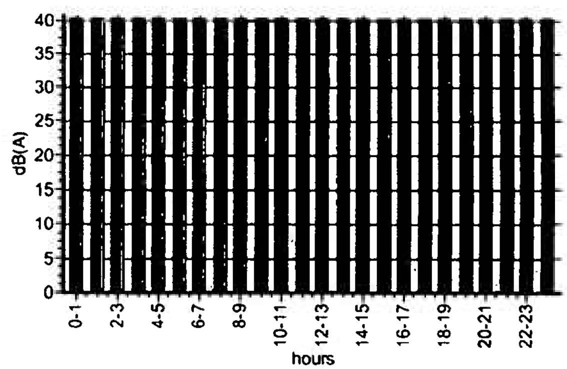
Day



Spectrum



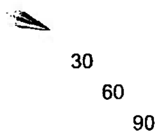
24h Distribution



Floor 1. Floor Name Dolsontown Road - East LrD 47.1 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Day



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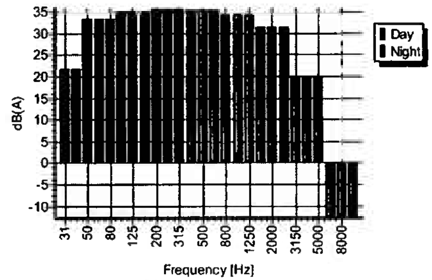

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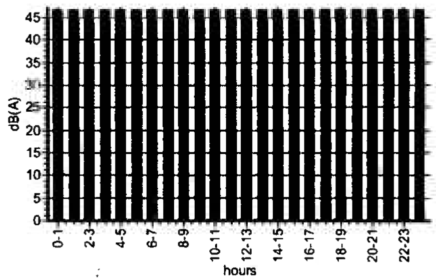
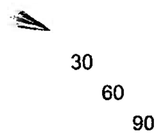
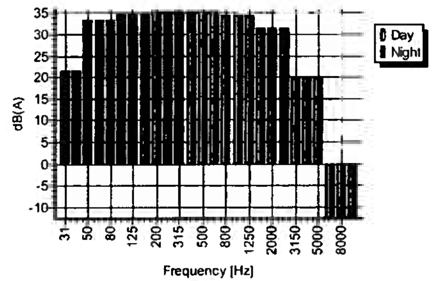


Floor 2. Floor Name Dolsontown Road - East LrD 47.2 dB(A)

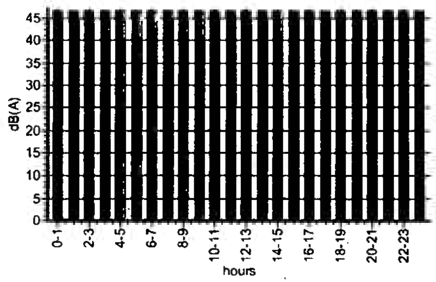
Day



Spectrum



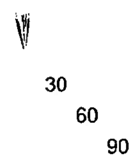
24h Distribution



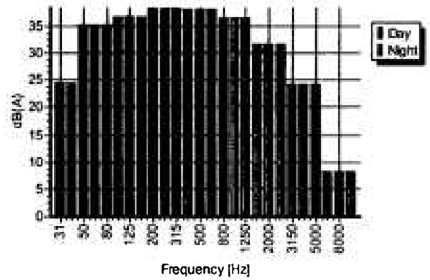
Floor 1. Floor Name Dolsontown Road - South LrD 49.3 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

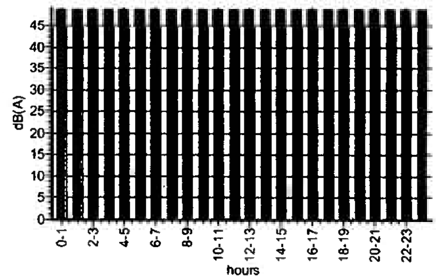
Day



Spectrum

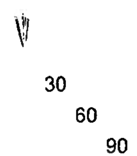


24h Distribution

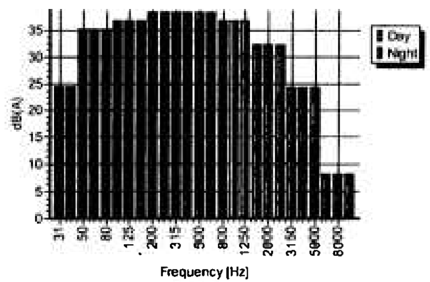


Floor 2. Floor Name Dolsontown Road - South LrD 49.6 dB(A)

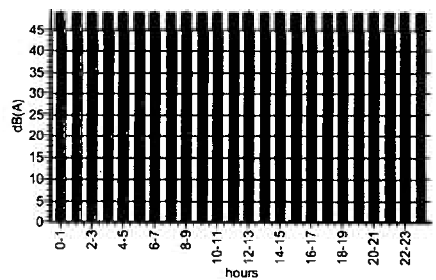
Day



Spectrum



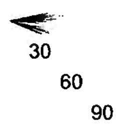
24h Distribution



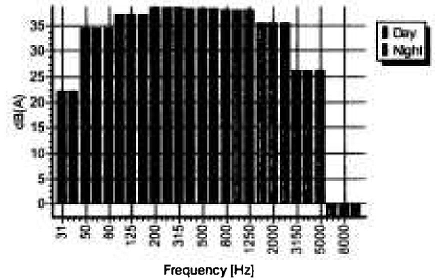
Floor 1. Floor Name Dolsontown Road - West LrD 50.0 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

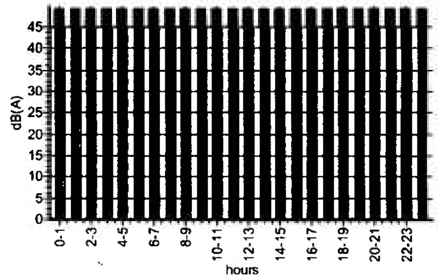
Day



Spectrum

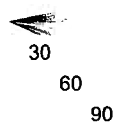


24h Distribution

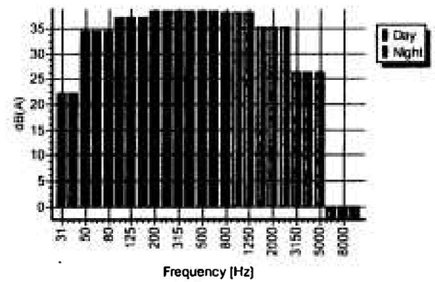


Floor 2. Floor Name Dolsontown Road - West LrD 50.0 dB(A)

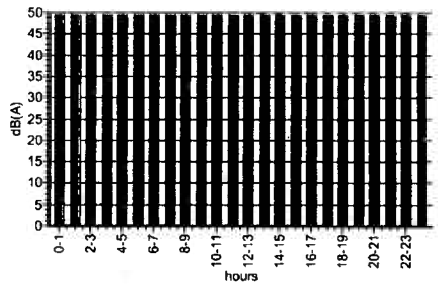
Day



Spectrum



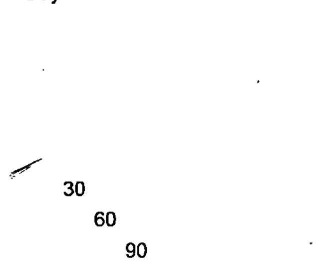
24h Distribution



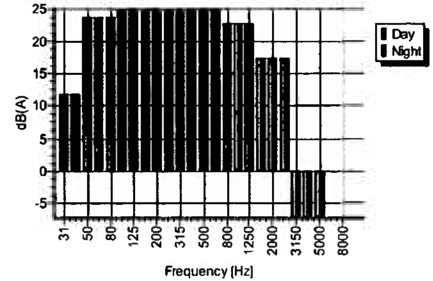
Floor 1. Floor Name Genung Street LrD 36.4 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Day



Spectrum



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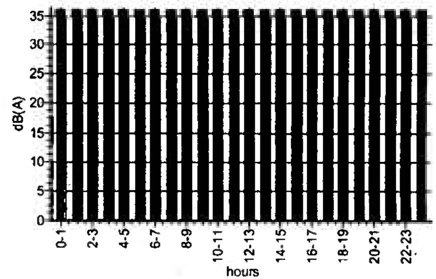
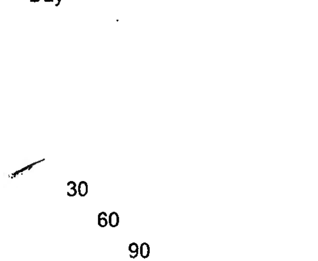
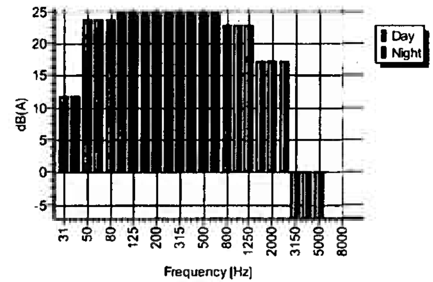


Floor 2. Floor Name Genung Street LrD 36.5 dB(A)

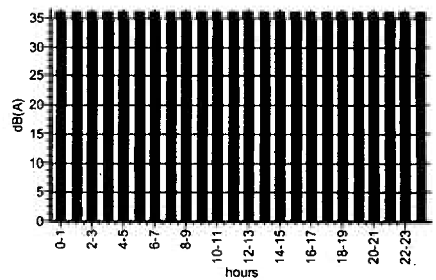
Day



Spectrum



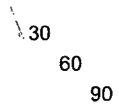
24h Distribution



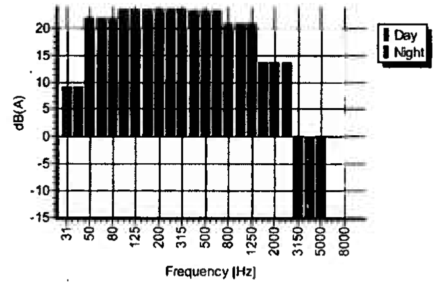
Floor 1. Floor Name Moon School LrD 34.7 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

Day



Spectrum



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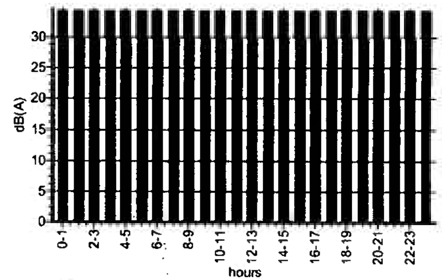
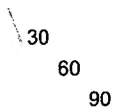
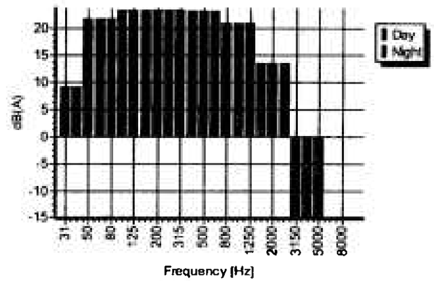


Floor 2. Floor Name Moon School LrD 34.7 dB(A)

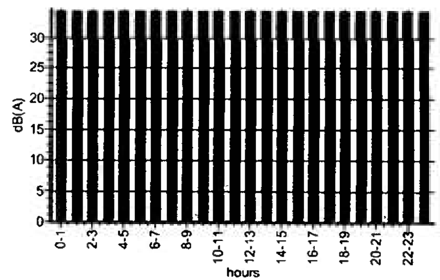
Day



Spectrum



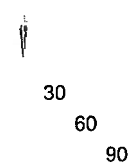
24h Distribution



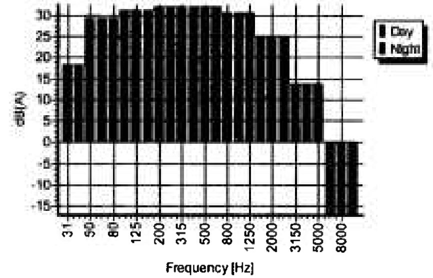
Floor 1. Floor Name Public Space LrD 43.4 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

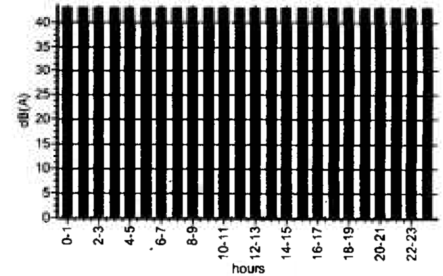
Day



Spectrum

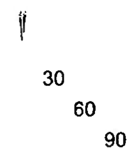


24h Distribution

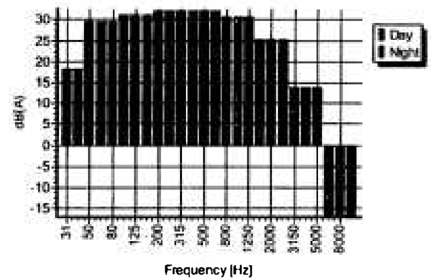


Floor 2. Floor Name Public Space LrD 43.5 dB(A)

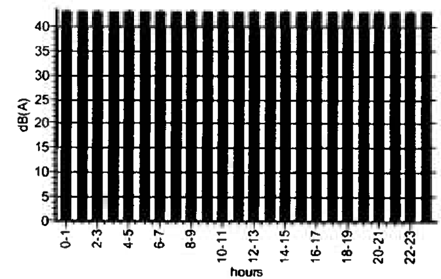
Day



Spectrum



24h Distribution



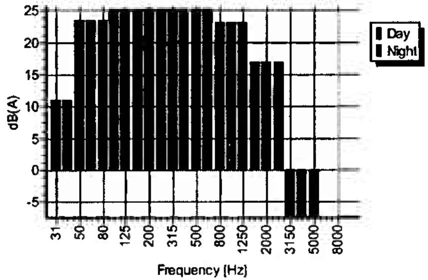
Floor 1. Floor Name Ruth Court LrD 38.6 dB(A)

Wawayanda Energy Facility
Base Analysis/03-01 GA/A-Weighted/MCNR Rating D

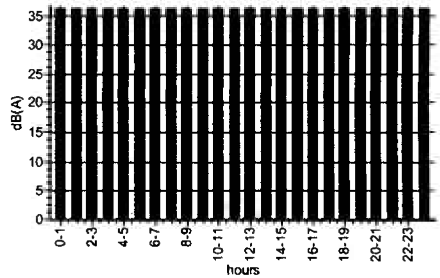
Day

30
60
90

Spectrum



24h Distribution

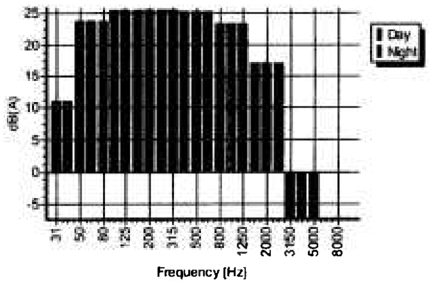


Floor 2. Floor Name Ruth Court LrD 36.7 dB(A)

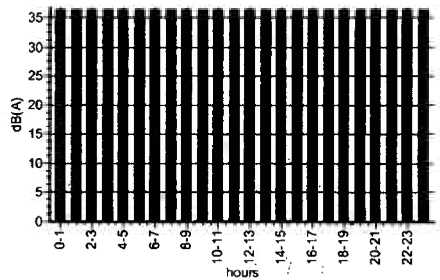
Day

30
60
90

Spectrum



24h Distribution



Ldn Analysis

Wawayanda Energy Facility - Receiver Sound Levels
Base Analysis/03-01 GA/Ldn/MCNR Rating C

Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	41.8
2. Floor		41.9
1. Floor	Dolsontown Road - East	48.9
2. Floor		48.9
1. Floor	Dolsontown Road - South	51.7
2. Floor		52.0
1. Floor	Dolsontown Road - West	51.5
2. Floor		51.6
1. Floor	Genung Street	37.6
2. Floor		37.7
1. Floor	Moon School	35.9
2. Floor		36.0
1. Floor	Public Space	45.7
2. Floor		45.8
1. Floor	Ruth Court	37.9
2. Floor		37.9

Wawayanda Energy Facility - Receiver Sound Levels
Base Analysis/03-01 GA/Ldn/MCNR Rating D

Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	46.9
2. Floor		47.0
1. Floor	Dolsontown Road - East	53.6
2. Floor		53.6
1. Floor	Dolsontown Road - South	55.7
2. Floor		56.0
1. Floor	Dolsontown Road - West	56.4
2. Floor		56.4
1. Floor	Genung Street	42.8
2. Floor		42.9
1. Floor	Moon School	41.1
2. Floor		41.1
1. Floor	Public Space	49.8
2. Floor		49.9
1. Floor	Ruth Court	43.0
2. Floor		43.1

SoundPLAN 5.[illegible]13/2000

C-Weighted Analysis

Wawayanda Energy Facility - Receiver Sound Levels
Base Analysis/03-01 GA/C-Weighted/MCNR Rating C

Floor	Name	LrN dB(C)
1. Floor	Country View Manor	57.2
2. Floor		57.2
1. Floor	Dolsontown Road - East	64.0
2. Floor		64.0
1. Floor	Dolsontown Road - South	66.8
2. Floor		66.8
1. Floor	Dolsontown Road - West	65.0
2. Floor		65.0
1. Floor	Genung Street	54.2
2. Floor		54.3
1. Floor	Moon School	51.9
2. Floor		52.0
1. Floor	Public Space	60.8
2. Floor		60.8
1. Floor	Ruth Court	53.7
2. Floor		53.8

Wawayanda Energy Facility - Receiver Sound Levels
Base Analysis/03-01 GA/C-Weighted/MCNR Rating D

Floor	Name	LrN dB(C)
1. Floor	Country View Manor	60.0
2. Floor		60.0
1. Floor	Dolsontown Road - East	66.6
2. Floor		66.6
1. Floor	Dolsontown Road - South	68.9
2. Floor		69.0
1. Floor	Dolsontown Road - West	67.7
2. Floor		67.7
1. Floor	Genung Street	56.9
2. Floor		57.0
1. Floor	Moon School	54.7
2. Floor		54.8
1. Floor	Public Space	63.0
2. Floor		63.0
1. Floor	Ruth Court	56.5
2. Floor		56.6

Cumulative Facility Noise Modeling

Wawayanda Energy Facility - Receiver Sound Levels
Base Analysis/03-01 GA/A-Weighted/Masada Analysis

Floor	Name	Lr dB(A)
1. Floor	Country View Manor	34.6
2. Floor		34.7
1. Floor	Dolsontown Road - East	27.8
2. Floor		27.9
1. Floor	Dolsontown Road - South	28.6
2. Floor		28.7
1. Floor	Dolsontown Road - West	33.4
2. Floor		33.5
1. Floor	Genung Street	25.2
2. Floor		25.4
1. Floor	Moon School	31.9
2. Floor		32.0
1. Floor	Public Space	26.5
2. Floor		26.5
1. Floor	Ruth Court	32.6
2. Floor		33.1

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Leq)
Cumulative Construction Analysis - A-Weighted - Site Excavation

Floor	Name	Daytime [illegible] dB(A)
1. Floor	Country View Manor	57.3
2. Floor		57.4
1. Floor	Dolsontown Road - East	61.4
2. Floor		61.5
1. Floor	Dolsontown Road - South	67.6
2. Floor		67.7
1. Floor	Dolsontown Road - West	62.2
2. Floor		62.2
1. Floor	Genung Street	50.6
2. Floor		50.7
1. Floor	Moon School	54.0
2. Floor		54.1
1. Floor	Public Space	60.2
2. Floor		60.3
1. Floor	Ruth Court	54.9
2. Floor		55.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Leq)
Cumulative Construction Analysis - A-Weighted - Concrete Pouring

Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	53.3
2. Floor		53.4
1. Floor	Dolsontown Road - East	57.4
2. Floor		57.5
1. Floor	Dolsontown Road - South	63.6
2. Floor		63.7
1. Floor	Dolsontown Road - West	58.2
2. Floor		58.2
1. Floor	Genung Street	46.6
2. Floor		46.7
1. Floor	Moon School	50.0
2. Floor		50.1
1. Floor	Public Space	56.2
2. Floor		56.3
1. Floor	Ruth Court	51.3
2. Floor		51.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Leq)
Cumulative Construction Analysis - A-Weighted - Steel Erection

Floor	Name	Leq dB(A)
1. Floor	Country View Manor	57.3
2. Floor		57.4
1. Floor	Dolsontown Road - East	61.4
2. Floor		61.5
1. Floor	Dolsontown Road - South	67.6
2. Floor		67.7
1. Floor	Dolsontown Road - West	62.2
2. Floor		62.2
1. Floor	Genung Street	50.6
2. Floor		50.7
1. Floor	Moon School	54.0
2. Floor		54.1
1. Floor	Public Space	60.2
2. Floor		60.3
1. Floor	Ruth Court	55.3
2. Floor		55.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Leq)
Cumulative Construction Analysis - A-Weighted - Equipment Installation

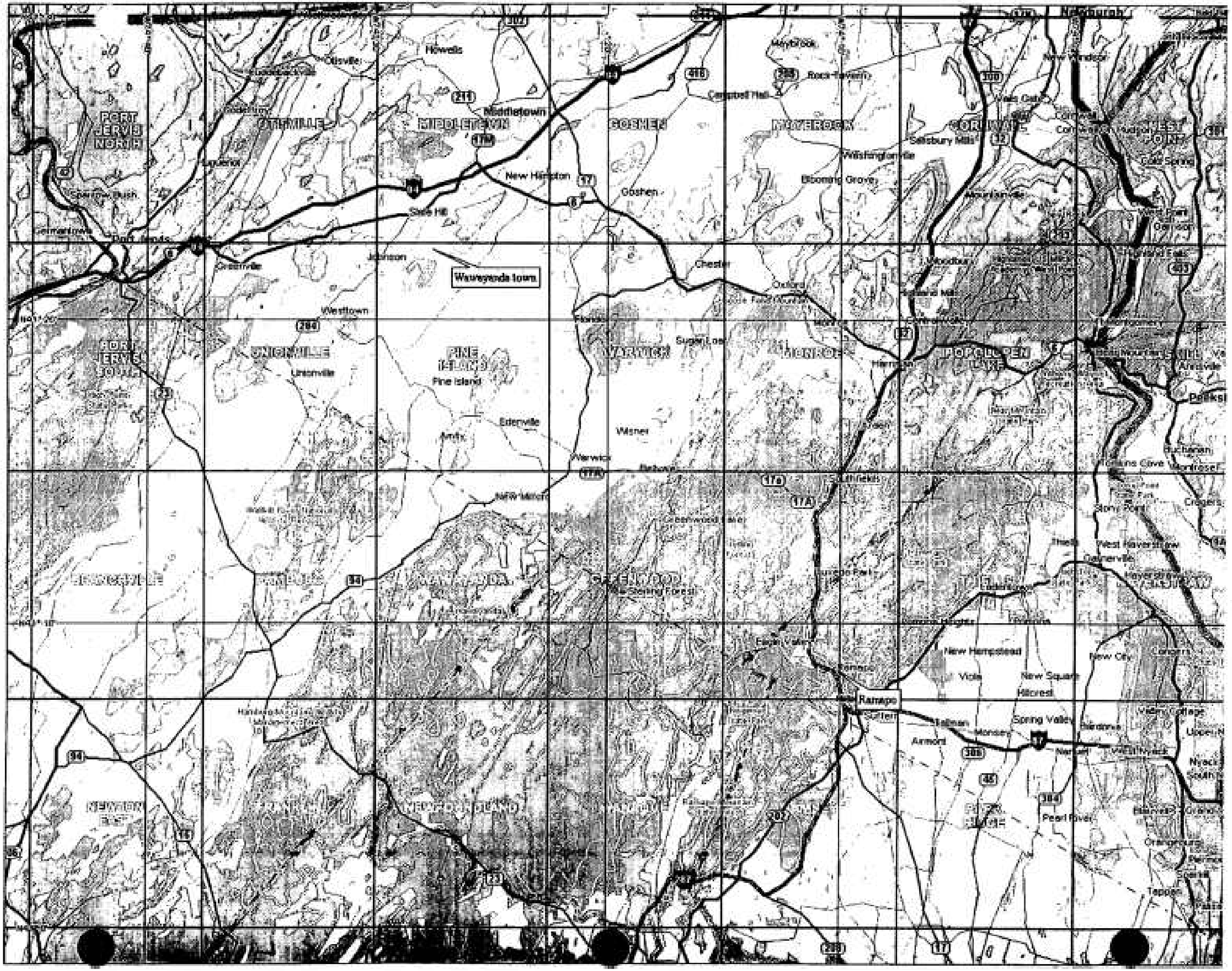
Floor	Name	Daytime Level dB(A)
1. Floor	Country View Manor	52.3
2. Floor		52.4
1. Floor	Dolsontown Road - East	56.4
2. Floor		56.5
1. Floor	Dolsontown Road - South	62.6
2. Floor		62.7
1. Floor	Dolsontown Road - West	57.2
2. Floor		57.2
1. Floor	Genung Street	45.6
2. Floor		45.7
1. Floor	Moon School	49.0
2. Floor		49.1
1. Floor	Public Space	55.2
2. Floor		55.3
1. Floor	Ruth Court	49.9
2. Floor		50.4

Wawayanda Energy Facility - Construction Noise Analysis - Receiver Sound Levels (Leq)
Cumulative Construction Analysis - A-Weighted - Site Clean Up & Plant Finishing

Floor	Name	Daytime Leq dB(A)
1. Floor	Country View Manor	47.3
2. Floor		47.4
1. Floor	Dolsontown Road - East	51.4
2. Floor		51.5
1. Floor	Dolsontown Road - South	57.6
2. Floor		57.7
1. Floor	Dolsontown Road - West	52.2
2. Floor		52.2
1. Floor	Genung Street	40.6
2. Floor		40.7
1. Floor	Moon School	44.0
2. Floor		44.1
1. Floor	Public Space	50.2
2. Floor		50.3
1. Floor	Ruth Court	44.9
2. Floor		45.4

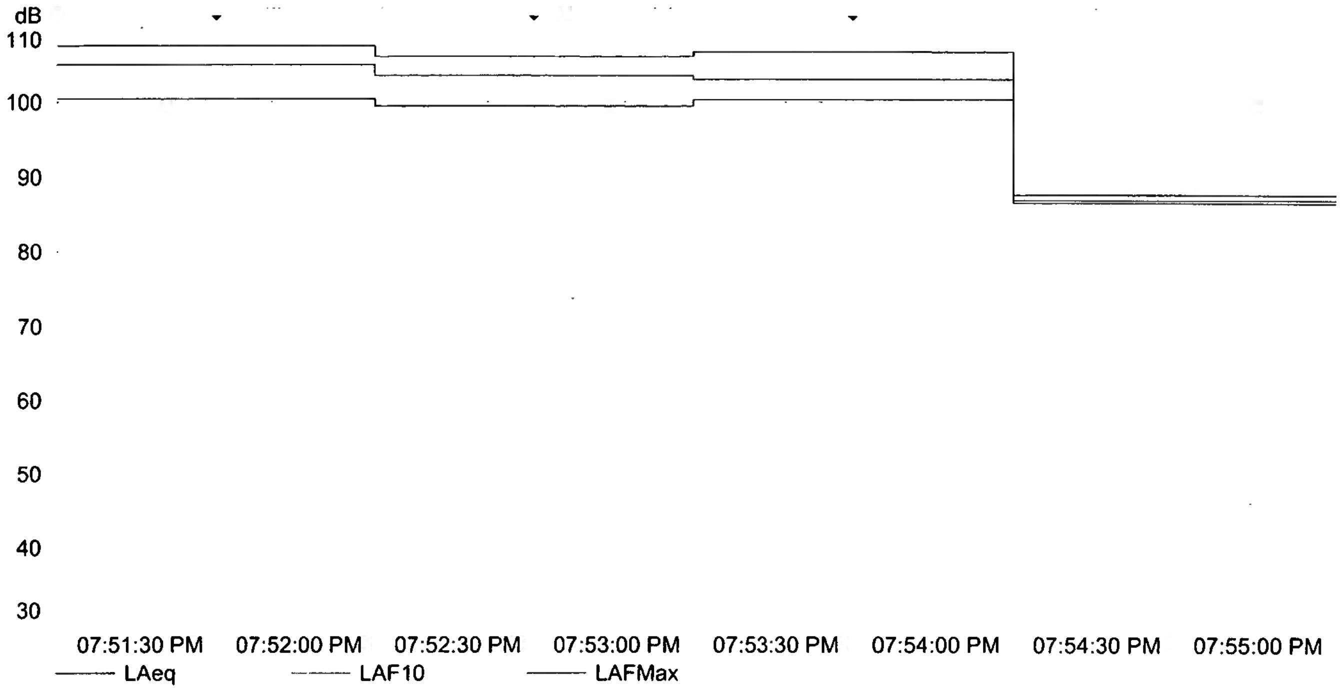
Plant Sound Power Levels

		31.5	63.0	125.0	250.0	500.0	1000.0	2000.0	4000.0	8000.0	A-Weight
At Torne Brook Farm (A-4)											
Ramapo Station (Appendix L-2, last table)		70.0	61.0	52.0	48.0	43.0	38.0	32.0	22.0	16.0	45.4
Distance Term:	4300.0 ft	-70.7	-70.7	-70.7	-70.7	-70.7	-70.7	-70.7	-70.7	-70.7	
Atmoshperic AA	4300.0 ft	0.0	-0.1	-0.4	-1.3	-3.1	-5.8	-11.5	-32.9	-114.9	
Ramapo Plant PWL		141	132	123	120	117	114	114	126	202	201
At Torne Brook Farm (A-4)											
Torne Valley Station (Appendix A, Table A-1)		66.3	59.0	52.0	45.2	42.4	38.8	32.2	23.4	2.3	45
Distance Term:	2200.0 ft	-64.8	-64.8	-64.8	-64.8	-64.8	-64.8	-64.8	-64.8	-64.8	
Atmoshperic AA	2200.0 ft	0.0	-0.1	-0.2	-0.7	-1.6	-3.0	-5.9	-16.8	-58.8	
Torne Valley Station PWL		131	124	117	111	109	107	103	105	126	125
Total Plant PWL		141	132	124	120	117	115	115	126	202	201
Distance Term to Wawayanda	116000.0 ft	-99.3	-99.3	-99.3	-99.3	-99.3	-99.3	-99.3	-99.3	-99.3	
Atmoshperic AA	116000.0 ft	0.0	-3.5	-10.6	-35.4	-84.9	-155.6	-311.1	-887.5	-3100.8	
Station SPL at Wawayanda		42	30	14	-14	-67	-140	-296	-861	-2998	7
Excavation PWL			109	113	113	117	119	115	112		
Concrete Pouring PWL			105	109	109	113	115	111	108		
Steel Erection PWL			109	113	113	117	119	115	112		
Mechancial PWL			104	108	108	112	114	110	107		
Clean-Up PWL			99	103	103	107	109	105	102		
Worse-Case			109	113	113	117	119	115	112		122
Distance Term to Wawayanda	116000.0 ft	-99.3	-99.3	-99.3	-99.3	-99.3	-99.3	-99.3	-99.3	-99.3	
Atmoshperic AA	116000.0 ft	0.0	-3.5	-10.6	-35.4	-84.9	-155.6	-311.1	-887.5	-3100.8	
Station SPL at Wawayanda			6	3	-22	-67	-136	-295	-875		-1


Newburgh
Howells
Otisville
Maybrook
Rock Tavern
New Windsor
Campbell Hall
Middletown
PORT JERVIS NORTH
OTISVILLE
MIDDLETOWN
GOSHEN
MAYBROOK
Salisbury Mills
Cornwall on Hudson
Washingtonville
Cold Spring
New Hampton
Blooming Grove
Goshen
Sparrow Bush
Mountainville
Slate Hill
Germantown
West Point
Greenville
Johnson
Chester
Woodbury
Highland Falls
Wawayanda town
Oxford
Highland Mills
Westtown
Florida
Harriman
PORT JERVIS SOUTH
UNIONVILLE
PINE ISLAND
WARWICK
Sugar Loaf
MONROE
Unionville
Pine Island
Peekskill
Edenville
Wisner
Amity
Buchanan
Warwick
Tomkins Cove
Montrose
Southfields
Stony Point
Greenwood Lake
Thiells
West Haverstraw
Garnerville
Haverstraw
GREENWOOD
Sterling Forest
Tuxedo Park
Eagle Valley
New Hempstead
New City
Congers
Viola
New Square
Hillcrest
Ramapo
Suffern
Tallman
Spring Valley
Valley Cottage
Airmont
Monsey
Nanuet
Nyack
NEWTON EAST
NEWFOUNDLAND
Pearl River
Orangeburg
Tappan

Local Activities Analysis

Orange County Speedway



Cursor: 06/14/2001 07:52:14 PM - 07:53:14 PM LAeq=99.4 dB LAF10=103.5 dB LAFMax=106.1 dB

Wawayanda Energy Facility - Receiver Sound Levels
Orange County Speedway - A-Weigthed Analysis

Floor	Name	Day time level dB(A)
1. Floor	Country View Manor	52.3
2. Floor		52.3
1. Floor	Dolsontown Road - East	49.3
2. Floor		49.3
1. Floor	Dolsontown Road - South	48.0
2. Floor		48.0
1. Floor	Dolsontown Road - West	47.9
2. Floor		47.9
1. Floor	Genung Street	54.1
2. Floor		54.1
1. Floor	Moon School	50.0
2. Floor		50.0
1. Floor	Public Space	47.4
2. Floor		47.4
1. Floor	Ruth Court	52.5
2. Floor		52.5

Wawayanda Energy Facility Source List
Orange County Speedway - A-Weigthed Analysis

Name	ObjNo	Src.type	l or S	LwA	Ko	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz
Orange County Fair Speedway	388	Point		135.9	0.0	117.8	122.9	124.4	127.8	131.0	129.2	128.0

Wawayanda Energy Facility - Receiver Sound Levels
Base Analysis/03-01 GA/Linear/MCNR Rating D - Comparison to Local Activities

Floor	[illegible]	[illegible] dB(A)	[illegible] dB( )
1. Floor	Country View Manor	61.6	61.6
2. Floor		61.7	61.7
1. Floor	Dolsontown Road - East	68.4	68.4
2. Floor		68.4	68.4
1. Floor	Dolsontown Road - South	70.8	70.8
2. Floor		70.9	70.9
1. Floor	Dolsontown Road - West	69.3	69.3
2. Floor		69.4	69.4
1. Floor	Genung Street	58.7	58.7
2. Floor		58.8	58.8
1. Floor	Moon School	56.4	56.4
2. Floor		56.4	56.4
1. Floor	Public Space	64.9	64.9
2. Floor		64.9	64.9
1. Floor	Ruth Court	58.2	58.2
2. Floor		58.3	58.3

Acoustical Terminology

Sound Power Levels & Sound Pressure Levels

Sound power level (PWL) is a single number that describes how much sound energy is radiated by a piece of equipment, independent of the surroundings or environment. Sound power level allows one piece of equipment to be directly compared with another, and then source-ranked to determine which should be attenuated first.

Sound power level is analogous to the wattage of a light bulb, whereas sound level is analogous to brightness. Sound power is *independent* of the environment, sound pressure is *dependant* on the environment. When a 75-watt light bulb is placed in a room painted white or black, it still radiates the same amount of energy. However, the apparent brightness of the light bulb does not remain the same; it changes as the environment changes. In the room painted white, many reflections are causing the apparent brightness of the bulb to increase, and in the room painted black, much of the light is being absorbed, so the apparent brightness decreases.

For sound, a room painted white is analogous to a contemporary home with sparse furnishings and hardwood floors, i.e., little absorbing material and many reflections. A room painted black is analogous to a colonial home with overstuffed chairs, carpets and paintings on the wall, i.e, many absorbing materials and fewer reflections. A blender or vacuum cleaner would have a higher sound level in the contemporary home versus the colonial one. Similar to the light bulb wattage however, the sound power level of the source would remain the same.

For the most part, no meter "directly" measures sound power. Instead, it is calculated from sound level measurements corrected for reflections, distance to the source, directivity, etc. Sound intensity meters can be used to determine the in-situ sound intensity level of a source, (power/unit area). Since these meters measure sound level and the direction that the sound comes from, they inherently account for reflections and other environmental factors. An adjustment for distance or area is then applied to the levels, to derive the sound power level of the equipment.

With respect to the relationship between sound power levels and sound pressure levels, the conversions are provided below. Note that the technique does not include air absorption effects, which can be significant at large distances. Moreover, the calculations are valid for free-field conditions only, (i.e., outdoors).

$$PWL = SPL + 20 \text{ Log } (R) - 2$$

or

$$SPL = PWL - 20 \text{ Log } (R) + 2$$

Where R is the distance in feet from the source to the receiving point.

Examples:

A small power plant is reported to have a sound power level of 114 dBA. What is the sound level at 250 feet?

$$SPL = 114\ dBA - 20\ Log\ (250) + 2$$

$$SPL = 68\ dBA$$

The sound level of a diesel pay loader is 85 dBA at 50 feet. What is the sound power level?

$$PWL = 85 + 20\ log\ (50) - 2$$

$$PWL = 117\ dBA$$

If instead, one has a sound pressure level (SPL_1) at a given distance (R_1) and wants to know what the sound pressure level (SPL_2) will be at another distance (R_2), then the formula becomes:

$$SPL_2 = SPL_1 - 20\ log\ (R_2/R_1)$$

The sound level of a transformer is given as 80 dBA at 50 feet. What is the sound level at 300 feet?

$$SPL_{300} = SPL_{50} - 20\ log\ (300/50)$$

$$SPL_{300} = 80 - 16$$

$$SPL_{300} = 64\ dBA$$

Note: Do no use these formulas to convert 3-foot sound levels from equipment manufacturers, to levels at further distances. The equations are only valid when both locations are significantly removed from the source, i.e., R_1 & $R_2 \geq$ 5x to 10x the largest dimension of the equipment.

Measured Parameters

The human ear responds to a frequency range from about 20 hertz to 20,000 hertz. Since the ear is not equally sensitive to low and high frequency sound, noise level meters use "A - Weighting" filters which approximate this uneven sensitivity. The measurements are called A-weighted levels, and are reported in units of decibels, dB(A). To further approximate the response of human hearing, sound level meters are equipped with octave band filters. These filters divide the audible range into 9 separate "frequency-bins" as shown in the following table:

Octave Band Filter Frequency Ranges

Octave Band Center Frequency	Frequency Range
31.5 Hz	22 Hz - 44 Hz
63 Hz	44 Hz - 88 Hz
125 Hz	88 Hz - 177 Hz
250 Hz	177 Hz - 355 Hz
500 Hz	355 Hz - 710 Hz
1000 Hz	710 Hz - 1420 Hz
2000 Hz	1420 Hz - 2840 Hz
4000 Hz	2840 Hz - 5680 Hz
8000 Hz	5680 Hz - 11360 Hz

Statistical Measurements

Since community noise levels change over time, statistical measurements are used to quantify their variability. These measures take into account the percentage of time the environment is at a given loudness. For example, the statistical measure L_{10}, (said "L-Ten") is the level exceeded 10% of the time, i.e., only 10% of the time are measured levels higher than this value. Ninety percent of the time, measured levels are below this value. The L_{10} level typically represents the loudest and shortest noise events occurring in the environment, such as car, bus and plane passbys.

The L_{50}, (said "L-Fifty) is the level exceeded 50% of the time. Half the time the measured noise levels will be above this value, and half the time below this level. The L_{90}, (said "L-Ninety") is the sound level exceeded 90% of the time and is called the "background" or residual sound level. Only 10% of the time are measured levels lower than this value, and therefore the L_{90} represents the environment at its quietest periods.

Sound level measurements may also be reported as "equivalent energy levels,"or L_{EQ}. An L_{EQ} is a single number that is "equivalent" to the actual fluctuating noise level, for any given measurement period. Typically, the L_{EQ} falls between the L_{10} and L_{50}.

Appendix O
Emergency Response
Plan

APPENDIX O EMERGENCY RESPONSE PLANNING

Memorandum

To: **FILE**

From **Don Neal**

Date: **July 31, 2001**

Re: **Consultation with Town of Wawayanda Local Emergency Planner Committee (LEPC) representative and New Hampton Fire Department Personnel**

Calpine personnel met with Town of Wawayanda Fire and Emergency response personnel on July 31st, 2001. The purpose of the meeting was to review the emergency response capabilities of the Town, and discuss plans to prepare emergency response plans and resources for the construction and operation of the Wawayanda Energy Center.

Attendee:	**Representing:**	**Role:**
Halsey Decker	Town of Wawayanda	Deputy Emergency Mgr.
	Orange County	Deputy Fire Coordinator
Dave Devine	Calpine	Project Dev. Manager
Warren Tomlins	New Hampton Fire District	Chief
Scott Ray	Calpine	Safety & Health Manager
Jeffery G. Mills Sr.	New Hampton Fire District	Commissioner
Don Neal	Calpine	Environmental Manager
James Cary Jr.	New Hampton Fire District	Assistant Chief
James Cary Sr.	New Hampton Fire District	Assistant Chief
Thomas Lyons Jr.	Town of Wawayanda	Wawayanda Emergency Planning Coordinator

Minutes:

- Calpine presented an overview of the project, a description of the proposed plant, and a description of the Article X permitting process, which requires Calpine to model any and all hazards that could occur with the proposed facility. The Calpine Stony Brook Emergency Response Plan was provided to the attendees prior to the meeting. The discussion covered chemicals that would be present on site and how these chemicals are utilized in the plant.

- Calpine discussed a typical Emergency Response Plan and the responsibilities of Plant personnel with respect to fire/emergency response situations:
  - First responder capabilities
  - Incident Commander status and required actions
  - On and off-site notification processes
  - Typical interface with local Fire Departments

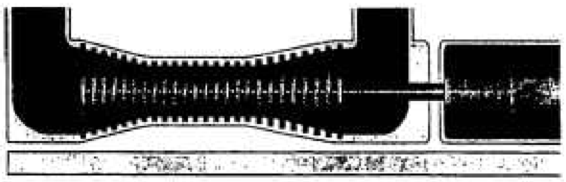
- Comments from the Fire Department on the Emergency Response Plan included:
  - Transfer of Incident
  - Notification process - who, what and when to call
  - Confined Space services not available in the immediate area
  - HazMat team is available from the County
  - Mutual aid agreement from surrounding townships.

- Calpine presented a schedule for development of fire and emergency response plans and capabilities to support the project:
  - Under the Article X process, Calpine anticipates that the project will receive approval to permit construction to commence in mid-2002.
    - Calpine's construction contractor will be responsible for developing and implementing a safety plan and implementing it for all construction work.
    - The Town advised that effective January 2002, New York State Law would reflect the standards and requirements of the ICBO (International Constructions Building Organization) and that the Project would be subject to the requirements of these codes.
  - During preparation for startup, Calpine Operations staff would prepare an emergency response plan, similar to that from Stony Brook, but updated to current regulation and tailored to the specifics of the Wawayanda Plant.
  - Calpine's insurance carrier will require extensive fire protection capabilities on-site. Calpine agreed to work with the fire district throughout the design process regarding the layout of certain fire safety features, particularly site access issues and fire protection loop design to ensure compatibility.

- The Wawayanda LEPC representative indicated that there was probably sufficient personnel and equipment to respond to a plant emergency but that site-specific training of emergency response personnel would be necessary. Specific comments included:
  - The Orange County HazMat team equipment resides within the New Hampton Fire District in close proximity to the plant. However, the HazMat personnel do not necessarily reside or work within the New Hampton Fire District, which would increase response time somewhat.
  - The Wawayanda Town Supervisor must approve implementation of emergency response actions within the town that require town expenditures.

- The New Hampton Fire District will prepare and file a Mutual Aid Response Plan that defines the emergency response system in the event of an emergency at the Wawayanda Energy Center. The New Hampton Fire District would be the first responder followed by Middletown and Slate Hill.
- The nearest hospital is Horton Hospital, about 2.5 miles from the Project site. Mobile Life Support Services would provide Emergency Medical Technician (EMT) services per their contract with Wawayanda.
- The Wawayanda LEPC is part of the Orange County LEPC – there are occasional coordination meetings.
- The New Hampton Fire District has two 1,000 gallon per minute (gpm) pumper trucks with 1,000 gallon storage tanks. They are also about to receive a new pumper truck capable of 1,500 gpm flow and 3,000 gallons of storage.
- There are 6 ladder trucks within 5 miles of the Project site.

EMERGENCY RESPONSE GUIDE



STONY BROOK OPERATORS

STONY BROOK, NY

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UNIVERSITY AT STONY BROOK
2099 SUNY
STONY BROOK, NY 11794-2099

Prepared By:
Spectrum Environmental Enterprises, Inc.
715 Route 15 South
Lake Hopatcong, NJ 07849
(973-663-0600)

EMERGENCY RESPONSE GUIDE

Proprietary Rights

Calpine
Stony Brook Operators

EMERGENCY RESPONSE GUIDE

TABLE OF CONTENTS

APPENDICES:

1 < Site Map
2 < Emergency Response Organization Chart
3 < Job Title Cross-Reference Table
4 < Job Duties
5 < Hazard Profiles
6 < Hot Zone Table
7 < Decision Trees
8 < Emergency Telephone Directory
9 < Reportable Quantity (RQ) Table
10 < Incident Description Forms

Calpine
Stony Brook Operators

EMERGENCY RESPONSE GUIDE

1.0 EXECUTIVE SUMMARY

1.1 SBO's Policy on Emergency Response

Calpine Stony Brook Operators (SBO) is committed, first and foremost, to protecting the *health and safety* of personnel throughout the cogeneration plant (COGEN) and adjacent State University of New York (SUNY) Campus. We are also committed to preserving the integrity of the *surrounding environment,* including the air, lands, waters and wildlife. Our final commitment is to protecting *vital equipment* within the COGEN, as long as this effort does not compromise the health and safety of our employees.

SBO will provide the resources necessary to implement this *Emergency Response Guide (ERG),* and ensure that these highly valued commitments are carried-out.

1.2 Defining an Emergency

The Federal Emergency Management Agency (FEMA) defines an emergency as *"any unplanned event that can cause deaths or significant injuries to employees, customers or the public; or that can shut down your business, disrupt operations, cause physical or environmental damage, or threaten the facility's financial standing or public image".*

This definition captures the essence of the incidents addressed in SBO's ERG.

1.3 What is the Emergency Response Guide About?

The *ERG* is a comprehensive, *"quick-reference guide"* to emergency response, which provides *hands-on* information in a *user-friendly* format. The ERG is designed to address a variety of emergencies including *plant injuries, search and rescue activities, HAZMAT incidents, fire fighting, terrorist incidents and plant evacuations.* The primary objective of the ERG is to facilitate a safe and organized response effort.

The ERG is intended to accomplish the followings five *objectives*:

1. ***Organize** the Emergency Response Effort,*

2. *Establish **Roles & Responsibilities** for each Emergency Responder,*

3. *Provide **Emergency Response Procedures** for addressing common emergencies,*

4. *Identify **Required Notifications and Emergency Contacts**, and*

5. *Provide **Quick Reference Materials** like Hazard Profiles, Hot Zone Tables, Reportable Quantity (RQ) Tables and Decision Trees.*

The ERG is also designed to contain the elements of Calpine's *Corporate Emergency Communications Plan* and Calpine's *Public Relations Policy on Responding to the News Media*. The *Corporate Communications Plan* provides guidance on performing notifications within the company as well as external notifications in an emergency situation. It stresses the prompt notification of public safety facilities and senior management, and ensures that various corporate public relations issues are addressed. It also contains a brief overview of how to assemble a response team, control information going to the media, and conclude emergency situations with an assessment and thank-you to all parties involved.

The *Public Relations Policy* is specifically written to direct individuals on responding to media inquiries. The policy states that, "Calpine employees and consultants *should not* respond to media inquiries without coordinating with Public Relations". The document provides phone numbers for Corporate Public Relations personnel and instructions on what to do when approached by the media. It also explains that this policy is necessary to ensure that accurate information is disseminated and the integrity of the company is maintained.

1.4 Limitations of the Emergency Response Guide

The ERG is designed to address those emergencies most commonly encountered at the cogeneration plant, and is not intended to capture every possible emergency scenario. For example, considering the geographic location of SBO this guide does not specifically address *natural disasters* like earthquakes, floods, tornadoes, or mud-slides. The ERG does address, however, many of the conditions created by natural disasters, like oil/chemical spills, fires, injuries, and so on.

Furthermore, the ERG is not a *"stand-alone"* document and may need to be used in conjunction with the following manuals:

1. *SBO Safety and Health Manual,*

2. *SBO Plant Environmental Compliance Manual (PECM), and*

3. *SBO Spill Prevention Plan.*

1.5 Location and Maintenance of the Emergency Response Guide

The ERG will be revised by the Operations Supervisor on an as-needed basis. This individual, therefore, contains the "Master Copy" of the ERG. The distribution of this guide is as follows:

Copy 1 - General Manager
Copy 2 - (Eliminated)
Copy 3 - Operations Supervisor (Master Copy)
Copy 4 - Maintenance Supervisor
Copy 5 - Control Room
Copy 6 - SUNY EHS Manager
Copy 7 - SUNY Public Safety Headquarters

1.6 Reference Materials

The following reference materials were used in the development of the ERG.

1. *OSHA Regulations (Title 29, Code of Federal Regulations, Part 1910),*

2. *EPA Regulations (Title 40, Code of Federal Regulations),*

3. *NYSDEC Regulations (Title 6, New York Code of Rules & Regulations),*

4. *Suffolk County Regulations (Article 12, Suffolk County Code of Administrative Regulations)*

5. *North American Emergency Response Guidebook,*

6. *FEMA Web Site and Emergency Management Guide for Business & Industry,*

7. *NIOSH Pocket Guide to Chemical Hazards, and*

8. *American Red Cross - Standard First Aid.*

1.7 Regulatory Overview

The ERG was not developed to satisfy one-specific regulatory requirement, but rather satisfies several local, state and federal regulations. This section is intended to summarize the regulations of specific relevance to the ERG and the emergency response and reporting procedures therein.

1.7.1 OSHA Regulations:

The Occupational Safety and Health Administration (OSHA) is a federal agency with the primary role of *"protecting employees from exposure to hazards in the workplace"*. The OSHA regulations of particular significance, Chapter 29 of the Code of Federal Regulations (CFR), are summarized as follows:

- *HAZWOPER Regulations* - The Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations reside in 29 CFR 1910.120 and apply to any facility engaged in *emergency response operations* for releases of hazardous substances. Among other requirements, this regulation stipulates the need to develop and implement an *"Emergency Response Plan"*, designed to address pre-emergency planning, roles and responsibilities, emergency and evacuation procedures, emergency medical treatment, and post-emergency actions. The ERG was designed and implemented, to a great extent, to satisfy this requirement. In addition, employees serving on an emergency response team must receive in-depth emergency response or *HAZMAT Training*, as identified in Section 2.2 and Section 8.

- *Fire Protection Regulations* - OSHA's Fire Protection regulations reside in 29 CFR 1910.155 through 1910.165, and outline the requirements associated with fire brigades, incipient and structural fire fighting training, fire suppression equipment, fire detection systems and alarm systems. These regulations also require the development of *written policy statements, emergency action plans and fire prevention plans.* The ERG contains a detailed explanation of SBO's Emergency Response Organization, the roles and responsibilities of the Emergency Response Team (ERT), the training credentials of the ERT and the alarms used to summon the ERT or signal an evacuation. Sections 2, 3 and 7 contain greater detail on these issues.

> ***NOTE*** ➢ *As explained in Section 7, SBO personnel are provided with "incipient" fire fighting training, only, and are therefore not equipped to form Fire Brigades.*

- *Emergency Reporting Requirements* - OSHA requires notification under 29 CFR 1904.8 for incidents involving *fatalities or multiple hospitalizations (3 or more people)*. These notification requirements are captured within the ERG and explained in more detail in Section 10.

1.7.2 EPA Regulations:

The United States Environmental Protection Agency (EPA) is the federal agency responsible for developing and enforcing regulations to *protect our environment*. The EPA regulations of specific interest to this guide, Chapter 40 of the Code of Federal Regulations (CFR), are summarized as follows:

- *Oil Pollution Prevention* – The Oil Pollution Prevention regulations, 40 CFR 112, focus on the development and implementation of a *Spill Prevention Control and Countermeasures (SPCC) Plan.* In addition to ensuring the proper handling and storage of *petroleum products*, the SPCC Plan is required to address *spill response*. The ERG, therefore, captures the *spill response-related* requirements of this regulation, and SUNY's separate *SPCC Plan* (See Section 1.3) addresses the *preventive measures* associated with this regulation.

- *Oil Spill Reporting* – The EPA regulations in 40 CFR 110 identify reporting requirements for *discharges of oil in "harmful quantities" to navigable waters of the U.S. or adjoining shorelines. Harmful quantities* of *oil* are defined to include an "oily film or sheen upon the surface of the water or adjoining shorelines, or an oily sludge or emulsion beneath the surface of the water or upon adjoining shorelines". If an oil spill of this nature occurs in *any quantity*, immediate notification must be made to the *National Response Center* (See Section 10).

> ***NOTE*** ➢ *Since SBO is not within the vicinity of navigable waters or adjoining shorelines, this reporting requirement is not applicable.*

- *Hazardous Substance Spill Reporting* – Similar to the oil spill reporting requirements, the EPA also established regulations for reporting spills of *hazardous substances* (See 40 CFR 117 and 40 CFR 302). If a hazardous substance is released to the environment (land, water, air) in excess of an established *reportable quantity (RQ)*, the National Response Center must be immediately notified. Notification requirements for spills of *hazardous substances* are included in this guide.

- *Extremely Hazardous Substance Spill Reporting* – The EPA regulations of 40 CFR 355, identify additional spill reporting requirements. Specifically, if a *"hazardous substance"* or an *"extremely hazardous substance"* is released to the environment (land, water, air) in excess of an established *RQ*, the Local Emergency Planning Committees (LEPC) and the State Emergency Response Commission must be notified. This notification is in addition to the National Response Center. Notification requirements for reportable spills of *extremely hazardous substances* are included in this guide.

1.7.3 NYSDEC Regulations:

The *New York State Department of Environmental Conservation (NYSDEC)* is responsible for developing and enforcing environmental regulations in the State of New York. The NYSDEC regulations of specific interest to this guide, Title 6 of the New York Code of Rules and Regulations (NYCRR), are summarized as follows:

- *PBS Program* - The New York Petroleum Bulk Storage (PBS) regulations (6 NYCRR 611 - 614) regulate the handling and storage of *petroleum products, only.* The PBS requirements of greatest significance to the ERG are the *spill reporting requirements* in 6 NYCRR 613.8. NYSDEC must be notified *within 2-hours* of the release of a *petroleum product* to the lands or waters, *in any quantity*. These notification requirements are captured within the ERG and explained in detail in Section 10.

- *CBS Program* - The New York Chemical Bulk Storage (CBS) regulations, *6 NYCRR 595 - 599,* govern the handling and storage of State listed *"hazardous substances",* including acid, caustic and several of the water treatment chemicals used on-site. According to the CBS regulations, SBO is required to prepare and implement a written *"CBS Spill Prevention Report" (6 NYCRR 598.1).* In addition to ensuring the proper handling and storage of *hazardous substances*, this report is required to address *spill response*. The ERG, therefore, captures the *spill response-related* requirements of this regulation, and SBO's separate *Spill Prevention Plan* addresses the *preventive measures* associated with this regulation.

  Other relevant CBS requirements include the *spill reporting requirements*, in 6 NYCRR 595.3. NYSDEC must be notified *within 2-hours* of the release of a *hazardous substance* to the environment (land, water, air), in excess of its *reportable quantity (RQ)*. These notification requirements are captured within the ERG and explained in more detail in Section 10.

- *Hazardous Waste* - The New York Hazardous Waste Regulations, 6 NYCRR 371-376, regulate the handling, storage, transportation and disposal of *hazardous wastes*. The requirements of greatest significance to the ERG are the *spill reporting requirements* in 6 NYCRR 373-2.4. Both NYSDEC and the National Response Center must be *immediately notified* following a *hazardous waste related* release, fire or explosion that could threaten human health or the environment outside the facility. These notification requirements are captured within the ERG and explained in more detail in Section 10.

1.7.4 Suffolk County Regulations

The Suffolk County Department of Health Services (SCDHS) is a *local agency* responsible for establishing and enforcing various environmental, health and safety regulations. The SCDHS regulations of specific interest to this guide, Article 12 of the Suffolk County Code of Administrative Regulations, are summarized as follows:

- *Toxic and Hazardous Materials* - Article 12, Part 760-1200 of the Suffolk County Regulations governs the handling and storage of *toxic and hazardous materials*. Suffolk County includes petroleum products, hazardous substances and hazardous wastes in their definition of *toxic and hazardous materials*.

  The *spill reporting requirements* in Part 760-1217, require notification to the SCDHS *within 2-hours* of a release of a *toxic or hazardous material* to the lands or waters of Suffolk County, *regardless of quantity.* These notification requirements are captured within the ERG and explained in more detail in Section 10.

2.0 EMERGENCY RESPONSE ORGANIZATION

2.1 Overview of the Emergency Response Organization

The *Emergency Response Organization* is the framework by which SBO orchestrates its response. The Emergency Response Organization consists of an established *chain-of-command* with specific *job titles* and *responsibilities*. The *Incident Commander (IC)* is at the top of this chain-of-command with overall authority over the Emergency Response Organization.

The IC has various direct reports consisting of *three generic categories:*

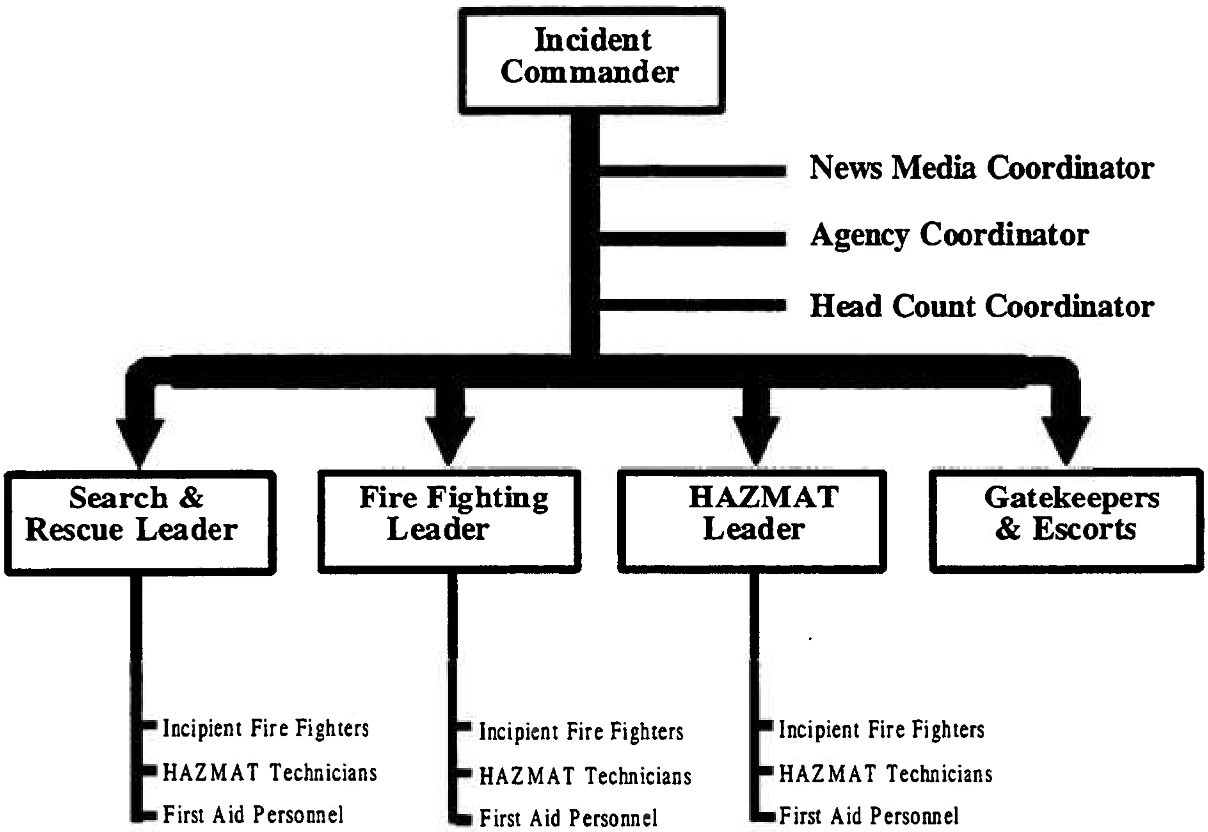
1. ***Staff Positions***--which include the *News Media Coordinator, Agency Coordinator and Head-Count Coordinator*--provide technical assistance and support to the IC with such issues as making statements to the news media, facilitating interactions with regulatory agencies, and accounting for missing personnel. Staff positions *do not* have any direct reports.

2. ***Supervisory Positions***--which include the *Search & Rescue Leader, Fire Fighting Leader and HAZMAT Leader*--supervise a specific component of the emergency such as rescue, fire-fighting or clean-up activities. These supervisory positions are assigned *Line Positions* to carry-out the incident objectives.

3. ***Front Line Positions***--which include *Gatekeepers, Escorts, Incipient Fire Fighters, HAZMAT Technicians and First Aid/CPR Personnel*--are directly responsible for the actual response effort. These individuals are at the scene of the incident performing front-line functions. Front Line Positions are at the end of the chain of command, and therefore do not have direct reports.

The hierarchy of SBO's organization is graphically represented in the figure on the following page, as well as in *Appendix 2.*

EMERGENCY RESPONSE ORGANIZATION



You may be looking at this figure thinking *"there are far more positions in this organization chart than employees on-site during off-shift hours"*. In special cases such as this, involving limited manpower, assign only those positions that are essential to the initial response and wait for outside assistance (SUNY Fire/Police, spill contractors, additional company personnel). When additional personnel arrive on-site, the Emergency Response Organization can be expanded.

NOTE ➢ *The "senior" Watch Engineer will fulfill the role of Incident Commander during off-shift hours, until a management employee arrives on-site.*

Also keep in mind that *one* individual can assume the roles of *more than one* position. For example, the *Incident Commander* may assume the combined roles of

News Media Coordinator, Agency Coordinator and Head-Count Coordinator, and assign another responder to assume the combined roles of *HAZMAT and Fire Fighting Leader.* As long as all the *"bases are covered"*, it is not essential to assign one employee to every position within the Emergency Response Organization.

The framework of the *Emergency Response Organization* can therefore be expanded or collapsed to meet the needs of the incident. The size of the organization is contingent upon the *type and severity* of the particular emergency.

For example, in a small-scale chemical spill the *IC* may directly supervise a few HAZMAT Technicians, without assigning any *"staff"* or *"supervisory"* positions. Medium size spills may call for the addition of a HAZMAT Leader, Fire Fighting Leader and Agency Coordinator to assist in managing the response. Large-scale spills involving fire and injured personnel may trigger the need for all positions within the organization chart.

> ***NOTE*** ➤ *The roles and responsibilities of each job position in the Emergency Response Organization are described in Section 3, and a summary of the specific job duties are located in Appendix 4.*

2.2 Members of the Emergency Response Team

Positions within the *Emergency Response Organization* are filled by SBO's *Emergency Response Team (ERT).* The ERT consists of both management and non-management employees with a variety of job titles and disciplines. The team also crosses departmental boundaries within the plant. The ERT is bound by a common commitment to protect the health and safety of fellow workers and the surrounding community; preserve the integrity of the environment; and protect the equipment and other valued assets which provide a place of employment.

Plant employees with training in *any one* of the following three areas are *automatically assigned* to the ERT:

1. *HAZMAT Technician Training (24-Hour OSHA HAZWOPER Course)*

2. *Fire Fighting Training (Incipient Fire Fighting Course)*

3. *First Aid/CPR Training*

Depending on the particular job title or level of experience, a Plant employee may be trained in one or more of these areas. All ERT members have an obligation to respond, when summoned, to the emergency at hand. It is the responsibility of each member, however, to inform the person-in-charge of their particular training credentials, prior to accepting a job assignment.

NOTE ➢ *Never accept an assignment without the proper training!*

2.3 *Assigning Job Positions*

To avoid becoming overwhelmed with tasks and information, the Incident Commander (IC) must delegate responsibility to other members of the ERT. The *Job Title Cross-Reference Table* in *Appendix 3* was specifically designed to assist in this process. The table identifies the plant personnel best suited for the eight *"staff" and "supervisory"* positions within the *Emergency Response Organization.*

The *Job Title Cross-Reference Table* was prepared as a *guide* to assist the IC in assigning job duties, *not as a requirement.* The final decision of *"who does what"* resides solely with the Incident Commander.

2.4 *Span of Control*

Span of Control is simply an allowable *range* of direct reports that may be managed by a single person. The allowable span for supervisory positions within the Emergency Response Organization may vary from *three to seven* direct reports. The ideal ratio, however, of direct reports assigned to any supervisory position is *five-to-one* (5:1).

For example, an Incident Commander should have an average of five direct reports and a maximum of seven. When the situation dictates the need for additional personnel, the IC must appoint an Agency Coordinator, HAZMAT Team Leader or other positions necessary to maintain the appropriate *Span of Control.*

2.5 *Internal Reporting of Emergencies*

All plant and non-plant personnel are responsible for the immediate reporting of emergencies to the *Control Room.* The Control Room is the first point of contact for all emergencies, including fires, HAZMAT spills, accidents/injuries, and so on. The Control Room can be summoned for assistance via any of the following methods.

1. *Hand-Held Radios*

   A large percentage of SBO employees carry hand-held radios. This equipment is valuable in summoning assistance, providing information to personnel in remote locations, and in coordinating various response activities.

2. *The Telephone System*

SBO's telephone system is designed to provide internal calls within the plant and SUNY Campus, as well as provide direct access to outside assistance, including the local police and fire departments, emergency clean-up contractors, and so on.

3. *Fire Alarm Pull-Boxes*

In addition to alerting plant personnel of fires, these *pull-boxes* can be used to summon emergency assistance (plant injuries, HAZMAT spills, and other emergencies). The moment a *pull-box* is activated an alarm will sound throughout the facility, as well as alert the Campus Public Safety Headquarters. The location of the *pull-box* will appear on a *Fire Alarm Console* in the Control Room, which is segregated into various zones. Plant personnel will then be immediately dispatched to the scene.

2.6 Summoning the Emergency Response Team

As described in subsequent sections of the guide, the decision to summon the *Emergency Response Team (ERT)* resides with the *Incident Commander (IC)*. All ERT members will be alerted via a *special tone* over the Public Address (PA) System followed by an emergency announcement. The *special tone* is the *Radio Siren (Button #3)* on the PA Control Console in the Control Room. Employees in remote locations of the COGEN will be notified via hand held radios.

The announcement will be performed by the IC, or designee, and consist of the following minimum information:

- *"Attention all Plant and Non-Plant personnel, this is not a drill! (repeat twice)! All Emergency Response Team members report immediately to the (designated location)."*

The announcement will be repeated several times to ensure that it is heard.

NOTE ➢ *When assistance is needed from the ERT during off-shift hours, it may be necessary to contact the homes of various company personnel. Appendix 8 contains these telephone numbers.*

2.7 Pre-Emergency Planning With Outside Parties

SBO is subject to the rather unique arrangement of being a tenant of SUNY - Stony Brook University ("SUNY" or "the University"). The University is equipped to support the entire campus with emergency response personnel and equipment. In fact, SUNY has internal police, fire, rescue and HAZMAT teams as well as an on-site medical center. SBO has therefore arranged to utilize SUNY's in-house services, prior to summoning assistance from the local emergency response agencies.

Rather than dialing "911" in an emergency SBO will dial "333" to contact SUNY Public Safety Headquarters, as indicated in *Appendix 8 (Emergency Telephone Directory)*. The Public Safety Headquarters will then dispatch the campus police, fire, HAZMAT or ambulance team to provide support. If SUNY's in-house services are not available or equipped to respond to the emergency, the Public Safety Headquarters will contact Setauket, Stony Brook, or Suffolk County emergency services for assistance.

NOTE* ➤ *Both the SUNY Public Safety Headquarters and the SUNY Environmental Protection Manager were issued copies of the ERG as indicated in Section 1.4.

SBO also established relationships with various spill response contractors, including Miller Environmental, Trade Winds and Clean Harbors, for assistance in addressing larger oil and chemical spills. The phone numbers for these contractors are also located in *Appendix 8*.

NOTE* ➤ *Guidance on notifying the appropriate regulatory agencies, response organizations and clean-up contractors is provided in the "Notification Process" (Section 10) and the "Decision Trees" (Appendix 7).

3.0 ROLES AND RESPONSIBILITIES

3.1 Incident Commander

The *Incident Commander (IC)* is at the top of the chain-of-command, and has overall authority for *managing* the response effort from start-to-finish. The *IC* has the power to commit the necessary resources and personnel, and is the single point of contact for all information and activities associated with the incident.

The responsibilities of this position will be conducted from a centralized location referred to as the *Incident Command Post*. The Incident Command Post is typically in a secured location, outside the *"hot-zone"*, to reduce the possibilities of disrupting communication between the IC and the other emergency responders. For example, the Control Room would be a good selection for the *Command Post* in large-scale incidents. Whereas small-scale incidents typically call for a *Field Command Post,* located at the scene of the incident.

Primary responsibility for carrying out the duties of the IC reside with the *General Manager* or other management personnel in Appendix 3. If the incident should occur during off-shift hours or holidays, the senior *Watch Engineer* will assume the role of IC until management personnel arrive on-site.

The IC must be careful not to focus too closely on the technical aspects of an incident, and must rather rely on the supporting positions within the Emergency Response Organization to carry-out the specific tasks. In other words, the IC should concentrate on managing the *big picture*. The IC must also maintain an appropriate *span of control* over his/her direct reports, as explained in *Section 2.4*.

NOTE* ➤ *The specific duties of this position are summarized in Appendix 4.

3.2 News Media Coordinator

The News Media Coordinator is responsible for making public announcements, holding press conferences, and any other communications with the news media, public interest groups, or the surrounding community. The General Manager has responsibility for this position when a member from Corporate Public Relations is unavailable. SBO employees **must not** release any information to the news media without coordinating with Public Relations or prior approval from this individual. The News Media Coordinator should also be familiar with the *Calpine Corporation Emergency Communications Plan* and *Calpine's Public Relations Policy on Responding to the News Media*.

If contacted by any media groups, inform them that all statements must be coordinated through Calpine's Public Relations Department. Take their name, number, and affiliation and inform them that someone will get back to them. An emergency situation may preclude coordination, in which case Corporate Public Relations should be notified afterwards so a record of media contacts can be maintained.

NOTE ➢ *The specific duties of this position are summarized in Appendix 4.*

3.3 Agency Coordinator

The primary role of the *Agency Coordinator* is to facilitate interactions with the local, state, and federal agencies and organizations, including the following:

- *Regulatory Agencies*--such as the Suffolk County Department of Health Services (SCDHS), the New York State Department of Environmental Conservation (NYSDEC) and the National Response Center (NRC),
- *Emergency Response Organizations*--including the local fire, police, hospitals and ambulance services,
- *Spill Response Contractors*--such as Miller Environmental and Trade Winds, and
- *SBO's Internal Support Groups*--such as corporate management, plant management, public relations and so on.

NOTE ➢ *The specific notification requirements are explained in Section 10.*

Another important function of the Agency Coordinator is to document all aspects of the incident, including conversations with regulatory agencies and organizations; *Appendix 10* contains a customized *Incident Description Form* for this purpose.

Lastly, the Agency Coordinator assists with any compliance issues that arise during the incident, such as guidance in protecting environmentally sensitive areas, direction on waste disposal, oversight of soil and groundwater remediation activities, and so on.

As indicated in *Appendix 3*, the Operations Supervisor is best suited for this position. If unavailable, however, this position can be filled by the Maintenance Supervisor, O&M Manager or any other member of the ERT trained in the use of this guide.

NOTE ➢ *The specific duties of this position are summarized in Appendix 4.*

3.4 Head-Count Coordinator

The primary duty of the *Head-Count Coordinator* is to *account for all personnel* on-site, including plant employees, non-plant personnel, outside contractors, visitors, or any other individual on the premises. This task must be performed quickly and accurately, and reported back to the IC. Remember, the sooner role-call is completed, the sooner it can be determined *"who's missing"* and whether or not a *rescue* attempt is necessary.

The need for this position typically arises during a *full or partial* evacuation of the Plant. SBO's *Evacuation Plan* resides in *Section 5.*

As indicated in the *Job Title Cross-Reference Table (Appendix 3),* any member of the ERT may fulfill the responsibilities of this position.

NOTE* ➢ *The specific duties of this position are summarized in Appendix 4.

3.5 Search and Rescue Leader

The role of the *Search and Rescue Leader* is to *locate and retrieve* any victims who are unconscious or disabled, and ensure that *first-aid/CPR* is administered. This individual must work quickly and decisively, without compromising the safety of the ERT. This is often a difficult balance for a Search and Rescue Leader to maintain, when the first impulse is to *rush in* and save the people in distress.

Section 6 describes the rescue capabilities of the ERT, and identifies the specific environments the team is qualified to enter. For example, if the rescue involves ropes and special rigging to retrieve the victim (*High Angle Rescue)* or rescues from a burning building *(Structural Fires),* then the ERT *is not* qualified to perform the rescue. Assistance from the SUNY or Suffolk County Fire & Rescue Teams would be necessary in these situations.

The Search and Rescue Leader will be assigned the appropriate members of the ERT for the type and severity of the rescue operation. This position reports directly to the IC.

Any "qualified" member of the ERT may assume the role of Search and Rescue Leader. This individual must possess, however, the appropriate level of training for the incident at hand. For example, if the rescue operation involves entry into an area containing hazardous materials, the individual must have HAZMAT Technician Training. The Search and Rescue Leader must also be trained in *First Aid/CPR.*

NOTE* ➢ *The specific duties of this position are summarized in Appendix 4.

3.6 Fire Fighting Leader

The role of the *Fire Fighting Leader* is to *contain* and *extinguish* any *incipient fires (small fires in the early stages)*. This individual should be at the scene supervising the front-line efforts of the emergency response team (ERT). The Fire Fighting Leader must also make periodic assessments of what additional resources will be needed to resolve the incident and communicate this information back to the IC.

As indicated in *Section 7 (Fire Fighting),* SBO's ERT is only qualified to respond to *incipient* fires! Any qualified member of the ERT may assume the role of Fire Fighting Leader as long as he/she has received incipient fire fighting training.

***NOTE ➢** The specific duties of this position are summarized in Appendix 4.*

3.7 HAZMAT Leader

The role of the *HAZMAT Leader* is to *secure, contain* and *clean-up* the release of any hazardous materials, substances or chemicals. This individual should be on the scene supervising the front-line effort of the ERT. A detailed description of the response measures for *HAZMAT Incidents* is provided in *Section 8.*

The HAZMAT Leader must also make periodic assessments of what additional resources will be needed to resolve the incident and communicate this information back to the IC.

Any qualified member of the ERT may assume the role of HAZMAT Leader. This individual must possess, at a minimum, the HAZMAT Technician Training identified in Section 2.2.

***NOTE ➢** The specific duties of this position are summarized in Appendix 4.*

3.8 Gatekeepers/Escorts

Gatekeepers and Escorts are assigned to protect the safety of personnel on-site as well as the outside agencies and organizations responding to the facility. Their specific roles are described as follows:

- *Gate-Keepers* are assigned to control the flow of traffic--fire, police, ambulance, spill response contractors--in and out of the *designated access points* to the facility. Although the COGEN is not completely enclosed by fencing and *access* *gates*, the role of the *"Gatekeeper"* is still essential. A *Gatekeeper* for this facility, therefore, may be controlling the flow of traffic through an actual *access gate* or an *access roadway*. The *designated access points* for this facility are identified in *Section 5.3*. *Gate-keepers* are also responsible for preventing the unauthorized exit of personnel from the facility; this is to ensure that plant and non-plant personnel do not exit the facility prior to being accounted for *(See the Evacuation Plan-Section 5*).

Access to and from the COGEN Plant will be controlled by the *Gatekeeper* via two entrances:

1. *Main Entrance* - located on the plant-east side of the property for *primary access* to and from the facility.

2. *North Gate Entrance* - a manually operated gate on the plant-north side of the facility designed for alternate or *emergency access* only.

NOTE ➢ *The location of these access points is identified in the Site Map (See Appendix 1).*

- *Escorts* will be used to guide the outside agencies and organizations from the *designated access point* to the scene of the incident. The main reason for this practice is to protect outside responders from any harm that may occur by inadvertently driving through an airborne chemical plume or other hazard. This practice is also intended to save valuable time that could otherwise be wasted by these responders searching for the scene of the emergency.

NOTE ➢ *The duties of these positions are also summarized in Appendix 4.*

3.9 Emergency Response Team

The role of the *Emergency Response Team (ERT)* is to take whatever action is necessary, within the guidelines of their training, to protect the health and safety of co-workers and the surrounding community. The secondary role of the ERT is to preserve the integrity of our environment and protect the equipment and other valued assets that provide us with a place of employment.

The *ERT* consists of both management and non-management employees with a variety of job titles and disciplines. Any qualified member of the ERT can assume one of the leadership positions described in Sections 3.1 through 3.8. The remaining members will be assigned to assist these positions, based on the needs of the incident and the training credentials of the individual. The ERT may also be called upon to augment or assist the efforts of outside spill response agencies and organizations.

Depending upon the emergency at hand, the ERT may assume the role of a *HAZMAT Team, Search and Rescue Team, Fire Fighting Team,* and so on. It is therefore essential to inform the IC, or team leader, of your training credentials prior to accepting a job assignment.

The general responsibilities of the ERT are summarized as follows:

- Immediately report to the designated muster location when summoned by the IC, as described in *Summoning the ERT (Section 2.6),*
- Accept job assignments from the IC and establish contact with your team leader *(Do not accept a job assignment for which you are not properly trained).*
- Remain in close contact with your team leader throughout the response effort,
- Carry-out the job duties for which you were assigned in a safe manner,
- Coordinate efforts with other members of the ERT, as well as any outside spill response contractors or emergency response agencies,
- Inform your supervisor of any resources needed to accomplish the task at hand.

3.10 Essential Equipment Operators

The role of the *Essential Equipment Operators* is very straight-forward. Rather than responding with the ERT, these individuals will be instructed by the Operations Supervisor or IC to simply remain in their present roles as plant operators. The reason being, Essential Equipment Operators comprise the skeleton crew of *"Watch Engineers" and "Assistant Watch Engineers"* needed to maintain/reduce unit load, isolate critical pieces of equipment, or secure the entire COGEN.

The role of *Essential Equipment Operators* becomes most critical during a *plant evacuation.* Under these circumstances, various *emergency shutdown procedures (Section 5.4)* will be followed prior to evacuating the facility.

The exact number of Essential Equipment Operators needed to operate the plant during an emergency will be determined by the IC at the time of the incident. The remaining operators will be instructed to either assist the ERT or report to the *primary assembly area.*

NOTE* ➢ *SBO's Operators receive extensive classroom and hands-on training in the operation and emergency shutdown of the cogeneration plant. Detailed operating instructions on all aspects of plant operation reside in the Control Room.

3.11 Plant and Non-Plant Personnel

The primary role of *Plant and Non-Plant Personnel* is one of *"awareness"*. If an individual witnesses an accident or encounters a fire, HAZMAT spill, or other incident, it is their responsibility to immediately summon assistance from the *Control Room.* This can be accomplished through a number of communication devices, including telephones, radios, or by simply pulling the closest fire alarm. Refer to *Internal Reporting of Emergencies (Section 2.5)* for more detail.

Plant and Non-Plant Personnel must also pay close attention to general announcements made over the PA System, especially evacuation announcements, and *follow* the instructions provided. For example, if a *full* or *partial* evacuation were announced over the PA System, all Plant and Non-Plant Personnel would be instructed to leave their work locations and report to a designated *assembly area*. A role call would then be conducted to ensure that all personnel were accounted for. All Plant and Non-Plant Personnel must remain at this assembly area until either the "All-Clear" announcement is made over the PA System, or they are dismissed by the Head Count Coordinator or IC. Under no circumstances may these individuals leave the premises without prior authorization. Otherwise, the ERT would unnecessarily deploy a Search and Rescue Team to locate personnel who *are not* actually missing. In addition to being a waste of valuable time, this exercise may jeopardize the safety of our ERT. The details of a *full* and *partial* evacuation are explained *Section 5.*

Plant and Non-Plant Personnel consist of the following individuals:

- Those employees who *are not* part of the Emergency Response Team,
- Any outside contractors, agency representatives, visitors, or other non-plant personnel.

4.0 PLANT INJURIES AND FIRST AID

This section of the ERG outlines the procedures to be followed in the event of a plant injury, accident, or medical emergency. Accidents are the leading cause of death for people between ages 0 to 44. Plant injuries, accidents and medical emergencies occur from a variety of causes, including injuries (slip, trip, fall, and cut), illnesses (heart attack or stroke), fires (burns, smoke inhalation), chemical spills, toxic gas inhalation, and so on. These incidents often happen quickly and without warning.

NOTE ➢ *Any plant employee who encounters accident victims or injured personnel must immediately notify the Control Room, as described in Section 2.5.*

There is no time to plan at the onset of an emergency, only time to react. Pre-emergency planning will help ensure the right procedures are followed in an *actual* accident or medical emergency, without delay. Administering First Aid and CPR within the first few minutes of an emergency can make the difference between life and death, and often makes the difference between permanent disability and complete recovery.

4.1 Check, Call, Care

The three fundamental elements of first aid response are as follows:

I. ***CHECK***
II. ***CALL***
III. ***CARE***

I. "Check" the Scene and the Victim:

Before anything can be done for the victim, you must first ensure that the emergency area is safe for you and other responders. Carefully *check* the scene by listening for unusual noises, sights, odors or behaviors. If there is still a hazard present, do not go near the victim or put yourself at risk!

NOTE ➢ *If retrieval of the victim is necessary from a hazardous environment, refer to Section 6 (Search and Rescue) or call for outside assistance (Appendix 8).*

Try to establish if the victim is conscious or responsive with a shout or a tap to the shoulder. If the victim is conscious, *check* for signs of distress, including confusion, skin discoloration, breathing difficulty, signs of pain/discomfort, injury and so on.

If the victim does not respond, you must assume they are unconscious. Since *"unconsciousness"* is a life-threatening situation requiring immediate assistance, proceed directly to *Steps 2 (Call) and 3 (Care).*

It is also important to observe the objects and equipment in the vicinity of an unconscious victim for clues to the cause. Bystanders may be useful in providing information about the circumstances of the incident, including friends and co-workers with knowledge of the victim's historical illnesses or medical conditions. This information may be vital in your conversation with outside responders.

Do not move a seriously injured accident victim, unless there is a clear and immediate danger, such as an approaching fire, chemical plume, storm, and so on. Unseen injuries to a victim (such as spinal, neck and head injuries) can be complicated if the victim is moved prior to being stabilized. If you must move the victim, do so very carefully to avoid causing additional damage.

II. "Call" for Outside Assistance:

Calling for help is often *the most important action* you can take to save a life! The first point of contact should be the Control Room, via any of the communication/alarm systems described in *Section 2.5 (Internal Reporting of Emergencies)*. Emergency telephone numbers are posted in the Control Room as well as in *Appendix 8* of this guide.

If possible, have someone else (co-workers, bystanders, etc...) make the call for emergency assistance while you begin care for the victim. Be sure to provide the dispatcher with the information obtained in *Step 1 (Checking the Scene and Victim)*. When you connect to the dispatcher, tell them the location of the victim (have the address ready), the condition of the victim (so the appropriate response team can be called), and the accident scene (in case more than one response team is needed.

NOTE ➢ *Do not hang up until the dispatcher hangs up!*

III. "Care" for Victim until Help Arrives:

After the emergency response team/ambulance has been called and is on the way, you should return to the victim. Check the victim for other life-threatening conditions that you might have missed the first time. If the victim is unconscious, now is the time to determine if the victim is *breathing,* has a *pulse,* or is *bleeding severely.*

1. *Check for Breathing* - If the victim is lying on their stomach, gently roll them over to their back, keeping the head, neck and back in a straight line the whole time you are rolling them. When the victim is on their back, tip their head back gently

and lift the chin to open the airway. Put your ear near the victims mouth and nose, with your head facing the victims chest. Look, listen and feel for breathing for about 5 to 10 seconds.

If the victim is breathing, then the victim will have a heart beat and a pulse. *Never perform chest compressions (CPR) on a victim that is breathing!* If the victim is not breathing, then the life of the victim is in immediate danger and action must be taken quickly. Give the victim a couple of breaths using rescue breathing as outline in Section 4.8. Then check for a pulse.

2. *Check for Pulse* - To check for a pulse, put your index and middle fingers on the neck of the victim at the Adam's Apple. Slide your fingers toward you into the groove next to the Adam's Apple, on the side of the victim's neck. Your fingers should then be on one of the main blood vessels that are found along both sides of the neck. Hold still and count to about 5 to 10 seconds to feel for the pulse of the victim. If the victim has a pulse but is not breathing, you should administer artificial respiration (Rescue Breathing). If the victim does not have a pulse, you should administer *Cardiopulmonary Resuscitation (CPR)* as outlined in Section 4.9.

3. *Check for Severe Bleeding* - Check the victim for bleeding by visually inspecting the victim's body from head to toe, as well as from front to back. Look for signs of bleeding such as blood soaked clothing, pools of blood next to the victim, blood marks on the skin of the victim, or heavy bruising and/or discoloration under the skin. Use your best judgement on whether or not the bleeding is severe. Control the bleeding if possible, by placing a clean covering over the wound and applying direct pressure. Continue caring for the victim's injuries using first aid as outlined in the following subsections.

NOTE* ➢ *Refer to the universal precautions on the following page to reduce contact with the victims blood.

4.2 Cuts, Scrapes and Bruises

The most common injuries encountered in the workplace are injuries to the soft tissue. The soft tissue is the skin, fat and muscle of the body. Injury to the soft tissue is commonly referred to as a wound. A "closed" wound is damage to the soft tissue under the skin, and can be seen as a bruise. A bruise indicates bleeding under the skin. An "open" wound is when the skin is broken, and bleeding is apparent. "Open" wounds include cuts, scrapes, avulsions, and punctures. All "open" wounds are at risk of infection, so all "open" wounds need to be covered to control the bleeding and prevent infection from occurring.

Bandages and dressings are the most common coverings for the control of bleeding and the prevention of infection. Assorted bandages and dressings are included in the emergency first aid kits, made available to all employees. If a sterile dressing isn't available, then a clean cloth or similar material may be used as a substitute. The use of the various types of bandages is taught in the First Aid Course.

Care should be taken to ensure that the blood of the victim does not get onto you. *Blood born pathogens* carried by the victim can put you at risk of disease and/or infection.

To reduce the risk of *infection* while administering first aid you should do the following:

1. *Avoid being splashed by blood.*

2. *Place a barrier between you and the blood of the victim by using items such as latex gloves, wound dressings and bandage wraps.*

3. *Cover any cuts, scrapes, or wounds on your skin.*

4. *Wash your hands immediately after providing care, even if you wore gloves. Do not use a wash basin in a food preparation area.*

5. *Avoid eating, drinking, and touching your mouth, nose, and eyes while providing care.*

6. *Avoid touching objects that may have been contaminated with blood.*

7. *Avoid handling your own personal items while providing care.*

After the wound has been covered with a dressing and bandage, apply pressure to the area of the wound. Pressure will help to reduce any bleeding that has not been stopped by the dressing and bandage. Then, elevate the wound to further help to reduce the flow of the blood to the wound.

If these procedures fail to stop the bleeding, and the wound is located on a body extremity, such as an arm or leg, use a pressure point. A pressure point is a spot on the body where you can press the artery against the underlying bone in order to squeeze it into a constricted state, to further help to staunch the flow of blood to the wound. Pressure points are located on the insides of the upper arms and the hips.

Bleeding Control should be performed according to the following procedure:

1. *Cover the wound with a clean, sterile dressing and press firmly against the wound with your hand*

2. *Elevate the wound above the level of the heart (if possible)*

3. *Cover the wound dressing with a bandage or similar wrap.*

4. *If the bleeding doesn't stop, apply additional dressings to the wound.*

5. *Use the pressure point leading* to the wound. Squeeze the artery against the bone of the leg or arm.

4.3 Shock

Severe bleeding and injury can cause failure in the body's circulatory system. When the circulatory system does not deliver blood to the organs of the body as it should, the organs fail to function properly. This leads to a condition known as shock. Any significant loss of fluids or serious injury is likely to produce a shock reaction.

Shock is the body's natural attempt to keep oxygen rich blood flowing to the most important organs, such as the brain, heart and lungs. When oxygen-deprived tissues in the legs and arms begin to die, the body will send blood to them and away from the vital organs. As the brain is affected by the loss of blood, the victim may become restless, drowsy, and/or unconscious. As the heart is affected, irregular beating occurs, the hearts rhythm and pulse is lost, and the heart fails to pump blood. When the heart stops, breathing stops and death will result.

The following procedure should be used to care for *shock victims:*

1. *Lie victim down in a comfortable, resting position to help minimize the pain. Pain can intensify stress on the body and compound the effects of shock.*

2. *Control any bleeding from the victim. Loss of blood is a major factor in producing a shock reaction in a victim.*

3. *Try to maintain the victims normal body temperature. If the victim is cool, cover their body to keep them warm. If the victim is hot, fan them, or wipe them with a damp cloth to keep them cool.*

4. *Reassure the victim that help is on the way and they will be fine.*

5. *Elevate the legs about 12 inches high to promote the blood flow to the brain, heart, and other vital organs. Do not elevate the legs if you suspect head, neck, back, hip or leg injuries; leave them lying flat.*

6. *Do not give food or liquids to the victim, even if they ask for them.*

7. *Call the local emergency number immediately. Shock can not be treated by first aid alone, advance medical care is required as soon as possible.*

4.4 Burns

Burns are produced though heat, electricity, radiation, or chemicals. Burns destroy the skin layers. When the skin breaks, loss of fluids and infection may result. This may result in the body losing temperature control. Deep burns may also affect the person's ability to breathe. The deeper the burn, the more severe it usually is. Burns are classified according to the following three categories, depending on the severity:

I. First Degree Burns:

First degree burns are *superficial* and only involve the top layer of skin. The skin is usually red and dry and the burn is painful, and may be swollen. First degree burns commonly include superficial sunburns. First degree burns will typically heal within 5 to 6 days without causing permanent scarring.

II. Second Degree Burns:

Second degree burns are also called *partial-thickness burns*, and involve the top layers of the skin. The skin turns red and has blisters that may burst open and release clear fluid. The burned skin may appear mottled, swollen and wet. These types of burns are often painful. The burn usually will heal within 3 to 4 weeks, and may leave a scar.

III. Third Degree Burns:

Third degree burns are also called a *full-thickness burn,* and involve the destruction of all layers of skin and the underlying fat, muscles, bones and nerves. These burns look brown or charred black, with the exposed tissue underneath sometimes appearing white. They can be extremely painful, or can be painless if the burn destroys the nerve endings.

Use the following procedure to care for *burns:*

1. *Stop the burning. Put out the source of heat, or remove the victim from the area.*

2. *Cool the burn. Flush the burn using large amounts of cool water. Use a hose, bucket, shower, or tub to soak or immerse the burn. Water soaked towels may be used on burns that cannot be easily immersed in water, as long as they are kept cool and wet. Do not use ice, or ice water. Ice causes body heat loss.*

3. *Cover the burn. Use clean, sterile bandages and dressings, or a clean cloth to cover the burn. Large burns may require a clean dry sheet to cover them*

properly. Keep the wound covered loosely, but maintained in place. Covering the burn keeps out the air, helping to reduce the pain, and helping to prevent infection.

4.5 Fractures, Dislocations, Sprains and Strains

Injuries to the muscles, bones and joints are very common; the four basic types of injuries are *fractures, dislocations, strains and sprains.*

I. Fractures

Fractures can be a crack, chip or complete break in a bone. Fractures may be open or closed. An open fracture involves an open wound that is caused by the end of the broken bone tearing through the skin. Open fractures have the added risks of severe bleeding and infection. Closed fractures, which are far more common, do not involve broken skin and are far less dangerous.

II. Dislocations

Dislocations are the separation of a bone from its normal position in the joint. This is typically caused by the tearing of the ligaments that hold the bone in place at the joint. When the bone is out of place, the joint fails to function correctly.

III. Strains

A *strain* is the tearing or stretching of muscles or tendons. Strains usually occur in the muscles of the back, neck, thigh, or lower leg by lifting something heavy or over-exerting a muscle. Strains may often reoccur in the neck and back.

IV. Sprains

Sprains involve the tearing of ligaments at a joint. Sprains usually occur in the joints of the ankle, knee, wrist, and fingers. Mild sprains typically swell at first, but will heal quickly if the victim rests the joint and does not rush a recovery. If the sprain is swollen and painful, and the victim returns to activity too soon, proper healing will not occur; the joint will remain weak and promote re-injury. A severe sprain may also involve a fracture or a dislocation of the bones at the joint.

Care for a *fracture, dislocation, strain or sprain* should be conducted as follows:

1. *Check for life-threatening conditions, and decide whether or not to call an ambulance.*

2. *Call for an ambulance if the victims head, neck or back is injured, or if the victim is having trouble breathing. If so, do not move the victim, leave them lying flat.*

3. *Apply ice to any swelling.*

4. *Immobilize the injury if transport is necessary.*

4.6 Sudden Illnesses

Sudden illnesses are brought on from a variety of causes including emotional stress or trauma, heat fatigue, medication (or lack of it), and medical conditions like diabetes, epilepsy, or heart disease.

When someone becomes violently ill in a sudden and unexpected manner, it is often difficult to tell what is wrong. The victim may experience nausea or vomiting, shortness of breath, localized pain, skin discoloration, or changes in consciousness. The victim may also have trouble speaking, if they can speak at all. If you have any doubts about the severity of the illness, call for immediate emergency assistance.

Even if the cause of the *sudden illness* is unknown, you can still provide care for the victim using the following procedures:

1. *Check the scene for clues to the cause of the illness.*

2. *Check the victim for life-threatening conditions such as unconsciousness, breathing difficulty, no breathing, no pulse, bleeding, or severe chest pain.*

3. *Call the appropriate local emergency responder (Appendix 8), if necessary.*

4. *Care for life-threatening conditions.*

5. *Make the victim comfortable until help arrives (adjust body position, provide blanket, loosen ties or tight clothes, elevate legs, etc.).*

6. *If the victim vomits, place them on their side.*

7. *Do not give the victim anything to eat or drink.*

4.7 Poisoning

Poisons are any substances that can cause injury, illness or death if they get on or into the body. Poisons may be introduced into the body by four methods: *ingestion, inhalation, absorption, and injection.*

I. Ingestion

Ingested poisons include drugs and medications, foods like certain mushrooms and shellfish, pesticides, cleaners and certain plants. Combinations of certain substances may be toxic and can cause poisoning even if they are not poisonous by themselves. Ingestion may be deliberate or accidental. Keep all products in their original containers and read the containers precautions, warnings, and incompatibilities prior to use.

II. Inhalation

Inhaled poisons include toxic gases such as carbon monoxide from engine exhaust, ammonia and chlorine vapors water treatment systems, and carbon dioxide from sewers and wells. They also include fumes from glues, thinners and paints, or inhaled drugs like crack cocaine. Keep work areas well ventilated

III. Absorption

Absorbed poisons enter the body through the skin. Various chemicals, solvents, fertilizers and other substances we come in contact with every day, can produce toxic effects when absorbed through the skin. Other examples include certain plants like poison ivy or poison oak, which release toxins through their leaves. Personal Protective Equipment worn properly will prevent this.

IV. Injection:

Injected poisons enter the body through a hole in the skin. The most common every day examples are through the bites and stings of insects, spiders, ticks, and so on. Poisons may also be introduced into the body by contact with sharp tools or objects in the plant, an open wound that is not properly protected, or through hypodermic needles used in administering medications/drugs.

If you suspect that someone has been *poisoned*, follow these instructions:

1. *Call the Poison Control Center or local response agencies (Appendix 8). Check the scene for safety before approaching and gathering clues.*

2. *Remove the victim from the source of poison, or collect samples of the poison.*

3. *Check the victim for consciousness, breathing, and pulse.*

4. *Care for any life-threatening conditions.*

5. *If the victim is conscious, ask them questions about what happened.*

4.8 Emergency Breathing Techniques

A severe breathing problem that threatens a victim's life is considered a breathing emergency. Breathing emergencies can be the result of injuries or illnesses. Breathing may stop because of choking, drowning, electric shock, injury to the brain, diseases of the brain, or a heart attack. Signs of breathing emergencies include gasping for air, wheezing and gurgling, difficulty speaking, and a bluish tinted skin. If a victim's breathing is restricted long enough, or stops altogether, the victim will become unconscious, the heart will stop beating, and death will result.

The three emergency breathing techniques described in this section are *"Rescue Breathing", the "Heimlich Maneuver" and "Blocked Airway Rescue Breathing":*

I. Rescue Breathing:

Rescue breathing is the first step toward saving the victim, and should be performed as follows:

1. *Make sure that outside emergency assistance is on the way.*
2. *Place victim on his/her back and open the airway. Tilt victim's head back gently with one hand on the forehead and two fingers of the other hand under the chin.*
3. *Pinch victim's nose shut, and cover victim's mouth with your mouth.*
4. *Give two slow breaths into the victim until you see the chest rise. If your breaths do not go in, try to re-tilt the head. If your breaths still do not go in, go to "Blocked Airway Rescue Breathing".*
5. *After you get two slow breaths into the victim, check for a pulse. If a pulse is present, but the person is still not breathing, continue to the Step 6. If there is no pulse, go to the procedure for CPR in Section 4.9*
6. *Give one slow breath about every five seconds for about one-minute.*
7. *Recheck for a pulse and breathing.*
8. *Continue Step 6 as long as the person has a pulse, but is still not breathing.*

II. Heimlich Maneuver:

The Heimlich Maneuver consists of a series of abdominal thrusts, designed to expel food or other foreign objects from the airway of *conscious choking victims*. Choking is a common breathing emergency that occurs when the airway is partially or completely blocked. If a choking person is coughing forcefully, you should let them try to cough up the blocking object. If the victim continues to cough without expelling the object and is unable to speak, it means the airway has gone from partially blocked to completely obstructed. Immediately call for an ambulance and begin abdominal thrusts *(the Heimlich Maneuver)*.

The *Heimlich Maneuver* is performed on *"conscious victims"* as follows:

1. *Stand behind the victim and wrap both of your arms around the victim's waist.*

2. *Make a fist with one hand and place the thumb of that hand against the middle of the victim's abdomen (below the rib cage and above the navel). If the victim is pregnant or too big for you to reach around the abdomen, place your fist against the center of the victim's breastbone.*

3. *Grasp your fist with your other hand and give quick inward/upward thrusts into the abdomen, or quick thrusts into the chest, until the object is expelled.*

4. *If the object is not expelled, breathing may stop and unconsciousness may occur. If an unconscious person is not breathing, you must begin "Blocked Airway Rescue Breathing" immediately. Remember that it is more important to get air in than to get the object out.*

III. Blocked Airway Rescue Breathing:

Blocked Airway Rescue Breathing is performed on "unconscious victims" as follows:

1. *Place victim on his/her back and try to open the airway. Tilt head back gently with one hand on the forehead and two fingers of the other hand under the chin.*

2. *Pinch the victim's nose shut, and cover the victim's mouth with your mouth. Give two slow breaths into the victim until you see the chest rise. If the chest does not rise, re-tilt the person's head. If air still does not go in, abdominal thrusts or chest thrusts are needed. Abdominal thrusts should not be done to a pregnant woman.*

3. *Abdominal thrusts – Straddle one or both of the victim's legs and place the heel of one hand against the middle of the abdomen between the navel and the rib cage. Give up to five quick, upward thrusts towards the victim's head.*

4. *Chest thrusts - If the victim is pregnant, kneel to one side of the victim and place the heel of one hand in the center of the victim's breastbone and give up to five quick, downward thrusts.*

5. *Lift the jaw and tongue and sweep out the mouth with a finger.*

6. *Tilt head back and try to give two slow breaths into the victim until you see the chest rise.*

7. *Repeat breaths, thrusts, and sweeps until your breaths go in.*

8. *Check for pulse and give one slow breath every five seconds for about one minute.*

9. *Recheck pulse and breathing about every minute.*

4.9 Cardiac Arrest and CPR

When the heart stops beating, or beats so poorly that it does not circulate the blood, it is a life threatening condition called cardiac arrest. A person in cardiac arrest is unconscious, not breathing, and has no pulse. Causes of cardiac arrest include heart disease, drowning, choking, electric shock, and severe injury. Cardiac arrest can happen suddenly and unexpectedly, or may happen after giving the signals of a heart attack.

The most common signal of a heart attack is pain in the chest ranging from discomfort to an unbearable crushing sensation that does not go away. The pain may spread from the chest to the shoulder, arm, neck, jaw or back. Any chest pain that is severe, lasts longer than ten minutes, or persists even during rest requires immediate medical attention. Other signs of a heart attack include difficulty breathing, heavy perspiration, and pale or bluish skin.

When you suspect a person is having a heart attack, stop the victim from whatever activity he or she is doing. Have them sit down and rest. If the signs of a heart attack remain, call for an ambulance. Cardiac arrest may follow, so be prepared to give *Cardiopulmonary Resuscitation (CPR).*

CPR is a combination of *chest compressions* and *rescue breathing,* which provide a temporarily substitute for the failed heart and lungs of the victim. CPR dramatically increases the victim's chances for survival.

NOTE ➢ *Only perform CPR on "unconscious victims", who are not breathing and do not have a pulse.*

Use the following procedure to perform *Cardiopulmonary Resuscitation (CPR):*

1. *Make sure that an ambulance is on the way.*

2. *Follow the steps for Rescue Breathing (Section 4.8) until it is determined that the victim does not have a pulse.*

3. *Kneel to one side of the victim and find the correct hand position on the victims breastbone by finding the notch at the lower end of the breastbone. Place the heel of one hand above this notch and place the other hand directly on top of that, keeping your fingers off the chest.*

4. *Position your shoulders over your hands and compress the chest fifteen times in rhythm, pressing straight down about two inches, and allowing the chest to rise before the next compression.*

5. *Give the victim two slow breaths.*

6. *Do three more sets of fifteen compressions and two breaths.*

7. *Recheck for a pulse and breathing for about five seconds.*

8. *If there is no pulse, continue with four sets of fifteen compressions and two breaths, and recheck for a pulse and breathing. Continue compressions if there is no pulse. Continue with rescue breathing if there is a pulse but no breathing. Stop CPR when the victim has a pulse and is breathing.*

4.10 Heat Stress

Overexposure to heat and humidity can often result in heat-related stress/illness. Heat Stress is very common among HAZMAT and Fire Fighting Teams, due to the obvious environmental conditions as well as the type of protective clothing worn. Heat-related illness may be moderate to severe. If the signs of an oncoming heat stress are detected in the early stages, you can often prevent it.

The three types of heat stress/illness most commonly encountered include *heat cramps, heat exhaustion and heat stroke.*

I. Heat Cramps

Heat cramps are the least severe form of heat-related illness, and serve as a warning that the heat is getting too much for the body to withstand. Heat cramps are often painful muscle spasms in the legs and abdomen. They are often the first warning sign of a heat-related emergency.

II. Heat Exhaustion

Heat exhaustion is a more severe heat-related illness that often affects workers wearing heavy clothing in hot, humid environments (HAZMAT Teams and Fire Fighters). Physical signs of heat exhaustion include cool, moist, pale, and flushed skin. The victim may also feel a headache, nausea, dizziness, weakness or exhaustion.

III. Heat Stroke

Heat Stroke is the most severe heat-related illness and is a serious medical emergency. It is also the least common. Heat Stroke typically develops after heat exhaustion, if the symptoms of heat exhaustion are not treated. Heat stroke is a result of the body's cooling system shutting down when the body is overwhelmed by the heat. The signs of heat stroke include red, hot, dry skin; changes in consciousness; rapid, weak pulse; and rapid, shallow breathing. Immediately call for an ambulance if you suspect a victim has heat stroke.

To care for any of the prior *heat-related illnesses*, perform the following:

1. *Move victim to a cool, well ventilated place.*

2. *Give them cool water or a sports beverage to drink (if they are conscious). Give about 4 ounces (one glass) of liquid every 15 minutes. Do not give salt tablets or salt water.*

3. *Stretch any cramping muscles gently, and lightly massage the cramping area; or apply cool, wet towels to the victim.*

4. *When the illness is gone, normal activity may resume. Watch for further signs of heat-related illness, and keep the victim drinking fluids.*

5. *If the victim refuses water, vomits, or loses consciousness, it means the situation is getting worse. Call for an ambulance immediately. Place the victim on his or her side. Watch for signs of breathing problems.*

6. *Cool the body with ice packs or cold packs on the victims wrists, ankles, groin, armpits, and on sides of the neck.*

5.0 EVACUATION PLAN

Considering the type and quantity of hazardous substances on-site, it is unlikely that a total plant evacuation will be necessary. It is even less likely that an evacuation of the surrounding Stony Brook Campus and community will be required. However, if the need arises it is best to be prepared.

This section describes the signal for an evacuation, the primary assembly area, evacuation routes, facility access, and emergency shutdown procedures to be followed during an evacuation. The actual evacuation route and assembly area may vary, however, depending on the situation. Access to evacuation routes and exits shall be maintained free of equipment and debris to facilitate a timely and safe evacuation.

NOTE* ➢ *The related roles and responsibilities of the Emergency Response Team, Essential Equipment Operators, and Plant and Non-Plant Personnel are also described in Section 3 (Roles and Responsibilities).

5.1 Signal for an Evacuation

Facility evacuations will be coordinated by the Incident Commander. After the IC conducts an initial assessment of the incident, he/she will determine whether an evacuation is necessary.

The signal for a full or partial evacuation of the facility consists of a *special tone (whooping sound)* over the Public Address (PA) System followed by a general announcement. This tone is activated by pressing *Button #1* on the PA Control Console in the Control Room. Employees in remote locations of the COGEN will be notified via hand held radios.

The announcement will be performed by the IC, or designee, and consist of the following minimum information:

- *"Attention all Plant and Non-Plant personnel, this is not a drill! Attention all Plant and Non-Plant personnel, this is not a drill! Due to (state reason for evacuation) all personnel (or specific areas of the Plant) must immediately evacuate their work locations and proceed to the (designated assembly area)."*

The announcement will be repeated several times to ensure that all personnel on-site are properly informed. The announcement should also contain the appropriate route for arriving safely at the assembly area; be sure to consider the effects of chemical vapors, smoke inhalation and wind directions when determining this route. The IC must also determine whether to make a separate announcement to summon the ERT *(See Section 2.6)*.

5.2 Primary Assembly Area

The *primary assembly area* for an evacuation is the parking lot adjacent to the *Main Entrance (See the Site Map in Appendix 1)*. This location is subject to change by the IC, depending on the type of emergency, wind direction, and other considerations.

Once assembled, the *Head-Count Coordinator* will conduct roll-call to ensure that all Plant and non-Plant personnel have been accounted for, and quickly report back to the IC. All supervisory/management employees must assist in this process by accounting for the employees assigned to them that day. It is also important to account for the *non-plant personnel* on-site, including outside contractors, visitors, and so on. The *Visitor's Log Book* will prove useful in this process.

It is essential for all personnel to remain at the assembly area until the *all-clear* signal has been announced over the PA System. Remember, the sooner role call is completed the sooner you can determine *"who's missing"* and whether a *rescue* attempt is necessary.

5.3 Evacuation Routes and Facility Access

The *primary evacuation route* is identified in the Site Map *(See Appendix 1)*. This route consists of the main roadway from the parking lot to Gymnasium Road and across the campus via North Loop Road. The direction (left or right) to take on North Loop Road will be determined by the IC at the time of the emergency.

The *primary access point* for the COGEN is at the corner of Gymnasium Road and the main service road into the plant *(See Appendix 1)*. A *Gate-Keeper* will be assigned to this location to control the flow of traffic and prevent unauthorized access to and from the facility. The *North Gate Entrance* was selected as the back-up or alternate access point for the facility. The *designated access point* will be established by the IC at the onset of an emergency, and all other entrances will be secured. The IC will have to consider the type of emergency, location of the incident, wind direction and various other factors when selecting this access point.

5.4 Emergency Shutdown

In the event of a large fire, chemical release or other emergency triggering a total evacuation of the facility, it may be necessary to conduct an *emergency shutdown* of the COGEN. An emergency shutdown involves the rapid isolation of critical power plant equipment, prior to exiting the facility. In addition to protecting the equipment from significant damage or self-destruction, emergency shutdowns reduce the threat to human health and the environment. This activity involves securing fuel/chemical sources, isolating electrical feeds and securing other equipment capable of adversely impacting the incident.

Essential Equipment Operators consist of those "Watch Engineers" and "Assistant Watch Engineers" assigned the vital role of operating or isolating critical plant equipment. These individuals receive extensive classroom and hands-on training in the operation and emergency shutdown of plant equipment.

In addition to securing the primary plant equipment--gas turbines, steam boilers, gas compressors, fuel oil transfer pumps, natural gas mains, etc.--it may be necessary to isolate ancillary equipment as well. For example, if the incident involves a *fire* it may be prudent to secure all ventilation systems. If the incident involves an *airbome chemical release* it may be necessary to secure specific chemical isolation valves. *Essential Equipment Operators* must work closely with the IC to ensure that the appropriate equipment is isolated as soon as possible.

Under extreme circumstances, an emergency shutdown of the cogeneration plant can be performed within 5 to 10 minutes. Two SCBAs are mounted in the Control Room to provide life support, if necessary, during an emergency shutdown.

6.0 SEARCH AND RESCUE

6.1 Role of the ERT

The role of the ERT in a *search and rescue operation* is to quickly *locate and retrieve* the victim, and perform emergency *first-aid/CPR*. All *search and rescues* must be performed, however, with the highest regard for safety of the *emergency responders*.

Our first impulse when a friend or fellow worker is injured and in need of assistance, is to rush-in and carry them to safety. This knee-jerk reaction, however, can be a fatal one. Far too many lives are lost each year when the *"rescuers"* become *"victims"*, because they respond to an incident without considering the hazards or taking appropriate precautions.

> ***NOTE*** ➤ *Plant and Non-Plant personnel who witness an injury or encounter a victim in need of rescue must immediately contact the Control Room via plant radios, telephones, fire alarm pull-boxes or other means of communication.*

The IC will either directly supervise the ERT throughout the search and rescue operation, or assign a *Search and Rescue Leader (See Section 3.5)*. The IC must use sound-judgement in ensuring that the ERT performs only those *search and rescue* operations for which they are trained. For example, the ERT is qualified to perform most *"HAZMAT"* and *"confined space"* rescues, but is not qualified to perform *"high angle"* and certain *"fire-related"* rescues.

Search and rescue operations are, therefore, unique in that they may call upon all three training credentials of the ERT: *1) HAZMAT Training, 2) First Aid/CPR Training, and 3) Fire Fighting Training.*

> ***NOTE*** ➤ *If the search and rescue requires the use of turn out gear and an SCBA, or involves entering a* ***structural fire*** *(advanced interior/exterior fires), then rescuers must be trained in structural fire fighting (See Section 7).*

6.2 HAZMAT Rescues

Hazardous material (HAZMAT) rescues involve entering an environment containing oil/chemical spills, airborne chemical releases, or other hazards to locate and retrieve a victim. Only those members of the ERT with *HAZMAT Technician Training (24-Hour OSHA HAZWOPER Course)* are qualified to perform this type of *search and rescue*.

For example, assume that the Sulfuric Acid tank is overfilled during a chemical delivery and an employee becomes overwhelmed by fumes. The rescue operation will require *HAZMAT Technicians* to don chemical resistant suits and an SCBA to retrieve the victim, as well as personnel trained to resuscitate the victim and provide necessary first aid.

6.3 Confined Space Rescues

A *confined space* may present an array of lethal hazards including oxygen deficient atmospheres, chemically toxic atmospheres, explosive atmospheres, and other hazards. A confined space *entry or rescue*, therefore, involves specialized training in the use of *monitoring equipment, self contained breathing apparatus and other personal protective equipment (PPE)*, and must be approached with extreme caution.

A *confined space* is defined by OSHA as a space that:

1. Is large enough and so configured that an employee can bodily enter and perform assigned work; and

2. Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and

3. Is not designed for continuous employee occupancy.

4. SBO personnel received a training course in *confined space entry,* and are qualified to monitor for oxygen deficient/toxic atmospheres. Various members of the ERT are also trained in the use of SCBAs and other PPE, via the *HAZMAT Technician Course*. The ERT is therefore qualified to perform some *confined space rescues*.

The ERT is not, however, qualified to retrieve a victim from a confined space using ropes and special rigging *(See Section 6.5),* or a confined space containing advanced structural fires or smoke-filled atmospheres *(See Section 6.4)*. It is therefore left to the discretion of the IC to determine whether the confined space rescue can be safely performed by the ERT, or whether outside assistance is necessary (such as the SUNY Fire/Police/Rescue).

6.4 Fire Related Rescues

Fire-related rescues involve the rescue of victims overcome by smoke inhalation, badly burned or incapacitated by other fire-related injuries. However, since the majority of the *ERT (See Section 7)* is trained in *incipient* fire fighting only, their response capabilities are rather limited.

For example, let's assume an employee using a cutting torch to remove pipe supports is struck unconscious when the pipe springs free of the bracket. As the victim falls to the ground the torch ignites some oily rags in the vicinity. If the ERT is able to approach the victim in the early stages of the fire without the need for *SCBAs* or *turnout gear*, then *incipient trained* fire fighters can perform the rescue. If the fire spreads to the structure and begins to generate excessive smoke and heat, then the rescue would require *structural/advanced* fire fighting skills.

NOTE* ➢ *If the search and rescue requires the use of turn out gear and an SCBA, or involves entering a* **structural fire** *(advanced interior/exterior fires), then rescuers must be trained in structural fire fighting (See Section 7).

6.5 High Angle Rescue

High Angle Rescues involve ropes and rigging to retrieve victims, or the use of repelling/belaying skills. Rescues of this nature are beyond the qualifications of the ERT, and require assistance from outside agencies. The ERT may be capable, however, of entering the environment to immobilize the victim, administer first aid and await assistance from the SUNY Fire/Rescue Squad.

An exception to this rule involves the use of a tripod. SBO personnel have been trained in performing *simple extractions using a tripod.* If the victim can be retrieved using this equipment, the rescue can be performed by the ERT.

7.0 FIRE FIGHTING

7.1 Role of the ERT

The role of the ERT is to fight *incipient fires: small fires in the early stages.* The ERT is not qualified to fight *structural fires (See Section 7.3)*. The person directly in-charge of the ERT is the *Fire Fighting Leader (Section 3.6)* or the IC, depending on the circumstances.

The ERT is also expected to take all reasonable measures to ensure that the fire does not spread off-site, re-occur, or spread to other locations of the Plant. In some situations, members of the ERT may be asked to assist the local fire department as *Escorts (See Section 3.8)*. Escorts are used to guide outside responders, who are unfamiliar with the layout of the facility, to the scene of the incident.

> ***NOTE*** ➤ *Any Plant employee who encounters a fire is expected to activate the closest fire alarm pull box, prior to attempting to extinguish the fire. If a fire alarm pull box is unavailable, contact the Control Room via the closest PA or telephone. Only those employees with "incipient" fire fighting training are qualified to extinguish fires.*

7.2 Incipient Fire Fighting

Incipient fire fighting involves the use of basic fire fighting equipment, such as fire extinguishers and small hose systems, from ***outside the "hot zone"***. An *incipient fire* is defined as *"a fire in the initial or beginning stage which can be controlled or extinguished by portable fire extinguishers, Class II standpipe (1½" hose system) or small hose systems (system of hoses from □ " to 1"), without the need the need for protective clothing or breathing apparatus".*

There are *three* levels of Incipient Fire Fighting Training. SBO's ERT is currently trained to *Incipient Level One*. Refrêsher training is provided on an annual basis. These three training levels are as follows:

1. **Incipient I** - Involves offensive and defensive fire suppression duties using "portable fire extinguishers", only!

2. **Incipient II** - Involves offensive and defensive fire suppression duties using "portable fire extinguishers" and "low-volume hand-lines".

3. **Incipient III** - Involves the same capabilities as Incipient II, plus the ability to perform defensive operations to control advanced fires using "high volume

hand-lines and/or portable and fixed master stream devices".

NOTE ➢ As previously stated, all levels of "incipient fire fighting" are performed from ***outside the "hot zone"!***

Incipient fire fighting is often referred to as *"Fight and Flight"* fire fighting, because it involves a brief opportunity to *"fight"* the fire in its early stages, followed by *"flight"* or evacuation if the fire progresses to *advanced stages.*

For example, if a trash can catches fire during a welding activity and can be quickly extinguished with portable fire extinguishers, it would qualify as an *incipient fire*. If the fire cannot be controlled/extinguished with basic fire fighting equipment and begins to spread throughout the room creating excessive heat and smoke, then it *no longer* qualifies as an *incipient fire.* Combating a fire at this stage requires the use of protective clothing, breathing apparatus and special fire-fighting skills. *Incipient Level I Fire Fighters* would be forced to evacuate the area and await assistance from the local fire department. *Incipient Level II and III Fire Fighters* could, however, use hose lines to suppress the fire and cool adjacent storage tanks/equipment in a "defensive mode" from *outside the hot zone.*

NOTE ➢ If the fire progresses beyond the "incipient stage", SBO must evacuate the area and call the SUNY Fire Department (Appendix 8) for assistance.

7.3 Structural Fire Fighting (Advanced Interior/Exterior)

Structural fire fighting involves the use of high volume hose lines (2 " diameter), portable and fixed master stream devices, *turnout gear* and *SCBA* to combat *advanced interior/exterior fires. Structural* fire fighting, therefore, takes place from **within the "hot-zone"** and involves fires beyond the *incipient stage*.

The point at which an *"incipient fire"* becomes a *"structural fire"* is often debated, but in most instances you can rely on the following *"rules of thumb"*:

1. If the fire requires the use of *turn-out gear* and an *SCBA*, it is a *structural fire.*

2. If the incident involves entry into a *smoke-filled* room, an atmosphere with *excessive heat* or entry into a burning building, it is a *structural fire.*

NOTE ➢ The ERT is not trained to fight advanced interior/exterior fires. If a fire of this magnitude occurs on-site, attempt to secure the area and immediately notify the SUNY Fire Department (Appendix 8). Furthermore, SBO personnel serving as an ***"Escort"*** *to the fire department* ***are not*** *permitted to enter burning buildings or other* structural/advanced fires.

8.0 HAZMAT RELEASES

8.1 Role of the ERT

The role of the ERT in a hazardous material (HAZMAT) *spill or airborne release* is to *secure, contain and clean-up* the incident as quickly and safely as possible. The only members of the ERT qualified to perform these tasks are the *Hazardous Material (HAZMAT) Technicians*. The person directly in-charge of the *ERT* will be the *HAZMAT Leader (Section 3.7)* or the *IC*, depending on the circumstances.

NOTE ➢ *Keep in mind that detailed "roles and responsibilities" and "job duties" are available for all members of the ERT in Section 3 and Appendix 4, respectively.*

HAZMAT Technicians receive 24-hours of prerequisite training from certified HAZMAT professionals *(24-Hour OSHA HAZWOPER Course)*. The course consists of a combination of *classroom and hands-on* training in the areas of toxicology, chemical hazards, respiratory and personal protective equipment (PPE), monitoring equipment, first aid, site control, and more. Any ERT members who receive this training are considered qualified *Hazardous Materials Technicians*, in accordance with 29 CFR 1910.120 (q)(6)(iii).

HAZMAT Technicians also receive approximately 8-hours of emergency response refresher training on an annual basis. SBO conducts this training on the premises and simulates site-specific emergency scenarios, including oil or chemical releases.

8.2 Assess the Release

The first order of business in any emergency, including HAZMAT releases, is to assess the hazards--direct and indirect-- to human health and the environment. This assessment is performed to determine the need for outside *medical assistance*, to conduct a *search and rescue (Section 6)*, or to perform an *evacuation (Section 5)*. It will also assist in determining whether the incident can be addressed *in-house* (SBO's ERT) or whether *outside* response agencies (SUNY Fire/Police) and cleanup contractors are needed.

The assessment is performed by the IC and consists of gathering the following information for notification and reporting purposes:

1. A description of the incident,
2. Type and quantity of discharged substance,
3. Wind speed and direction when appropriate,
4. Cause of the incident (if known), and

5. Steps being taken to contain, clean up, and remove the discharged substance.

8.3 Mobilize the ERT and Assign Job Positions

Upon determining the need for the ERT, during the *initial assessment,* the IC will now mobilize the team. This is accomplished using the *emergency announcement* identified in *"Summoning the ERT (Section 2.6).*

Once the ERT has assembled, the IC will establish an Emergency Response Organization using *Appendix 2,* and assign Job Duties using *Appendix 3 and 4.* Remaining ERT members will be assigned to support the various supervisory positions, depending on their abilities and training credentials.

For example, a small to medium size sodium hydroxide (caustic) spill to the soil may only require an *Incident Commander, Agency Coordinator and HAZMAT Leader.* Larger releases involving the need for outside assistance may require the addition of a *News Media Coordinator, Escorts and a Gatekeeper.* Lastly, if the incident is further compounded to include a large fire, nearly all positions within the Emergency Response Organization could be activated.

8.4 Secure the Area & Establish Hot Zones

Once the ERT is established, the *HAZMAT Leader* will provide guidance in *securing the area* and *establishing the hot zone.* This effort involves roping-off, demarcating and isolating the immediate area of the release to prevent entry of unauthorized personnel. It also involves ensuring that the remaining personnel are kept at safe distances from the release and are not subject to airborne chemical plumes and other hazards. The effect of wind direction is an obvious consideration in this effort. Larger incidents may also require securing the entire facility through the use of *Gate-Keepers.*

This effort also involves establishing the *"hot zone".* The *hot zone* is the vicinity presenting immediate hazards to human health and safety. Hot zones can only be entered by emergency personnel with the appropriate PPE, such as SCBAs and oil/chemical resistant suits.

The most accurate way to establish the hot zone is through the use of *monitoring equipment.* However, in the absence of this equipment you will have to rely on guidance from the *Hot Zone Table (Appendix 6), Hazard Profiles (Appendix 5), Material Safety Data Sheets (MSDS)* and your good judgement.

8.5 Donning PPE & Establishing DECON

Prior to entering a *hot zone* it is essential to don the appropriate *personal protective equipment (PPE)* and establish a *decontamination (DECON) area*. The *Hazard Profiles (Appendix 5) and MSDSs* will be instrumental in selecting PPE. Guidance will be provided by the *HAZMAT Leader* and *Incident Commander.*

The HAZMAT Leader should record the *hot zone entry/exit times* of each responder. This is to ensure that the responders are rotated on an equal basis to avoid fatigue. Common sources of fatigue among HAZMAT technicians include heat stress, as described in *Plant Injuries and First Aid (See Section 4.10)*. The chemical resistant suits bottle-up the body heat and restrict normal perspiration.

The DECON must also be set up in advance of hot zone entry, in preparation for quick returns of injured/contaminated personnel. Since the DECON team is also fully suited up with PPE, they provide a means of emergency back-up for the HAZMAT responders within the hot zone. SBO is equipped with DECON pools, spray bottles, scrub brushes and other DECON equipment.

8.6 Isolation and Clean-Up

Upon entering the hot zone, the first course of action will be *securing the release*; unless, of course, this has already been accomplished from outside the hot zone. Securing the release involves closing blocking valves, inserting tank plugs, or other means to isolate the source.

The ERT will then make every attempt to *contain* the release and prevent contact with *reactive/incompatible materials* or *Environmentally Sensitive Areas* (ESAs). *Containment measures* include blocking storm drains, deploying absorbent booms, building containment berms, and so on. The HAZMAT Leader should also consult *SBO's Spill Prevention Plan (SPCC Plan/CBS Spill Prevention Report)* for additional information regarding oil and chemical spills.

After the release has been contained, the ERT must direct their attention toward the *clean-up*. If the release involves acid or caustic spills it may first be prudent to neutralize the spill. Then transfer the waste materials into 55-gallon drums, tank trucks, dumpsters, or other suitable containers, via transfer pumps or vacuum tankers.

Lastly, ensure that containers are appropriately labeled and remove/isolate the containers in a safe location. Arrange for disposal of any recovered wastes, contaminated soil, groundwater, surface water, or other material resulting from the release.

NOTE ➢ *Ensure that all emergency equipment and systems are cleaned, inspected, recharged, reactivated, and ready for next time.*

9.0 TERRORIST INCIDENTS

9.1 Introduction

The Federal Emergency Management Agency (FEMA) defines *Terrorism* as *"the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom".* Terrorists often use threats to create fear among the public, to try to convince citizens that their government is powerless to prevent terrorism, and to get immediate publicity for their causes.

The Federal Bureau of Investigation (FBI) categorizes terrorism in the United States as one of two types--*domestic terrorism* or *international terrorism.* Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States.

Most terrorist incidents in the United States have involved small extremist groups using terrorism to achieve a designated objective. Local, State and Federal law enforcement officials monitor suspected terrorist groups and try to prevent or protect against a suspected attack. Additionally, the U.S. government works with other countries to limit the sources of support for terrorism.

Examples of terrorism range from mere threats to actual bombings, kidnappings, highjackings and biological/chemical attacks. The effects of terrorism can vary significantly from loss of life and injuries to property damage and disruptions in services such as electricity, water supply, public transportation and communications.

NOTE ➢ *In many cases, the facts and content of Section 9 were reproduced, without modification, from the FEMA Web Site and literature. Since this is public information, it can be reproduced without violating copyright laws.*

9.2 Preparing for Terrorist Incidents

To prevent or prepare for terrorist incidents you must understand the nature of terrorists. Terrorists often choose targets that offer little danger to themselves and areas with relatively easy public access. Foreign terrorists look for visible targets where they can avoid detection before or after an attack such as international airports, large cities, major international events and high-profile landmarks. As you can see, college campuses and power generating facilities are perfect candidates

for terrorist attacks. *Site Security* is one of the most effective means of preventing or reducing the risk of a terrorist incident. SBO should make every effort to restrict the flow of outside personnel and equipment in and out of the COGEN.
Preparing to deal with a terrorist incident involves many of the same techniques used to prepare for other crises. FEMA recommends the following precautionary measures:

- Be alert and aware of the surrounding area. The very nature of terrorism suggests that there may be little or no warning.

- Control/Restrict the flow of traffic to and from the facility and prohibit the entry of unauthorized personnel.

- Review emergency evacuation procedures (See Section 5) in advance and learn where emergency exits are located.

- Notice your immediate surroundings. Be aware of heavy or breakable objects that could move, fall or break in an explosion.

- Keep fire extinguishers in working order and know where they're located and how to use them.

- Obtain and maintain first aid/CPR training for as many personnel as possible.

- Maintain an adequate supply of the following emergency response supplies: battery-operated radios and flashlights, extra batteries, first aid kits, hard hats, fluorescent caution tape, and emergency response procedures/guides.

9.3 Bomb Threats and Explosions

Bombings are the most frequently used terrorist method in the United States, and are typically targeted toward large government or public facilities, transportation facilities, utilities and other public services. Past terrorist bombings in this country include bombings of the World Trade Center in New York City, the United States Capitol Building in Washington, D.C. and Mobil Oil corporate headquarters in New York City. For example, the bombing of the World Trade Center occurred on February 29, 1993, and resulted in the deaths of five people and thousands of injuries. The bomb left a crater 200 by 100 feet wide and five stories deep. The World Trade Center is the second largest building in the world and houses 100,000 workers and visitors each day.

9.3.1 Bomb Threats

If you receive a bomb threat be sure to consider the following:

- Attempt to get as much information from the caller as possible.
- Keep the caller on the line as long as possible and record everything that is said.
- Immediately contact the Control Room to perform a facility evacuation (See Section 5) and the Campus Department of Public Safety (Dial 333). The Public Safety Supervisor will assume command and initiate search of the building, upon arrival.
- If any suspicious objects or packages are found, avoid contact, clear the area around the suspicious package, and immediately notify Public Safety. Public Safety will most likely contact the Suffolk County Bomb Squad for assistance.
- In evacuating a building, avoid standing in front of windows or other potentially hazardous areas. Do not restrict sidewalk or streets to be used by emergency officials.

9.3.2 Responding to a Building Explosion

If an actual explosion occurs, evacuate all personnel as quickly and calmly as possible and gather in the *designated assembly area* for role-call and accountability (See Section 5). If items are falling off bookshelves or from the ceiling, get under a sturdy table or desk. If fire or smoke is encountered during the evacuation, consider the following precautions:

- Stay low to the floor and exit the building as quickly as possible.
- Cover nose and mouth with a wet cloth.
- When approaching a closed door, use the palm of your hand and forearm to feel the lower, middle and upper parts of the door. If it is not hot, brace yourself against the door and open it slowly. If it is hot to the touch, do not open the door--seek an alternate escape route.
- Heavy smoke and poisonous gases collect first along the ceiling. Stay below the smoke at all times.

9.4 Biological And Chemical Attacks

Biological and chemical weapons have been used primarily to terrorize unprotected civilian populations, and not as a weapon of war. This is because of fear of retaliation and the likelihood that the agent would contaminate the battlefield for long periods of time. The Persian Gulf War in 1991 and other confrontations in the Middle East were causes for concern in the United States regarding the possibility of chemical or biological warfare. While no incidents occurred, there remains a concern that such weapons could be involved in an accident or be used by terrorists.

9.4.1 Chemical Agents

Chemical agents are poisonous gases, liquids or solids that can kill or incapacitate people, destroy livestock or ravage crops. Some chemical agents are odorless and tasteless and are difficult to detect. They can have an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours to several days). Most chemical agents cause serious injuries or death. Severity of injuries depends on the type and amount of the chemical agent used, and the duration of exposure.

If SBO is of the belief that a chemical attack has occurred or a chemical threat is made, immediately notify the Department of Public Safety (Dial 333) and request assistance. You may be instructed to seek shelter within the COGEN and seal the premises or you may be instructed to evacuate immediately, depending upon a number of circumstances. Since exposure to chemical agents can be fatal, do not attempt to rescue or assist victims who have been exposed. You will most likely become a victim yourself. There is no assistance that untrained personnel can offer that would likely be of any value to victims of chemical agent attacks.

NOTE ➢ *SBO personnel are not trained or qualified to respond to incidents involving chemical agents.*

9.4.2 Biological Agents

Biological agents are infectious organisms or toxins used to produce illness or death in people, livestock and crops. Biological agents can be dispersed as aerosols or airborne particles. Terrorists may use biological agents to contaminate food or water because they are extremely difficult to detect.

Because biological agents cannot necessarily be detected and may take time to grow and cause disease, it is almost impossible to know that a biological attack has occurred. If SBO is of the belief that a biological attack has occurred or has been threatened with the release of a biological agent, immediately notify the Department of Public Safety (Dial 333) and request assistance. Similar to chemical agent attacks, SBO would most likely be instructed to either seek shelter where you are and seal the premises or evacuate immediately.

A person affected by a biological agent requires the immediate attention of professional medical personnel. Some agents are contagious, and victims may need to be quarantined. Also, some medical facilities may not receive victims for fear of contaminating the hospital population.

NOTE ➢ *SBO personnel are not trained or qualified to respond to incidents involving biological agents.*

10.0 NOTIFICATION PROCESS

The last activity an emergency responder wants to deal with at the onset of a HAZMAT release or other emergency is to waste valuable time searching through complex regulations and regulatory manuals to locate the *appropriate notifications*. *Section 10 and the Appendices 7 through 10* are intended to streamline this *notification process* by placing the appropriate local, state, and federal notifications at your fingertips. This is accomplished with a series of user-friendly *decision trees*, located in *Appendix 7*, that identify *"who"* to call and *"when"* to call them. Each *decision tree* addresses a specific type of incident.

The *decision trees* are used in conjunction with the following three *Appendices*, also described in this section:

- *Appendix 8 - Emergency Telephone Directory,*
- *Appendix 9 - Reportable Quantity (RQ) Table, and*
- *Appendix 10 - Incident Descriptions Forms.*

10.1 Required and Discretionary Notifications

There are two types of notifications in this guide:

1. *Required Notifications* - These notifications are *mandatory (required by law)* and involve contacting regulatory agencies like the National Response Center (NRC), New York State Department of Environmental Conservation (NYSDEC), and Suffolk County. The decision trees in *Appendix 7* identify the appropriate *"required notifications"* for various incidents.

2. *Discretionary Notifications* - *Discretionary notifications* are not required by law, but are rather performed to *summon assistance* or *inform in-house personnel.* These notifications include emergency spill contractors like Miller Environmental and Trade Winds Environmental; local response agencies like the SUNY Fire/Police or Stony Brook Medical Center; or management personnel from the cogeneration plant and Corporate Office. Various *discretionary notifications* are contained in *Appendix 8 (Emergency Telephone Directory).*

10.2 Incidents that Trigger "Required" Notifications

Required notifications are most commonly triggered by on-site *fires, explosions, or releases* involving petroleum or hazardous substances. Work related injuries involving *in-patient hospitalization or death* also trigger *required notifications.*

The primary role of the *decision trees in Appendix 7* is to identify the *"required notifications"* for the following most commonly encountered emergencies:

1. *Plant Injuries/Accidents*
2. *Fires and Explosions*
3. *Petroleum Spills*
4. *Chemical Spills*
5. *Airborne Releases*
6. *Hazardous Waste Incidents*

10.3 Notifying the Appropriate Regulatory Agencies

Depending on the type of incident, you may be required to notify as few as *one* and as many as *five* different agencies. These agencies appear throughout the *"Required Agency Notifications"* section of the decision trees:

1. *National Response Center (NRC)*
2. *Occupational Safety and Health Administration (OSHA)*
3. *New York State Department of Environmental Conservation (NYSDEC)*
4. *Suffolk County Fire, Rescue and Emergency Services (FRES)*
5. *Suffolk County Department of Health Services (SCDHS)*

1. *National Response Center (NRC)*

The NRC is the national communication headquarters, and single point of contact, for all incidents involving pollution reporting in the United States. Since the NRC is a *federal* regulatory agency, most *federal* statutes and regulations associated with spill prevention and response designate the NRC as the first agency to be notified. The NRC is manned and operated by *United States Coast Guard (USCG)* personnel on a 24-hour basis, and is located at the USCG Headquarters in Washington, DC. The *NRC* should not be confused with the *Nuclear Regulatory Commission*, for the purposes of this manual.

The NRC must be notified according to the following criteria:

- *Immediately* following the release of a *federal hazardous substance* to the environment (land, water, air) in excess of its *reportable quantity (RQ)*.

NOTE ☛ The list of hazardous substances and associated RQs for this facility are located in Appendix 9.

- *Immediately* following the release of a *petroleum product* to waters of the United States--rivers, oceans, wetlands--or adjoining shorelines, *in any quantity*.

NOTE ☛ You are therefore not required to notify the NRC of petroleum spills to the "land" (excluding shorelines), only.

- *Immediately* following a *hazardous waste related* release, fire or explosion that could threaten human health or the environment outside the facility.

The NRC is not typically notified of *air* or *water permit* violations, unless the incident is related to the release of *petroleum* or a *hazardous substance* in excess of an established *reportable quantity (RQ)*.

Once the NRC has been notified, they will in-turn contact other appropriate agencies, including the *Environmental Protection Agency (EPA)*, the local *United States Coast Guard (USCG)* office, the regional health commission, state environmental agencies and other relevant organizations. The determining factors for contacting these agencies are based on the severity of the incident; the water bodies, wildlife, habitats and other environmentally sensitive areas affected by the incident; and the states, counties, and municipalities requiring evacuation or other precautionary measures.

Releases are reported directly to the NRC Headquarters using the following 24-Hour Emergency Hotline:

- ***NRC Hotline (800-424-8802)***

2. *Occupational Safety and Health Administration (OSHA)*

The Occupational Safety and Health Administration (OSHA) is the single point of contact for all incidents involving accidents and deaths in the workplace. OSHA was created in 1970, "to assure safe and healthful working conditions for the men and women of our nation". OSHA regulations are therefore designed to protect workers from exposure to workplace hazards.

OSHA and its 25 State partners have had substantial success. Since 1970, the overall workplace death-rate has been cut in half. Overall injury and illness rates have declined in the industries where OSHA has concentrated its attention, yet have remained unchanged or have actually increased in the industries where OSHA has had less presence.

OSHA must be notified according to the following criteria:

- *Within 8 hours* of a work related incident resulting in an employee *death*.
- *Within 8 hours* of a work related incident resulting in the *in-patient hospitalization* of three or more employees.

Although the regional OSHA Office (Region 2) is located in New York City, accidents are reported directly to the OSHA Headquarters in Washington, D.C. using the following 24-Hour Emergency Hotline:

- ***OSHA Hotline (800-321-OSHA)***

3. *New York State Department of Environmental Conservation (NYSDEC)*

The *New York State Department of Environmental Conservation (NYSDEC)* is a government environmental agency manned and operated by civilian personnel. The NYSDEC Headquarters is located in Albany, New York. Similar to the *federal* role of the NRC, NYSDEC is the single point of contact for *state-related* environmental incidents. NYSDEC is also responsible for developing and enforcing environmental regulations in the State of New York.

NYSDEC must be notified according to the following criteria:

- *Within 2-hours* of the release of a *hazardous substance* to the environment (land, water, air), in excess of its *reportable quantity (RQ)*.

NOTE ☛ The list of hazardous substances and associated RQs for this facility are located in Appendix 9.

- *Within 2-hours* of the release of a *petroleum product* to the lands or waters, *in any quantity*.

- *Immediately* following a *hazardous waste related* release, fire or explosion that could threaten human health or the environment outside the facility.

The notification criteria for NYSDEC is identical to that of the NRC, with the exception of petroleum products. NYSDEC requires notification of petroleum spills to the *land or water*, whereas the NRC requires notification of spills to the *water*, only.

NYSDEC operates the following 24-Hour Emergency Hotline for reporting environmental incidents:

- ***NYSDEC Hotline (800-457-7362)***

4. *Suffolk County Fire, Rescue and Emergency Services (FRES)*

The Suffolk County Department of Fire, Rescue and Emergency Services (FRES) is a *local* agency responsible for managing emergency incidents throughout the Suffolk County area. This organization is also the designated Local Emergency Planning Committee (LEPC) for SBO. The FRES Headquarters is located in Yaphank, New York and is operated by civilian personnel. The primary mission of FRES is to protect the health and safety of the general public. In addition to their fire, rescue and emergency response capabilities, FRES will also provide assistance in orchestrating large-scale evacuations. FRES will coordinate these efforts with the local police/fire departments, regional health commissions, emergency planning committees, highway and bridge authorities, and so on.

The criteria for notifying FRES is very straight-forward: *FRES must be notified whenever a hazardous substance is released to the environment in excess of an established reportable quantity.*

The 24-Hour Emergency Hotline for FRES is as follows:

- ***FRES Hotline (631-924-5888)***

5. *Suffolk County Department of Health Services (SCDHS)*

The Suffolk County Department of Health Services (SCDHS) is a local agency responsible various environmental, health and safety issues. The agency is manned and operated by civilian personnel, and their headquarters is located in Hauppauge, New York. SCDHS is responsible for developing and enforcing environmental regulations for the Suffolk County area.

The SCDHS must be notified *within 2-hours* of the release of a *toxic or hazardous material* to the lands or waters, *regardless of quantity*. Their definition of *toxic or hazardous materials* includes petroleum products, acids and bases with pH values less than 4 or greater than 10, and any state or federal *hazardous substances.*

The Emergency Phone Numbers for SCDHS is as follows:

- ***Normal Working Hours (631-854-2537)***

10.4 Using the Decision Trees

The *Decision Trees* in *Appendix 7* provide assistance in identifying *"who"* to call and *"when"* to call them. Although primarily designed to address the *"required agency notifications"*, the *decision trees* guide the user to *"discretionary notifications"* as well. They also provide valuable reminders about mobilizing the ERT, contacting clean-up contractors, confirming reportable quantities (RQs) and documenting the details of the incident.

It is important to mention that the notifications within the *decision trees* are only intended to address the initial stages of an incident *(within the first 24-hours)*. They are not designed to address *verbal* or *written* notification requirements beyond this time-period.

The decision trees consist of the following four components:

1. *Incident Description*

   The *Incident Description* is the first component of the decision tree and appears immediately after the title. The *Incident Description* is intended to provide a detailed explanation of the exact scenario for which the decision tree applies. This information is intended to assist you in selecting the appropriate decision tree for the incident.

2. *Preliminary Actions*

   The second component of the decision trees, *Preliminary Actions,* identifies those activities you *must* consider *prior* to contacting the regulatory authorities. For example, the *Preliminary Actions* for a chemical spill would appear as follows:

1. *Dial 333 for emergency assistance--SUNY fire/police/ambulance--if necessary.*
2. *Mobilize ERT and respond to the incident (Appendix 2 through 6).*
3. *Call cleanup contractor, if necessary (Appendix 8).*
4. *Check the RQ Table to obtain the reportable quantity (Appendix 9).*
5. *Summarize the Incident in Part I of the Incident Description Form (Appendix 10).*
6. *Perform the Required Agency Notifications in the following decision tree.*

Keep in mind that the *"protection of human health and safety"* takes priority over all other demands. That's why the first *Preliminary Action* directs the user to *"Dial 333 for emergency assistance"*.

3. *Required Agency Notifications*

The third component of the decision trees, *Required Agency Notifications*, is the *"heart"* of the decision tree. This component contains the agency notifications required by law.

Whether a spill is reportable to one or more of these agencies depends not only on the type and quantity of the spill, but other aspects as well. For example; Has the spill reached the soil? Has the spill reached water? Has the spill reached soil and water? These questions must be answered to determine which agencies, if any, must be notified.

The question boxes in this component are designed to help the user more narrowly define the incident. Depending on your answer, you will be led to either another question box or to a notification box. The decision trees are designed to direct the user to one notification box only; this box will contain all the required notifications for the incident.

4. *Follow-Up Actions*

The last component of the decision tree, *Follow-Up Actions*, is essential to satisfying the reporting requirements of the incident. This component of response is most commonly forgotten, or overlooked, by emergency responders.

Follow-Up Actions consist of the following:

1. *Document All Notifications in Part II of the Incident Description Form.*
2. *Contact the appropriate Company and SUNY personnel (Appendix 8).*
3. *Fully Describe the Incident in Part III of the Incident Description Form.*
4. *Document the incident in the Control Room Logbook.*

10.5 Completing the Incident Description Form

Documentation is an *essential* component of the notification process. Each time a local, state, or federal agency is contacted, the conversation must be documented in an *Incident Description Form (IDF).* The *IDF* is a source of record for all activities and events associated with an incident, from start-to-finish.

The *IDF* is designed to accomplish many objectives. For one, it prompts you to record key facts and information needed by *regulatory agencies*, prior to making the actual notification. Secondly, it provides space for you to document critical information obtained from the regulatory agencies during and after the notifications. Lastly, it provides space for documenting the details of the incident including follow-up response and clean-up measures. *Sample IDFs* are provided at the end of this section, and a blank copy of the *IDF* is contained in *Appendix 10.*

In addition to serving as a legal document of the chain-of-events during an incident, the *IDF* is also essential to the company personnel responsible for preparing written follow-up reports.

The Incident Description Form consists of following three components:

1. *Part I: Incident Summary*

   Part I, the *Incident Summary,* is designed to assist you in summarizing vital facts about the incident, prior to contacting the appropriate agencies. This part contains the essential information agencies will be asking for during your conversation.

   Some of the information recorded in Part I includes the following:

   - *The type and estimated quantity of the spill,*
   - *The source and location of the incident,*
   - *The cause of the incident if this can be ascertained prior to notification,*
   - *The date and time the incident began,*
   - *The date and time the incident was first discovered,*
   - *The date and time the incident ended, and*
   - *The areas affected by the incident (land, water, air).*

2. *Part II: Agency Notification*

   Part II provides space to document each notification you are required to perform. This documentation consists of:

   - *The agency you notified,*
   - *The date and time you notified the agency,*

- *The name or operator ID number of the individuals you spoke with, and*
- *The "case" or "report" number assigned by the appropriate agencies.*

A separate line is provided for each agency you may be required to notify. Part II also provides space for relevant questions or comments an agency may make. Be certain to identify the agency when you enter this information.

3. *Part III: Full Incident Description*

Part III of the IDF is primarily designed for documenting the details of the incident, including the response and cleanup activities. Where Part I is designed for a quick summary of the vital points of an incident so that you can perform the agency notifications in Part II, Part III is designed for a more extensive description of the incident. A full description of what happened, what caused it, the progress of the cleanup effort, the repair of any equipment involved in the incident, and what was done to mitigate the incident; that is what Part III is all about.

The next several pages contain two properly completed *Incident Description Forms (IDF),* for hypothetical spill scenarios. These *sample IDFs* should be useful to you in responding to future incidents.

INCIDENT DESCRIPTION FORM

Calpine Stony Brook Operators (SBO)
University at Stony Brook
2099 SUNY
Stony Brook, NY 11794-2099

Telephone: 631-632-9227
Latitude: North 40°, 55 min., 30 sec.
Longitude: West 78°, 08 min., 30 sec.

PART I. INCIDENT SUMMARY

Enter the following information prior to notification	
Substance and estimated quantity:	1000 gallons of Diesel Fuel
Source and location of incident:	Fuel Supply Piping To Gas Turbines
Cause of incident if known:	Flange failure
Date and time incident began:	3/15/00 at about 0800 hours
Date and time incident was discovered:	3/15/00 at 1010 hours
Date and time incident ended:	3/15/00 at 1020 hours
Check (T) affected area(s): Lands (T)	Waters/Wetlands (T) Air ( )

PART II. AGENCY NOTIFICATION

Agency	Date/Time Notified	Operator Name/ID	Case/Report Number
NRC	3/15/00 - 1035 hrs	Petty Officer Monroe	12345
OSHA	n/a	n/a	n/a
New York State DEC	3/15/00 - 1125 hrs	Operator #6	12345
Suffolk County FRES	n/a	n/a	n/a
Suffolk County DHS	3/15/00 - 1145 hrs	Mr. Jones	12345
SUNY Public Safety	3/15/00 - 1045 hrs	Officer Thompson	n/a
SUNY - EHS Manager	3/15/00 - 1050 hrs	Mr. Johnson	n/a

Enter relevant questions or comments made by agencies
NYSDEC will be sending an inspector to the site ASAP. The NRC mentioned that they would be
Notifying our local Coast Guard Office.
Enter name and number of SBO person to contact for additional information
Operations Supervisor at 631-632-9900

PART III: FULL INCIDENT DESCRIPTION

Describe incident in detail

At approximately 1010 hours this morning an operator discovered a large leak in the fuel supply piping to the COGEN. In addition to contacting the soil on the west side of the COGEN, a significant amount of fuel oil reached a storm drain that discharges to the Retention Pond. We immediately secured the fuel oil system and isolated the leak by 1020 hours. Considering the rate at which fuel is pumped through the piping and the visual inspection performed, we estimate a spill of approximately 1000 gallons. Of this amount approximately 300 gallons reached the soil, 200 gallons reached the Retention Pond and 400 gallons was captured on the macadam.

Describe incident response and clean-up activities

SBO provided the initial response to the incident by placing oil absorbent booms around the the storm drain and the outer perimeter of the leak. Miller Environmental was contacted to Assist in the clean-up of contaminated soil on the premises and Trade Winds Environmental was dispatched to address any necessary clean-up of the Retention Pond. We are assisting these two organizations as best we can. Furthermore, SUNY has provided assistance by blocking the storm sewer piping downstream of the COGEN Plant to prevent further contamination of the environment.

Enter 24-hour follow-up information and any additional comments

The clean-up contractors have been working around the clock to remediate the area. The Bulk of the clean-up is complete. We have recaptured 700-800 gallons of oil. We have Removed 50-60 yards of soil. We are now pressure washing the macadam and the sewer Piping to remove all oil residue.

Your Name and Title: John Smith - Operations Supervisor

< < < < < < **Submit Completed Form to Operations Supervisor** = = = = = =

INCIDENT DESCRIPTION FORM

Calpine Stony Brook Operators (SBO)
University at Stony Brook
2099 SUNY
Stony Brook, NY 11794-2099

Telephone: 631-632-9227
Latitude: North 40°, 55 min., 30 sec.
Longitude: West 78°, 08 min., 30 sec.

PART I. INCIDENT SUMMARY

Enter the following information prior to notification	
Substance and estimated quantity:	50 gallons of Caustic
Source and location of incident:	Tank Truck Unloading Station
Cause of incident if known:	Hose Failure during Tank Truck Delivery
Date and time incident began:	3/15/00 at about 1000 hours
Date and time incident was discovered:	3/15/00 at 1010 hours
Date and time incident ended:	3/15/00 at 1020 hours
Check (T) affected area(s): Lands (T)	Waters/Wetlands ( ) Air ( )

PART II. AGENCY NOTIFICATION

Agency	Date/Time Notified	Operator Name/ID	Case/Report Number
NRC	3/15/00 - 1035 hrs	Petty Officer Monroe	12345
OSHA	n/a	n/a	n/a
New York State DEC	3/15/00 - 1125 hrs	Operator #6	12345
Suffolk County FRES	3/15/00 - 1045 hrs	Captain Smith	n/a
Suffolk County DHS	3/15/00 - 1115 hrs	Mr. Jones	n/a
SUNY Public Safety	n/a	n/a	n/a
SUNY - EHS Manager	3/15/00 - 1200 hrs	Mr. Johnson	n/a

Enter relevant questions or comments made by agencies
NYSDEC and the Suffolk County will be sending inspectors to the site ASAP.

Enter name and number of SBO person to contact for additional information
Operations Supervisor at 631-632-9227

PART III: FULL INCIDENT DESCRIPTION

Describe incident in detail
A small amount of caustic was released from a hose failure during a tank truck delivery at
1000 hours this morning. Although the spill occurred inside the Tank Truck Unloading Area,
an estimated 50 gallons of caustic sprayed over the side of the containment onto the soil.
The release was immediately secured by the tank truck driver at approximately 1020 hours.
The tank truck driver provided this estimate based on the amount of chemical off-loaded from
the tank truck.
Describe incident response and clean-up activities
SBO assisted the driver in securing the release and immediate area. SBO also assisted Trade
Winds Environmental in the neutralization/removal of liquid product and contaminated soil.
Enter 24-hour follow-up information and any additional comments
SBO worked with the clean-up contractors throughout the day to remove as much free flowing
product and soil as possible. Clean-up was complete by 5:00 p.m. the same day (3/15/00).

Your Name and Title: John Smith - Operations Supervisor

< < < < < < **Submit Completed Form to Operations Supervisor** = = = = = =

11.0 WRITTEN FOLLOW-UP REPORTS

SBO shall ensure the appropriate *written follow-up reports* are prepared and submitted subsequent to the incidents addressed by the *decision trees, (Appendix 7)*. The Operations Manager has primary responsibility for preparing *environmentally* related follow-up reports and the Maintenance Manager has responsibility for *health and safety* related follow-up reports. These written reports are an essential component of the follow-up effort, and typically provide closure to the incident in the eyes of the regulatory agencies.

11.1 Post Incident Investigation

In order to prepare *written follow-up reports*, it is essential to perform a *post-incident investigation* immediately following the release, fire, injury or other emergency. The investigation must be designed to gather details on the *type, quantity, location, date, time and duration* of the incident. It should also contain a description of the areas affected by the event as well as the *response and clean-up* measures taken.

The last essential component of the investigation is determining the *root cause* of the incident and recommending *corrective actions*, so similar occurrences may be prevented in the future. The nature of these corrective actions will depend on whether the incident was caused by human error or equipment failure. If human error is determined to be the cause, improved training, an increase in the level of supervision or, in extreme cases, disciplinary action may be warranted. If equipment failure is determined to be the cause, new equipment, redesign of existing equipment, or revised preventive maintenance procedures may be necessary.

The details of this investigation must be documented and retained on file with the *Incident Description Form (Appendix 10)* and other relevant documentation pertaining to the incident.

More extensive releases may also require post-incident sampling and remediation efforts of the affected areas. The sampling may include soil, air or water samples to determine on-site and off-site impacts, hydrogeolic and atmospheric investigations, mapping of contamination, and evaluation of potential impacts on plant life, wildlife, nearby water supplies and the surrounding population.

11.2 Preparing 5-Day SPDES Written Notices

A *5-Day Written Notice* must be prepared and submitted to the NYSDEC within 5 days of a noncompliance, or becoming aware of a noncompliance, which may endanger health or the environment, according to Part II-Section 5(b) of the State Pollutant Discharge Elimination System (SPDES) Permit. NYSDEC developed a *"Report of Noncompliance Event Form"*, which can be used as the 5-Day Written Notice.

This report is to be mailed or faxed to the appropriate DEC Regional Office, listed on the Report of Noncompliance Event Form. However, since the Port Authority of New York is the SPDES permit holder for the entire airport complex, SBO will submit this form to the Port Authority, who will then forward the form to NYSDEC.

The content of this report must contain the following components:

1. *DEC Water Contact;*
2. *DEC Region (to which the facility must report);*
3. *Report Type, either 5-Day, Permit Violation, Order Violation, Anticipated Noncompliance, or Bypass/Overflow;*
4. *SPDES Permit Number;*
5. *Facility Name;*
6. *Date of noncompliance;*
7. *Location (Outfall, Treatment Unit, or Pump Station);*
8. *Description of noncompliance and cause;*
9. *Answers to the following questions:*
    a. *Has the event ceased? (Yes)(No)*
    b. *If so, when?*
    c. *Was event due to plant upset? (Yes)(No)*
    d. *SPDES permit violated? (Yes)(No);*
10. *Start date, time of event;*
11. *End date, time of event;*
12. *Date, time oral notification made to DEC?;*
13. *DEC Official contacted;*
14. *Immediate Corrective Actions;*
15. *Preventive (long term) corrective actions;*
16. *Facility Representative*
    a. *Name;*
    b. *Title;*
    c. *Phone Number; and*
    d. *Fax Number.*

If an unanticipated bypass occurs, the *5-Day Written Notice* should include all of the information listed above as well as the following information. A bypass is defined as the anticipated or unanticipated intentional diversion of waste streams from any portion of a treatment works:

1. *Bypass amount;*
2. *Was prior DEC authorization received for this event? (Yes)(No);*
3. *DEC Official Contacted: and*
4. *Date of DEC approval.*

11.3 Preparing 14-Day CBS Investigation Reports

NYSDEC requires that all actual, probable or suspected releases or spills of hazardous substances requiring reporting must be immediately investigated, as per 6 NYCRR 596.6(b) of the Chemical Bulk Storage (CBS) regulations. The facility must then prepare and submit an investigation report within 14 days of the incident, describing the investigation as well as the cause of the release and an assessment of the impact of the release on the environment. The investigation must be conducted based on one or more of the following procedures:

1. *A visual inspection to initiate immediate response;*
2. *A physical investigation which may include sampling of the soil, air or water to determine on-site and off-site impacts, hydrogeologic and atmospheric investigations, mapping of contamination, and evaluation of potential impacts on plant life, wildlife, nearby water supplies and surrounding population;*
3. *Monitoring of interstitial area between the tank and secondary containment system;*
4. *An inspection to determine if the tank is tight. This may include an internal inspection, testing for structural soundness, nondestructive testing, inspection/testing of ancillary equipment or tightness test of the tank or piping system;*
5. *A check of inventory records to detect discrepancies;*
6. *Monitoring of observation wells; or*
7. *Any additional and further investigation which may be required by the department in order to adequately determine the cause of the release and to assess the impact of the release or spill on the environment.*

11.4 Preparing 30-Day Air Violation Reports

When an air pollution event occurs as the result of an equipment malfunction, an equipment startup or shutdown, or during the performance of necessary equipment maintenance, SBO may be entitled to a violation pardon or an emergency affirmative defense. The written reporting requirements vary based on the circumstances causing the air pollution event. These written reports act as defenses to liability for penalties when a facility has taken all reasonable steps to minimize the emission levels caused by a violation and when the emissions do not cause a potential threat to the public health, welfare, or the environment. These reporting requirements are driven by 6 NYCRR 201-1.4.

In order to obtain a violation pardon from an emission violation as the result of necessary scheduled equipment maintenance, start-up/shut down conditions and malfunctions or upsets the following actions and reporting requirements must be adhered to:

1. *The facility owner and/or operator shall compile and maintain records of all equipment maintenance or start-up/shutdown activities when they can be expected to result in an exceedance of any applicable emission standard.*

2. *The facility owner and/or operator shall submit a report of such activities to the commissioner's representative when requested to do so in writing or when so required by a condition of a permit or certificate issued for the corresponding air contamination source. The report shall include the following information:*

    a. *Why the violation was unavoidable;*
    b. *Incident:*
        i. *Time, frequency and duration of the maintenance and/or start-up/shutdown activities;*
        ii. *Identification of air contaminants,*
        iii. *Estimated emission rates.*

If a facility owner and/or operator is subject to continuous stack monitoring and quarterly reporting requirements, he need not submit reports for maintenance or start-up/shutdown for the facility to the commissioner's representative.

If the emission standard was exceeded due to a malfunction only, the Station must notify NYSDEC as soon as possible during normal working hours, but no later than two working days following the occurrence, or becoming aware of the occurrence. Within 30 days, when requested in writing by the commissioner's representative, a written report must be submitted to the Commissioner's representative and shall contain the following:

1. *Description of the malfunction;*
2. *Corrective action(s) taken;*
3. *Identification of the air contaminants; and*
4. *Estimate of the emission rates.*

An emergency constitutes an affirmative defense to an action brought for noncompliance with emission limitations or permit conditions for all facilities in the state of New York. The affirmative defense of an emergency as per 6 NYCRR 201-1.5, shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. *An emergency occurred and that the facility owner and/or operator can identify the cause(s) of the emergency;*

2. *The equipment at the permitted facility causing the emergency was at the time being properly operated;*

3. *During the period of the emergency the facility owner and/or operator took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and*

4. *The facility owner and/or operator notified the Department within two working days after the event occurred. This notice must contain a description of the emergency, any steps taken to mitigate the emissions, and corrective actions taken.*

11.5 Preparing 60-Day Oil Release Reports

If oil is spilled into any adjacent rivers or shorelines in a quantity greater than 1000 gallons, or if two spills of oil in any amount occur within a twelve-month period, a written report must be submitted to the EPA Regional Administrator within 60 days. This 60-Day Release Report is required by 40 CFR 112.4 and must contain the following information:

1. *Name of the facility;*
2. *Name of the owner or operator;*
3. *Location of the facility;*
4. *Date and year of initial facility operation;*
5. *Maximum storage or handling capacity of the facility during normal daily throughput;*
6. *Description of the facility, including maps, flow diagrams, and topographic maps;*
7. *A complete copy of the SPCC plan and any amendments;*
8. *The cause of the spill, including a failure analysis of system or subsystem in which the failure occurred;*
9. *The corrective actions and/or counter measures taken including an adequate description of equipment repaired or replaced; and*
10. *Additional countermeasures taken or contemplated to minimize the possibility of reoccurrence.*

11.6 Corporate Follow-up Procedures

Some emergency situations will end in a matter of hours while others will linger on, especially when significant environmental damage occurs or the event involves serious injuries or deaths. The ERT must evaluate the extent of the crisis to inform the necessary agencies and organizations--insurance, media, community leaders, employees, environmental agencies, etc.--of the steps being taken to solve the problems as well as prevent recurrences. After an emergency situation the following procedures should be followed in order to give closure to the event:

- *Recognition for Responders -* All personnel involved in the response--police, fire fighters, community leaders, company personnel, state personnel, clean up contractors, etc.--should be recognized and thanked for their contributions, in the form of a written letter or some other gesture of appreciation.

- *Internal Follow-Up Report* – An internal follow-up report should be prepared and routed within corporate, immediately following an emergency. The report should include a description of the event and the corrective measures ("lessons learned") to decrease the likelihood of a recurrence of the event. This document should be circulated throughout the company.

12.0 USING THE APPENDICES

*The successful outcome of any response effort is dependent upon **decisive action** and a **short response time**! Every moment counts.*

It is, therefore, unlikely to expect the ERT to begin reading this guide *page-by-page* at the onset of an emergency. The time to review and understand the content of the ERG is during training, emergency planning, and drilling.

The *Appendices,* on the other hand, provide a very valuable source of *quick reference* in an emergency. The *Appendices* contain the *"essentials"* for *organizing* and *conducting* the response effort, including a color coded map, an organization chart, job descriptions, Hazard Profiles, Decision Trees, an Emergency Telephone Directory and other useful information.

In essence, the *Appendices* comprise the *"heart"* of the ERG.

12.1 Site Map

Appendix 1 contains two color-coded *Site Maps* that identify the general layout of the facility, relevant buildings and structures, access roads and gates, and adjacent roadways. The *Site Maps* also identify the primary assembly area, evacuation route, and staging area to be used in a significant release, fire, or facility evacuation. Lastly, the *Site Maps* contain the locations of the bulk oils, chemicals and compressed gasses on-site. Storage containers larger than 55-gallons are considered *bulk storage* for the purposes of this guide.

12.2 Emergency Response Organization Chart

The *Emergency Response Organization Chart (Appendix 2)* is a graphical representation of the *chain-of-command* within SBO's Customized Emergency Response Organization. Large scale spills, fires or other emergencies may require the activation of most job positions within this organization. Smaller incidents, on the other hand, will require a significantly smaller organization. It is left to the discretion of the Incident Commander to be expand and collapse the framework to meet the needs of the incident.

12.3 Job Title Cross Reference Table

The *Job Title Cross Reference Table (Appendix 3)* provides *recommendations* on the appropriate plant personnel to assign to each job position. This table is designed for use as a guide for the Incident Commander in organizing the ERT and assigning job duties. Refer to *Sections 2.1 through 2.3* for additional information.

12.4 Job Duties

Appendix 4 contains the specific *Job Duties* for each member of the Emergency Response Team. These one-page summaries highlight key issues, keep the user focused, and prevent important tasks from falling through the cracks.

The *Job Duties* should be removed from the ERG at the on-set of an emergency and handed-out to the appropriate members of the ERT.

12.5 Hazard Profiles

Appendix 5 contains a series of one-page *Hazard Profiles* for the "bulk" liquids and compressed gasses on-site. *Hazard Profiles* are a *"quick-reference"* tool designed to summarize the *health hazards* associated with a product, identify the appropriate personal protective equipment (PPE), and provide guidance in performing *first aid*. *Hazard Profiles* also contain *emergency actions* to be followed in the event of a spill, fire or explosion.

SBO is also equipped with a complete listing of *Material Safety Data Sheets (MSDS)* for all products on-site (bulk and non-bulk). MSDSs are more comprehensive than *Hazard Profiles*, containing detailed information on the physical properties and chemical constituents. They also contain useful information on related health hazards, first aid, PPE, spill and fire fighting techniques, and regulatory information. Every product on-site must be accompanied by a MSDS. A *master-index* of MSDSs is maintained in the Control Room.

***NOTE ➢** The Hazard Profiles are designed for use in conjunction with the MSDSs, not in lieu of them.*

12.6 Hot Zone Table

The *"hot zone"* can be viewed as the area presenting *immediate hazards* to human health and safety, typically requiring the use of PPE. The *Hot Zone Table (Appendix 6)* contains *safe distance recommendations* for the bulk liquids/compressed gasses on-site. This information is valuable to first-responders seeking assistance in establishing *assembly areas, evacuation routes, and hot zones.* The table contains two scenarios: *one for small releases and one for large releases.*

Keep in mind, however, that the *Hot Zone Table* is to be used as a *guide* and not a *substitute* for actual monitoring data, first-hand experience, and good-old common sense.

12.7 Decision Trees

The *Decision Trees* in *Appendix 7* are designed to assist in the *"notification process".* The trees contain direction on notifying the appropriate regulatory agencies, emergency organizations, clean-up contractors, and company personnel. They also provide direction and reminders on such issues as *mobilizing the ERT, identifying reportable quantities (RQs), and documenting the response effort. Section 10.4* provides an in-depth description of *decision trees.*

12.8 Emergency Telephone Directory

The *Emergency Telephone Directory (Appendix 8)* is a one-page listing of the essential contacts needed in an emergency. The directory was prepared in a tabular format consisting of the following three categories:

1. *Regulatory Agencies*
2. *Emergency Assistance*
3. *Company Personnel*

12.9 Reportable Quantity Table

SBO is responsible for the storage and handling of a variety of petroleum products, chemicals, compressed gasses and hazardous wastes. If any of these hazardous substances come in contact with the environment *(land, water, air)* in excess of established *reportable quantities*, various local, state and federal agencies must be notified.

The *Reportable Quantity (RQ) Table* in *Appendix 9* contains the *hazardous substances* most commonly encountered at SBO, and their associated *RQs*. This table is used in conjunction with the *Decision Trees (Appendix 7)* as an essential part of the *"notification process".*

12.10 Incident Description Forms

The *Incident Description Form (Appendix 10)* is a tool for documenting the chain-of-events following an oil/chemical release, fire or other emergency. An *IDF* must be completed each time a *regulatory agency* is contacted, and submitted to the General Manager.

NOTE ➢ *A detailed description of the Incident Description Form, including fully prepared "samples", are provided in Section 10.5.*

13.0 ACRONYMS & ABBREVIATIONS

CBS	New York Chemical Bulk Storage Program
COGEN	Cogeneration Plant
CFR	Code of Federal Regulations
CPR	Cardiopulmonary Resuscitation
DEC	New York State Department of Environmental Conservation
DECON	Decontamination
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
ERG	Emergency Response Guide
ERT	Emergency Response Team
ESA	Environmentally Sensitive Area
FEMA	Federal Emergency Management Agency
FBI	Federal Bureau of Investigation
FRES	Suffolk County Department of Fire, Rescue & Emergency Services
HAZMAT	Hazardous Material
HAZWOPER	Hazardous Waste Operations and Emergency Response
IC	Incident Commander
IDF	Incident Description Form
LEPC	Local Emergency Planning Committee
MSDS	Material Safety Data Sheet

NIOSH	*National Institute for Occupational Safety and Health*
NRC	*National Response Center*
NYSDEC	*New York State Department of Environmental Conservation*
OSHA	*Occupational Safety and Health Administration*
PA	*Public Address System*
PECM	*Plant Environmental Compliance Manual*
PPE	*Personal Protective Equipment*
RQ	*Reportable Quantity*
SBO	*Calpine Stony Brook Operators*
SCBA	*Self Contained Breathing Apparatus*
SPCC	*Spill Prevention Control and Countermeasures*
SUNY	*State University of New York*
USCG	*U.S. Coast Guard*

Appendix P
Terrestrial Ecology

APPENDIX P TERRESTRIAL ECOLOGY STUDIES

ECOLOGICAL RESOURCES REPORT

VEGETATION, WILDLIFE, AND AQUATIC RESOURCES

CALPINE WAWAYANDA ENERGY CENTER SITE

TOWN OF WAWAYANDA
ORANGE COUNTY, NEW YORK

Prepared for:

TRC ENVIRONMENTAL GROUP
Boott Mills South
Foot of John Street
Lowell, Massachusetts 01852

Prepared by:

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.
23 County Route 6, Suite A
Phoenix, New York 13135

August 2001

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

(all figures follow text)

1.0 INTRODUCTION

This report describes the vegetation, wildlife, and aquatic resources identified on the Calpine Wawayanda Energy Center Site located in the Town of Wawayanda, Orange County, New York. The site investigated is approximately 87.6 acres in size and is bisected by Dolsontown Road (Figure 1).

Terrestrial Environmental Specialists, Inc. (TES) was contracted by TRC Environmental Group to describe the vegetation, wildlife, and aquatic resources on the site, as required for an Article X application for the proposed generating facility. In a separate effort, TES also delineated and described the wetlands on the site regulated by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. Results of the wetland delineation are presented in TES (2000) and TES (2001).

2.0 VEGETATION

The vegetation surveys of the Calpine Wawayanda Energy Center project site addressed common plant species and plant community composition, as well as endangered and threatened species. Results of these surveys are included in this section.

2.1 Methods

Background resource maps, the soil survey, and aerial photographs were initially collected and reviewed as part of the vegetation assessment. These maps and other background information assisted in directing the field surveys.

Letters were submitted to the New York State Department of Environmental Conservation (NYSDEC) Natural Heritage Program and the U.S. Fish and Wildlife Service (USFWS) for known records of endangered, threatened, and rare species in the area. Letters to and from these agencies are presented in Appendix A.

Data and notes on vegetation on the site were collected during the initial wetland surveys and at other specific times during the 2000 growing season. Dates of field surveys included: June 14 and 27; October 4, 30, and 31; and November 2.

Quantitative vegetation data on wetlands and adjacent uplands were collected in plots during the wetland surveys. These data, which included species composition and percent cover, are presented in the wetland delineation reports (TES 2000 and TES 2001). Additional qualitative information was collected on plant community composition (plant species and structure) during additional field reviews. TES botanists walked each plant community, made a list of species observed and took notes on community structure. All the plant data collected throughout the study are included in this report.

Where necessary, plant species collected from the site were identified using regional floras and keys, including: Fernald (1950), Gleason (1952), Petrides (1972), Newcomb (1977), and Gleason and Cronquist (1991). Scientific names of plant species used in this report follow Mitchell and Tucker (1997).

During the field surveys, trees over 12 inches in diameter at breast height (dbh) were identified and estimates made of density. Diameters of many of the trees were measured.

Upland and wetland plant communities were mapped during the field surveys using good quality 1991 black and white aerial photographs. Wetland cover types were flagged and land surveyed. The surveyed limits of the wetlands and the boundaries of the other upland vegetation and land use types are presented on the 1991 aerial photograph base. Acreage calculations of each cover type were made using a digital compensating polar planimeter.

2.2 Results

Plant species recorded on the site are listed in Table 1. The vegetation cover types in which the species commonly occur and relative abundance are also noted. A vegetation/land use cover map of the site is presented on Figure 7 using the 1991 aerial photograph as a base. Acreages of each vegetation/land use cover type on the site (including the laydown area) are presented in Table 2. Corresponding ecological communities recognized by Reschke (1990) are noted in Table 2.

2.2.1 General Site Description

The approximately 87.6-acre site is located in the Town of Wawayanda, Orange County, in southeastern New York (Figure 1). It is within the glaciated section of the oak-hickory forest region of the eastern deciduous forest (Braun 1950). In New York it is within the Wallkill subregion of the Mohawk-Hudson Physiographic Region (Stout 1958).

The site is located in the southern outskirts of the City of Middletown just north of Interstate Route 84. Dolsontown Road bisects the site. The site vicinity is primarily a rural setting of farmland, with scattered homes and commercial buildings. The site is primarily agricultural land, with wetlands primarily in the eastern and southern portions. A New York Power Authority (NYPA) overhead electric transmission line crosses the southern edge of the site. Topography of the site is moderately sloping in the eastern and western portions, with a broad flat in the center and along the southern edge of the site (Figure 1).

The NYSDEC Freshwater Wetlands map (Figure 2) does not show any regulated wetlands on the site, although wetland MD-19 is mapped northeast of the site beyond an abandoned railroad grade. The National Wetlands Inventory map shows several palustrine emergent wetlands and a linear palustrine emergent wetland in the eastern and southern portions of the site (Figure 3).

The Orange County Soil Survey (USSCS 1981) indicates that Mardin gravelly silt loam, Wayland silt loam, Hoosic gravelly sandy loam, Erie gravelly silt loam, and Rhinebeck silt loam occur on the site (Figure 4). Wayland silt loam is a hydric (wetland) soil, and Erie gravelly silt loam and Rhinebeck silt loam have the potential for hydric inclusions (USSCS 1989). Much of the sloped uplands on the site are mapped as Mardin gravelly silt loam. The Wayland soil occurs in the southern and eastern portions of the site corresponding with the wetland areas.

Drainage on the site is generally to the south. An unnamed tributary to Monhagen Brook flows across the eastern portion of the site from the north to the south (Figure 1). It flows onto the site through a culvert under the railroad grade and eventually into Monhagen Brook, which flows toward the east as it meanders along the southern site boundary. The NYSDEC has assigned a water classification to this unnamed tributary and Monhagen Brook of Class D with D standards (Figure 6). These waterbodies are not regulated by the NYSDEC under Article 15 Protection of Waters because they do not have a classification of C(t) or higher. None of this site is within the 100-year floodplain of the Monhagen Brook or its unnamed tributary (Figure 5).

2.2.2 Vegetation Community Descriptions

Plant species noted on the site during the course of the study are presented in Table 1. A vegetation/land use cover map of the site is provided on Figure 7, with acreages of the different cover types presented in Table 2.

A variety of vegetation and land use cover types occupy the site, as indicated by the vegetation cover map presented on Figure 7. Most of the northern and western portions of the site are agricultural land or open field developed from abandoned agricultural use (Figure 7). Hedgerows dominated by deciduous trees frequently occur along the edges of the agricultural fields. Wetlands of emergent and wet meadow types primarily occur along Monhagen Brook in the southern portion of the site and along its tributary in the eastern portion. A few scattered isolated wetlands also occur on the site.

Two small areas (2.4 acres or 2.8%) of the site are developed/residential (Table 2 and Figure 7). These areas include buildings, mowed lawn, and bordering trees. Common trees include sugar maple (*Acer saccharum*) and white pine (*Pinus strobus*).

Table 1.

Plant Species Observed by Vegetation Cover Type
Calpine Wawayanda Energy Center Site

TREES			VEGETATION COVER TYPES[a]							
Scientific Name[b]	**Common Name**	**Relative Abundance[c]**	**D/R**	**AC**	**OF**	**DFU**	**FW**	**OW**	**EW/ WM**	**SSW**
Acer rubrum	Maple, red	U				X				X
Acer saccharinum	Maple, silver	U				X			X	X
Acer saccharum	Maple, sugar	C	X			X				
Ailanthus altissima	Tree-of-heaven	U				X				
Betula populifolia	Birch, gray	C				X				X
Carya ovata	Hickory, shag-bark	C				X				
Fraxinus americana	Ash, white	C	X			X				
Fraxinus pennsylvanica	Ash, green	A			X	X	X		X	X
Juniperus virginiana	Cedar, eastern red	S				X				
Malus pumila	Apple	U				X				
Nyssa sylvatica	Black gum	U				X				
Pinus strobus	Pine, eastern white	U	X			X				
Pinus sylvestris	Pine, scotch	U	X							
Populus deltoides	Cottonwood, eastern	A				X				X
Populus tremuloides	Aspen, quaking	C				X				X
Prunus serotina	Cherry, black	A				X				
Quercus bicolor	Oak, swamp white	A				X				X
Quercus palustris	Oak, pin	C				X			X	X
Tilia americana	Basswood	C	X			X				
Ulmus americana	Elm, american	C	X			X			X	X

[a] D/R – Developed/Residential, AC – Agricultural Cropland, OF – Open Field, DFU – Deciduous Forest Upland, FW – Farmed Wetland, OW – Open Water, EW/WM – Emergent Wetland/Wet Meadow, SSW – Scrub-Shrub Wetland.
[b] Nomenclature follows Mitchell and Tucker (1997).
[c] Relative abundance in appropriate habitat: A - Abundant, C - Common, U - Uncommon, S - Scarce

Table 1. (Continued)

SHRUBS			VEGETATION COVER TYPES[a]							
Scientific Name[b]	**Common Name**	**Relative Abundance[c]**	**D/R**	**AC**	**OF**	**DFU**	**FW**	**OW**	**EW/ WM**	**SSW**
Cornus amomum	Dogwood, silky	A			X	X			X	X
Cornus foemina ssp. *racemosa*	Dogwood, gray	A			X	X			X	X
Lonicera tatarica	Honeysuckle, tartarian	A				X				
Parthenocissus quinquefolia	Creeper, Virginia	A				X				X
Rhamnus cathartica	Buckthorn, common	C			X	X				X
Rhus typhina	Sumac, staghorn	S				X				
Rosa multiflora	Rose, multiflora	A			X	X				
Rosa palustris	Rose, swamp	U							X	X
Rosa virginiana	Rose, Virginia	C				X				
Toxicodendron radicans	Ivy, poison	A				X				X
Toxicodendron vernix	Sumac, poison	S								X
Viburnum dentatum var. *lucidum*	Arrow-wood	A			X	X			X	X
Vitis sp.	Grape	A				X				X

HERBACEOUS			VEGETATION COVER TYPES[a]							
Scientific Name[b]	**Common Name**	**Relative Abundance[c]**	**D/R**	**AC**	**OF**	**DFU**	**FW**	**OW**	**EW/ WM**	**SSW**
Achillea millefolium	Yarrow	C	X	X	X		X			
Agrimonia parviflora	Agrimony, small flowered	C			X				X	X
Agropyron repens	Quackgrass	A		X	X					
Agrostis gigantea	Bentgrass, black	A		X	X		X		X	X
Alliaria petiolata	Mustard, garlic	U		X		X				X
Allium sp.	Wild onion	C	X	X		X				
Amaranthus retroflexus	Common amaranthus	U		X			X			
Ambrosia artemisiifolia	Ragweed, annual	C	X	X	X		X		X	
Anthoxanthum odoratum	Grass, sweet vernal	C		X	X					
Arctium minus	Burdock, common	C		X	X					
Arabis glabra	Tower-mustard	U		X						
Aster lateriflorus	Aster, calico	C			X				X	
Aster novae-angliae	Aster, New England	C			X				X	X
Aster laevis	Aster, smooth blue	C			X				X	X
Aster lanceolatus	Aster, tall white	C			X				X	

Table 1. (continued)

HERBACEOUS			VEGETATION COVER TYPES[a]							
Scientific Name[b]	**Common Name**	**Relative Abundance[c]**	**D/R**	**AC**	**OF**	**DFU**	**FW**	**OW**	**EW/ WM**	**SSW**
Aster sp.	Aster	C			X					
Asclepias syriaca	Milkweed, common	C		X	X					
Avena sativa	Oats	A		X			X		X	
Barbarea vulgaris	Winter-cress	A		X						
Bromus sp.	Brome grass	A		X	X					
Capsella bursa-pastoris	Common shepherd's purse	U		X			X			
Carex scoparia	Sedge, pointed broom	U							X	X
Carex sp.	Sedge	C	X						X	X
Carex stricta	Sedge, tussock	C							X	X
Carex vulpinoidea	Sedge, fox	C					X			X
Cerastium arvense	Chickweed, mouse-ear	C	X	X	X					
Cerastium viscosum	Chickweed, clammy mouse-ear	U		X						
Cerastium vulgatum	Chickweed, common mouse-ear	U	X	X						
Centaurea maculosa	Knapweed, spotted	A			X					
Chenopodium album	Goosefoot, white	U		X	X		X			
Cinna arundinacea	Wood-reedgrass, stout	U								X
Circaea lutetiana	Enchanter's nightshade	U				X				
Cirsium arvense	Thistle, creeping	A	X	X	X		X		X	
Cirsium sp.	Thistle	A							X	
Cirsium vulgare	Thistle, bull	C		X	X					
Conium maculatum	Poison hemlock	U							X	X
Convolvulus sepium	Hedge bindweed	U		X	X	X				
Cyperus esculentus	Nutsedge, yellow	A	X	X	X		X		X	
Dactylis glomerata	Grass, orchard	C		X	X					
Datura stramonium	Jimson weed	U		X						
Daucus carota	Wild carrot	C	X	X	X		X			
Digitaria sanguinalis	Crabgrass, hairy	U		X						
Dulichium arundinaceum	Sedge, three-way	U								X
Echinochloa crusgalli	Barnyard grass	U		X			X		X	
Eleocharis sp.	Spikerush	C					X	X		
Elymus virginicus	Wild-rye, Virginia	U							X	X
Epilobium coloratum	Purple-leaf willow-herb	U							X	
Epilobium hirsutum	Willow herb, tall	C							X	X

Table 1. (Continued)

HERBACEOUS			VEGETATION COVER TYPES[a]							
Scientific Name[b]	Common Name	Relative Abundance[c]	D/R	AC	OF	DFU	FW	OW	EW/ WM	SSW
Equisetum arvense	Horsetail, field	C	X	X	X		X		X	
Erigeron annuus	Fleabane, white-top	C		X	X					
Eupatorium maculatum	Joe-pye-weed, spotted	C							X	X
Euthamia graminifolia	Fragrant golden-rod, flat-top	A			X				X	X
Festuca arundinacea	Fescue	A		X						
Festuca rubra	Fescue, red	U			X					
Glecoma hederacea	Ivy, ground	A		X	X		X		X	
Galium sp.	Bedstraw	A							X	X
Helenium autumnale	Sneezeweed, common	U							X	
Heracleum maximum	Cow parsnip	U			X					
Hieracium sp.	Hawkweed	C		X					X	
Impatiens capensis	Touch-me-not, spotted	C								X
Iris versicolor	Blueflag	U						X		X
Juncus effusus	Rush, soft	A					X		X	X
Juncus tenuis	Rush, slender	A	X	X	X					
Juncus sp.	Rush	C		X			X		X	
Lemna sp.	Duckweed	A						X	X	
Leontodon autumnalis	Dandelion, fall	U		X	X					
Leucanthemum vulgare	Daisy, ox-eye	C		X	X		X			
Lobelia inflata	Indian-tobacco	U		X	X					
Lotus corniculatus	Trefoil, birds-foot	A		X	X					
Ludwigia palustris	Seedbox, marsh	U						X	X	X
Lychnis flos-cuculi	Ragged-robin	C		X	X		X			
Lycopus sp.	Bugleweed	C							X	X
Lythrum salicaria	Loosestrife, purple	A		X			X	X	X	X
Malva sylvestris	Mallow, high	S		X	X					
Mentha spicata	Spearmint	U					X		X	X
Myosotis sp.	Forget-me-not	C							X	
Nasturtium officinale	Watercress	C					X	X	X	X
Onoclea sensibilis	Fern, sensitive	C			X		X		X	X
Oxalis europaea	Woodsorrel, upright yellow	C		X	X					
Panicum dichotomiflorum	Grass, fall panic	A					X		X	
Panicum sp.	Grass, panic	C	X	X						

Table 1. (continued)

HERBACEOUS			VEGETATION COVER TYPES[a]							
Scientific Name[b]	Common Name	Relative Abundance[c]	D/R	AC	OF	DFU	FW	OW	EW/ WM	SSW
Phalaris arundinacea	Grass, reed canary	A		X	X		X		X	X
Phleum pratense	Timothy	A		X	X					
Phragmites australis	Reed, common	C					X		X	X
Phytolacca americana	Pokeweed, common	U				X				
Plantago lanceolata	Plantain, English	C	X	X			X			
Plantago major	Plantain, common	C	X	X			X		X	
Poa sp.	Grass	C	X	X	X			X	X	
Podophyllum peltatum	May-apple	C				X				
Polygonum aviculare	Knotweed, prostrate	C		X			X		X	
Polygonum hydropiperoides	Smartweed, swamp	A						X	X	
Polygonum persicaria	Lady's thumb	C		X			X			
Polygonum sagittatum	Tearthumb, arrow-leaf	A							X	X
Polygonum sp.		C			X		X	X	X	
Potentilla sp.	Cinquefoil	C		X	X					
Ranunculus sceleratus	Butter-cup, celery-leaf	C		X			X		X	
Rubus alleghaniensis	Blackberry	C			X	X				
Rubus occidentalis	Black raspberry	C			X				X	
Rumex acetosella	Sorrel, sheep	U	X	X	X				X	
Rumex crispus	Dock, curly	U			X		X		X	
Rudbeckia sp.	Coneflower	U			X					
Rumex sp.	Dock	U		X						
Scirpus tabernaemontani	Bulrush, soft-stem	U						X	X	X
Scutellaria lateriflora	Skullcap, blue	U							X	
Secale cereale	Perennial rye	C							X	X
Setaria faberi	Grass, Japanese bristle	C		X	X		X			
Setaria glauca	Grass, yellow bristle	C		X	X		X			
Setaria sp.	Grass	C			X					
Silene vulgaris	Campion, bladder	U		X			X			
Silene latifolia	Campion, white	U		X			X			
Solanum carolinense	Nightshade, carolina	U		X	X		X			
Solidago canadensis	Goldenrod, Canada	A		X	X		X			
Solidago gigantea	Goldenrod, giant	C		X	X		X		X	X
Solidago rugosa	Goldenrod, wrinkled	A								X

Table 1. (Continued)

HERBACEOUS			VEGETATION COVER TYPES[a]							
Scientific Name[b]	**Common Name**	**Relative Abundance[c]**	**D/R**	**AC**	**OF**	**DFU**	**FW**	**OW**	**EW/ WM**	**SSW**
Stellaria media	Chickweed, common	C		X			X			
Taraxacum officinale	Dandelion, common	C		X	X		X			
Thlaspi arvense	Penny-cress, field	C		X						
Trifolium hybridum	Clover, alsike	A		X			X		X	
Trifolium pratense	Clover, red	A	X	X	X		X		X	
Trifolium repens	Clover, white	C	X		X					
Typha latifolia	Cattail, broad-leaf	C						X	X	
Verbascum thapsus	Mullein	C				X				
Veronica serpyllifolia	Speedwell, thyme-leaved	C			X		X			
Vicia americana	Vetch, American purple	C		X	X					
Vicia sativa	Vetch, common	C		X	X					

Table 2.

Acreage of Land Use/Vegetation Cover Types
Calpine Wawayanda Energy Center Site

Land Use/Vegetation Cover Type	Ecological Community (Reschke 1990)	Project Site[a] (Acres)	Laydown Site[b] (Acres)	Total Site (Acres)	% of Total Site
Developed/Residential	Mowed Lawn	1.40	1.05	2.45	2.8%
Agriculture Cropland	Cropland/Field Crops	40.87	16.84	57.71	65.9%
Open Field	Successional Old Field	1.81	4.69	6.50	7.4%
Deciduous Forest Upland	Chestnut Oak Forest	0.23	2.94	3.17	3.6%
Open Water	Deep Emergent Marsh	0.31	0.49	0.80	0.9%
Farmed Wetland		3.08	—	3.08	3.5%
Wet Meadow	Shallow Emergent Marsh	—	7.57	7.57	8.7%
Emergent Wetland	Shallow Emergent Marsh	3.76	0.82	4.58	5.2%
Scrub-Shrub Wetland	Shrub Swamp	1.74	—	1.74	2.0%
	TOTAL	**53.20**	**34.40**	**87.60**	**100.0%**

[a] North of Dolsontown Road
[b] South of Dolsontown Road

About 65.9% (57.7 acres) of the site consists of agricultural cropland (Table 2). During the 2000 growing season, 49.6 acres were cut for oats and hay, while another 8.1 acres were planted in corn (*Zea mays*). Open fields occur onsite in areas abandoned from agricultural use and in uplands under the transmission line right-of-way. They cover 6.5 acres or 7.4% of the site (Table 2 and Figure 7). The open fields are dominated by a mix of grasses and forbes. Common plant species include: timothy (*Phleum pratense*), fescue (*Festuca arundinacea*), brome grass (*Bromus* sp.), red clover (*Trifolium pratense*), thistle (*Cirsium arvense*), wild carrot (*Daucus carota*), and common plantain (*Plantago major*).

The agricultural fields and open fields are frequently bounded by hedgerows of deciduous forest upland. The deciduous forest is considered a chestnut-oak association and covers 3.2 acres or about 3.6% of the site (Table 2 and Figure 7). Common tree species included: black cherry (*Prunus serotina*), pin oak (*Quercus palustris*), white ash (*Fraxinus americana*), and swamp white oak (*Quercus bicolor*).

Wetlands occur primarily in the eastern and southern portions of the site along the tributary to Monhagen Brook and the brook itself (Figures 7 and 8). Total wetland area on the site is 17.8 acres or about 20% of the site (Table 2). Emergent and wet meadow are the prevalent wetland types. There are lesser amounts of open water and farmed wetland.

Two small areas of shallow open water are mapped on the site (Figure 7); they are likely remnants of farm ponds. These areas of open water/deep emergent marsh only cover 0.8 acre or 0.9% of the site (Table 2). The pond edges contain soft-stem bulrush (*Scirpus tabernaemontani*), broad-leaf cattail (*Typha latifolia*), purple loosestrife (*Lythrum salicaria*), and reed canary grass (*Phalaris arundinacea*). Where water was 6 inches to 12 inches in depth, soft-stem bulrush, spikerush (*Eleocharis* sp.) and swamp smartweed (*Polygonum hydropiperoides*) were present. Duckweed (*Lemna* sp.) was abundant on the water surface.

Farmed wetlands occur along the bottomland near the tributary to Monhagen Brook in the eastern portion of the site (Figure 7). These wetlands occupy 3.1 acres or 3.5% of the site (Table 2). Portions were planted in oats and portions cut for hay in the 2000 growing season. Dominant plants included: oats, yellow nutsedge (*Cyperus esculentus*), fall panic grass (*Panicum dichotomiflorum*), ragweed (*Ambrosia artemisiifolia*), redtop (*Agrostis gigantea*), cursed crowfoot (*Ranunculus scleratus*), purple loosestrife, and reed canary grass.

Wet meadows are areas of shallow emergent marsh. They occur in the southern portion of the site in areas abandoned from agricultural use and within the overhead electric transmission line right-of-way in the bottomland adjacent to Monhagen Brook (Figure 7). Wet meadow covers 7.6 acres or 8.7% of the site (Table 2). Portions of the wet meadow areas are dominated by reed canary grass and purple loosestrife. Rush (*Juncus* sp.), redtop, fall panic grass, and common plantain are also common.

Emergent wetlands (shallow emergent marsh) were found along Monhagen Brook and its tributary (Figure 7). This community type covers 4.6 acres or 5.2% of the site (Table 2). Reed canary grass and purple loosestrife are common throughout this community. Common reed grass (*Phragmites australis*) was abundant along the ditch that extends into the tributary stream in the northcentral portion of the site. Forget-me-not (*Myosotis* sp.) and swamp smartweed were abundant in the stream tributary channel. Scattered shrubs and silver maple (*Acer saccharinum*) occurred along the edges.

Scrub-shrub wetlands cover 1.7 acres or 2.0% of the site (Table 2 and Figure 7). They were dominated by silky dogwood, gray dogwood (*Cornus foemina* ssp. *racemosa*), American elm, and buckthorn in the shrub layer. Pin oak (*Quercus palustris*) is also common in the small scrub-shrub wetland next to the railroad grade in the northern portion of the site. The herbaceous layer was dominated by redtop, asters, narrow-leaf goldenrod (*Euthamia graminifolia*), rough-stem goldenrod (*Solidago rugosa*), fox sedge (*Carex vulpinoidea*), purple loosestrife, tearthumb (*Polygonum sagittatum*), and late goldenrod (*Solidago gigantea*).

2.2.3 Trees over Twelve Inches in Diameter

Only a small portion of the site contains trees. They are mostly in hedgerows, along the railroad grade, and bordering the developed/residential area north of Dolsontown Road. There are about 90 trees onsite. Most of the trees are deciduous, commonly ranging 13 to 22 inches in diameter and 50 to 70 feet in height. About 70% of the trees were pin oak, black cherry, and swamp white oak. In much fewer numbers were: green ash, eastern cottonwood (*Populus deltoides*), apple (*Malus pumila*), shagbark hickory (*Carya ovata*), swamp white oak, white ash, basswood (*Tilia americana*), American elm, willow, white pine, scotch pine (*Pinus sylvestris*), and sugar maple.

There are no trees listed on the New York State Big Tree Register from Orange County. Of note on the site was a very large (53.3 inches in diameter) swamp white oak in the northcentral portion of the site just south of the pond. The champion New York swamp white oak is from Livingston County and is approximately 69 inches in diameter.

2.3 Endangered and Threatened Species

Contact letters were sent to the USFWS and the New York Natural Heritage Program (NYNHP) to determine whether any records existed for endangered or threatened species on the site. These letters are included in Appendix A. The USFWS reported that *"Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area"*. The NYNHP has reported that *"We have no records of known occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of your site"*.

The most recently updated plant list published by the NYNHP (Young 2000) lists about 94 endangered, threatened, or rare plant species as being recorded in Orange County. Based on the field searches by TES botanists and the disturbed nature of the site, none of these species were found or would be expected to occur on the site. Several of these species are tidal, salt marsh, or wetland species that would not occur on the site. Another group of species are found in dry, sandy areas and would not occur on the site.

3.0 WILDLIFE

3.1 Methods

Field surveys for wildlife resources were conducted during 2000 on September 27; October 4, 30, and 31; and November 7; and in 2001 on May 17 and 18. In addition, incidental observations of wildlife were recorded while conducting field work in wetlands on June 27 and November 2, 2000.

Each vegetation cover type was walked and observations of wildlife were recorded. A long-handled dip net was used in the ponds onsite to sample for tadpoles or fish, and cover objects were overturned to look for amphibians and reptiles.

The information review for amphibians and reptiles consisted of reviewing interim maps produced with data from the NYSDEC Herp Atlas Project. These maps identify the topographic blocks (7½ minute quads) in which the species were recorded between 1990 and 1998. These maps were used to provide information on those species of amphibians and reptiles found in the vicinity of the site and likely to be present in the site.

Birds onsite were identified visually and by calls and songs. Species were recorded in each vegetation cover type they were observed using. If a species did not respond to any habitat on the site, it was recorded as a "flyover".

Information on breeding birds is available for the 5 km x 5 km "block" in which the site is found. These data were collected between 1980 and 1985, for the New York Breeding Bird Atlas, a project of the Federation of New York State Bird Clubs, Inc., the NYSDEC, and Cornell University Laboratory of Ornithology. The maps produced from these data are published in Andrle and Carroll (1988). The species list for the block in which the site is found was used as the basis for determining those species likely to be breeding birds on the site.

Mammal data were collected by visual observations of individuals or their sign (for example, tracks, scat, tunnels, trails) in each vegetation cover type. Tracks of some species, such as raccoons, are particularly evident in soft mud in moist or wet areas. No trapping effort was undertaken.

3.2 Results

3.2.1 Amphibians and Reptiles

Table 3 presents information on the species of amphibians and reptiles recorded during the Herp Atlas Project in the topographic quad in which the site is found, or in at least one of the eight adjacent topographic quads. The table provides a list of species likely to be found in the vicinity of the site. The "Possible" column in Table 3 indicates those species that could possibly occur onsite, based on the habitats and their configuration onsite. The small ponds, ditch, creek, and wetlands on the site are habitats in which most of the amphibians might be found, although species such as the northern spring peeper, the juvenile form (eft) of the red-spotted newt, and the wood frog may wander far from the waterbodies in which they breed and could be found in many different vegetation cover types. Northern spring peepers were heard calling and green frog tadpoles were abundant in the ponds in both the northern and southern portions of the site. Adult green frogs were observed in several locations, and a single leopard frog was seen in the northern portion of the site.

All of the "Possible" species of amphibians, except northern redback salamander, require open water (ponds or streams) in which to breed. The northern redback salamander is usually associated with forested habitats, but it can be found in moist soils in open areas and in otherwise disturbed areas such as residential areas.

Most of the salamander species recorded in the site topographic quad or adjacent quads are not likely to be found on the site. The several mole salamanders (*Ambystoma* spp.) are usually associated with wet, forested areas where they breed in vernal ponds (those that dry up regularly). The two dusky salamanders, northern red salamanders, and longtail salamanders are found in small, rocky streams, usually in wooded areas. Four-toed salamanders are found in wet woods and sphagnum wetlands, and slimy salamanders are found on hillsides in wooded ravines. None of the above habitat types are found on the site.

Several turtle species are possible on the site, and all but the eastern box turtle are generally associated with waterbodies (ponds or streams). Painted turtles are especially common, and are likely inhabitants of the small ponds on the site. Some of the turtles

Table 3.

Amphibians and Reptiles Observed or with Potential to Occur on the Calpine Wawayanda Energy Center Site

SALAMANDERS

Common Name[a]	Scientific Name	ATLAS[b]	Possible[c]	Observed on Site	State Listed[d]
Marbled salamander	*Ambystoma opacum*	IN			SPEC
Jefferson salamander	*Ambystoma jeffersonianum*	IN			SPEC
Blue-spotted salamander	*Ambystoma laterale*	ADJACENT			SPEC
Spotted salamander	*Ambystoma maculatum*	IN			
Red-spotted newt	*Notophthalmus v. viridescens*	ADJACENT	X		
Northern dusky salamander	*Desmognathus fuscus*	ADJACENT			
Allegheny dusky salamander	*Desmognathus ochrophaeus*	ADJACENT			
Northern redback salamander	*Plethodon cinereus*	IN	X		
Northern slimy salamander	*Plethodon glutinosus*	IN			
Four-toed salamander	*Hemidactylium scutatum*	IN			
Northern red salamander	*Pseudotriton r. ruber*	ADJACENT			
Northern two-lined salamander	*Eurycea bislineata*	ADJACENT	X		
Longtail salamander	*Eurycea l. longicauda*	ADJACENT			SPEC

TOADS AND FROGS

Common Name	Scientific Name	ATLAS	Possible	Observed on Site	State Listed
Eastern American toad	*Bufo a. americanus*	ADJACENT	X		
Northern cricket frog	*Acris c. crepitans*	ADJACENT			END
Gray treefrog	*Hyla versicolor*	ADJACENT	X		
Northern spring peeper	*Pseudacris c. crucifer*	IN	X	X	
Bullfrog	*Rana catesbeiana*	IN			
Green frog	*Rana clamitans melanota*	IN	X	X	

(a) Common and scientific names according to Collins (1997).
(b) Species recorded during the New York Amphibian and Reptile Atlas (1990-1998 INTERIM DATA). "IN" = Recorded in 7½ minute quad in which the site is found, "ADJACENT" = Recorded in an adjacent quad.
(c) Possible inhabitant of site, based on available on-site habitats.
(d) State listed species: END = Endangered, THR = Threatened, SPEC = Special Concern Species.

Table 3. (continued)

TOADS AND FROGS

Common Name	Scientific Name	ATLAS	Possible	Observed on Site	State Listed
Wood frog	*Rana sylvatica*	IN	X		
Northern leopard frog	*Rana pipiens*	ADJACENT	X	X	
Pickerel frog	*Rana palustris*	IN	X		

TURTLES

Common Name	Scientific Name	ATLAS	Possible	Observed on Site	State Listed
Common snapping turtle	*Chelydra s. serpentina*	ADJACENT	X	X	
Common musk turtle	*Sternotherus odoratus*	ADJACENT	X		
Spotted turtle	*Clemmys guttata*	IN			SPEC
Bog turtle	*Clemmys muhlenbergii*	ADJACENT			END
Wood turtle	*Clemmys insculpta*	IN	X		SPEC
Eastern box turtle	*Terrapene c. carolina*	IN	X		SPEC
Redbelly turtle	*Pseudemys rubriventris*			X	
Eastern painted turtle	*Chrysemys p. picta*	IN	X	(see text)	

SNAKES

Common Name	Scientific Name	ATLAS	Possible	Observed on Site	State Listed
Northern water snake	*Nerodia s. sipedon*	ADJACENT	X		
Northern brown snake	*Storeria d. dekayi*	IN	X		
Northern redbelly snake	*Storeria o. occipitomaculata*	ADJACENT	X		
Common garter snake	*Thamnophis sirtalis*	ADJACENT	X	X	
Eastern ribbon snake	*Thamnophis sauritus*	ADJACENT	X		
Eastern hognose snake	*Heterodon platirhinos*	ADJACENT			SPEC
Northern ringneck snake	*Diadophis punctatus edwardsii*	ADJACENT			
Northern black racer	*Coluber c. constrictor*	IN	X		
Smooth green snake	*Liochlorophis vernalis*	ADJACENT	X		
Black rat snake	*Elaphe o. obsoleta*	ADJACENT			
Eastern milk snake	*Lampropeltis t. triangulum*	IN	X		
Timber rattlesnake	*Crotalus horridus*	ADJACENT			THR

observed in the pond on the northern portion of the site were likely painted turtles, although none were positively identified (see below). Remains of a snapping turtle were found in the northern portion of the site. Even largely aquatic species of turtles, however, lay their eggs in upland areas and in fact, three turtle nests were observed (the eggshell remains were found) in the hayfield adjacent to the pond in the southern part of the site. The turtle species that dug the nests and laid these eggs could not be determined from the remains. The juxtaposition of open, upland vegetation communities adjacent to ponds makes the area good nesting habitat for several species of turtle.

During May 2001, in the pond in the northern portion of the site, a count of 38 turtles was obtained using binoculars from the shoreline. The turtles observed in the north pond all had stripes on their heads, a characteristic of both painted turtles and redbelly turtles. At least a third of those observed were redbelly turtles because they were too large to be painted turtles. The smaller turtles could have been either small redbelly turtles or various sizes of painted turtles. One large female redbelly turtle was positively identified in the small open water area just south of the farm road.

A number of snake species are possible inhabitants of the site. The northern water snake and the eastern ribbon snake are usually associated with waterbodies. Northern brown snakes and eastern milk snakes are often found in open fields and near farms and residential areas. Black racers are generally associated with open field-type habitats, where they prey on rodents, other small mammals, and nestling birds. Smooth green snakes are also found in open habitats such as meadows, where they feed largely on insects. Garter snakes can be found in virtually any habitat and are a very common species in New York. One juvenile eastern garter snake was found under the bark of a fallen tree near the pond in the southern part of the site.

Other snake species on the list are found in habitats that are not present on the site. Hognose snakes are usually found in areas with sandy soils, often associated with upland pine or mixed forests. Northern ringneck snakes and black rat snakes are usually associated with wooded habitats in New York. Timber rattlesnakes in New York have winter den sites on rocky slopes and outcrops, and summer in wooded areas.

3.2.2 Birds

Table 4 provides a list of bird species that were recorded during the 1980 to 1985 New York Breeding Bird Atlas Project in the 5 km by 5 km block in which the site is found. Several other species on the list were observed onsite during field surveys, but were not recorded as breeding during the Atlas project. Atlas data provide a degree of confidence in breeding status, with most of the listed species being confirmed breeders in the block.

Table 4.

Birds Observed or with Potential to Occur on the Calpine Wawayanda Energy Center Site

BIRDS				VEGETATION COVER TYPES[d]								
Common Name[a]	Scientific Name	ATLAS[b]	On-site[c] potential breeder	D/R	AC	OF	DFU/ HR	FW	OW	EW/ WM	SSW	State Listed[e]
Great blue heron	*Ardea herodias*							f.o.	X			
Green heron	*Butorides virescens*	PRO								f.o.	X	
Turkey vulture	*Cathartes aura*				f.o.							
Canada goose	*Branta canadensis*	CON	X	X	X			X		X		
Wood duck	*Aix sponsa*	CON										
American black duck	*Anas rubripes*	CON										
Mallard	*Anas platyrhynchos*	CON	X					X	X	X		
Cooper's hawk	*Accipiter cooperii*	PRO										SPEC
Broad-winged hawk	*Buteo platypterus*	CON										
Red-tailed hawk	*Buteo jamaicensis*	CON	X		X		X					
American kestrel	*Falco sparverius*	CON	X									
Ruffed grouse	*Bonasa umbellus*	CON										
Killdeer	*Charadrius vociferus*	CON	X		X							
Spotted sandpiper	*Actitis macularia*		X							X		
Common snipe	*Gallinago gallinago*		X					X				
American woodcock	*Scolopax minor*	PRO	X									
Ring-billed gull	*Larus delawarensis*				f.o.							
Rock dove	*Columba livia*	CON	X									
Mourning dove	*Zenaida macroura*	CON	X		X			X		X		
Black-billed cuckoo	*Coccyzus erythropthalmus*	CON	X									
Yellow-billed cuckoo	*Coccyzus americanus*	CON										
Great horned owl	*Bubo virginianus*	CON	X									
Barred owl	*Strix varia*	CON										

(a) Common and Scientific Names according to American Ornithologists' Union (1998) and supplements through 2000.
(b) Breeding Bird Atlas Data for block in which site is found: POS = Possible breeder, PRO = Probable breeder, CON = Confirmed breeder.
(c) Based on available habitats on the site.
(d) Vegetation cover types are listed as follows: D/R – Developed/Residential, AC – Agricultural Cropland, OF – Open Field, DFU/HR – Deciduous Forest Upland/Hedgerow, FW – Farmed Wetland, OW – Open Water, EW/WM – Emergent Wetland/Wet Meadow, SSW – Scrub Shrub Wetland. X = Species observed on site, f.o. = species flew over site.
(e) State listed species: END = Endangered, THR = Threatened, SPEC = Special Concern Species.

Table 4. (continued)

BIRDS			On-site[c]	VEGETATION COVER TYPES[d]								
Common Name[a]	Scientific Name	ATLAS[b]	On-site[c] potential breeder	D/R	AC	OF	DFU/ HR	FW	OW	EW/ WM	SSW	State Listed[e]
Common nighthawk	*Chordeiles minor*	CON										SPEC
Chimney swift	*Chaetura pelagica*	CON	X		f.o.		f.o.					
Belted kingfisher	*Ceryle alcyon*	CON					X			f.o.		
Red-bellied woodpecker	*Melanerpes carolinus*	CON	X				X					
Downy woodpecker	*Picoides pubescens*	CON	X				X					
Hairy woodpecker	*Picoides villosus*	CON	X				X					
Northern flicker	*Colaptes auratus*	CON	X				X			X		
Pileated woodpecker	*Dryocopus pileatus*	CON										
Eastern wood-pewee	*Contopus virens*	CON										
Willow flycatcher	*Empidonax traillii*	CON	X								X	
Least flycatcher	*Empidonax minimus*	CON	X									
Eastern phoebe	*Sayornis phoebe*	CON	X				X					
Great crested flycatcher	*Myiarchus crinitus*	CON										
Eastern kingbird	*Tyrannus tyrannus*	CON	X									
Yellow-throated vireo	*Vireo flavifrons*	CON										
Warbling vireo	*Vireo gilvus*		X				X					
Red-eyed vireo	*Vireo olivaceus*	CON	X				X					
Blue jay	*Cyanocitta cristata*	CON	X		X		X					
American crow	*Corvus brachyrhynchos*	CON	X		X	X		X				
Tree swallow	*Tachycineta bicolor*	CON	X									
Barn swallow	*Hirundo rustica*	CON	X		X					X	X	
Black-capped chickadee	*Poecile atricapilla*	CON	X				X					
Tufted titmouse	*Baeolophus bicolor*	CON	X				X					
White-breasted nuthatch	*Sitta carolinensis*	CON	X				X					
Brown creeper	*Certhia americana*	CON										
House wren	*Troglodytes aedon*	CON	X				X					
Blue-gray gnatcatcher	*Polioptila caerulea*	CON										
Eastern bluebird	*Sialia sialis*		X		X							
Veery	*Catharus fuscescens*	CON										
Wood thrush	*Hylocichla mustelina*	CON	X				X					
American robin	*Turdus migratorius*	CON	X	X	X		X			X		
Gray catbird	*Dumetella carolinensis*	CON	X	X			X				X	
Northern mockingbird	*Mimus polyglottos*	CON	X		X	X	X				X	
Brown thrasher	*Toxostoma rufum*	CON	X									
European starling	*Sturnus vulgaris*	CON	X	X	X							

Table 4. (continued)

BIRDS				VEGETATION COVER TYPES[d]								
Common Name[a]	**Scientific Name**	**ATLAS[b]**	**On-site[c] potential breeder**	**D/R**	**AC**	**OF**	**DFU/ HR**	**FW**	**OW**	**EW/ WM**	**SSW**	**State Listed[e]**
Cedar waxwing	*Bombycilla cedrorum*	CON	X									
Blue-winged warbler	*Vermivora pinus*	CON										
Golden-winged warbler	*Vermivora chrysoptera*	CON	X									SPEC
Yellow warbler	*Dendroica petechia*	CON	X				X				X	
Chestnut-sided warbler	*Dendroica pensylvanica*	CON	X				X					
Blackburnian warbler	*Dendroica fusca*	CON										
Pine warbler	*Dendroica pinus*	CON										
Prairie warbler	*Dendroica discolor*	CON										
Black-and-white warbler	*Mniotilta varia*	CON										
American redstart	*Setophaga ruticilla*	CON										
Ovenbird	*Seiurus aurocapillus*	CON										
Louisiana waterthrush	*Seiurus motacilla*	CON										
Common yellowthroat	*Geothlypis trichas*	CON	X								X	
Scarlet tanager	*Piranga olivacea*	CON										
Eastern towhee	*Pipilo erythrophthalmus*	CON										
Chipping sparrow	*Spizella passerina*	CON	X									
Field sparrow	*Spizella pusilla*	CON	X			X					X	
Savannah sparrow	*Passerculus sandwichensis*	POS	X		X			X		X	X	
Grasshopper sparrow	*Ammodramus savannarum*	CON	X									SPEC
Song sparrow	*Melospiza melodia*	CON	X	X			X			X	X	
Swamp sparrow	*Melospiza georgiana*	CON	X							X	X	
White-throated sparrow	*Zonotrichia albicollis*									X		
White-crowned sparrow	*Zonotrichia leucophrys*										X	
Northern cardinal	*Cardinalis cardinalis*	CON	X				X				X	
Rose-breasted grosbeak	*Pheucticus ludovicianus*	CON	X									
Indigo bunting	*Passerina cyanea*	CON	X									
Bobolink	*Dolichonyx oryzivorus*	CON	X		X							
Red-winged blackbird	*Agelaius phoeniceus*	CON	X	X	X	X	X	X		X	X	
Eastern meadowlark	*Sturnella magna*	CON	X									
Common grackle	*Quiscalus quiscula*	CON	X	X			X			X		
Brown-headed cowbird	*Molothrus ater*	CON	X	X		X	X					
Baltimore oriole	*Icterus galbula*	CON	X				X					
Purple finch	*Carpodacus purpureus*	CON										
House finch	*Carpodacus mexicanus*	CON	X				X			X		
Pine siskin	*Carduelis pinus*				f.o.							

Table 4. (Continued)

BIRDS			On-site[c]	VEGETATION COVER TYPES[d]								
Common Name[a]	Scientific Name	ATLAS[b]	potential breeder	D/R	AC	OF	DFU/ HR	FW	OW	EW/ WM	SSW	State Listed[e]
American goldfinch	*Carduelis tristis*	CON	X		f.o.	X	X			X	X	
House sparrow	*Passer domesticus*	CON	X				X			f.o.		

The assessment of the potential for species to be breeders onsite is based on available habitats. The Atlas data are attributable to a much wider variety of habitats than are found on site. The block that includes the site contains far more types of habitat, especially large tracts of wooded habitats on hillsides west and northwest of the site than are present on the site.

Breeding bird species on the site include species, such as savannah sparrow, bobolink, and red-winged blackbird, that use open field and agricultural lands. The small ponds near croplands and fields provide breeding habitat for Canada geese and mallards, while the adjacent emergent wetlands and wet meadows are inhabited by swamp sparrows, and red-winged blackbirds. Areas containing shrubs provide nesting areas for willow flycatchers, common yellowthroats, yellow warblers, and gray catbirds. Species associated with residential areas, farms, buildings, and driveways such as those onsite include: killdeer, barn swallow, American robin, common grackle, European starling, and house sparrow.

Lastly, there is some onsite breeding potential for species that nest in trees that are not necessarily within a large tract of forest. Bird species that use the hedgerows onsite or the edges of the deciduous forest include: red-tailed hawk, blue jay, house wren, common flicker, and Baltimore oriole. The site lacks forest cover that would provide breeding habitat for most of the warbler species listed in Table 4.

3.2.3 Mammals

Table 5 lists the species of mammals that are likely to be present on the site and indicates the vegetation cover type for those that were observed. Rodents, such as the white-footed mouse and meadow vole, and other small mammals, such as shrews and moles, have small home ranges likely to be entirely on the site. Medium-sized mammals, such as the raccoon, skunk, and opossum, and larger species, such as the red fox and white-tailed deer, range farther, and the site is likely to constitute only part of their home ranges.

Several species listed in Table 5, including meadow jumping mouse and meadow vole, are characteristic of open habitats such as open fields, hay fields, and wet meadows. Star-nosed moles are often associated with moist habitats such as wet meadows, and muskrats are always associated with open waterbodies and adjacent emergent wetlands for food. Short-tailed shrews are not restricted to a particular vegetation cover type and can be found virtually anywhere, including in residential areas. The eastern gray squirrel and the white-footed mouse are usually associated with forested areas, although the hedgerows with large, old trees (especially oaks) can provide suitable habitat. Species generally associated with large tracts of forest, such as the porcupine and some bats, are not likely inhabitants of the site.

Table 5.

Mammals Observed or with Potential to Occur on the Calpine Wawayanda Energy Center Site

MAMMALS			VEGETATION COVER TYPES[a]							
Common Name[b]	**Scientific Name**	**Possible[c]**	**D/R**	**AC**	**OF**	**DFU/ HR**	**FW**	**OW**	**EW/ WM**	**SSW**
Virginia opossum	*Didelphis virginiana*	X								
Masked shrew	*Sorex cinereus*	X								
Short-tailed shrew	*Blarina brevicauda*	X								
Star-nosed mole	*Condylura cristata*	X								
Eastern cottontail	*Sylvilagus floridanus*	X		X	X				X	
Eastern chipmunk	*Tamias striatus*	X				X				
Woodchuck	*Marmota monax*	X		X	X	X	X		X	
Eastern gray squirrel	*Sciurus carolinensis*	X				X				
Meadow jumping mouse	*Zapus hudsonius*	X								
White-footed mouse	*Peromyscus leucopus*	X								
Meadow vole	*Microtus pennsylvanicus*	X			X					
Common muskrat	*Ondatra zibethicus*	X						X	X	
House mouse	*Mus musculus*	X								
Coyote	*Canis latrans*	X								
Red fox	*Vulpes vulpes*	X		X		X			X	
Raccoon	*Procyon lotor*	X		X			X		X	
Short-tailed weasel	*Mustela erminea*	X								
Striped skunk	*Mephitis mephitis*	X								
White-tailed deer	*Odocoileus virginianus*	X		X	X	X	X		X	X

(a) Vegetation cover types are listed as follows: D/R – Developed/Residential, AC – Agricultural Cropland, OF – Open Field, DFU/HR – Deciduous Forest Upland/Hedgerow, FW – Farmed Wetland, OW – Open Water, EW/WM – Emergent Wetland/Wet Meadow, SSW – Scrub Shrub Wetland.
(b) Common and scientific names according to Whitaker and Hamilton (1998).
(c) Based on available habitats on site.

3.3 Endangered and Threatened Species

Contact was made with the U.S. Fish and Wildlife Service (USFWS) and the NY Natural Heritage Program (NYNHP) regarding records on the presence of endangered or threatened species on or in the vicinity of the site. The USFWS responded that except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under their jurisdiction are known to exist in the project impact area. The NYNHP responded that they have no records of known occurrences of rare or state-listed animals or significant habitats on or in the immediate vicinity of the site.

No endangered, threatened, or special concern wildlife species were observed on the site. Regarding amphibians and reptiles, the Herp Atlas records show a number of listed species that have been recorded either in the topographic quad in which the site is located or in an adjacent quad (Table 3). Of these eleven listed species, only two turtle species (wood turtle and eastern box turtle) are considered possible inhabitants of the site, and neither of these species was found.

The wood turtle, although widely distributed in New York, is listed as a Special Concern species. Wood turtles are found in association with water, often streams with hard sand or gravel bottoms and moderate current. Although associated with forests, areas with a mixture of openings such as wet meadows, upland fields and pastures are also used. Most individuals hibernate in water, often flowing water, in deep pools under overhanging roots or logs in streams, or in beaver lodges or muskrat burrows. Nests are placed in locations with exposure to sunlight, well-drained but moist soil not subject to flooding, in substrates free of rocks and thick vegetation. Monhegan Brook and the meadows and fields adjacent to it were considered possible habitat for this species. A specific search for the species in May, 2001 resulted in no observations of the species.

The eastern box turtle is also listed as a Special Concern species in New York, and was recorded in the topographic quad in which the site is found. This is generally a species of open wooded habitats, but it also occurs in open habitats such as pastures, meadows, and even residential areas. Nest sites are usually open, elevated patches of sandy or loamy soil, although some nests are constructed in the woods. Eastern box turtles were considered to be possible inhabitants on the site, most likely in areas adjacent to wooded areas offsite, such as along the western boundary of the site. No box turtles were observed during any of the field surveys.

Two species of birds (golden-winged warbler and grasshopper sparrow), state-listed as Special Concern, were confirmed breeders during the Breeding Bird Atlas Project in the block in which the site is found. These species were considered to be potential breeding species on the site. Golden-winged warblers nest in areas with scattered patches of grass, thick brush, and a few trees. Some accounts indicate a preference for wet or swampy areas. Potential on-site habitats for golden-winged warblers include the emergent wetland/scrub-shrub wetland in the northern part of the site, the open areas adjacent to Monhegan Brook, and under the transmission lines including the area around the pond in the southern part of the site. The May 2001 survey did not reveal the presence of this species anywhere on the site.

Grasshopper sparrows breed in open grasslands, primarily grain croplands and pastureland. In successional old fields, favored plant species include orchard grass, alfalfa, red clover, lespedeza, and poverty grass. Some of these plant species were observed in the various open (especially agricultural cropland) cover types on the site. The complex of agricultural land (fields planted in oats, and hay fields) in which crops are rotated, provides a large enough area on the site to provide habitat for grasshopper sparrows. The specific survey for this species in May, 2001 did not find the species to be present on the site. No grasshopper sparrows were seen or heard on the site or in the vicinity.

No listed species of mammals were found on the site and none are reasonably likely to inhabit the site.

4.0 SURFACE WATER AND AQUATIC RESOURCES

4.1 Methods

Physical and chemical data were collected at six stream locations (five in the tributary and one in Monhagen Brook) on or near the site (Figure 9). Stream width, depth, velocity, water temperature, pH, dissolved oxygen, and conductivity data were collected. Observations of substrate characteristics, canopy cover, and adjacent habitats were also recorded. Data were collected on September 27 and November 9, 2000.

4.2 Results

The unnamed tributary to Monhagen Brook that flows in a southerly direction through the site is classified as a Class D stream with D standards by the NYSDEC. Monhagen Brook in this area has the same classification. The tributary flows from NYSDEC freshwater wetland MD-19 northeast of the site, under the abandoned railroad grade that forms the northeast site boundary. The tributary flows south through a 5-foot culvert under Dolsontown Road, just east of the southern portion of the site, and into Monhagen Brook, which in turn flows easterly into the Wallkill River.

Physical and chemical measurements of the streams are shown in Table 6. Descriptions of sampling locations from upstream to downstream are presented in the following section.

Starting upstream on the tributary, sampling location C is just downstream from where the tributary flows through a culvert in the abandoned railroad bed that forms the northeast boundary of the site (Figure 9). At this point the tributary was fairly narrow (7 feet wide), shallow (0.8 feet), with a relatively swift current (0.68 ft./sec.). The gravelly, open channel was bordered by stream banks vegetated primarily with reed canary grass and purple loosestrife.

Sampling location B is a narrow (5.5 feet wide) constriction located just below a culvert under a farm road (Figure 9). Below this sampling location, the tributary widens into a small pond with a silt substrate. The velocity was somewhat lower (0.50 ft./sec.) and the depth (1.3 ft.) was greater than upstream. Streamside vegetation consisted primarily of purple loosestrife and swamp smartweed, and there was some open water in the small pond.

Sampling location A is just upstream from the culvert under Dolsontown Road (Figure 9). Water velocity was quite low (0.10 ft./sec.) and the channel width was relatively wide (19 ft.) at this location. Here the tributary resembled a weed-choked ditch, vegetated with swamp smartweed, purple loosestrife, and reed canary grass. As indicated on the aerial photograph (Figure 9) the tributary between sampling locations A and C has been channelized in straight-line segments.

At sampling location D, just south of Dolsontown Road, the tributary was relatively narrow (8 ft.) and slow-moving (0.05 ft./sec.). The substrate was silty with embedded rocks. Purple loosestrife and reed canary grass dominated the east side of the tributary, whereas the west side was bordered by a small stand of maple saplings.

Sampling location E is at a bend in the stream. Here, the stream channel was wide (22 feet) with a silty, mucky substrate with very slow-moving water (0.03 ft/sec). The instream cover is nearly 100% swamp smartweed, and both banks are dominated by purple loosestrife and reed canary grass.

The temperature, dissolved oxygen, pH, and conductivity measurements obtained at the sampling locations on this tributary are all within normal ranges, considering the dates of sampling, physical characteristics of the tributary, and surrounding land uses.

Sampling location F is on Monhagen Brook upstream of its intersection with the unnamed tributary (Figure 9). At this location, the creek had 6-foot-high vertical banks, and a sand and gravel bottom, approximately 40% of which was vegetated with waterweed (*Elodea* sp.). There was no canopy cover over the stream. Velocity of the water was relatively high (0.47 ft./sec.). Adjacent to the creek are emergent wetlands dominated by purple loosestrife, and open field vegetation types.

Table 6.

Physical and Chemical Measurements taken from Monhagen Brook and Unnamed Tributary to Monhagen Brook, Calpine Wawayanda Energy Center Site

		PARAMETER							
SAMPLING LOCATION	**SAMPLING DATES**	**Depth (ft.)**	**Width (ft.)**	**Velocity (ft/sec)[a]**	**Temp. (°C)**	**DO (ppm)[b]**	**pH[c]**	**Cond.[d] (µmhos/cm)**	**Substrate**
A	Sept. 27, 2000	1.3	19	0.10	11	5.4	7.6	430	Silt
B	Sept. 27, 2000	1.3	5.5	0.50	11.5	5.6	7.4	460	Silt
C	Sept. 27, 2000	0.8	7	0.68	12	6.0	7.4	460	Gravel/ Sand
D	Nov. 9, 2000	0.8	8	0.05	6	6.6	7.1	N/A	Silt w/ Rocks
E	Nov. 9, 2000	1.2	22	0.03	7	6.4	7.4	N/A	Silt
F	Nov. 9, 2000	1.0	18	0.47	8	N/A	8.0	N/A	Gravel/ Sand

(a) Marsh-McBirney Model 201 Electronic Current Meter
(b) YSI Model 5LB D.O. Meter
(c) Oakton Model 35624-20 ATC pH meter
(d) Hach Model 19250 Mini Conductivity Meter

N/A = Not Available

5.0 WATER LINES

A field reconnaissance of the water line corridors was conducted on June 21, 2001. Two water line connections will service the facility, a line for potable water and a line for process water. The potable water line will be placed within the bed of Dolsontown Road (Figure 1) between the site and Route 17M. The potable water line will be attached to the bridge that crosses Monhagen Creek just east of the junction of Dolsontown Road and Route 17M. Because the potable water line will be within the roadbed, there are no vegetation, wetlands, aquatic, or wildlife resources associated with this corridor.

The source of the process water to be used for operations at the facility is the Middletown Wastewater Treatment plan located west of the site. Effluent leaving the wastewater treatment plant site will be discharged to the effluent supply line at a manhole located just south of the waste treatment facility. The supply line will run easterly, then northerly for a short distance and then turn again to the east to enter a joint pipeline corridor with the Project wastewater pipeline between the Middletown Wastewater Treatment property and the northwest corner of the Project site. The Project wastewater discharge line will run from the Project site to the Middletown Wastewater Treatment Plan via the joint corridor, breaking to the north to enter the treatment plant at an existing inlet pipe (Figure 1).

5.1 Vegetation

From the project site, the water line corridor crosses an open field community associated with the agricultural fields and an existing transmission line ROW. The corridor then passes through a scrub-shrub upland before splitting into a northern and southern fork. Common species in these cover types are: thistle, wild carrot, Canada goldenrod, aster, tartarian honeysuckle, and poison ivy. After breaking from the common corridor, the northern fork (Project wastewater discharge line) passes through a hedgerow dominated by black locust, box elder, Virginia creeper, grape, honeysuckle, and ground ivy. The southern fork (effluent supply line) intersects similar open field and scrub-shrub upland communities.

5.2 Wetlands

There are no NYSDEC mapped freshwater wetlands in the vicinity of the water line (Figure 2). The small emergent wetland near the south fork of the corridor shown on the NWI map (Figure 3) is at the edge of the forested community and not in the water line corridor. The two small areas of palustrine unconsolidated bottom wetlands depicted on the NWI map were excavated ponds but are no longer present, possibly removed by the construction of an addition to the wastewater treatment plant. No wetlands were found along the water line corridor during the field review.

5.3 Wildlife

The wildlife species observed using the cover types in the water line corridor are common. The deciduous forest upland hedgerow provides habitat for the following bird species: red-eyed vireo, American robin, northern cardinal, downy woodpecker, blue jay, gray catbird, and house wren. Barn swallows and tree swallows were feeding over the wastewater treatment plant property, and European starlings were present on the grounds. Scrub-shrub upland vegetation provides habitat for yellow warblers, alder flycatchers, and song sparrows.

5.4 Endangered and Threatened Species

No wildlife species listed as endangered, threatened, or special concern was observed within the water line corridors, nor are there any listed species with potential to be present.

6.0 SUMMARY

TES was contracted by TRC Environmental Group to perform vegetation, wildlife, and aquatic resource studies on the proposed Calpine Wawayanda Energy Center Site located in the Town of Wawayanda, Orange County, New York. The site is approximately 87.6 acres in size and is located in a rural setting with scattered houses and commercial developments in the southern outskirts of the City of Middletown.

Most of the site is open agricultural land, or successional old fields that have developed in areas abandoned from agricultural use. Wetlands cover about 20% of the site and are primarily emergent and wet meadow types associated with bottomlands along Monhagen Brook and its tributary in the southern and eastern portions of the site. Some of the wetlands are farmed. No NYSDEC wetland is mapped for the site.

Plant species noted on the site are listed in the report and a description is provided of the community structure of each plant community. The plant species found are common and generally characterize areas of past disturbance. There are no known records of endangered or threatened plant species on or near the site and none was found during the study.

Trees generally occur on the site in hedgerows and along borders of properties. Pin oak, black cherry, and swamp white oak are the prevalent species. No tree listed on the NYS Big Tree Register occurs in Orange County.

Wildlife resources were studied on the site. Species lists are provided for amphibians, reptiles, birds, and mammals based on available regional data and field observations. Species that occur or are likely to occur on the site are noted. The species observed on the site are generally common to abundant species, typical of the habitats present on the site. Correspondence from state and federal agencies did not reveal any known records of endangered, threatened, or special concern species. Although there is potential for two special concern turtles and two special concern birds, none were noted on the site.

The site is within the Wallkill River Basin. A tributary to Monhagen Brook drains southerly across the site and discharges into the mainstem of Monhagen Brook, which meanders along the southern edge of the site. No floodplain is mapped on the site. Physical and chemical stream data were collected in five locations along the tributary and one location in Monhagen Brook. The tributary to Monhagen Brook has been channelized in the past and is bordered by emergent wetlands. The mainstem of Monhagen Brook is much larger than the tributary and its channel is more deeply cut into the adjacent land. Water chemical parameters measured during the study were within expected ranges.

The potable water line for the project will be constructed within the roadbed of Dolsontown Road, and will be attached to the bridge that crosses Monhagen Brook. There are no natural resources associates with this corridor. The water line corridors for the process water and wastewater are located west of the facility, originating at the treatment plant. No wetlands occur within the corridor. Vegetation cover types through which the corridor passes include open field and scrub-shrub communities. Commonly occurring wildlife species occur in this area.

7.0 REFERENCES

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AGENCY CORRESPONDENCE – PROTECTED SPECIES

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 LUKER ROAD
CORTLAND, NY 13045

June 23, 2000

Mr. Stephen L. Sheridan
Assistant Environmental Scientist
Terrestrial Environmental Specialists, Inc.
23 County Route 6, Suite A
Phoenix, NY 13135

Dear Mr. Sheridan:

This responds to your letter of June 13, 2000, requesting information on the presence of Federally listed or proposed endangered or threatened species in the vicinity of the Dolsontown Road property in the Town of Wawayanda, Orange County, New York.

Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) is required with the U.S. Fish and Wildlife Service (Service). Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

The above comments pertaining to endangered species under our jurisdiction are provided pursuant to the Endangered Species Act. This response does not preclude additional Service comments under the Fish and Wildlife Coordination Act or other legislation.

For additional information on fish and wildlife resources or State-listed species, we suggest you contact:

New York State Department
of Environmental Conservation
Region 3
21 South Putt Corners Road
New Paltz, NY 12561-1676
(914) 256-3000

New York State Department
of Environmental Conservation
Wildlife Resources Center - Information Services
New York Natural Heritage Program
700 Troy-Schenectady Road
Latham, NY 12110-2400
(518) 783-3932

National Wetlands Inventory (NWI) maps may or may not be available for the project area. However, while the NWI maps are reasonably accurate, they should not be used in lieu of field surveys for determining the presence of wetlands or delineating wetland boundaries for Federal regulatory purposes. Copies of specific NWI maps can be obtained from:

Cornell Institute for Resource Information Systems
302 Rice Hall
Cornell University
Ithaca, NY 14853
(607) 255-4864

Work in certain waters and wetlands of the United States may require a permit from the U.S. Army Corps of Engineers (Corps). If a permit is required, in reviewing the application pursuant to the Fish and Wildlife Coordination Act, the Service may concur, with or without stipulations, or recommend denial of the permit depending upon the potential adverse impacts on fish and wildlife resources associated with project implementation. The need for a Corps permit may be determined by contacting Mr. Joseph Seebode, Chief, Regulatory Branch, U.S. Army Corps of Engineers, 26 Federal Plaza, New York, NY 10278 (telephone: [212] 264-3996).

If you require additional information please contact Michael Stoll at (607) 753-9334.

Sincerely,

Mark W. Clough

ACTING FOR

David A. Stilwell
Field Supervisor

cc: NYSDEC, New Paltz, NY (Environmental Permits)
NYSDEC, Latham, NY
COE, New York, NY

Terrestrial
Environmental
Specialists, inc.
23 COUNTY ROUTE 6, SUITE A, PHOENIX, NY 13135
(315) 695-7228 FAX (315) 695-3277

June 13, 2000

Ms. Jean Petrusiak
NYSDEC Wildlife Resources Center-Information Services
New York Natural Heritage Program
700 Troy-Schenectady Road
Latham, NY 12110-2400

Re: Significant Habitats and State-listed Threatened/ Endangered Species,
Dolsontown Road Property, Town of Wawayanda, Orange County, New York
TES File No. 2285

Dear Ms. Petrusiak:

Terrestrial Environmental Specialists, Inc. (TES) is collecting background environmental information for a proposed development in the Town of Wawayanda, Orange County, New York. The site is bound on the south by Dolsontown Road and an abandoned railroad right-of-way to the east and north. I have enclosed a copy of the NYSDOT topographic map (Middletown Quadrangle) with the approximate site locations outlined. The site is approximately 53 acres.

Please respond in writing regarding the presence of any known occurrence of state listed (or proposed for listing) threatened/endangered species or significant habitats located within the site boundary. If you need additional information or have any questions, please contact me. Thank you.

Sincerely,

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.

Stephen L. Sheridan

Stephen L. Sheridan
Assistant Environmental Scientist

SLS/dmm
Enclosures

cc: L. Gresock

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
Wildlife Resources Center – New York Natural Heritage Program
700 Troy-Schenectady Road, Latham, New York 12110-2400
Phone: (518) 783-3932 FAX: (518) 783-3916

John P. C...
Commi...

DATA REQUEST FORM: Please complete one form per project or activity.

Requestor: Stephen L. Sheridan

Organization: Terrestrial Environmental Specialists, Inc. (TES

Address: 23 County Route 6, Suite A

City: Pheonix State: NY Zip: 13135

Phone: (315) 695-7228 Fax: (315) 695-3277

Signature of Requestor: Stephen L. Sheridan

1. Title of Project: ______

2. Site Location:
Town(s): Wawayanda, ______, ______
County(ies): Orange, ______, ______
USGS Topographic 7 ½' Quad Name(s): Middletown, ______

3. Describe the current and past use of the site (e.g. commercial, agricultural land, forest, roadway, etc.):
Agriculture

4. Is this project subject to SEQR review? ___Yes ___No ?

If yes, who is the Lead Agency? ______

Address of Lead Agency: ______

5. Proposed Project or Activity. Please check one. If you want to give additional details, you may do so on the lines below or in an accompanying letter.

___Residential Development ___Commercial Development ___Industrial Development
___Municipal or County Planning/Zoning ___Utility (electric, water, sewer)
___Assessment for Conservation ___Cellular/Communications Tower
_✓_Potential Land Purchase (to be used for: ______
_✓_Other: site assesment

(OVER)

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
Wildlife Resources Center - New York Natural Heritage Program
700 Troy-Schenectady Road, Latham, New York 12110-2400
Phone: (518) 783-3932 FAX: (518) 783-3916

John P. Cahill
Commissioner

July 7, 2000

Stephen L. Sheridan
Terrestrial Environmental Specialists Inc
23 County Rte 6, Suite A
Phoenix, NY 13135

Dear Mr. Sheridan:

In response to your recent request, we have reviewed the New York Natural Heritage Program databases with respect to the proposed 53 acre Development, Dolsontown Road parcel, area as indicated on the map you provided, located in the Town of Wawayanda, Orange County.

> We have no records of <u>known</u> occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of your site.

The absence of data does not mean, however, that rare or state-listed species, natural communities or other significant habitats do not exist on or adjacent to the proposed site, but rather that our files currently do not contain any information which indicates their presence. For most sites, comprehensive field surveys have not been conducted. For these reasons, we cannot provide a definitive statement on the presence or absence of rare or state-listed species, or of significant natural communities. This information should <u>not</u> be substituted for <u>on-site</u> surveys that may be required for environmental assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

This response applies only to known occurrences of rare or state-listed animals, and plants, significant natural communities, and other significant habitats. For information regarding regulated areas or permits that may be required under state law (e.g., <u>regulated wetlands</u>), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

Sincerely,

Betty Ketcham

Betty A. Ketcham, Information Services
NY Natural Heritage Program

Enc.
cc: Reg. 3, Wildlife Mgr.
Reg. 3, Fisheries Mgr.

Appendix Q
Wetland Delineation

APPENDIX Q WETLAND RESOURCES

DELINEATION REPORT – PROJECT SITE

WETLAND DELINEATION REPORT

CALPINE WAWAYANDA ENERGY CENTER SITE

TOWN OF WAWAYANDA
ORANGE COUNTY, NEW YORK

Prepared for:

TRC ENVIRONMENTAL GROUP
Boott Mill South
Foot of John Street
Lowell, MA 01852

Prepared by:

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.
23 County Route 6, Suite A
Phoenix, New York 13135

Project Investigators:

Joseph M. McMullen
Stephen L. Sheridan

August 2000

TABLE OF CONTENTS

LIST OF FIGURES

(all figures follow text)

(Oversize Figure 8 in Back Pocket)

1.0 INTRODUCTION

This report describes the wetland resources identified on the Calpine Wawayanda Energy Center Site located in the Town of Wawayanda, Orange County, New York. The site investigated is approximately 53 acres in size and is located north of Dolsontown Road (Figure 1).

Terrestrial Environmental Specialists, Inc. (TES) was contracted by the TRC Environmental Group to delineate and describe the wetlands on the site regulated by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. The delineation of the regulated wetlands was conducted using the methods described in the 1987 Corps Wetlands Delineation Manual (Environmental Laboratory 1987).

This report is intended to be used as documentation of the wetland boundaries. It includes the following: agency resource information; methods; a results section which includes a general site description, site ecology, and wetland descriptions; and a summary of the findings. This report is complemented by photographs and wetland determination data sheets presented in the appendices.

2.0 AGENCY RESOURCE INFORMATION

Prior to the field investigation at the property, various maps and other sources of background information were reviewed. These included: the New York State Department of Transportation (NYSDOT) topographic map (Middletown quadrangle) (Figure 1); the NYSDEC Freshwater Wetlands Map (Figure 2); the National Wetlands Inventory (NWI) Map (Figure 3) published by the U.S. Fish and Wildlife Service (USFWS); and the Orange County Soil Survey Map (Figure 4) prepared by the U.S. Soil Conservation Service. The Flood Insurance Rate Map published by the Federal Emergency Management Agency (Figure 5) and the Stream Classification Map (Figure 6) published by the NYSDEC were also reviewed, as well as a 1991 aerial photograph.

3.0 ENDANGERED AND THREATENED SPECIES

Contact letters were sent to the USFWS and the NYSDEC Natural Heritage Program to determine whether any records existed for endangered or threatened species on the site. These letters are included in Appendix A.

The USFWS reported that *"Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area"*.

The NYSDEC Natural Heritage Program has reported that *"We have no records of <u>known</u> occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of your site."*

Based on the agency responses and field reviews by TES, it is concluded that no conflicts with endangered species exist on this site.

4.0 METHODS

The background information maps, aerial photographs, and soils information discussed above were used during the field review of the site. These maps assisted in the initial identification of potential wetland areas.

Detailed flagging and data collection of the wetland boundaries on the site were performed by TES on June 14 and 27, 2000. The boundaries were delineated using the federal criteria for vegetation, soils, and hydrology (Environmental Laboratory 1987, Reed 1988, USSCS 1989, USDA NRCS 1998).

Surveyor's ribbon was placed along the wetland boundary based on observations of vegetation, soils, and hydrology conditions. These observations were made along transects located perpendicular to the wetland boundary. Additional observations of vegetation, soils, and hydrology were made at intermediate locations between the transects for the placement of additional flagging. Each wetland flag was labeled with the letter of the wetland and was numbered consecutively. The flagged wetland boundaries were surveyed by John Nelting, P.L.S.

The wetland was delineated by Joseph M. McMullen and Stephen L. Sheridan. Their resumes are included in Appendix D.

To further support the wetland boundary, data on vegetation, soils, and hydrology were collected on June 27, 2000 in plots along transects located perpendicular to the wetland boundary on the site. Eighteen plots were sampled and their locations are shown on Figure 9. Plots were located on the upland and wetland sides of the boundary at various locations. The plot data were recorded on data sheets similar to those used in the federal manual (Environmental Laboratory 1987).

Vegetation data were collected in the plots at both the upland and wetland end of each transect. Ocular estimates of the percent areal cover by plant species for each vegetation layer (tree, shrub, and herbaceous layers) were recorded. The plots varied in size by vegetation layer being sampled. The sizes were: 30-foot diameter for the trees, 10-foot diameter for the shrubs, and 5-foot diameter for the herbaceous layer.

The presence of wetland vegetation was determined when more than 50 percent of the dominant species in a sample plot had an indicator status of obligate (OBL), facultative-wet (FACW), or facultative (FAC+, FAC), excluding FAC-. The dominant species for each layer in a plot were determined by ranking the species in decreasing order of percent cover and recording those species which, when cumulatively totaled, immediately exceeded 50 percent of the total cover of that layer. Additionally, any plant species that comprised 20 percent or more of the total cover for each layer was considered to be a dominant species.

Scientific nomenclature for plant species follows *A Checklist of New York State Plants* (Mitchell and Tucker 1997). The indicator status for each dominant plant species was determined using the *National List of Plants that Occur in Wetlands: Northeast (Region 1)* (Reed 1988) and the *1995 Supplement To the List Of Plant Species That Occur In Wetlands: Northeast (Region 1)* (Tiner *et al.* 1995). For any species not included in the list, the indicator status was designated using the *Manual of Vascular Plants of Northeastern United States and Adjacent Canada* (Gleason and Cronquist 1991), *New Britton and Brown Illustrated Flora* (Gleason 1952), and *Gray's Manual of Botany* (Fernald 1950).

Soil and hydrology data were collected in soil pits or soil borer holes to a depth of 20 inches within each sample plot. Soil characteristics were noted along the soil profile at the depth specified by the Corps criteria (Environmental Laboratory 1987). Procedures for identifying hydric soils as outlined in the *Field Indicators of Hydric Soils in the United States* (USDA NRCS 1995) were also followed. Soil colors were determined by using the Munsell color chart. Primary and secondary indicators of hydrology were also noted at each sample plot. The wetland boundary was refined on the basis of intermediate soil borer holes along each transect.

5.0 RESULTS

Results of the wetland delineation and survey are shown on Figures 8 and 9, with a large-scale copy of the plan presented in the back pocket. Representative photographs of the site are presented in Appendix B. Plot data are presented in Appendix C.

5.1 General Site Description

The approximately 53-acre site is located in the Town of Wawayanda, Orange County, New York (Figure 1). The site is located north of Dolsontown Road and south of an abandoned railroad line. Topography of the site is moderately sloping in the northern and southeastern portions, with a broad flat in the center.

The NYSDEC Freshwater Wetlands map (Figure 2) does not show any regulated wetlands on the site, however, the map does identify Wetland MD-19 to the northeast of the site. The National Wetlands Inventory map shows a palustrine emergent wetland, palustrine excavated pond, and a linear palustrine emergent wetland in the eastern portion of the site (Figure 3).

The Orange County Soil Survey (USSCS 1981) indicates that Mardin gravelly silt loam, Wayland silt loam, Hoosic gravelly sandy loam, Erie gravelly silt loam, and Madalin silt loam occur on the site (Figure 4). Wayland silt loam and Madalin silt loam are hydric (wetland) soils and the Erie gravelly silt loam has the potential for hydric inclusions (USSCS 1989).

An unnamed tributary to Monhagen Brook flows across the site from the northeast to the south (Figure 1). It flows under Dolsontown Road through a large culvert. The NYSDEC has assigned a water classification to this unnamed tributary of Class D with D standards (Figure 6). This waterbody is not regulated by the NYSDEC under Article 15 Protection of Waters because the stream does not have a classification of C(t) or higher. None of this site is within the 100-year floodplain of the Monhagen Brook or its unnamed tributary (Figure 5).

5.2 Site Ecology

A variety of vegetation and land use cover types occupy the site as indicated by a vegetation cover map presented on Figure 7. The majority of the site consists of agricultural cropland currently in production. The current crop is oats (*Avena sativa*); corn (*Zea mays*) was planted last year. A developed/residential area, consisting of a residence and an outbuilding, occupies a small area in the southern portion of the site along Dolsontown Road. Open field areas include idle agricultural land. Species present in open fields include Canada thistle (*Cirsium arvense*), quack grass (*Agropyron repens*), and red fescue (*Festuca rubra*).

A scrub-shrub and deciduous forest upland lies along the northeastern border of the site adjoining the abandoned railroad line. Tree species present included American elm (*Ulmus americana*), pin oak (*Quercus palustris*), with other scattered trees such as white ash (*Fraxinus americana*), tree-of-heaven (*Ailanthus altissima*), and black cherry (*Prunus serotina*). Shrub layer vegetation included American elm, buckthorn (*Rhamnus cathartica*), multiflora rose (*Rosa multiflora*), and honeysuckle (*Lonicera tatarica*).

Wetland community types occur in the central portion of the site along the tributary to Monhagen Brook. Wetland types include open water, emergent wetland, scrub-shrub wetland, and farmed wetland. These communities are described in the following section.

5.3 Wetland Descriptions

Wetland boundaries are shown on Figure 8. The location of plots and photographs are shown on Figure 9. Photographs of the wetlands and plot data are presented in Appendices B and C, respectively.

Three wetland areas were found on the project site (Figures 8 and 9). These wetlands are labeled Wetland A, B, and C. They total 8.89 acres and occur in the center of the site along the tributary to Monhagen Brook.

Wetland A

Wetland A is a 0.12 acre scrub-shrub wetland (Figures 7 and 8). It is an isolated wetland and is adjacent to the abandoned railroad right-of-way. Wetland A contains pin oak and American elm in the tree layer. Silky dogwood (*Cornus amomum*) and swamp rose (*Rosa palustris*) are present in the shrub layer. The herbaceous layer contains purple loosestrife (*Lythrum salicaria*), pointed broom sedge (*Carex scoparia*), blue flag (*Iris versicolor*), aster (*Aster* sp.), reed canary grass (*Phalaris arundinacea*), and poison ivy (*Toxicodendron radicans*).

Soil samples taken contained low matrix chromas with mottles. Hydrology was indicated by inundation of the area.

Wetland B

Wetland B contains three cover types: scrub-shrub wetland, emergent wetland, and a pond. It is 4.11 acres in size and is located in the east-central portion of the site between the railroad grade and a farm road (Figures 7 and 8). It is associated with the tributary stream that crosses the site.

The scrub-shrub areas of Wetland B contain silky dogwood, grey dogwood (*Cornus foemina* ssp. *racemosa*), American elm, and buckthorn in the shrub layer. The herbaceous layer was dominated by redtop (*Agrostis gigantea*), asters, narrow-leaf goldenrod (*Euthamia graminifolia*), rough-stem goldenrod (*Solidago rugosa*), fox sedge (*Carex vulpinoidea*), purple loosestrife, tearthumb (*Polygonum sagittatum*), and late goldenrod (*Solidago gigantea*).

The emergent wetland portions of Wetland B were dominated by reed canary grass, and to a lesser extent purple loosestrife. A small farm pond occurs within Wetland B. The pond edge contains soft-stem bulrush (*Scirpus tabernaemontani*), broad-leaf cattail (*Typha latifolia*), purple loosestrife, and reed canary grass. Where water was 6 inches to 12 inches in depth, soft-stem bulrush, spikerush (*Eleocharis* sp.) and *Polygonum* sp. were present.

Soils in Wetland B matched the description of Wayland silt loam, a hydric soil. Soil samples had low matrix chromas with mottles. Wetland hydrology was indicated by drainage patterns and standing water in places.

Wetland C

Wetland C is a combination of tributary stream, drainage ditch, and farmed wetland and is 4.66 acres in size (Figures 7 and 8). Wetland C is associated with the tributary stream that crosses the site; it is separated from Wetland B by a farm road.

Portions of Wetland C may be considered Prior Converted (PC) by the National Resource Conservation Service (NRCS). A request for a PC determination is being made by the landowner.

Wetland C includes a drainage ditch that extends to the north and receives water from two tile drains. Common reed grass (*Phragmites australis*) was abundant in the portion of Wetland C along this drainage ditch.

In areas of Wetland C adjacent to the stream common reed, purple loosestrife, reed canary grass, and redtop were common. Forget-me-not (*Myosotis* sp.) and smartweed (*Polygonum amphibium*) were abundant in the stream tributary channel. Scattered shrubs and silver maple (*Acer saccharinum*) occurred along the edges.

Areas of Wetland C that are currently in cultivation contained oats, yellow nutsedge (*Cyperus esculentus*), ragweed (*Ambrosia artemisiifolia*), redtop, cursed crowfoot (*Ranunculus scleratus*), purple loosestrife, and reed canary grass.

The soils sampled in Wetland C matched the description for Wayland silt loam, a hydric soil. Soil samples exhibited low matrix chromas with common and prominent mottles. Wetland hydrology was indicated by inundated conditions and drainage patterns.

6.0 SUMMARY

TES delineated wetlands on a 53-acre site located in the Town of Wawayanda, Orange County, New York (Figure 1). The site is located north of Dolsontown Road and south of an abandoned railroad line. The majority of the site consists of cropland and open field.

Drainage from the site flows south from an unnamed tributary to Monhagen Brook (Figure 1). This unnamed tributary has a Class of D with D standards. There are no NYSDEC regulated wetland on the project site, although one is mapped just northeast of the site. The NWI map shows a pond and a palustrine emergent wetland associated with the stream.

Three Corps-regulated wetland areas totaling 8.89 acres were delineated on the site. Wetland A is a 0.12-acre scrub-shrub wetland, Wetland B is 4.11 acres and contains scrub-shrub, emergent, and pond areas. Wetland C is 4.66 acres and is a combination of stream/emergent, drainage ditch, and farmed wetland. Portions of Wetland C may be considered prior converted.

7.0 REFERENCES

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USDA NRCS. 1998. Field Indicators of Hydric Soils In the United States. USDA NRCS, Washington, D.C.

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** A-1U **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** DFU
Investigators: J. McMullen, S. Sheridan **Flag No.:** A-2 **Field Photo** (roll/frame): 1-11

Do normal environmental conditions exist at the plant community? (If no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Species	Cover	Status	*
Ulmus americana	70%	FACW-	*
Quercus palustris	30%	FACW	*
Fraxinus americana	5%	FACU	
Ailanthus altissima	3%	FACU-	
Prunus serotina	3%	FACU	

Dominance = 114 **50%** = 57.0 **20%** =22.8

SHRUBS

Species	Cover	Status	*
Ulmus americana	30%	FACW-	*
Rhamnus cathartica	30%	FACU+	*
Rosa multiflora	10%	FACU	
Lonicera tatarica	10%	FACU	

Dominance = 80 **50%** = 40.0 **20%** =16.0

HERBS

Species	Cover	Status	*
Alliaria petiolata	80%	FACU-	*
Parthenocissus quinquefolia	10%	FACU	
Toxicodendron radicans	5%	FAC	

Dominance = 95 **50%** = 47.5 **20%** =19.0

VINES

Species	Cover	Status	*
Vitis sp.	30%	FAC	*

Dominance = 30 **50%** = 15.0 **20%** =6.0

Percent of Dominant Species that are OBL, FACW, and/or FAC: 66.7%

☑ **Greater than 50% of plant species are FAC or wetter.**

☐ **Less than or equal to 50% of plant species are FAC or wetter.**

Remarks:

SOILS

Mapping Unit: Erie gravelly silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 8.0 (in.)

Mottled No

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

4 / 2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☑ 5 y Other -

6 / 4

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Grav/Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) **or** ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary Indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks: *Edge of RR Row remnants*

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** A-1W **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** SSW
Investigators: J. McMullen, S. Sheridan **Flag No.:** A-2 **Field Photo** (roll/frame): 1-9,10

Do normal environmental conditions exist at the plant community? (If no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Species	Cover	Status	*
Quercus palustris	20%	FACW	*
Ulmus americana	10%	FACW-	*

Dominance = 30 **50% =** 15.0 **20% =**6.0

SHRUBS

Species	Cover	Status	*
Cornus amomum	40%	FACW	*
Rosa palustris	10%	OBL	*

Dominance = 50 **50% =** 25.0 **20% =**10.0

HERBS

Species	Cover	Status	*
Lythrum salicaria	30%	FACW+	*
Aster sp.	20%	FAC	*
Carex scoparia	20%	FACW	*
Toxicodendron radicans	10%	FAC	
Phalaris arundinacea	10%	FACW	
Iris versicolor	10%	OBL	

Dominance = 100 **50% =** 50.0 **20% =**20.0

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Erie gravelly silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 6.0 (in.)

Mottled Yes

A horizon matrix color
2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☐
2.5 y☑ 5 y☐ Other -
4/1

B horizon matrix color
2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☐
2.5 y☐ 5 y☑ Other -
6/2

B horizon mottle color, if present
2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☑
2.5 y☐ 5 y☐ Other -
5/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly/Loam

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? Yes **Depth of surface water:** <1 (in.)

% Area inundated: ☑ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? Yes **Depth to saturated soil:** ____ (in.) **or** ☑ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary indicators:
☑ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary indicators:
☑ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes
Is the Sample Plot a Wetland? Yes
Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine
Sample Plot No.: B-1U **Date:** 6/27/00
Town/County/State: Wawayanda / Orange Co. / NY
Community Type: Open Field
Investigators: J. McMullen, S. Sheridan
Flag No.: B-17 (2nd) **Field Photo** (roll/frame): 1-1

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Species	Cover	Status	*
Viburnum dentatum var. lucidum	10%	FACW-	*
Rhamnus cathartica	2%	FACU+	

Dominance = 12 50% = 6.0 20% =2.4

HERBS

Species	Cover	Status	*
Cirsium arvense	70%	FACU	*
Agropyron repens	60%	FACU-	*
Festuca rubra	30%	FACU	
Asclepias syriaca	10%	FACU-	
Potentilla sp.	5%	FAC	
Aster sp.	2%	FAC	
Anthoxanthum odoratum	2%	FACU	

Dominance = 179 50% = 89.5 20% =35.8

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 33.3%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Hoosic gravelly sandy loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☐ Soil with potential hydric inclusions ☑ Non-hydric

Depth of A horizon: 8.0 (in.)

Mottled No

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4 / 2

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
7 / 3

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) SltLoam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☐ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____(in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____(in.) or ☐ Surface

Other evidence of hydrology? ☐ Yes (see Hydrology Indicators) ☑ No

Primary indicators:
- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands

Secondary indicators:
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:
☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No
Is the Sample Plot a Wetland? No
Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** B-1W **Date:** 6/27/00
Town/County/State: Wawayanda / Orange Co. / NY **Community Type:** SSW
Investigators: J. McMullen, S. Sheridan **Flag No.:** B-17 (2nd) **Field Photo** (roll/frame): 1-2

Do normal environmental conditions exist at the plant community? (If no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Species	Cover	Status	*
Cornus foemina ssp. racemosa	30%	FAC-	*
Cornus amomum	10%	FACW	*

Dominance = 40 50% = 20.0 20% =8.0

HERBS

Species	Cover	Status	*
Carex vulpinoidea	60%	OBL	*
Polygonum sagittatum	40%	OBL	*
Aster sp.	30%	FAC	
Lythrum salicaria	20%	FACW+	
Solidago gigantea	10%	FACW	
Lycopus sp.	5%	OBL	
Carex sp.	5%	FACW	
Impatiens capensis	5%	FACW	
Juncus effusus	5%	FACW+	
Galium sp.	2%		

Dominance = 182 50% = 91.0 20% =36.4

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 75.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Wayland silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:
☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 8.0 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/1

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☑ 5 y Other -
6/2

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Clay/Loam

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
- ☐ Matrix chroma of 2 without mottle
- ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** . (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary indicators:
- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☑ Drainage Patterns in Wetlands

Secondary indicators:
- ☑ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☑ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:
- ☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes
Is the Sample Plot a Wetland? Yes
Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** B-2W **Date:** 6/27/00

Town/County/State Wawayanda / Orange Co. / NY **Community Type:** EW

Investigators: J. McMullen, S. Sheridan **Flag No.:** B-12 **Field Photo** (roll/frame): 1-4,5

Do normal environmental conditions exist at the plant community? (If no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	
Phalaris arundinacea	100%	FACW	*

Dominance = 100 **50% =** 50.0 **20% =**20.0

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 12.0 (in.)

Mottled Yes

A horizon matrix color

2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☐
2.5 y☐ 5 y☑ Other -

4/1

B horizon matrix color

2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☐
2.5 y☐ 5 y☑ Other -

5/1

B horizon mottle color, if present

2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☐
2.5 y☑ 5 y☐ Other -

5/4

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Distinct

Hydric soil indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

- ☐ Matrix chroma of 2 without mottle
- ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? Yes **Depth to saturated soil:** ____ (in.) or ☑ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary Indicators:

- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☑ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands

Secondary Indicators:

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:

☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes

Is the Hydric Soil Criterion Met? Yes

Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks: *Adjacent upland from road is 3 feet above wetland. Obvious fill material.*

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** B-3U **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Ag Field
Investigators: J. McMullen, S. Sheridan **Flag No.:** B-4 **Field Photo** (roll/frame): 1-7

Do normal environmental conditions exist at the plant community? (If no, explain): Yes

VEGETATION
(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	*
Avena sativa	40%	FACU	*
Juncus sp.	30%	FAC	*
Trifolium pratense	30%	FACU-	*
Ambrosia artemisiifolia	10%	FACU	
Agrostis gigantea	5%	FACW	
Rumex sp.	5%	FAC	
Plantago major	2%	FACU	
Erigeron annuus	1%	FACU	

Dominance = 123 **50% =** 61.5 **20% =**24.6

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 33.3%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Erie gravelly silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☑ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 8.0 (in.)

Mottled No

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/2

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
3/2

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Grav/Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:
☐ Histosol ☐ Aquic Moisture Regime
☐ Histic Epipedon ☐ Redoximorphic Features
☐ Sulfidic Odor ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer
☐ Gleyed

Upland soil indicators:
☑ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary Indicators:
☐ Inundated ☐ Saturated in Upper 12 in.
☐ Water Marks ☐ Drift Lines
☐ Sediment Deposits ☐ Drainage Patterns in Wetlands

Secondary Indicators:
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** B-3W **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** SSW
Investigators: J. McMullen, S. Sheridan **Flag No.:** B-4 **Field Photo** (roll/frame): 1-8

Do normal environmental conditions exist at the plant community? (If no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Species	Cover	Status	*
Ulmus americana	10%	FACW-	*

Dominance = 10 **50% =** 5.0 **20% =**2.0

SHRUBS

Species	Cover	Status	*
Cornus foemina ssp. racemosa	90%	FAC-	*
Ulmus americana	10%	FACW-	
Cornus amomum	10%	FACW	
Rhamnus cathartica	2%	FACU+	

Dominance = 112 **50% =** 56.0 **20% =**22.4

HERBS

Species	Cover	Status	*
Agrostis gigantea	80%	FACW	*
Euthamia graminifolia	20%	FAC	
Aster sp.	20%	FAC	
Solidago rugosa	10%	FAC	
Lythrum salicaria	10%	FACW+	
Carex vulpinoidea	2%	OBL	
Onoclea sensibilis	2%	FACW	

Dominance = 144 **50% =** 72.0 **20% =**28.8

VINES

Species	Cover	Status	*
Vitis sp.	30%	FAC	*

Dominance = 30 **50% =** 15.0 **20% =**6.0

Percent of Dominant Species that are OBL, FACW, and/or FAC: 75.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 16.0 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

4/2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☑ 5 y Other -

6/2

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

5/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silty/Sand/Loam

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) **or** ☐ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary Indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☑ Drainage Patterns in Wetlands

Secondary Indicators:

☑ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☑ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** C-1U **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** AgField
Investigators: J. McMullen, S. Sheridan **Flag No.:** C-36,C-37 **Field Photo** (roll/frame): 1-12

Do normal environmental conditions exist at the plant community? (If no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	*
Avena sativa	80%	FACU	*
Cirsium arvense	20%	FACU	
Asclepias syriaca	5%	FACU-	
Erigeron annuus	5%	FACU	
Trifolium pratense	3%	FACU-	
Agrostis gigantea	2%	FACW	
Ambrosia artemisiifolia	2%	FACU	
Capsella bursa-pastoris	2%	FACU	
Arctium sp.	2%	FAC	
Taraxacum officinale	2%	FACU-	

Dominance = 123 50% = 61.5 20% =24.6

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Mardin gravelly silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☐ Soil with potential hydric inclusions ☑ Non-hydric

Depth of A horizon: 8.0 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5/3

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/4

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
6/1

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly/Loam

Mottle abundance: (few/common/many) Few

Mottle contrast: (faint/distinct/prominent) Distinct

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** (in.)

% Area Inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary indicators:
☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No
Is the Sample Plot a Wetland? No
Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** C-1W **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** EW
Investigators: J. McMullen, S. Sheridan **Flag No.:** C-36,C-37 **Field Photo** (roll/frame): 1-13

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	
Phragmites australis	100%	FACW	*
Lythrum salicaria	10%	FACW+	

Dominance = 110 **50% =** 55.0 **20% =**22.0

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Wayland silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:
☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 3.0 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
3/2

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other - Gley 1
6/N

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
5/4

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Clay

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☑ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks: *Channelized in the past*

HYDROLOGY

Is the ground surface inundated ? Yes **Depth of surface water:** 2 (in.)

% Area inundated: ☑ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? Yes **Depth to saturated soil:** ____ (in.) **or** ☑ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary Indicators:
☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☑ Drainage Patterns in Wetlands

Secondary Indicators:
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks: *Ditch between Ag fields*

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes
Is the Sample Plot a Wetland? Yes
Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** C-2U **Date:** 6/27/00

Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Ag Field

Investigators: J. McMullen, S. Sheridan **Flag No.:** C-62 **Field Photo** (roll/frame): 1-19,20

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	*
Agropyron repens	70%	FACU-	*
Cirsium arvense	40%	FACU	*
Asclepias syriaca	20%	FACU-	
Ambrosia artemisiifolia	10%	FACU	
Avena sativa	10%	FACU	
Trifolium pratense	5%	FACU-	
Plantago major	3%	FACU	
Erigeron annuus	3%	FACU	
Solanum carolinense	2%	UPL	
Vicia sativa	2%	FACU-	

Dominance = 165 50% = 82.5 20% = 33.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Mardin gravelly silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☐ Soil with potential hydric inclusions ☑ Non-hydric

Depth of A horizon: 8.0 (in.)

Mottled No

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

4/2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

3/2

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☐ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☑ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary indicators:

- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands

Secondary Indicators:

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? No

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine
Sample Plot No.: C-2W **Date:** 6/27/00
Town/County/State: Wawayanda / Orange Co. / NY
Community Type: Ag Field
Investigators: J. McMullen, S. Sheridan
Flag No.: C-62 **Field Photo** (roll/frame): 1-18

Do normal environmental conditions exist at the plant community? (if no, explain): No

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	*
Avena sativa	50%	FACU	*
Cyperus esculentus	40%	FACW	*
Polygonum aviculare	10%	FACU	
Polygonum sp.	10%	FAC	
Lythrum salicaria	5%	FACW+	
Agrostis gigantea	2%	FACW	
Ranunculus sceleratus	2%	OBL	

Dominance = 119 50% = 59.5 20% =23.8

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 50.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Wayland silt loam
Different than mapped? No

The mapped soil type is recognized by the NRCS as:
☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 10.0 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
3 / 1

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5 / 1

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5 / 4

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____(in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____(in.) or ☐ Surface

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary Indicators:
☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☑ Drainage Patterns in Wetlands

Secondary Indicators:
☑ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☑ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes
Is the Sample Plot a Wetland? Yes
Additional Remarks: *Farmed wetland*

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** C-3Ua **Date:** 6/27/00

Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Ag Field

Investigators: J. McMullen, S. Sheridan **Flag No.:** C-69 **Field Photo** (roll/frame):

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	*
Avena sativa	100%	FACU	*
Cirsium arvense	10%	FACU	
Trifolium pratense	3%	FACU-	
Solanum carolinense	3%	UPL	
Ranunculus sceleratus	2%	OBL	

Dominance = 118 **50% =** 59.0 **20% =**23.6

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? Yes

The mapped soil type is recognized by the NRCS as:

☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 12.0 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

3 / 2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

6 / 1

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

5 / 6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Clay/Loam

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary Indicators:

- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands

Secondary indicators:

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? Yes

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** C-3Ub **Date:** 6/27/00

Town/County/State: Wawayanda / Orange Co. / NY **Community Type:** Ag Field

Investigators: J. McMullen, S. Sheridan **Flag No.:** C-3 **Field Photo** (roll/frame):

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	*
Avena sativa	80%	FACU	*
Agrostis gigantea	30%	FACW	*
Leucanthemum vulgare	10%	FACU	
Taraxacum officinale	2%	FACU-	
Cerastium arvense	2%	UPL	
Thlaspi arvense	2%	UPL	
Asclepias syriaca	2%	FACU-	
Capsella bursa-pastoris	1%	FACU	

Dominance = 129 50% = 64.5 20% =25.8

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 50.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? Yes

The mapped soil type is recognized by the NRCS as:

☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 14.0 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

4/2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

6/1

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

5/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Clay/Loam

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☐ Yes (see Hydrology Indicators) ☑ No

Primary indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? Yes

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** C-3W **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** EW/Ditch
Investigators: J. McMullen, S. Sheridan **Flag No.:** C-69 **Field Photo** (roll/frame): 1-21,22

Do normal environmental conditions exist at the plant community? (If no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Species	Cover	Status	*
Acer saccharinum	20%	FACW	*

Dominance = 20 **50% =** 10.0 **20% =**4.0

HERBS

Species	Cover	Status	*
Polygonum aviculare	80%	FACU	*
Lythrum salicaria	40%	FACW+	*
Myosotis sp.	10%	OBL	
Phalaris arundinacea	10%	FACW	
Aster sp.	5%	FAC	
Carex stricta	2%	OBL	
Typha latifolia	2%	OBL	

Dominance = 149 **50% =** 74.5 **20% =**29.8

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 66.7%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks: *Ditch with maple on edge*

SOILS

Mapping Unit: Wayland silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:

☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 2.0 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4 / 1

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
6 / 1

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5 / 6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Clay

B horizon soil texture: (sand/silt/clay/loam/other) Grav/Silt/Clay

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? Yes **Depth of surface water:** 12 (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☑ 76-100

Is soil saturated ? Yes **Depth to saturated soil:** ____ (in.) **or** ☑ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary Indicators:

☑ Inundated
☑ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☑ Drainage Patterns in Wetlands

Secondary Indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks: *In ditch*

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** C-4U **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Ag Field
Investigators: J. McMullen, S. Sheridan **Flag No.:** C-11 **Field Photo** (roll/frame):

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	*
Cirsium arvense	60%	FACU	*
Avena sativa	50%	FACU	*
Arabis glabra	20%	FACU	
Taraxacum officinale	5%	FACU-	

Dominance = 135 50% = 67.5 20% = 27.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

☐ Greater than 50% of plant species are FAC or wetter.

☑ Less than or equal to 50% of plant species are FAC or wetter.

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? Yes

The mapped soil type is recognized by the NRCS as:
☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 12.0 (in.)

Mottled No

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/2

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☑ 5 y Other -
6/4

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Grav/Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☐ Yes (see Hydrology Indicators) ☑ No

Primary Indicators:
☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** C-4W **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Ag Field
Investigators: J. McMullen, S. Sheridan **Flag No.:** C-11 **Field Photo** (roll/frame): 1-24

Do normal environmental conditions exist at the plant community? (if no, explain): No

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	*
Avena sativa	80%	FACU	*
Phalaris arundinacea	20%	FACW	
Ranunculus sceleratus	20%	OBL	
Glechoma hederacea	10%	FACU	
Trifolium pratense	10%	FACU-	
Ambrosia artemisiifolia	3%	FACU	
Agrostis gigantea	3%	FACW	
Polygonum aviculare	2%	FACU	

Dominance = 148 **50% =** 74.0 **20% =** 29.6

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 12.0 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
2 / 1

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4 / 1

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5 / 6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Clay/Loam

Mottle abundance: (few/common/many) Few

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil Indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) **or** ☐ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary indicators:

☐ Inundated
☑ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☑ Drainage Patterns in Wetlands

Secondary indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks: *Farmed wetland*

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine
Sample Plot No.: C-5W **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY
Community Type: WM, edge of Ag Field
Investigators: J. McMullen, S. Sheridan
Flag No.: C-21 **Field Photo** (roll/frame):

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	*
Agrostis gigantea	60%	FACW	*
Cyperus esculentus	30%	FACW	*
Lythrum salicaria	20%	FACW+	
Avena sativa	20%	FACU	
Ranunculus sceleratus	10%	OBL	
Phalaris arundinacea	10%	FACW	
Ambrosia artemisiifolia	3%	FACU	

Dominance = 153 50% = 76.5 20% = 30.6

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Wayland silt loam
Different than mapped? No

The mapped soil type is recognized by the NRCS as:
☑ Hydric ☐ Soil with potential hydric inclusions ☐ Non-hydric

Depth of A horizon: 8.0 (in.)

Mottled Yes

A horizon matrix color
2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr ☐
2.5 y ☑ 5 y ☐ Other -
3/1

B horizon matrix color
2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr ☐
2.5 y ☑ 5 y ☐ Other -
4/1

B horizon mottle color, if present
2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr ☐
2.5 y ☐ 5 y ☐ Other -
4/4

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? Yes **Depth of surface water:** <1 (in.)

% Area inundated: ☑ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? Yes **Depth to saturated soil:** ____ (in.) or ☑ **Surface**

Other evidence of hydrology? ☑ **Yes (see Hydrology Indicators)** ☐ **No**

Primary Indicators:
☑ Inundated
☐ Water Marks
☐ Sediment Deposits
☑ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:
☑ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes
Is the Sample Plot a Wetland? Yes
Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine **Sample Plot No.:** Up-1 **Date:** 6/27/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Ag Field
Investigators: J. McMullen, S. Sheridan **Flag No.:** **Field Photo** (roll/frame): 14-17

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	*
Avena sativa	90%	FACU	*
Panicum sp.	10%	FAC	
Silene latifolia	2%	FACU	
Thlaspi arvense	2%	UPL	

Dominance = 104 **50% =** 52.0 **20% =**20.8

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Mardin gravelly silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☐ Soil with potential hydric inclusions ☑ Non-hydric

Depth of A horizon: 6.0 (in.)

Mottled No

A horizon matrix color
2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☑
2.5 y☐ 5 y☐ Other -
3/2

B horizon matrix color
2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☐
2.5 y☑ 5 y☐ Other -
6/4

B horizon mottle color, if present
2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☐
2.5 y☐ 5 y☐ Other -

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary indicators:
☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary indicators:
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No
Is the Sample Plot a Wetland? No
Additional Remarks:

JOSEPH M. MCMULLEN

Principal Environmental Scientist

Mr. McMullen holds a M.S. degree in biology with a concentration in botany. He has 25 years' experience in environmental consulting, with over 20 years active experience in wetland study. His specific expertise in wetlands studies includes: aerial photograph interpretation; wetland delineations; wetland vegetation cover type mapping; state and federal permitting; wetland creation planning; wetland construction monitoring; post-construction monitoring of created and restored wetlands; and expert testimony. He holds all available wetland delineation certifications. Mr. McMullen has been involved in hundreds of wetland studies in New York, and has made numerous presentations on various aspects of wetland permitting and study. He has also performed numerous vegetation surveys, including endangered and threatened plant surveys, vegetation/habitat cover mapping, and descriptions of plant communities. Mr. McMullen has considerable mapping experience using CIR, true color, and black and white imagery. He has performed wildlife habitat studies and fisheries work on various projects. His experience includes work in Alaska, Florida, Puerto Rico, and all the northeastern states from Michigan to Virginia to Maine.

Education

M.S. Biology/West Virginia University/1974.
B.S. Biology/Saint Francis College/1971.

Project Experience

Government Projects

- Provided a vegetation/habitat cover map, a vegetation description, and an assessment of rare and endangered plant species for a unique swamp forest in New Jersey.
- Prepared a vegetation cover map and flora survey for a 4,300-acre naval base in Virginia.
- Mapped wetlands and listed dominant plant species for a village in central New York.
- Mapped and described environmentally sensitive areas (wetlands, floodplains, steep slopes, and prime farmland) for a village in central New York.
- Worked with the New Jersey Department of Environmental Protection to develop a statewide system of wildlife habitat classification.
- Prepared the vegetation and forestry sections of a forest, fish, and wildlife management plan for a Corps of Engineers facility in Pennsylvania.
- Performed a vegetation study of a 2,500-acre bald cypress slough in Lee County, Florida, for the U.S. Army Corps of Engineers.
- Mapped and described wetlands for a town in Broome County, New York.
- Developed and implemented a wetland creation plan for a Consent Order to resolve a Corps wetland violation for a town in central New York.
- Developed and implemented a study to assess the restoration of aquatic vegetation at a nature center in central New York.

Commercial and Industrial Development Projects

- Used Habitat Evaluation Procedures (HEP) to evaluate the wildlife habitat and the projected impact of a development project on a 400-acre wetland in New Jersey.
- Prepared a DEIS under SEQR guidelines for a shopping center in central New York; main issues were drainage, wetlands, traffic, and zoning.
- Provided a detailed wetland evaluation in support of a DEC and Corp of Engineers wetland permit application for an office complex site.
- Prepared reports, wetland permit applications, and developed a wetland mitigation plan for a major retail development in Boardman Township, Ohio.
- Assessed wetlands on several potential development sites in the Akron-Canton area of Ohio.
- Prepared information on SEQR and wetland permits for two cemeteries in central New York.
- Provided input into a wetland mitigation plan and responses to agency comments for a distribution center in the Town of Wilton, New York.
- Performed a wetland delineation and report for a large parcel in the City of Saratoga Springs, New York.
- Prepared a 5-acre wetland creation plan and negotiated a resolution of a DEC wetland violation for an area near Syracuse, New York.
- Acquired state and federal wetland permits and prepared DEIS sections under SEQR for a large glass manufacturing facility in Geneva, New York.
- Prepared SEQR material for a mall expansion site and a mixed commercial site near Watertown, New York.
- Acquired wetland and stream disturbance permits for a railroad station in Middletown, New York.
- Delineated wetlands for a large manufacturing facility in Canandaigua, New York.
- Assessed habitat areas and mapped wetlands for a development in the Town of Ithaca, New York.
- Mapped wetlands for a proposed semi-conductor manufacturing facility site in central New York.
- Coordinated archeological surveys and performed wetlands delineations for a trucking center in central New York.

Electric Power Generation Projects (fossil-fueled & nuclear)

- Prepared vegetation cover type maps for 12,000 acres of mixed communities for sites proposed for coal-fired facilities.
- Prepared written testimony and interrogatory responses concerning plant communities and related impacts of power plant construction.
- Collected, analyzed and interpreted data for plant ecology studies on the primary and secondary sites for a proposed major electric generating station.
- Designed and supervised the data collection and report preparation for an intensive study of vegetation and designed a 5-year monitoring program to assess the impacts of the construction of a nuclear power plant in New Jersey.
- Designed and implemented a vegetation study including cover type mapping, an endangered and threatened species survey, and quantitative sampling for two potential power plant sites in southeastern Michigan.

- Prepared several sections of a DEIS under SEQR, and prepared wetland delineations for a DEC and Corps of Engineers wetland permit for a 1000-MW cogeneration facility in central New York.
- Used color infra-red aerial photographs to map vegetation stress over several years in a 50-square-mile area near Pittsburgh, Pennsylvania.
- Mapped wetlands using color infra-red aerial photographs in two areas totaling 62 square miles in east-central Pennsylvania.

Hydroelectric Projects

- Prepared sections on soils and vegetation for an environmental report on the renovation of an existing, non-operating hydroelectric generating facility.
- Prepared a report on the status of endangered plant species in the vicinity of a proposed hydroelectric facility.
- Prepared a vegetation description and provided input on impacts for a potential hydroelectric pump-storage facility in West Virginia.
- Served as Group Leader in charge of coordinating subcontractors conducting Phase I vegetation studies for the Susitna Hydroelectric Project, a major hydroelectric development project in Alaska.
- Served as Project Manger for a feasibility study on a hydroelectric project on the Lehigh River in northeastern Pennsylvania.
- Assisted in a water quality and fisheries sampling program at a proposed hydroelectric site on the Ohio River.
- Performed a vegetation survey (species list, community descriptions, and endangered and threatened species) for hydroelectric project areas in Piscataquis and Hancock counties, Maine.
- Collected data to assess the impacts upon wetlands due to proposed changes in pool levels at a hydroelectric facility on the Hudson River.
- Prepared a detailed report on the botanical resources, with emphasis on wetland conditions and possible changes due to proposed water level alterations, along a 7-mile reach of the Kennebec River, Maine, and for another project on the Sebasticook River, Maine.
- Described the botanical resources and searched for endangered, threatened or rare plant species for a hydroelectric facility on the upper Hudson River, New York.
- Prepared the botanical resources section of a FERC license application for a major, new dam on the Black River, New York.
- Acted as Project Manager and performed wetlands and fisheries studies for two hydroelectric projects on the LaChute River, Essex Co., New York.

Electric Transmission Projects

- Provided input for an environmental assessment and routing analysis for a 138 kV transmission line in Pennsylvania.
- Participated in an environmental assessment and routing analysis for a 115 kV transmission line in northern New York.
- Performed field inventories of vegetation and land use for 400 miles of 345 kV, 230 kV, and 765 kV transmission line rights-of-way across New York.
- Performed field inventories of vegetation and land use on 300 miles of rights-of-way for 230 and 765 kV transmission lines in northern New York.

- Performed studies necessary for the preparation of several sections of an Article VII application for a 30-mile 345 kV transmission line and prepared all necessary wetland studies and reports for state and federal permitting.
- Mapped wetlands and assessed regulated streams for a wetland and stream disturbance permit application for a 17-mile overhead electric distribution/transmission line in Otsego County, New York.

Hazardous and Solid Waste Management Projects

- Supervised the preparation and authored various sections of a comprehensive draft environmental impact statement prepared under the guidelines of the New York State Environmental Quality Review Act for a proposed county sanitary landfill.
- Prepared the vegetation description of a potential landfill site in central New York.
- Assessed three potential landfill sites in Broward County, Florida, for various environmental conflicts.
- Performed a wetland survey, vegetation cover mapping, and rare plant species survey on a proposed resource recovery site in central Massachusetts.
- Utilizing the concepts of Pennsylvania Modified (PAM) HEP, assisted in the ecological evaluation of five sites in eastern Pennsylvania for potential use as ash disposal areas.
- Participated in an ecological inventory of three candidate sites for a resource recovery facility in Broome County, New York.
- On a waste-to-energy facility, devised a salt marsh restoration and creation plan for a coastal wetland in eastern Massachusetts and supervised its implementation.
- Performed fisheries sampling, wetlands mapping, and rare species surveys for a hazardous waste site in northern New York.
- Performed vegetation surveys, endangered plant searches, and wetland studies for a 1,500-acre county landfill in northern New York.
- Developed a wetland restoration plan and implemented vegetation plantings for a hazardous waste clean-up site in central New York.
- Provided input into a wetland restoration plan for a hazardous waste site in Franklin County, New York.
- Developed a wetland restoration plan for a sanitary landfill in northern New York.

Mine Projects

- Evaluated proposed gravel mine and quarry sites in eastern New York for protected plants and environmental conflicts.
- Assessed several quarry sites in eastern New York and the lower Hudson region for wetlands and endangered plant species.
- Provided expert testimony in defense of a restoration plan for a quarry site in eastern New York.
- Developed a wetland restoration plan for an aggregate mine in central New York.

Pipeline and Fiber Optic Cable Projects

- Prepared several sections of a DEIS for an 11-mile sewer line near Watertown, New York.

- Designed and implemented multi-year research projects involving the restoration of wetlands following the construction of natural gas pipelines.
- Performed wetland and stream surveys and organized stream disturbance and wetland permits for a water and sewer line project in Chenango County, New York.

Residential Development Projects

- Performed wetland surveys and state and federal wetland permitting for numerous subdivisions in central New York.
- Developed environmental assessment forms and SEQR material for several residential subdivisions in New York.
- Assessed wetland boundaries and class ranking and provided vegetation descriptions for areas in central New York tentatively mapped under the Freshwater Wetlands Act.
- Assessed a wetland in the Pine Barrens of Long Island for rare plant species.
- Performed multiple searches for endangered plant species on a 4500-acre area proposed for residential development in the Pine Barrens area of Ocean County, New Jersey.

Awards and Certifications

Grant-in-aid of Research from The Society of Sigma Xi, 1972.

U.S. Fish and Wildlife Service Habitat Evaluation Procedures Certification Program, 1981.

Provisional Certified Wetland Delineator, Baltimore District, U.S. Army Corps of Engineers, 1993.

Professional Wetland Scientist, Society of Wetland Scientists, 1995.

Memberships

New England Botanical Club
New York Flora Association
New York State Wetlands Forum, Inc. (Board of Directors)
Society of Wetlands Scientists
Southern Appalachian Botanical Club
The Wildlife Society (New York Chapter)

JOSEPH M. MCMULLEN
(Addendum)

Publications

McMullen, J. M. 1974. Anatomical and morphological variation in Podophyllum peltatum L. due to aspect and elevation. M.S. Thesis, West Virginia University, Morgantown.

McMullen, J. M., and J. F. Clovis. 1974. Anatomical variation in Podophyllum peltatum L. due to aspect and elevation. West Virginia Academy of Science Proceedings, Biology Section: 274-280.

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McMullen, J., R. S. Slack, V. J. Lucid, and P. G. Kalka. 1975. Breeding bird census: shrub community II. American Birds 29: 1113-1114.

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McMullen, J. M., and R. S. Slack. 1977. Breeding bird census: mixed hardwoods forest. American Birds 31: 30.

McMullen, J. M., R. S. Slack, and V. J. Lucid. 1977. Breeding bird census: mixed hardwoods. American Birds 31: 29-30.

McMullen, J. M. 1983. Vegetative abuse. New York Forester 40(4): np.

McMullen, J. M. 1984. Cedar Waxwing caught on fishing line. Kingbird 34: 169.

McMullen, J. M. 1984. Freshwater wetlands: the effect of hydro development. Hydro-Review 3(4): 88-91.

McMullen, J. M. (Technical Author). 1985. Nature Trail Guide Booklet for the Clay Marsh Nature Center. ed. by Nicholas Aurucchio for the Town of Clay, NY.

McMullen, J. M. 1985. Endangered species: is there a darter in your dam? Hydro-Review 4(4): 50-54.

McMullen, J. M. 1986. Place names tell tales about trees. Pennsylvania Game News. Vol. 57(5): 18-21.

McMullen, J. M. 1986. New York's Endangered, Threatened and Rare Plant Species. Clintonia, Vol. 1: 1-3.

McMullen, J. M. 1987. New and Noteworthy Plants from the Erie Lake Plain of New York. Clintonia, Vol. 2: 1-3.

McMullen, J.M. 1987. Selection of Plant Species for Use in Wetlands Creation and Restoration. ed. by J. Zelazny and J. S. Feierabend. Proceedings, Increasing our Wetland Resources Symposium, National Wildlife Federation, Washington, D.C.

McMullen, J. M. 1988. More than just hunting. Pennsylvania Game News. Vol. 59(8): 3-5.

McMullen, J. M. 1992. Conservation - Heeding Yesterday's Lessons. Pennsylvania Game News. Vol. 63(7): 3-5.

McMullen, J.M., B.P. Carr, and D. Wheelock. 1994. Ferns of the Clark Reservation Area. New York Flora Association Newsletter. Vol 5(1):3-4.

McMullen, J.M. and P.A. Meacham. 1996. A Comparison of Wetland Boundaries Delineated in the Field to those Boundaries on Existing State and Federal Wetland Maps in Central New York State. "in" Wetlands: Environmental Gradients, Boundaries, and Buffers. ed. by G. Mulamoottil. CRC Press, Inc., Boca Raton, FL.

McMullen, J.M. and M.E. Burger. 1996. Initial Natural Revegetation in Wetlands Restored after Pipeline Construction. New York State Wetlands Forum Newsletter. Vol. 3(1):11-12.

McMullen, J.M. 1996. Neglected Members of our New York Flora: Trees and Shrubs. New York Flora Association Newsletter. Vol. 7(1):2-3.

McMullen, J.M., M.E. Burger, and S.D. Shupe. 1997. Evaluation of Different Grasses to Restore Wetlands and Control Weed Species after Pipeline Construction. The Sixth International Symposium of Environmental Concerns in Rights-of-Way Management. ed. by J.R. Willliams, J.W. Goodrich-Mahoney, J.R. Wisniewski, and J. Wisniewski, Elsevier Science, New York.

McMullen, J. M. 1999. Are Wetland Scientists Inadvertently Spreading Purple Loosestrife and Phragmites? New York State Wetlands Forum Newsletter. Vol. 6(1): 4.

Presentations at Conferences/Meetings

1979. *Use of Aerial Photographs in Environmental Studies*. Central New York Region of the American Society of Photogrammetry. Watertown, NY.

1982. *Wildflowers of Alaska*. Onondaga Audubon. Syracuse, NY.

1987. *Wetlands - State-of-the-Art*. New York Upstate Chapter, American Society of Landscape Architects. Syracuse, NY.

1988. *Assessments for endangered, threatened, and rare species - a view from the private sector*. 15th Annual Natural Area Association Conference. Syracuse, NY.

1989. *Wetlands Mitigation/Wetland Enhancement Projects*. Onondaga County Environmental Management Council Meeting. Syracuse, NY.

1990. *Wetlands Mitigation Options*. Wetlands - The Changing Regulatory Environment. Whiteman, Osterman & Hanna. Syracuse, NY.

1993. *Wetlands Delineation and Mitigation - The Consultants Role*. Environmental Law Committee of the Onondaga County Bar Association. Syracuse, New York.

1993. *Federal Wetlands Regulations and Wetland Delineations*. Wetlands Workshop and Field Trip, Onondaga County Environmental Management Council and Planning Federation. Baldwinsville, New York.

1993. *SEQR - The Consultants Perspective*. Advanced EIS Training for Department of Regulatory Affairs Staff, New York State Department of Environmental Conservation. Oswego, New York.

1994. *Wetlands Delineation and Wetland Mitigation*. Wetlands - The Ever-Changing Regulatory Environment. New York Planning Federation and Whiteman, Osterman & Hanna. Syracuse, New York.

1994. *A Comparison of Field Delineated Wetlands Boundaries in Central New York to those Boundaries Existing on State and Federal Wetlands Maps*. Wetlands: Environmental Gradients, Boundaries and Buffers. Wetlands Research Centre, University of Waterloo. Niagara Falls, Canada.

1994. *Assessment of Subsurface Flow Constructed Wetlands for Wastewater Treatment in the Town of LaFayette.* Low-Cost Small Community Wastewater Treatment Systems Seminar. New York State Energy and Research Development Authority. Albany, New York.

1995. *Assessment of Different Grass Species to Inhibit the Invasion of Purple Loosestrife and Common Reed Grass when Restoring Wetlands in Rights-of-way.* Wetlands '95. New York State Wetlands Forum. Syracuse, New York.

1996. *Assessment of Impacts on Areas Adjacent to Wetlands.* Wetlands '96: Partnership for the Future. New York State Wetlands Forum, Inc. Bear Mountain, New York.

1997. *Evaluation of Different Grasses to Restore Wetlands and Control Weed Species after Pipeline Construction.* Environmental Concerns in Rights-of-Way Management, Sixth International Symposium. Energy Power Research Institute, New Orleans, Louisiana.

1997. *Effects of Brushmat/Corduroy Roads on Wetlands within Rights-of-Way.* Poster Session. Environmental Concerns in Rights-of-Way Management, Sixth International Symposium. Energy Power Research Institute, New Orleans, Louisiana.

1997. *Wetland Identification and Management.* Rural Landowners Workshop. Cornell Cooperative Extension, Skaneateles, New York.

1998. *Basic Steps in Wetlands Creation and Restoration, with Examples from First-Hand Experience.* New York Planning Federation Annual Conference, Rochester, New York.

1999. *Practical Considerations in Wetlands Creation and Restoration and their Effect on Mitigation Success.* Wetlands Forum Conference, Syracuse, New York.

1999. *Vegetation along Nine Mile Creek.* Nine Mile Creek Day, Camillus, New York.

1999. *Practical Wetland Remediation and Restoration Techniques.* Poster Session. Wetlands and Remediation – An International Conference. Salt Lake City, Utah.

2000. *The Identification of Wetland Herbaceous Plants in Winter.* New York State Wetlands Forum Conference, Binghamton, New York.

2000. *Practical Considerations in Wetland Creation/Restoration.* Sediment and Wetland Remediation – Technical Seminar, Buffalo, New York.

STEPHEN L. SHERIDAN

Assistant Environmental Scientist

Mr. Sheridan has over 8 years of professional experience in the environmental field. He has participated in hundreds of environmental studies. His primary area of experience is wetlands.

Education

B.S. Environmental Studies/SUNY, College of Environmental Science and Forestry/1992.
B.A. Economics/University of Maryland/1989.

Project Experience

Commercial and Industrial Development Projects

- Prepared wetland and water quality permit applications and supporting report for an 8-acre retail development in central New York.
- Participated in wetland delineation and permit application preparation at a proposed industrial site in Orange County, New York.
- Participated in a wetland delineation of a 53-acre site for a proposed industrial facility, Orange County, New York.
- Prepared wetland and water quality permit applications for a 23-acre development, Cortland County, New York.

Previous Employment Experience

Center for Ecological Management of Military Lands, Colorado State University. Conducted over 100 wetland delineations at Ft. Drum, New York using GPS to map the wetlands. Monitored construction activities for compliance with federal environmental standards and permit conditions.

Louis Berger & Associates,
Participated in over 100 wetland delineations for road expansion projects in New Jersey, Delaware, New York, and Maryland. Monitored construction of nine wetland mitigation sites in New Jersey and Delaware. Participated in a vegetation density study at a Superfund site, PA. Used computer models to estimate erosion and to estimate pollution loads from different road improvements and new road projects.

Cornell University Field Station, Shackelton Point, NY.
Assisted with collection of data for on going fisheries studies at the station.

Certification

Certificate of Completion, 40 hour OSHA Health and Safety Training Course for Hazardous Waste Operations, 1994.

DELINEATION REPORT – SOUTHERN LAYDOWN AREA

WETLAND DELINEATION REPORT

CALPINE WAWAYANDA ENERGY CENTER
SITE 2

TOWN OF WAWAYANDA
ORANGE COUNTY, NEW YORK

Prepared for:

TRC ENVIRONMENTAL GROUP
Boott Mill South
Foot of John Street
Lowell, MA 01852

Prepared by:

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.
23 County Route 6, Suite A
Phoenix, New York 13135

Project Investigators:

Joseph M. McMullen
Stephen L. Sheridan

February 2001

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

This report describes the wetland resources identified on the Calpine Wawayanda Energy Center-Site 2 located in the Town of Wawayanda, Orange County, New York. The site investigated is approximately 48 acres in size and is located south of Dolsontown Road and north of Interstate Route 84 (Figure 1). For reference, this site is located across Dolsontown Road from the proposed Calpine Wawayanda Energy Center Site (Site 1). A Wetland Delineation Report for Site 1 was provided previously.

Terrestrial Environmental Specialists, Inc. (TES) was contracted by the TRC Environmental Group to delineate and describe the wetlands on the site regulated by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. The delineation of the regulated wetlands was conducted using the methods described in the 1987 Corps Wetlands Delineation Manual (Environmental Laboratory 1987). No state-regulated wetlands are mapped for this area.

This report is intended to be used as documentation of the wetland boundaries. It includes the following: agency resource information; methods; a results section which includes a general site description, site ecology, and wetland descriptions; and a summary of the findings. This report is complemented by photographs and wetland determination data sheets presented in the appendices.

2.0 AGENCY RESOURCE INFORMATION

Prior to the field investigation of the property, various maps and other sources of background information were reviewed. These included: the New York State Department of Transportation (NYSDOT) topographic map (Middletown quadrangle) (Figure 1); the New York State Department of Environmental Conservation (NYSDEC) freshwater wetlands map (Figure 2); the National Wetlands Inventory (NWI) map (Figure 3) published by the U.S. Fish and Wildlife Service (USFWS); and the Orange County soil survey map (Figure 4) prepared by the U.S. Soil Conservation Service (currently Natural Resource Conservation Service). The Flood Insurance Rate Map published by the Federal Emergency Management Agency (Figure 5) and the Stream Classification Map (Figure 6) published by the NYSDEC were also reviewed, as well as a 1991 aerial photograph.

3.0 ENDANGERED AND THREATENED SPECIES

Contact letters were sent to the USFWS and the NYSDEC Natural Heritage Program to determine whether any records existed for endangered or threatened species for the adjacent Site I. These letters are included in Appendix A.

The USFWS reported that *"Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area".*

The NYSDEC Natural Heritage Program has reported that *"We have no records of known occurrences of rare or state-listed animals or plants, significant natural communities, or other significant habitats, on or in the immediate vicinity of your site."*

4.0 METHODS

The background information maps, aerial photographs, and soils information discussed above were used during the field review of the site. These maps assisted in the initial identification of potential wetland areas.

Detailed flagging and data collection of the wetland boundaries on the site were performed by TES on October 30 and 31 and November 2, 2000. The boundaries were delineated using the federal criteria for vegetation, soils, and hydrology (Environmental Laboratory 1987, Reed 1988, USSCS 1989, USDA NRCS 1998).

Surveyor's ribbon was placed along the wetland boundary based on observations of vegetation, soils, and hydrology conditions. These observations were made along transects located perpendicular to the wetland boundary. Additional observations of vegetation, soils, and hydrology were made at intermediate locations between the transects for the placement of additional flagging. Each wetland flag was labeled with the letter of the wetland and was numbered consecutively. The flagged wetland boundaries were surveyed by John Nelting, P.L.S.

The wetlands were delineated by Joseph M. McMullen, Stephen L. Sheridan, and Cathie A. Baumgartner. Their resumes are included in Appendix D.

To further support the wetland boundary, data on vegetation, soils, and hydrology were collected on November 2, 2000 in plots along transects located perpendicular to the wetland boundary on the site. Twenty-two plots were sampled and their locations are shown on Figure 9. Plots were located on the upland and wetland sides of the boundary at various locations. The plot data were recorded on data sheets similar to those used in the federal manual (Environmental Laboratory 1987).

Vegetation data were collected in the plots at both the upland and wetland end of each transect. Ocular estimates of the percent areal cover by plant species for each vegetation layer (tree, shrub, and herbaceous layers) were recorded. The plots varied in size by vegetation layer being sampled. The sizes were: 30-foot diameter for the trees, 10-foot diameter for the shrubs, and 5-foot diameter for the herbaceous layer.

The presence of wetland vegetation was determined when more than 50 percent of the dominant species in a sample plot had an indicator status of obligate (OBL), facultative-wet (FACW), or facultative (FAC+, FAC), excluding FAC-. The dominant species for each layer in a plot were determined by ranking the species in decreasing order of percent cover and recording those species which, when cumulatively totaled, immediately exceeded 50 percent of the total cover of that layer. Additionally, any plant species that comprised 20 percent or more of the total cover for each layer was considered to be a dominant species.

Scientific nomenclature for plant species follows *A Checklist of New York State Plants* (Mitchell and Tucker 1997). The indicator status for each dominant plant species was determined using the *National List of Plants that Occur in Wetlands: Northeast (Region 1)* (Reed 1988) and the *1995 Supplement To the List Of Plant Species That Occur In Wetlands: Northeast (Region 1)* (Tiner *et al.* 1995). For any species not included in the list, the indicator status was designated using the *Manual of Vascular Plants of Northeastern United States and Adjacent Canada* (Gleason and Cronquist 1991), *New Britton and Brown Illustrated Flora* (Gleason 1952), and *Gray's Manual of Botany* (Fernald 1950).

Soil and hydrology data were collected in soil pits or soil borer holes to a depth of 20 inches within each sample plot. Soil characteristics were noted along the soil profile at the depth specified by the Corps criteria (Environmental Laboratory 1987). Procedures for identifying hydric soils as outlined in the *Field Indicators of Hydric Soils in the United States* (USDA NRCS 1995) were also followed. Soil colors were determined by using the Munsell color chart. Primary and secondary indicators of hydrology were also noted at each sample plot. The wetland boundary was refined on the basis of intermediate soil borer holes along each transect.

5.0 RESULTS

Results of the wetland delineation and survey are shown on Figures 8 and 9, with a large-scale copy of the plan presented in the back pocket. Representative photographs of the site are presented in Appendix B. Plot data are presented in Appendix C.

5.1 General Site Description

The approximately 48-acre site is located in the Town of Wawayanda, Orange County, New York (Figure 1). The site is located south of Dolsontown Road and north of Interstate Route 84 (Figure 1). The site is on the outskirts of Middletown and is primarily a rural setting of farmland, with scattered homes and commercial buildings. The northern portion of the site is primarily agricultural land, with wetlands primarily in the southern portion. A New York Power Authority (NYPA) overhead electric transmission line crosses the southern edge of the site. Topography of the site is moderately sloping in the eastern and western portions, with a broad flat in the center and along the southern edge of the site.

The NYSDEC Freshwater Wetlands map (Figure 2) does not show any regulated wetlands on the site. The National Wetlands Inventory map shows several palustrine emergent wetlands, and a linear palustrine emergent wetland in the eastern portion of the site (Figure 3).

The Orange County Soil Survey (USSCS 1981) indicates that Mardin gravelly silt loam, Wayland silt loam, Hoosic gravelly sandy loam, Erie gravelly silt loam, and Rhinebeck silt loam occur on the site (Figure 4). Wayland silt loam is a hydric (wetland) soil and the Erie gravelly silt loam and Rhinebeck silt loam have the potential for hydric inclusions (USSCS 1989). The Wayland soil occurs in the southern and eastern portions of the site.

Drainage on the site is generally to the south. An unnamed tributary to Monhagen Brook flows across the eastern portion of the site from the north to the south (Figure 1). It flows onto the site through a large culvert under Dolsontown Road and into Monhagen Brook, which flows to the east as it meanders along the southern site boundary. The NYSDEC has assigned a water classification to this unnamed tributary and Monhagen Brook of Class D with D standards (Figure 6). These waterbodies are not regulated by the NYSDEC under Article 15 Protection of Waters because they do not have a classification of C(t) or higher. None of this site is within the 100-year floodplain of the Monhagen Brook or its unnamed tributary (Figure 5).

5.2 Site Ecology

A variety of vegetation and land use cover types occupy the site, as indicated by the vegetation cover map presented on Figure 7. Acreage of each cover type is indicated in Table 1. Most of the northern portion of the site is agricultural land or open field developed from abandoned agricultural use (Figure 7). Hedgerows dominated by deciduous trees frequently occur along the edges of the agricultural fields. Wetlands of emergent and wet meadow types primarily occur along Monhagen Brook in the southern portion of the site and along its tributary in the eastern portion. A few scattered isolated wetlands also occur on the site.

About 48.9% (23.5 acres) of the site consists of agricultural cropland (Table 1). During the 2000 growing season, 15.4 acres were cut for hay, while another 8.1 acres were planted in corn (*Zea mays*). Open fields occur on site in areas abandoned from agricultural use and in uplands under the transmission line right-of-way. They cover 5.2 acres or 10.8% of the site (Table 1 and Figure 7). The open fields are dominated by a mix of grasses and forbes. Common plant species include: timothy (*Phleum pratense*), fescue (*Festuca arundinacea*), brome grass (*Bromus* sp.), red clover (*Trifolium pratense*), thistle (*Cirsium arvense*), wild carrot (*Daucus carota*), and common plantain (*Plantago major*).

The agricultural fields and open fields are frequently bounded by hedgerows, which occupy 3.5 acres or 7.3% of the site (Table 1 and Figure 7). The hedgerows are comprised of deciduous forest and shrub areas. Common tree species included: black cherry (*Prunus serotina*), pin oak (*Quercus palustris*), white ash (*Fraxinus americana*), and swamp white oak (*Quercus bicolor*). Common shrub species were common buckthorn (*Rhamnus cathartica*), tartarian honeysuckle (*Lonicera tatarica*), multiflora rose (*Rosa multiflora*), and poison ivy (*Toxicodendron radicans*).

Wetlands primarily occur in the southern portion of the site along the tributary to Monhagen Brook. Wetland types include open water, emergent wetland, wet meadow, and farmed wetland. These communities are described in the following section.

5.3 Wetland Descriptions

Wetland boundaries are shown on Figure 8. The location of plots and photographs are shown on Figure 9. Photographs of the wetlands and plot data are presented in Appendices B and C, respectively.

Seven wetland areas were found on the project site (Figure 8). These wetlands are labeled Wetlands D, E, F, G, H, I, and J. They total 14.8 acres (Table 1) and primarily occur in the southern portion of the property along Monhagen Brook and in the eastern portion of the site along the tributary stream. Emergent and wet meadow are the prevalent wetland types (Figure 7).

Wetland D

Wetland D is composed of emergent wetland, wet meadow, and farmed wetland. It is 5.4 acres in size and is located in the eastern portion of the site (Figures 7 and 8). It is associated with Monhagen Brook and its tributary.

All three cover types are dominated by reed canary grass (*Phalaris arundinacea*) and purple loosestrife (*Lythrum salicaria*). The difference between the cover types is hydrologic regime; emergent wetland usually contains water at the surface. Swamp smartweed (*Polygonum hydropiperoides*) was abundant in the tributary to Monhagen Brook.

Although hydrologic regimes are different between the different cover types; they all displayed the same hydrologic indicators. These indicators included drainage patterns in the wetlands and two secondary indicators, oxidized root channels in the upper 12 inches and local soil survey data. The soils in Wetland D matched the description of

Table 1

Acreage of Land Use/Vegetation Cover Types

Land Use/Vegetation Cover Type	Acres	% of Total Site
Developed/Agriculture	1.0	2.0%
Agriculture Cropland	23.5	48.9%
Open Field	5.2	10.8%
Scrub-Shrub Upland	0.9	1.9%
Deciduous Forest Upland	2.6	5.4%
Open Water	0.7	1.5%
Farmed Wetlands	1.0	2.0%
Wet Meadow	9.9	20.7%
Emergent Wetland	3.2	6.7%
TOTAL	**48.0**	**100%**

Wayland silt loam, a hydric soil. Soil samples had a low chroma matrix with mottles and frequently had a sulfidic odor.

Wetland E

Wetland E is a small, isolated farmed wetland 0.04 acre in size (Figure 8). It was dominated by spikerush (*Eleocharis* sp.), soft rush (*Juncus effusus*), and reed canary grass.

Soils in Wetland E are mapped as Mardin gravelly silt loam, a non-hydric soil, but soil samples had a low matrix chroma with mottles. Wetland hydrology was indicated by oxidized root channels in the upper 12 inches and by passing the FAC neutral test.

Wetland F

Wetland F is a small, isolated 0.3-acre wet meadow (Figure 8). It was dominated by fall panic grass (*Panicum dichotomiflorum*) and tearthumb (*Polygonum* sp.).

The soils are mapped as Rhinebeck silt loam, a soil with potential hydric inclusions. However, the soil in Wetland F matched the description for Madalin silt loam, the hydric soil inclusion in Rhinebeck silt loam. Soil samples had a low matrix chroma with mottles. Wetland hydrology was indicated by drainage patterns and two secondary indicators: oxidized root channels in the upper 12 inches and local soil survey data.

Wetland G

Wetland G is 2.6 acres in size and is located in the southwestern portion of the site. It is primarily a wet meadow adjacent to Monhagen Brook; it is separated from Wetland H by a maintained access road within the NYPA Marcy South Transmission Line. The wet meadow was dominated by reed canary grass and purple loosestrife.

Soils in Wetland G matched the description for Wayland silt loam, a hydric soil. Soil samples had a low matrix chroma with mottles and a sulfidic odor. Wetland hydrology was indicated by drainage patterns and two secondary indicators: oxidized root channels and local soil survey data.

Wetland H

Wetland H is 4.8 acres in size and is located north of the transmission line access road in the southwestern portion of the site (Figure 8). It is primarily a wet meadow with some emergent pockets and is dominated by reed canary grass and purple loosestrife. Wetland H also contained a small open water pond, which was dominated by broad-leaf cattail (*Typha latifolia*), tearthumb, and duckweed (*Lemna* sp.). Wetland H is separated from Wetland G by the maintenance road for the transmission line.

Soils in Wetland H matched the description for Wayland silt loam, a hydric soil. Soil samples had a low matrix chroma with mottles and a sulfidic odor. Wetland hydrology was evident form two secondary indicators: oxidized root channels and local soil survey data. Additionally, Plot H-2W had gleyed soils and soils saturated in the upper 12 inches of the soil profile.

Wetland I

Wetland I is an isolated wetland 0.9 acre in size. It is a wet meadow in an agricultural cropland area (Figures 7 and 8). In certain years, this area is probably a farmed wetland. It was dominated by rush, redtop (*Agrostis gigantea*), and broad-leaf plantain (*Plantago major*).

The soil in Wetland I is mapped as Rhinebeck silt loam, a soil with potential hydric inclusions. However, the soil in Wetland I matched the description for Madalin silt loam, the hydric inclusion in Rhinebeck silt loam. Soil samples had a low matrix chroma with mottles. Wetland hydrology was evident from two secondary indicators: oxidized root channels and local soil survey data.

Wetland J

Wetland J is a small, isolated area 0.8 acre in size. It is a wet meadow dominated by reed canary grass and aster (*Aster* sp.).

The soil in Wetland J is mapped as Rhinebeck silt loam, a soil with potential hydric inclusions. However, the soil in Wetland J matched the description for Madalin silt loam, the hydric inclusion in Rhinebeck silt loam. The soil sample had a low matrix chroma with mottles. Wetland hydrology was evident from drainage patterns and two secondary indicators: oxidized root channels and local soil survey data.

6.0 SUMMARY

TES delineated wetlands on a 48-acre site located in the Town of Wawayanda, Orange County, New York. The site is referred to as Site 2 and is located south of Dolsontown Road and north of Interstate Route 84.

The site is located on the outskirts of Middletown, in a rural setting, with scattered homes and commercial developments. Much of the site is agricultural land or open field that developed from abandoned agricultural land. Wetlands occur on the site along Monhagen Brook which flows to the east across the southern portion of the site, and along a tributary stream in the eastern portion of the site. A few isolated wetlands also occur. Monhagen Brook and its tributary are Class D waters. No floodplain is mapped for the site.

No state-regulated wetlands are mapped for the area. Seven Corps-regulated wetlands totaling 14.8 acres were delineated on the site. The wetlands are primarily emergent and wet meadow types, with a few areas of farmed wetland. The wetlands primarily occur in the southern and eastern portions of the site.

7.0 REFERENCES

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WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 | Sample Plot No.: J-1W | Date: 11/2/00

Town/County/State: Wawayanda / Orange Co. / NY | Community Type: WM

Investigators: JM,SS | Flag No.: G-8 | Field Photo (roll/frame): A-14

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Phalaris arundinacea	80%	FACW	*
Aster sp.	30%	FAC	*
Lythrum salicaria	5%	FACW+	
Solidago gigantea	2%	FACW	
Polygonum sp.	2%	FAC	

Dominance = 119 50% = 59.5 20% =23.8

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Rhinebeck silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☑ Soil with potential hydric inclusion ☐ Non-hydric

Depth of A horizon: 8 (in.)

Mottled: Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

3/2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

4/1

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

4/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

- ☐ Matrix chroma of 2 without mottle
- ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No | Depth of surface water: ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No | Depth to saturated soil: ____ (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary indicators:

- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☑ Drainage Patterns in Wetlands

Secondary indicators:

- ☑ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☑ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:

☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes

Is the Hydric Soil Criterion Met? Yes

Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** J-1U **Date:** 11/2/00

Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Agricultural

Investigators: JM,SS **Flag No.:** G-8 **Field Photo** (roll/frame): A-13

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Dactylis glomerata	40%	FACU	*
Panicum sp.	20%	FAC	*
Arctium sp.	20%	FAC	*
Cerastium sp.	20%	FA C	*
Bromus sp.	10%	FAC	
Trifolium pratense	10%	FACU-	
Taraxacum officinale	10%	FACU-	
Lotus corniculatus	5%	FACU-	
Plantago major	5%	FACU	
Amaranthus sp.	2%	FAC	
Daucus carota	2%	FACU	
Hieracium sp.	2%	FAC	

Dominance = 146 50% = 73.0 20% =29.2

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 50.0%

☐ Greater than 50% of plant species are FAC or wetter.

☑ Less than or equal to 50% of plant species are FAC or wetter.

Remarks:

SOILS

Mapping Unit: Mardin gravelly silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 6 (in.)

Mottled No

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

4/2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

6/4

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☐ Yes (see Hydrology Indicators) ☑ No

Primary Indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? No

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** I-1W **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** WM
Investigators: JM,SS **Flag No.:** F-22 **Field Photo** (roll/frame): A-18,19

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Juncus sp.	70%	FAC	*
Agrostis gigantea	20%	FACW	
Plantago major	20%	FACU	
Echinochloa crusgalli	5%	FACU	
Phalaris arundinacea	5%	FACW	
Lythrum salicaria	2%	FACW+	
Polygonum sp.	2%	FAC	
Epilobium coloratum	2%	FACW+	

Dominance = 126 50% = 63.0 20% =25.2

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks: *Previously com*

SOILS

Mapping Unit: Rhinebeck silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☑ Soil with potential hydric inclusion ☐ Non-hydric

Depth of A horizon: 4 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr ☐ 2.5 y ☐ 5 y Other - ; 4/1

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr ☐ 2.5 y ☐ 5 y Other - ; 5/1

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr ☐ 2.5 y ☐ 5 y Other - ; 4/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Few

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary Indicators:
- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands

Secondary Indicators:
- ☑ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☑ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes
Is the Sample Plot a Wetland? Yes
Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** I-1Ub **Date:** 11/2/00

Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Agricultural Corn

Investigators: JM,SS **Flag No.:** F-4 **Field Photo** (roll/frame): A-20,21

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Solanum sp.	20%	FACU	*
Cerastium sp.	10%	FA C	*

Dominance = 30 50% = 15.0 20% =6.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks: *Previously corn*

SOILS

Mapping Unit: Mardin gravelly silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 4 (in.)

Mottled No

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

5/4

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

6/4

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

☐ Histosol ☐ Aquic Moisture Regime
☐ Histic Epipedon ☐ Redoximorphic Features
☐ Sulfidic Odor ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer
☐ Gleyed

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary Indicators:

☐ Inundated ☐ Saturated in Upper 12 in.
☐ Water Marks ☐ Drift Lines
☐ Sediment Deposits ☐ Drainage Patterns in Wetlands

Secondary Indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? No

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** I-1Ua **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Agricultural
Investigators: JM,SS **Flag No.:** F-22 **Field Photo** (roll/frame): A-17

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	
Cerastium sp.	5%	FA C	*
Allium sp.	2%	FACU	*

Dominance = 7 **50% =** 3.5 **20% =**1.4

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks: *Previously com*

SOILS

Mapping Unit: Mardin gravelly silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 6 (in.)

Mottled No

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

5 / 4

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

6 / 4

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other)
Gravelly Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other)
Gravelly Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☐ Yes (see Hydrology Indicators) ☑ No

Primary Indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:

☐ Oxidized Root Channels in Upper 12 inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? No

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** H-2W **Date:** 11/2/00
Town/County/State: Wawayanda / Orange Co. / NY **Community Type:** WM
Investigators: JM,SS **Flag No.:** E-101 **Field Photo** (roll/frame): A-29

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Phalaris arundinacea	100%	FACW	*
Lythrum salicaria	2%	FACW+	
Carex stricta	2%	OBL	

Dominance = 104 50% = 52.0 20% =20.8

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

- [x] **Greater than 50% of plant species are FAC or wetter.**
- [ ] **Less than or equal to 50% of plant species are FAC or wetter.**

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

- [x] Hydric
- [ ] Soil with potential hydric inclusion
- [ ] Non-hydric

Depth of A horizon: 8 (in.)

Mottled No

A horizon matrix color

[ ] 2.5 yr [ ] 5 yr [ ] 7.5 yr [ ] 10 yr
[x] 2.5 y [ ] 5 y Other -

4 / 1

B horizon matrix color

[ ] 2.5 yr [ ] 5 yr [ ] 7.5 yr [ ] 10 yr
[ ] 2.5 y [ ] 5 y Other - 10y

4 / 1

B horizon mottle color, if present

[ ] 2.5 yr [ ] 5 yr [ ] 7.5 yr [ ] 10 yr
[ ] 2.5 y [ ] 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

- [ ] Histosol
- [ ] Histic Epipedon
- [x] Sulfidic Odor
- [x] Gleyed
- [ ] Aquic Moisture Regime
- [x] Redoximorphic Features
- [ ] Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

- [ ] Matrix chroma of 2 without mottle
- [ ] Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** (in.)

% Area inundated: [ ] 1-25 [ ] 26-75 [ ] 76-100

Is soil saturated ? Yes **Depth to saturated soil:** (in.) or [x] **Surface**

Other evidence of hydrology? [x] **Yes (see Hydrology Indicators)** [ ] **No**

Primary Indicators:

- [ ] Inundated
- [ ] Water Marks
- [ ] Sediment Deposits
- [x] Saturated in Upper 12 in.
- [ ] Drift Lines
- [ ] Drainage Patterns in Wetlands

Secondary Indicators:

- [x] Oxidized Root Channels in Upper 12 Inches
- [ ] Water-Stained Leaves
- [x] Local Soil Survey Data
- [ ] FAC-Neutral Test

Upland Indicators:

- [ ] Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes

Is the Hydric Soil Criterion Met? Yes

Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks: *Pond - Broadleaf cattail, Polygonum sp., Duckweed*

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** H-2U **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Agriculture-Hay Field
Investigators: JM,SS **Flag No.:** E101 **Field Photo** (roll/frame): A-28

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Glechoma hederacea	50%	FACU	*
Bromus sp.	30%	FAC	*
Trifolium pratense	10%	FACU-	
Festuca arundinacea	10%	FACU	
Taraxacum officinale	5%	FACU-	
Lotus corniculatus	5%	FACU-	
Cerastium sp.	5%	FA C	
Capsella bursa-pastoris	2%	FACU	
Arctium sp.	2%	FAC	

Dominance = 119 50% = 59.5 20% =23.8

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 50.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Mardin gravelly silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 6 (in.)

Mottled No

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/3

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5/4

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☐ Yes (see Hydrology Indicators) ☑ No

Primary indicators:
☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No
Is the Sample Plot a Wetland? No
Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** H-1W **Date:** 11/2/00

Town/County/State Wawayanda / Orange Co. / NY **Community Type:** WM

Investigators: JM,SS **Flag No.:** E-117 **Field Photo** (roll/frame): A-23

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Phalaris arundinacea	90%	FACW	*
Lythrum salicaria	40%	FACW+	*

Dominance = 130 50% = 65.0 20% =26.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☑ Hydric ☐ Soil with potential hydric inclusion ☐ Non-hydric

Depth of A horizon: 10 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

4 / 1

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

6 / 1

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

4 / 6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☑ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary indicators:

- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands

Secondary indicators:

- ☑ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☑ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:

☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes

Is the Hydric Soil Criterion Met? Yes

Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** H-1U **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Agriculture-Corn
Investigators: JM,SS **Flag No.:** E-117 **Field Photo** (roll/frame): A-22

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	
Cerastium sp.	30%	FAC	*
Solanum sp.	5%	FACU	
Glechoma hederacea	5%	FACU	

Dominance = 40 **50% =** 20.0 **20% =**8.0

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks: *Previously corn*

SOILS

Mapping Unit: Mardin gravelly silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 4 (in.)

Mottled No

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

5/4

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

6/4

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** (in.) or ☐ Surface

Other evidence of hydrology? ☐ Yes (see Hydrology Indicators) ☑ No

Primary Indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** G-1W **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** WM
Investigators: JM,SS **Flag No.:** D-19 **Field Photo** (roll/frame): A-24,25

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Phalaris arundinacea	90%	FACW	*
Lythrum salicaria	30%	FACW+	*
Cirsium sp.	5%	FACU	

Dominance = 125 50% = 62.5 20% =25.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Wayland silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:
☑ Hydric ☐ Soil with potential hydric inclusion ☐ Non-hydric

Depth of A horizon: 10 (in.)

Mottled Yes

A horizon matrix color
2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☐
2.5 y☑ 5 y☐ Other - 4/1

B horizon matrix color
2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☐
2.5 y☑ 5 y☐ Other - 5/1

B horizon mottle color, if present
2.5 yr☐ 5 yr☐ 7.5 yr☐ 10 yr☑
2.5 y☐ 5 y☐ Other - 4/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☑ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary indicators:
- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☑ Drainage Patterns in Wetlands

Secondary indicators:
- ☑ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☑ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes
Is the Sample Plot a Wetland? Yes
Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** F-1W **Date:** 11/2/00
Town/County/State: Wawayanda / Orange Co. / NY **Community Type:** WM
Investigators: JM,SS **Flag No.:** C-3 **Field Photo** (roll/frame): A-16

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Panicum dichotomiflorum	90%	FACW-	*
Polygonum sp.	30%	FAC	*
Echinochloa crusgalli	10%	FACU	
Epilobium coloratum	5%	FACW+	
Juncus effusus	5%	FACW+	

Dominance = 140 50% = 70.0 20% =28.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Rhinebeck silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☑ Soil with potential hydric inclusion ☐ Non-hydric

Depth of A horizon: 8 (in.)

Mottled: Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/2

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5/2

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
4/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No Depth of surface water: ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No Depth to saturated soil: ____ (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary indicators:
- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☑ Drainage Patterns in Wetlands

Secondary indicators:
- ☑ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☑ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** F-1U **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** OF
Investigators: JM,SS **Flag No.:** C-3 **Field Photo** (roll/frame): A-15

Do normal environmental conditions exist at the plant community? (If no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Cirsium arvense	80%	FACU	*
Poa sp.	40%	FAC	*
Solanum carolinense	20%	UPL	
Polygonum sp.	10%	FAC	
Setaria sp.	5%	FAC	
Phalaris arundinacea	5%	FACW	

Dominance = 160 50% = 80.0 20% =32.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 50.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Rhinebeck silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☑ Soil with potential hydric inclusion ☐ Non-hydric

Depth of A horizon: 6 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/2

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5/3

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5/4

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Few

Mottle contrast: (faint/distinct/prominent) Distinct

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☐ Yes (see Hydrology Indicators) ☑ No

Primary Indicators:
☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No
Is the Sample Plot a Wetland? No
Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** E-1W **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Farmed Wetland
Investigators: JM,SS **Flag No.:** B-3 **Field Photo** (roll/frame): A-3

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Eleocharis sp.	60%	FACW	*
Juncus effusus	10%	FACW+	
Phalaris arundinacea	10%	FACW	
Lythrum salicaria	5%	FACW+	
Plantago major	2%	FACU	
Juncus sp.	2%	FAC	

Dominance = 89 50% = 44.5 20% =17.8

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Mardin gravelly silt loam

Different than mapped? Yes

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 4 (in.)

Mottled: Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☑ 5 y Other -
4/1

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5/1

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
5/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No Depth of surface water: ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No Depth to saturated soil: ____ (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary Indicators:
☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:
☑ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☑ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** E-1U **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Agricultural Field
Investigators: JM,SS **Flag No.:** B-3 **Field Photo** (roll/frame): B-3

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	
Dactylis glomerata	60%	FACU	*
Trifolium pratense	50%	FACU-	*
Lotus corniculatus	20%	FACU-	
Taraxacum officinale	10%	FACU-	
Phalaris arundinacea	10%	FACW	
Barbarea vulgaris	5%	FACU	
Cerastium viscosum	2%	UPL	

Dominance = 157 **50% =** 78.5 **20% =**31.4

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Mardin gravelly silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 8 (in.)

Mottled No

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

4/2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

6/4

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary Indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No

Is the Hydric Soil Criterion Met? No

Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** D-4W **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** WM
Investigators: JM,SS **Flag No.:** A-110 **Field Photo** (roll/frame): A-31

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Phalaris arundinacea	80%	FACW	*
Lythrum salicaria	50%	FACW+	*
Cirsium arvense	20%	FACU	

Dominance = 150 50% = 75.0 20% =30.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:
☑ Hydric ☐ Soil with potential hydric inclusion ☐ Non-hydric

Depth of A horizon: 8 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/1

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5/1

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
4/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☑ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary Indicators:
☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☑ Drainage Patterns in Wetlands

Secondary indicators:
☑ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☑ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** D-4U **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Agricultural Hay Field
Investigators: JM,SS **Flag No.:** A-110 **Field Photo** (roll/frame): A-30

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Poa sp.	50%	FAC	*
Plantago major	50%	FACU	*
Lotus corniculatus	20%	FACU-	
Trifolium pratense	20%	FACU-	
Cerastium sp.	5%	FA C	
Taraxacum officinale	5%	FACU-	

Dominance = 150 50% = 75.0 20% =30.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 50.0%

☐ Greater than 50% of plant species are FAC or wetter.

☑ Less than or equal to 50% of plant species are FAC or wetter.

Remarks:

SOILS

Mapping Unit: Mardin gravelly silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 4 (in.)

Mottled No

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/3

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
5/4

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:
☐ Histosol ☐ Aquic Moisture Regime
☐ Histic Epipedon ☐ Redoximorphic Features
☐ Sulfidic Odor ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer
☐ Gleyed

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary Indicators:
☐ Inundated ☐ Saturated in Upper 12 in.
☐ Water Marks ☐ Drift Lines
☐ Sediment Deposits ☐ Drainage Patterns in Wetlands

Secondary Indicators:
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No
Is the Sample Plot a Wetland? No
Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** D-3W **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Farmed Wetland
Investigators: JM,SS **Flag No.:** A-16 **Field Photo** (roll/frame): A-11

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Phalaris arundinacea	100%	FACW	*
Eleocharis sp.	5%	FACW	
Lythrum salicaria	5%	FACW+	

Dominance = 110 50% = 55.0 20% =22.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Wayland silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:
☑ Hydric ☐ Soil with potential hydric inclusion ☐ Non-hydric

Depth of A horizon: 5 (in.)

Mottled Yes

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
4/1

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☑ 5 y Other -
4/1

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
4/6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:
- ☐ Histosol
- ☐ Histic Epipedon
- ☑ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary Indicators:
- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☑ Drainage Patterns in Wetlands

Secondary Indicators:
- ☑ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☑ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:
☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes
Is the Sample Plot a Wetland? Yes
Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** D-3U **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Agricultural-Hay Field
Investigators: JM,SS **Flag No.:** A-16 **Field Photo** (roll/frame): A-12

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Poa sp.	95%	FAC	*
Plantago lanceolata	10%	UPL*	
Phalaris arundinacea	5%	FACW	
Potentilla sp.	2%	FAC	
Cirsium arvense	2%	FACU	
Taraxacum officinale	2%	FACU-	

Dominance = 116 50% = 58.0 20% =23.2

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Mardin gravelly silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 8 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

4 / 2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☑ 5 y Other -

5 / 3

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

5 / 6

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

Mottle abundance: (few/common/many) Few

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary Indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** D-2W **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** EW
Investigators: JM,SS **Flag No.:** A-33 **Field Photo** (roll/frame): A-9

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Species	Cover	Status	
Cornus amomum	5%	FACW	*
Ulmus americana	5%	FACW-	*

Dominance = 10 50% = 5.0 20% =2.0

HERBS

Species	Cover	Status	
Lythrum salicaria	80%	FACW+	*
Phalaris arundinacea	60%	FACW	*
Polygonum sagittatum	10%	OBL	
Aster lanceolatus	2%	FACU	
Solidago gigantea	2%	FACW	

Dominance = 154 50% = 77.0 20% =30.8

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

☑ Greater than 50% of plant species are FAC or wetter.

☐ Less than or equal to 50% of plant species are FAC or wetter.

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☑ Hydric ☐ Soil with potential hydric inclusion ☐ Non-hydric

Depth of A horizon: 8 (in.)

Mottled: Yes

A horizon matrix color

2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr ☑
2.5 y ☐ 5 y ☐ Other -

4 / 1

B horizon matrix color

2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr ☐
2.5 y ☑ 5 y ☐ Other -

4 / 1

B horizon mottle color, if present

2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr ☑
2.5 y ☐ 5 y ☐ Other -

5 / 6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Common

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☑ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No Depth of surface water: ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No Depth to saturated soil: ____ (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary Indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☑ Drainage Patterns in Wetlands

Secondary Indicators:

☑ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☑ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes
Is the Hydric Soil Criterion Met? Yes
Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** D-2U **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Agricultural-Hay Field
Investigators: JM,SS **Flag No.:** A-33 **Field Photo** (roll/frame): A-10

Do normal environmental conditions exist at the plant community? (If no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = 50% = 20% =

SHRUBS

Dominance = 50% = 20% =

HERBS

Species	Cover	Status	
Dactylis glomerata	50%	FACU	*
Bromus sp.	50%	FAC	*
Lotus corniculatus	5%	FACU-	
Taraxacum officinale	5%	FACU-	

Dominance = 110 50% = 55.0 20% =22.0

VINES

Dominance = 50% = 20% =

Percent of Dominant Species that are OBL, FACW, and/or FAC: 50.0%

☐ Greater than 50% of plant species are FAC or wetter.

☑ Less than or equal to 50% of plant species are FAC or wetter.

Remarks:

SOILS

Mapping Unit: Mardin gravelly silt loam **Different than mapped?** No

The mapped soil type is recognized by the NRCS as:
☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 8 (in.)

Mottled No

A horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -
4/3

B horizon matrix color
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -
6/4

B horizon mottle color, if present
☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Gravelly Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:
☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:
☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** (in.) or ☐ Surface

Other evidence of hydrology? ☐ Yes (see Hydrology Indicators) ☑ No

Primary indicators:
☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary indicators:
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:
☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No
Is the Sample Plot a Wetland? No
Additional Remarks:

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** D-1W **Date:** 11/2/00

Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Farmed Wetland

Investigators: JM,SS **Flag No.:** A-6 **Field Photo** (roll/frame): A-1

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	
Phalaris arundinacea	95%	FACW	*
Lythrum salicaria	5%	FACW+	
Eleocharis sp.	2%	FACW	

Dominance = 102 **50% =** 51.0 **20% =**20.4

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 100.0%

Greater than 50% of plant species are FAC or wetter. ☑

Less than or equal to 50% of plant species are FAC or wetter. ☐

Remarks:

SOILS

Mapping Unit: Wayland silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☑ Hydric ☐ Soil with potential hydric inclusion ☐ Non-hydric

Depth of A horizon: 8 (in.)

Mottled Yes

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☑ 10 yr
☐ 2.5 y ☐ 5 y Other -

3 / 1

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

4 / 1

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☑ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

5 / 6

A horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other) Silt/Loam

Mottle abundance: (few/common/many) Many

Mottle contrast: (faint/distinct/prominent) Prominent

Hydric soil indicators:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Gleyed
- ☐ Aquic Moisture Regime
- ☑ Redoximorphic Features
- ☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☐ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** ____ (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** ____ (in.) or ☐ Surface

Other evidence of hydrology? ☑ Yes (see Hydrology Indicators) ☐ No

Primary Indicators:

- ☐ Inundated
- ☐ Water Marks
- ☐ Sediment Deposits
- ☐ Saturated in Upper 12 in.
- ☐ Drift Lines
- ☑ Drainage Patterns in Wetlands

Secondary Indicators:

- ☑ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☑ Local Soil Survey Data
- ☐ FAC-Neutral Test

Upland Indicators:

☐ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? Yes

Is the Hydric Soil Criterion Met? Yes

Is the Hydrology Criterion Met? Yes

Is the Sample Plot a Wetland? Yes

Additional Remarks:

Prepared by: Terrestrial Environmental Specialists, Inc. Rev. 6/99

WETLAND DETERMINATION DATA SHEET

Project: TRC-2285 Calpine-Wawayanda Site 2 **Sample Plot No.:** D-1U **Date:** 11/2/00
Town/County/State Wawayanda / Orange Co. / NY **Community Type:** Agricultural
Investigators: JM,SS **Flag No.:** A-6 **Field Photo** (roll/frame): A-2

Do normal environmental conditions exist at the plant community? (if no, explain): Yes

VEGETATION

(* = Dominant species in each stratum)

TREES

Dominance = **50% =** **20% =**

SHRUBS

Dominance = **50% =** **20% =**

HERBS

Species	Cover	Status	
Dactylis glomerata	60%	FACU	*
Trifolium pratense	50%	FACU-	*
Lotus corniculatus	20%	FACU-	
Taraxacum officinale	10%	FACU-	
Phalaris arundinacea	10%	FACW	
Barbarea vulgaris	5%	FACU	
Cerastium viscosum	2%	UPL	

Dominance = 157 **50% =** 78.5 **20% =**31.4

VINES

Dominance = **50% =** **20% =**

Percent of Dominant Species that are OBL, FACW, and/or FAC: 0.0%

Greater than 50% of plant species are FAC or wetter. ☐

Less than or equal to 50% of plant species are FAC or wetter. ☑

Remarks:

SOILS

Mapping Unit: Marden gravelly silt loam

Different than mapped? No

The mapped soil type is recognized by the NRCS as:

☐ Hydric ☐ Soil with potential hydric inclusion ☑ Non-hydric

Depth of A horizon: 8 (in.)

Mottled No

A horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

4/2

B horizon matrix color

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☑ 2.5 y ☐ 5 y Other -

5/3

B horizon mottle color, if present

☐ 2.5 yr ☐ 5 yr ☐ 7.5 yr ☐ 10 yr
☐ 2.5 y ☐ 5 y Other -

A horizon soil texture: (sand/silt/clay/loam/other)
Gravelly Silt/Loam

B horizon soil texture: (sand/silt/clay/loam/other)
Gravelly Silt/Loam

Mottle abundance: (few/common/many)

Mottle contrast: (faint/distinct/prominent)

Hydric soil indicators:

☐ Histosol
☐ Histic Epipedon
☐ Sulfidic Odor
☐ Gleyed
☐ Aquic Moisture Regime
☐ Redoximorphic Features
☐ Sandy Soils with Organic Streaking or High Organic Content in Surface Layer

Upland soil indicators:

☐ Matrix chroma of 2 without mottle ☑ Matrix chroma greater than 2

Remarks:

HYDROLOGY

Is the ground surface inundated ? No **Depth of surface water:** (in.)

% Area inundated: ☐ 1-25 ☐ 26-75 ☐ 76-100

Is soil saturated ? No **Depth to saturated soil:** (in.) **or** ☐ **Surface**

Other evidence of hydrology? ☐ **Yes (see Hydrology Indicators)** ☑ **No**

Primary Indicators:

☐ Inundated
☐ Water Marks
☐ Sediment Deposits
☐ Saturated in Upper 12 in.
☐ Drift Lines
☐ Drainage Patterns in Wetlands

Secondary Indicators:

☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test

Upland Indicators:

☑ Insufficient hydrologic indicators met. No primary indicators and less than two secondary indicators observed.

Remarks:

JURISDICTIONAL DETERMINATION

Is the Hydrophytic Vegetation Criterion Met? No
Is the Hydric Soil Criterion Met? No
Is the Hydrology Criterion Met? No

Is the Sample Plot a Wetland? No

Additional Remarks:

JOSEPH M. MCMULLEN

Principal Environmental Scientist

Mr. McMullen holds a M.S. degree in biology with a concentration in botany. He has 25 years' experience in environmental consulting, with over 20 years active experience in wetland study. His specific expertise in wetlands studies includes: aerial photograph interpretation; wetland delineations; wetland vegetation cover type mapping; state and federal permitting; wetland creation planning; wetland construction monitoring; post-construction monitoring of created and restored wetlands; and expert testimony. He holds all available wetland delineation certifications. Mr. McMullen has been involved in hundreds of wetland studies in New York, and has made numerous presentations on various aspects of wetland permitting and study. He has also performed numerous vegetation surveys, including endangered and threatened plant surveys, vegetation/habitat cover mapping, and descriptions of plant communities. Mr. McMullen has considerable mapping experience using CIR, true color, and black and white imagery. He has performed wildlife habitat studies and fisheries work on various projects. His experience includes work in Alaska, Florida, Puerto Rico, and all the northeastern states from Michigan to Virginia to Maine.

Education

M.S. Biology/West Virginia University/1974.
B.S. Biology/Saint Francis College/1971.

Project Experience

Government Projects

- Provided a vegetation/habitat cover map, a vegetation description, and an assessment of rare and endangered plant species for a unique swamp forest in New Jersey.
- Prepared a vegetation cover map and flora survey for a 4,300-acre naval base in Virginia.
- Mapped wetlands and listed dominant plant species for a village in central New York.
- Mapped and described environmentally sensitive areas (wetlands, floodplains, steep slopes, and prime farmland) for a village in central New York.
- Worked with the New Jersey Department of Environmental Protection to develop a state-wide system of wildlife habitat classification.
- Prepared the vegetation and forestry sections of a forest, fish, and wildlife management plan for a Corps of Engineers facility in Pennsylvania.
- Performed a vegetation study of a 2,500-acre bald cypress slough in Lee County, Florida, for the U.S. Army Corps of Engineers.
- Mapped and described wetlands for a town in Broome County, New York.
- Developed and implemented a wetland creation plan for a Consent Order to resolve a Corps wetland violation for a town in central New York.
- Developed and implemented a study to assess the restoration of aquatic vegetation at a nature center in central New York.

Commercial and Industrial Development Projects

- Used Habitat Evaluation Procedures (HEP) to evaluate the wildlife habitat and the projected impact of a development project on a 400-acre wetland in New Jersey.
- Prepared a DEIS under SEQR guidelines for a shopping center in central New York; main issues were drainage, wetlands, traffic, and zoning.
- Provided a detailed wetland evaluation in support of a DEC and Corp of Engineers wetland permit application for an office complex site.
- Prepared reports, wetland permit applications, and developed a wetland mitigation plan for a major retail development in Boardman Township, Ohio.
- Assessed wetlands on several potential development sites in the Akron-Canton area of Ohio.
- Prepared information on SEQR and wetland permits for two cemeteries in central New York.
- Provided input into a wetland mitigation plan and responses to agency comments for a distribution center in the Town of Wilton, New York.
- Performed a wetland delineation and report for a large parcel in the City of Saratoga Springs, New York.
- Prepared a 5-acre wetland creation plan and negotiated a resolution of a DEC wetland violation for an area near Syracuse, New York.
- Acquired state and federal wetland permits and prepared DEIS sections under SEQR for a large glass manufacturing facility in Geneva, New York.
- Prepared SEQR material for a mall expansion site and a mixed commercial site near Watertown, New York.
- Acquired wetland and stream disturbance permits for a railroad station in Middletown, New York.
- Delineated wetlands for a large manufacturing facility in Canandaigua, New York.
- Assessed habitat areas and mapped wetlands for a development in the Town of Ithaca, New York.
- Mapped wetlands for a proposed semi-conductor manufacturing facility site in central New York.
- Coordinated archeological surveys and performed wetlands delineations for a trucking center in central New York.

Electric Power Generation Projects (fossil-fueled & nuclear)

- Prepared vegetation cover type maps for 12,000 acres of mixed communities for sites proposed for coal-fired facilities.
- Prepared written testimony and interrogatory responses concerning plant communities and related impacts of power plant construction.
- Collected, analyzed and interpreted data for plant ecology studies on the primary and secondary sites for a proposed major electric generating station.
- Designed and supervised the data collection and report preparation for an intensive study of vegetation and designed a 5-year monitoring program to assess the impacts of the construction of a nuclear power plant in New Jersey.
- Designed and implemented a vegetation study including cover type mapping, an endangered and threatened species survey, and quantitative sampling for two potential power plant sites in southeastern Michigan.

- Prepared several sections of a DEIS under SEQR, and prepared wetland delineations for a DEC and Corps of Engineers wetland permit for a 1000-MW cogeneration facility in central New York.
- Used color infra-red aerial photographs to map vegetation stress over several years in a 50-square-mile area near Pittsburgh, Pennsylvania.
- Mapped wetlands using color infra-red aerial photographs in two areas totaling 62 square miles in east-central Pennsylvania.

Hydroelectric Projects

- Prepared sections on soils and vegetation for an environmental report on the renovation of an existing, non-operating hydroelectric generating facility.
- Prepared a report on the status of endangered plant species in the vicinity of a proposed hydroelectric facility.
- Prepared a vegetation description and provided input on impacts for a potential hydroelectric pump-storage facility in West Virginia.
- Served as Group Leader in charge of coordinating subcontractors conducting Phase I vegetation studies for the Susitna Hydroelectric Project, a major hydroelectric development project in Alaska.
- Served as Project Manger for a feasibility study on a hydroelectric project on the Lehigh River in northeastern Pennsylvania.
- Assisted in a water quality and fisheries sampling program at a proposed hydroelectric site on the Ohio River.
- Performed a vegetation survey (species list, community descriptions, and endangered and threatened species) for hydroelectric project areas in Piscataquis and Hancock counties, Maine.
- Collected data to assess the impacts upon wetlands due to proposed changes in pool levels at a hydroelectric facility on the Hudson River.
- Prepared a detailed report on the botanical resources, with emphasis on wetland conditions and possible changes due to proposed water level alterations, along a 7-mile reach of the Kennebec River, Maine, and for another project on the Sebasticook River, Maine.
- Described the botanical resources and searched for endangered, threatened or rare plant species for a hydroelectric facility on the upper Hudson River, New York.
- Prepared the botanical resources section of a FERC license application for a major, new dam on the Black River, New York.
- Acted as Project Manager and performed wetlands and fisheries studies for two hydroelectric projects on the LaChute River, Essex Co., New York.

Electric Transmission Projects

- Provided input for an environmental assessment and routing analysis for a 138 kV transmission line in Pennsylvania.
- Participated in an environmental assessment and routing analysis for a 115 kV transmission line in northern New York.
- Performed field inventories of vegetation and land use for 400 miles of 345 kV, 230 kV, and 765 kV transmission line rights-of-way across New York.
- Performed field inventories of vegetation and land use on 300 miles of rights-of-way for 230 and 765 kV transmission lines in northern New York.

- Performed studies necessary for the preparation of several sections of an Article VII application for a 30-mile 345 kV transmission line and prepared all necessary wetland studies and reports for state and federal permitting.
- Mapped wetlands and assessed regulated streams for a wetland and stream disturbance permit application for a 17-mile overhead electric distribution/transmission line in Otsego County, New York.

Hazardous and Solid Waste Management Projects

- Supervised the preparation and authored various sections of a comprehensive draft environmental impact statement prepared under the guidelines of the New York State Environmental Quality Review Act for a proposed county sanitary landfill.
- Prepared the vegetation description of a potential landfill site in central New York.
- Assessed three potential landfill sites in Broward County, Florida, for various environmental conflicts.
- Performed a wetland survey, vegetation cover mapping, and rare plant species survey on a proposed resource recovery site in central Massachusetts.
- Utilizing the concepts of Pennsylvania Modified (PAM) HEP, assisted in the ecological evaluation of five sites in eastern Pennsylvania for potential use as ash disposal areas.
- Participated in an ecological inventory of three candidate sites for a resource recovery facility in Broome County, New York.
- On a waste-to-energy facility, devised a salt marsh restoration and creation plan for a coastal wetland in eastern Massachusetts and supervised its implementation.
- Performed fisheries sampling, wetlands mapping, and rare species surveys for a hazardous waste site in northern New York.
- Performed vegetation surveys, endangered plant searches, and wetland studies for a 1,500-acre county landfill in northern New York.
- Developed a wetland restoration plan and implemented vegetation plantings for a hazardous waste clean-up site in central New York.
- Provided input into a wetland restoration plan for a hazardous waste site in Franklin County, New York.
- Developed a wetland restoration plan for a sanitary landfill in northern New York.

Mine Projects

- Evaluated proposed gravel mine and quarry sites in eastern New York for protected plants and environmental conflicts.
- Assessed several quarry sites in eastern New York and the lower Hudson region for wetlands and endangered plant species.
- Provided expert testimony in defense of a restoration plan for a quarry site in eastern New York.
- Developed a wetland restoration plan for an aggregate mine in central New York.

Pipeline and Fiber Optic Cable Projects

- Prepared several sections of a DEIS for an 11-mile sewer line near Watertown, New York.

- Performed wetlands permitting for a 30-mile natural gas pipeline in central New York.
- Designed and implemented multi-year research projects involving the restoration of wetlands following the construction of natural gas pipelines.
- Performed wetland and stream surveys and organized stream disturbance and wetland permits for a water and sewer line project in Chenango County, New York.
- Designated wetlands along a 12-mile municipal water line in western New York.
- Delineated wetlands along several fiber optic cable lines in eastern New York.

Residential Development Projects

- Performed wetland surveys and state and federal wetland permitting for numerous subdivisions in central New York.
- Developed environmental assessment forms and SEQR material for several residential subdivisions in New York.
- Assessed wetland boundaries and class ranking and provided vegetation descriptions for areas in central New York tentatively mapped under the Freshwater Wetlands Act.
- Assessed a wetland in the Pine Barrens of Long Island for rare plant species.
- Performed multiple searches for endangered plant species on a 4500-acre area proposed for residential development in the Pine Barrens area of Ocean County, New Jersey.

Awards and Certifications

Grant-in-aid of Research from The Society of Sigma Xi, 1972.
U.S. Fish and Wildlife Service Habitat Evaluation Procedures Certification Program, 1981.
Provisional Certified Wetland Delineator, Baltimore District, U.S. Army Corps of Engineers, 1993.
Professional Wetland Scientist, Society of Wetland Scientists, 1995.

Memberships

New England Botanical Club
New York Flora Association
New York State Wetlands Forum, Inc. (Board of Directors)
Society of Wetlands Scientists
Southern Appalachian Botanical Club
The Wildlife Society (New York Chapter)

JOSEPH M. MCMULLEN
(Addendum)

Publications

McMullen, J. M. 1974. Anatomical and morphological variation in Podophyllum peltatum L. due to aspect and elevation. M.S. Thesis, West Virginia University, Morgantown.

McMullen, J. M., and J. F. Clovis. 1974. Anatomical variation in Podophyllum peltatum L. due to aspect and elevation. West Virginia Academy of Science Proceedings, Biology Section: 274-280.

Baumgartner, C. A., J. McMullen, V. J. Lucid, and R. S. Slack. 1975. Breeding bird census: shrub community. American Birds 29: 1113.

McMullen, J., R. S. Slack, V. J. Lucid, and P. G. Kalka. 1975. Breeding bird census: shrub community II. American Birds 29: 1113-1114.

Slack, R. S., C. A. Baumgartner, and J. McMullen. 1975. Breeding bird census: open field. American Birds 29: 1138-1139.

Slack, R. S., P. G. Kalka, V. J. Lucid, and J. McMullen. 1975. Breeding bird census: red maple forest. American Birds 29: 1082-1083

Slack, R. S., and J. M. McMullen. 1976. Red-tailed hawk preys on common gallinule. The Kingbird 26: 202.

McMullen, J. M., and R. S. Slack. 1977. Breeding bird census: mixed hardwoods forest. American Birds 31: 30.

McMullen, J. M., R. S. Slack, and V. J. Lucid. 1977. Breeding bird census: mixed hardwoods. American Birds 31: 29-30.

McMullen, J. M. 1983. Vegetative abuse. New York Forester 40(4): np.

McMullen, J. M. 1984. Cedar Waxwing caught on fishing line. Kingbird 34: 169.

McMullen, J. M. 1984. Freshwater wetlands: the effect of hydro development. Hydro-Review 3(4): 88-91.

McMullen, J. M. (Technical Author). 1985. Nature Trail Guide Booklet for the Clay Marsh Nature Center. ed. by Nicholas Aurucchio for the Town of Clay, NY.

McMullen, J. M. 1985. Endangered species: is there a darter in your dam? Hydro-Review 4(4): 50-54.

McMullen, J. M. 1986. Place names tell tales about trees. Pennsylvania Game News. Vol. 57(5): 18-21.

McMullen, J. M. 1986. New York's Endangered, Threatened and Rare Plant Species. Clintonia, Vol. 1: 1-3.

McMullen, J. M. 1987. New and Noteworthy Plants from the Erie Lake Plain of New York. Clintonia, Vol. 2: 1-3.

McMullen, J.M. 1987. Selection of Plant Species for Use in Wetlands Creation and Restoration. ed. by J. Zelazny and J. S. Feierabend. Proceedings, Increasing our Wetland Resources Symposium, National Wildlife Federation, Washington, D.C.

McMullen, J. M. 1988. More than just hunting. Pennsylvania Game News. Vol. 59(8): 3-5.

McMullen, J. M. 1992. Conservation - Heeding Yesterday's Lessons. Pennsylvania Game News. Vol. 63(7): 3-5.

McMullen, J.M., B.P. Carr, and D. Wheelock. 1994. Ferns of the Clark Reservation Area. New York Flora Association Newsletter. Vol 5(1):3-4.

McMullen, J.M. and P.A. Meacham. 1996. A Comparison of Wetland Boundaries Delineated in the Field to those Boundaries on Existing State and Federal Wetland Maps in Central New York State. "in" Wetlands: Environmental Gradients, Boundaries, and Buffers. ed. by G. Mulamoottil. CRC Press, Inc., Boca Raton, FL.

McMullen, J.M. and M.E. Burger. 1996. Initial Natural Revegetation in Wetlands Restored after Pipeline Construction. New York State Wetlands Forum Newsletter. Vol. 3(1):11-12.

McMullen, J.M. 1996. Neglected Members of our New York Flora: Trees and Shrubs. New York Flora Association Newsletter. Vol. 7(1):2-3.

McMullen, J.M., M.E. Burger, and S.D. Shupe. 1997. Evaluation of Different Grasses to Restore Wetlands and Control Weed Species after Pipeline Construction. The Sixth International Symposium of Environmental Concerns in Rights-of-Way Management. ed. by J.R. Willliams, J.W. Goodrich-Mahoney, J.R. Wisniewski, and J. Wisniewski, Elsevier Science, New York.

McMullen, J. M. 1999. Are Wetland Scientists Inadvertently Spreading Purple Loosestrife and Phragmites? New York State Wetlands Forum Newsletter. Vol. 6(1): 4.

McMullen, J.M. 2000. Vegetation Sampling – Difference Between Frequency and Cover. New York State Wetlands Forum Newsletter. Vol. 7(1):8.

Presentations at Conferences/Meetings

1979. *Use of Aerial Photographs in Environmental Studies*. Central New York Region of the American Society of Photogrammetry. Watertown, NY.

1982. *Wildflowers of Alaska*. Onondaga Audubon. Syracuse, NY.

1987. *Wetlands - State-of-the-Art*. New York Upstate Chapter, American Society of Landscape Architects. Syracuse, NY.

1988. *Assessments for endangered, threatened, and rare species - a view from the private sector*. 15th Annual Natural Area Association Conference. Syracuse, NY.

1989. *Wetlands Mitigation/Wetland Enhancement Projects*. Onondaga County Environmental Management Council Meeting. Syracuse, NY.

1990. *Wetlands Mitigation Options*. Wetlands - The Changing Regulatory Environment. Whiteman, Osterman & Hanna. Syracuse, NY.

1993. *Wetlands Delineation and Mitigation - The Consultants Role*. Environmental Law Committee of the Onondaga County Bar Association. Syracuse, New York.

1993. *Federal Wetlands Regulations and Wetland Delineations*. Wetlands Workshop and Field Trip, Onondaga County Environmental Management Council and Planning Federation. Baldwinsville, New York.

1993. *SEQR - The Consultants Perspective*. Advanced EIS Training for Department of Regulatory Affairs Staff, New York State Department of Environmental Conservation. Oswego, New York.

1994. *Wetlands Delineation and Wetland Mitigation*. Wetlands - The Ever-Changing Regulatory Environment. New York Planning Federation and Whiteman, Osterman & Hanna. Syracuse, New York.

1994. *A Comparison of Field Delineated Wetlands Boundaries in Central New York to those Boundaries Existing on State and Federal Wetlands Maps*. Wetlands: Environmental Gradients, Boundaries and Buffers. Wetlands Research Centre, University of Waterloo. Niagara Falls, Canada.

1994. *Assessment of Subsurface Flow Constructed Wetlands for Wastewater Treatment in the Town of LaFayette.* Low-Cost Small Community Wastewater Treatment Systems Seminar. New York State Energy and Research Development Authority. Albany, New York.

1995. *Assessment of Different Grass Species to Inhibit the Invasion of Purple Loosestrife and Common Reed Grass when Restoring Wetlands in Rights-of-way.* Wetlands '95. New York State Wetlands Forum. Syracuse, New York.

1996. *Assessment of Impacts on Areas Adjacent to Wetlands.* Wetlands '96: Partnership for the Future. New York State Wetlands Forum, Inc. Bear Mountain, New York.

1997. *Evaluation of Different Grasses to Restore Wetlands and Control Weed Species after Pipeline Construction.* Environmental Concerns in Rights-of-Way Management, Sixth International Symposium. Energy Power Research Institute, New Orleans, Louisiana.

1997. *Effects of Brushmat/Corduroy Roads on Wetlands within Rights-of-Way.* Poster Session. Environmental Concerns in Rights-of-Way Management, Sixth International Symposium. Energy Power Research Institute, New Orleans, Louisiana.

1997. *Wetland Identification and Management.* Rural Landowners Workshop. Cornell Cooperative Extension, Skaneateles, New York.

1998. *Basic Steps in Wetlands Creation and Restoration, with Examples from First-Hand Experience.* New York Planning Federation Annual Conference, Rochester, New York.

1999. *Practical Considerations in Wetlands Creation and Restoration and their Effect on Mitigation Success.* Wetlands Forum Conference, Syracuse, New York.

1999. *Vegetation along Nine Mile Creek.* Nine Mile Creek Day, Camillus, New York.

1999. *Practical Wetland Remediation and Restoration Techniques.* Poster Session. Wetlands and Remediation – An International Conference. Salt Lake City, Utah.

2000. *The Identification of Wetland Herbaceous Plants in Winter.* New York State Wetlands Forum Conference, Binghamton, New York.

2000. *Practical Considerations in Wetland Creation/Restoration.* Sediment and Wetland Remediation – Technical Seminar, Buffalo, New York.

2000. *Effects of Brushmat/Corduroy Roads on Wetlands within Rights-of-Way after Pipeline Construction.* 7th International Symposium on Environmental Concerns in Rights-of-Way Management, Calgary, Alberta, Canada.

CATHIE A. BAUMGARTNER

Principal Environmental Scientist

Ms. Baumgartner has been a partner of the firm for over 22 years. She has participated in and served as project manager for hundreds of environmental studies. Her primary areas of expertise are ornithology and herpetology. Ms. Baumgartner's project experience, although it includes the full spectrum of services provided by TES, has focused on hazardous waste assessments, hydroelectric licensing, and governmental initiatives. She has often applied her scientific expertise in assessing threatened and endangered species. In this regard, she has worked on several large development projects in New Jersey and is intimately familiar with the complex regulations that apply to endangered species in that state.

Education

M.S. Zoology/Pennsylvania State University/1973.
B.A. Biology/Douglass College, Rutgers University/1969.

Project Experience

Government Projects

- Designed and supervised studies of amphibian, reptilian, and fish resources of a 4,300-acre U.S. Navy facility in Virginia.
- Managed the preparation of a Forest, Fish, and Wildlife Management Plan at the Tioga-Hammond Lakes facility in Pennsylvania for the Baltimore District Corps of Engineers.
- Conducted a fish habitat study using the Instream Flow Incremental Methodology (IFIM) for the U.S. Forest Service on the Mad River in New Hampshire.
- Managed a major recreation use characterization and economic value study along 80 miles of the Allegheny, Monongahela, and Ohio rivers in Pennsylvania.
- Managed a project to select a national cemetery site in the Albany, New York area for the U.S. Department of Veterans Affairs.
- Conducted a natural resource assessment project associated with an innovative approach to wastewater treatment in upstate New York.
- Participated in and managed multi-year environmental studies (vegetation and wildlife inventory, endangered species, wetlands) for development of a new park by the NYS Office of Parks, Recreation, and Historic Preservation, culminating in State and Federal environmental permits for the project.

Airport Projects

- Designed and supervised environmental studies (wetlands, endangered species, instream flow, fish resources) at six airport expansion/redevelopment projects in New York and New Jersey.

Commercial and Industrial Development Projects

- Supervised preparation of a report assessing a lake shoreline development project in central New York.
- Participated in shellfish surveys and habitat assessments for six marina developments in Atlantic County, New Jersey.
- Participated in field surveys and report preparation for the selection of a site for a major industrial facility in central New York.

Electric Power Generation Projects (fossil-fueled & nuclear)

- Designed, implemented and prepared reports on herpetofaunal surveys at proposed nuclear power plant sites in New York, New Jersey, and Rhode Island.
- Designed, supervised, and prepared reports on herpetofaunal surveys at two proposed fossil fuel power plant sites in New York, and two in Michigan.
- Authored testimony and responses to interrogatories on the environmental assessment of a proposed electric generating facility.
- Conducted literature search on ecological parameters of selected marine fauna in conjunction with a generation facility feasibility study.
- Collected ornithological data at eight proposed power plant sites.
- Designed and implemented data collection for a herpetofaunal baseline and monitoring program assessing the impacts of construction of a nuclear power plant in New Jersey.

Hydroelectric Projects

- Participated in the preparation of a report assessing the impacts of the renovation of a small hydroelectric facility on the Susquehanna River in New York.
- Coordinated the environmental analysis of three access road corridors for Phase I of the Susitna Hydroelectric Project in south-central Alaska.
- Participated in the evaluation of recreational facilities and the potential for further recreational development at two hydroelectric sites in western Pennsylvania.
- Served as Deputy Environmental Study Director for Phase I of the Susitna River Hydroelectric Project, Alaska, and in this capacity assisted in the coordination of technical aspects of the environmental study program.
- Managed a study supporting an Exhibit E for the FERC license application regarding a hydroelectric facility on the Ottauquechee River, Vermont.
- Contributed to the FERC licensing efforts (Exhibit E) for five hydroelectric projects in New York and Pennsylvania.
- Coordinated an environmental feasibility report for hydropower development at the Kent Dam, Kent, Ohio.

- Served as Assistant Environmental Project Manager for the preparation of the environmental report for the proposed 48-megawatt hydroelectric station at the Pike Island Lock and Dam on the Ohio River.
- Collected water quality data (dissolved oxygen and temperature) as part of a multi-year study associated with hydroelectric development along the Allegheny and Ohio rivers in Pennsylvania.
- Participated in the review of documents and preparation of a request for a change in FERC license article requirements for a hydroelectric facility in Onondaga County, New York.

Electric Transmission Projects

- Coordinated a route selection study for a 115 kV transmission line.

Hazardous and Solid Waste Management Projects

- Managed an ecological inventory study of three candidate sites for a resource recovery facility in Broome County, New York.
- Collected plant and animal (aquatic and terrestrial) tissues for laboratory analysis at three hazardous waste sites in New York and New Jersey.
- Conducted vegetation and wildlife surveys at six proposed solid waste facility projects in New Jersey.
- Managed and participated in the preparation of a Bird Control and Deterrent Plan for the solid waste management facilities at Haneman Environmental Park in Atlantic County, New Jersey.
- Performed field surveys and prepared Habitat Based Assessment reports for three inactive hazardous waste sites in New York.
- Participated in the preparation of a Bird Control Plan as a permit condition for a solid waste transfer station in Rochester, New York.
- Managed a multi-year bird monitoring program at numerous solid waste handling facilities in Atlantic County, New Jersey, including performing field surveys and writing monthly reports.
- Prepared ecological assessment reports, including potential exposure pathway analyses, for five hazardous waste sites in central New York and one in western Illinois.

Highway and Bridge Projects

- Served as Environmental Project Manager on three highway redevelopment projects in Pennsylvania in which impacts on noise and air quality were investigated.

Mine Projects

- Performed an endangered species search and habitat assessment, and participated in a noise study, at a proposed sand mining operation on Long Island, New York.
- Collected field data on amphibians, reptiles, birds, and mammals for a environmental impact assessment on a mine expansion project in Columbia County, New York.

Pipeline and Fiber Optic Cable Projects

- Conducted wetland delineations along a 5-mile-long water and sewer line corridor in Orange County, New York.
- Managed, performed field work, and prepared wetland permit application documents for a 175-mile fiber optic cable corridor in eastern New York.

Residential Development Projects

- Delineated wetland boundaries at a project site in Ocean County, New Jersey in support of CAFRA and US Army Corps of Engineers permit requirements.
- Conducted endangered species (amphibians, reptiles, and birds) surveys for 46 commercial and residential development projects in New Jersey.

Scientific Research Projects

- Participated in data collection on migrating peregrine falcons as part of a nationwide effort.
- Conducted literature searches on habitat requirements, distribution, and predator-prey interactions of selected vertebrates of the Northeast.
- Participated in data collection on timing of spring migration in several species of owls in upstate New York.
- Conducted research on habitat ecology of several species of stream vertebrates.
- Participated in a ratio-tracking study of an endangered species in southern New Jersey.

Awards and Certifications

Phi Sigma (National Biological Honor Society), 1971-1973.
Sigma Delta Epsilon (Graduate Women in Science), 1972-1973.
Certificate of Completion, Designing and Conducting Studies Using Instream Flow Incremental Methodology, U.S. Fish and Wildlife Service, 1984.
Certificate of Completion, Field Techniques for Stream Habitat Analysis, U.S. Fish and Wildlife Service, 1984.
Certificate of Completion, Use of the Computer Based Physical Habitat Simulation Model, U.S. Fish and Wildlife Service, 1984.
Certificate of Completion, Airport-related Wildlife Hazards and Damage Control Workshop, U.S. Department of Agriculture, Animal Damage Control, 1991.
Certificate of Completion, 24 Hour OSHA Health and Safety Training Course for Hazardous Waste Operations, 1992.

STEPHEN L. SHERIDAN

Assistant Environmental Scientist

Mr. Sheridan has over 8 years of professional experience in the environmental field. He has participated in hundreds of environmental studies. His primary area of experience is wetlands.

Education

B.S. Environmental Studies/SUNY, College of Environmental Science and Forestry/1992.
B.A. Economics/University of Maryland/1989.

Project Experience

Commercial and Industrial Development Projects

- Prepared wetland and water quality permit applications and supporting report for an 8-acre retail development in central New York.
- Participated in wetland delineation and permit application preparation at a proposed industrial site in Orange County, New York.
- Prepared wetland and water quality permit applications for a 23-acre development, Cortland County, New York.
- Participated in a wetland delineation and habitat study on a 110-acre site for a proposed industrial facility, Orange County, New York.
- Participated in a wetland delineation and prepared a delineation report on a 165-acre site for a proposed commercial/industrial site in Orange County, New York.
- Prepared the wetland design plan for a proposed wetland mitigation bank in Albany County, New York.

Electric Transmission Projects

- Participated in a vegetation survey along 120 miles of electric transmission line right-of-way. This study prescribed a treatment timetable for the control of woody vegetation.

Government

- Supervised the installation of woody plant material at four wetland mitigation sites at a U.S. Army facility in Watertown, New York.

Residential Development Projects

- Participated in a wetland delineation for a 103-acre housing subdivision in Onondaga County, New York.
- Conducted a wetland investigation on a 32-acre residential site.

Previous Employment Experience

Center for Ecological Management of Military Lands, Colorado State University. Conducted over 100 wetland delineations at Ft. Drum, New York using GPS to map the wetlands. Monitored construction activities for compliance with federal environmental standards and permit conditions.

Louis Berger & Associates,
Participated in over 100 wetland delineations for road expansion projects in New Jersey, Delaware, New York, and Maryland. Monitored construction of nine wetland mitigation sites in New Jersey and Delaware. Participated in a vegetation density study at a Superfund site, PA. Used computer models to estimate erosion and to estimate pollution loads from different road improvements and new road projects.

Cornell University Field Station, Shackelton Point, NY.
Assisted with collection of data for on going fisheries studies at the station.

Certification

Certificate of Completion, 40 hour OSHA Health and Safety Training Course for Hazardous Waste Operations, 1994.

Wetland Professional in Training, Society of Wetland Scientists, 1995.

AGENCY CORRESPONDENCE -- WETLANDS

Terrestrial
Environmental
Specialists, inc.
23 COUNTY ROUTE 6, SUITE A, PHOENIX, NY 13135
(315) 695-7228 FAX (315) 695-3277

August 16, 2000

Mr. Lance Kolts
NYS Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, NY 12561-1696

Re: Calpine Wawayanda Energy Center, Town of Wawayanda, Orange County, New York
TES File No. 2285

Dear Lance:

On behalf of TRC Environmental Corporation, TES requests a field review and a determination of NYSDEC wetlands jurisdiction on the Calpine Wawayanda Energy Center site located on Dolsontown Road in the Town of Wawayanda, Orange County, New York. The site is bounded by Dolsontown Road to the south and an abandoned railroad right-of-way to the north and east. TES flagged Corps-regulated wetlands on the site and we have enclosed a copy of the Wetland Delineation Report for your review.

No NYSDEC wetland is mapped for the site. However, based on the published NYSDEC Freshwater Wetlands Map, regulated wetland MD 19 occurs just to the north.

We would appreciate you calling us to schedule this field review at your earliest convenience. If you have any questions or need anything additional, please give me or Stephen Sheridan a call.

Sincerely,

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.

Joseph M. McMullen
Principal

JMM/dmm
Enclosure

cc: A. Hueston –TRC Environmental Corp.

Terrestrial
Environmental
Specialists, inc.
23 COUNTY ROUTE 6, SUITE A, PHOENIX, NY 13135
(315) 695-7228 FAX (315) 695-3277

March 20, 2001

Mr. Lance Kolts
NYS Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, NY 12561-1696

Re: Calpine Wawayanda Energy Center, Town of Wawayanda, Orange County, New York
TES File No. 2285

Dear Lance:

On August 16, 2000 I sent you a letter requesting a field review and a determination of NYSDEC wetlands jurisdiction on the Calpine Wawayanda Energy Center site located on Dolsontown Road in the Town of Wawayanda, Orange County, New York. We also submitted a copy of the Wetland Delineation Report for your review.

In a follow-up telephone conversation on September 8, 2000 you stated that you were familiar with the area and did not need to look at the site. The nearest point of wetlands on our site was some distance from NYSDEC Wetland MD-19. Because of the distance between wetlands on our site and MD-19, you indicated that you would not be extending jurisdiction to the wetland on our site.

I would appreciate written verification of your determination. This would help to complete our file. If you have any questions or need anything additional, please give me or Stephen Sheridan a call. Thank you.

Sincerely,

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.

Joseph M. McMullen
Principal

JMM/dmm

cc: P. Chan – TRC Environmental Corp.

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
Bureau of Habitat, Region 3
21 South Putt Corners Road, New Paltz, New York 12561
Phone: (845) 256-3062 • **FAX:** (845) 255-4659
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

April 6, 2001

Mr. Joseph M. McMullen
Terrestrial Environmental Specialists, Inc.
23 County Route 6, Suite A
Phoenix, NY 13135

Dear Mr. McMullen,

After reviewing materials you sent to me, I have the following comments:

In regards to the Calpine Energy Center site in the Town of Wawayanda, Orange County, plans show a wetland area delineated by your organization. This area is separated from NYS DEC Wetland MD-19 by a railroad grade of substantial height and width. The two portions are hydrologically connected by a Tributary stream of the Monhagen Brook.

Because this is an obvious separation between the two wetlands and the mapped DEC wetland MD-19 is only shown on one side of the man-made separation, the policy indicates that DEC will not impose Article 24 Regulations on that portion of wetland not shown on the DEC map. The "new" area will be recommended for addition to the wetlands maps at some future amendment process.

Please note that other regulations may apply to the project. Contact with Local, State and Federal agencies is recommended prior to commencing site work.

If I can be of further assistance, please feel free to contact me at (845) 256-3062.

Sincerely,

Lance S Kolts

Lance Kolts
Principle Fish & Wildlife Tech
845-256-3062

LK:roc

Terrestrial Environmental Specialists, inc.
23 COUNTY ROUTE 6, SUITE A, PHOENIX, NY 13135
(315) 695-7228 FAX (315) 695-3277

August 16, 2000

Mr. Brian A. Orzel
New York District, Corps of Engineers
Jacob K. Javits Federal Building
New York, New York 10278

Re: Calpine Wawayanda Energy Center, Town of Wawayanda, Orange County, New York
TES File No. 2285

Dear Brian:

On behalf of TRC Environmental Corporation, TES requests a field review to affirm Corps-regulated wetlands on the Calpine Wawayanda Energy Center site located on Dolsontown Road in the Town of Wawayanda, Orange County, New York. The site is bounded by Dolsontown Road to the south and an abandoned railroad right-of-way to the north and east. TES delineated the wetland on the site and we have enclosed a copy of the Wetland Delineation Report for your review.

We would appreciate your scheduling this field review at your earliest convenience. We believe this field verification of delineated wetland boundaries is needed prior to a pre-application meeting.

Please give me or Stephen Sheridan a call to schedule the field review. If you need anything additional or have any further questions, please call.

Sincerely,

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.

Joseph M. McMullen
Principal

JMM/dmm
Enclosure

cc: A. Hueston – TRC Environmental Corp.

Terrestrial
Environmental
Specialists, inc.
23 COUNTY ROUTE 6, SUITE A, PHOENIX, NY 13135
(315) 695-7228 FAX (315) 695-3277

October 6, 2000

Mr. Brian A. Orzel
New York District, Corps of Engineers
Jacob K. Javits Federal Building
New York, New York 10278

Re: Calpine Wawayanda Energy Center, Town of Wawayanda, Orange County, New York
Corps Permit Application No. 2000-01276-YS
TES File No. 2285

Dear Brian:

Please find attached the revised plan that you requested in your October 3, 2000 letter, which shows the 2-foot contour intervals.

If you need anything additional or have further questions, please call me or Stephen Sheridan.

Sincerely,

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.

Joseph M. McMullen
Principal

JMM/dmm
Enclosure

cc: A. Hueston – TRC Environmental Corp.

Terrestrial
Environmental
Specialists, inc.
23 COUNTY ROUTE 6, SUITE A, PHOENIX, NY 13135
(315) 695-7228 FAX (315) 695-3277

November 21, 2000

Mr. Brian A. Orzel
New York District, Corps of Engineers
Jacob K. Javits Federal Building
New York, New York 10278

Re: Calpine Wawayanda Energy Center, Town of Wawayanda, Orange County, New York
Corps Permit Application No. 2000-01276-YS
TES File No. 2285

Dear Brian:

Please find attached the revised plan that you requested at the November 2, 2000 field meeting, which shows acreages of the wetlands and cross-hatching of the wetland areas.

If you need anything additional or have further questions, please call me or Stephen Sheridan.

Sincerely,

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.

Stephen Sheridan

for Joseph M. McMullen
Principal

JMM/dmm
Enclosure

cc: A. Hueston – TRC Environmental Corp.

Terrestrial
Environmental
Specialists, inc.
23 COUNTY ROUTE 6, SUITE A, PHOENIX, NY 13135
(315) 695-7228 FAX (315) 695-3277

June 7, 2001

Mr. Brian A. Orzel
New York District, Corps of Engineers
Jacob K. Javits Federal Building
New York, New York 10278

Re: Calpine Wawayanda Energy Center, Site 2, Town of Wawayanda,
Orange County, New York
TES File No. 2285

Dear Brian:

Please find enclosed a revised survey for the Calpine Wawayanda Energy Center – Site 2 located on the south side of Dolsontown Road in the Town of Wawayanda, Orange County, New York. The revised survey reflects the changes discussed on May 23, 2001 at the field review for Site 2.

We would appreciate receipt of a written jurisdictional determination for both Site 1 and Site 2.

Please call me or Stephen Sheridan if you need anything additional or have any further questions.

Sincerely,

TERRESTRIAL ENVIRONMENTAL SPECIALISTS, INC.

Joseph M. McMullen
Principal

JMM/dmm
Enclosure

cc: P. Chan – TRC Environmental Corp.

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF:
Regulatory Branch

JUL 0 9 2001

SUBJECT: Permit Application Number 2000-01276-YS
by Calpine Construction Finance Company, LP

Joseph M. McMullen
Terrestrial Environmental Specialists
23 County Route 6, Suite A
Phoenix, New York 13135-2117

Dear Mr. McMullen:

On August 18, 2000, the New York District Corps of Engineers received a request for a Department of the Army jurisdictional determination for the above referenced project. This request was made by Terrestrial Environmental Specialists, as consultant for Calpine Construction Finance Company, LP. The site consists of approximately 53.2303 acres, in the Hudson River Basin, located on Dolsontown Road in the Town of Wawayanda, Orange County, New York. The proposed project would involve the construction of an electric generating plant to be known as the Wawayanda Energy Center.

In the letter received on August 18, 2000, your office submitted a proposed delineation of the extent of waters of the United States within the subject property. A site inspection was conducted by representatives of this office on November 2, 2000, in which it was agreed that changes would be made to the delineation and that the modified delineation would be submitted to this office. On November 24, 2000, this office received the modified delineation.

Based on the material submitted and the observations of the representatives of this office during the site visit, this site has been determined to contain jurisdictional waters of the United States based on: the presence of wetlands determined by the occurrence of hydrophytic vegetation, hydric soils and wetland hydrology according to criteria established in the 1987 "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1; and the presence of a defined water body (e.g. stream channel, lake, pond, river, etc.) which is part of a tributary system.

Based on the above, it has also been determined that the drawing entitled "Survey Of Property For Calpine Eastern Corporation Town of Wawayanda Orange County, New York", prepared by John Nelting Land Surveyor, dated May 30, 2000, and last revised November 17, 2000, appears to be an accurate depiction of the extent of the waters of the United States on the subject site. This drawing indicates that there are three (3) wetland areas on the project site.

The first wetland (flag numbers A-1 through A-7) is located near the northeastern corner of the property and is approximately 0.1237 acres within the subject property. The second wetland (flag numbers B-1 through B-21) is located along the eastern property line, approximately 350 feet southeast of the first wetland, and is approximately 4.0575 acres within the subject property. The third wetland (flag numbers C-1 through C-71) is located in the central and southern portions of the site, just west of the second wetland, and is approximately 4.6678 acres. These wetlands are considered to be above the headwaters.

It should be noted that, in light of the recent U.S. Supreme Court decision (Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, No. 99-1178, January 9, 2001), the first wetland, as described above, does not meet the current criteria of waters of the United States under Section 404 of the Clean Water Act. The Court ruled that isolated, intrastate waters can no longer be considered waters of the United States, based solely upon their use by migratory birds. The remaining wetlands on the property are part of a tributary system, and are considered to be waters of the United States, under the jurisdiction of the Corps of Engineers.

This determination regarding the delineation shall be considered valid for a period of five years from the date of this letter. Enclosed is a Notification of Administrative Appeal Options which provides information on your acceptance of this approved jurisdictional determination.

It is strongly recommended that the development of the site be carried out in such a manner as to avoid as much as possible the discharge of dredged or fill material into the delineated waters of the United States. If the activities proposed for the site involve such discharges, authorization from this office may be necessary prior to the initiation of the proposed work. The extent of such discharge of fill will determine the level of authorization that would be required.

If any questions should arise concerning this matter, please contact Brian A. Orzel, of my staff, at (212) 264-0183.

Sincerely,

George Nieves
Chief, Western Permits Section

Enclosure

cf: NYSDEC - Region 3
    Town of Wawayanda

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Calpine Construction Finance Company, LP	File Number: 2000-01276	Date: July 9, 2001

Attached is:		See Section Below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of Permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the New York District Engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations (JD) associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the New York District Engineer. Your objections must be received by the New York District Engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the New York District Engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the New York District Engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the New York District Engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the North Atlantic Division Engineer, ATTN: CENAD-ET-O, Fort Hamilton Military Community, Building 301, General Lee Avenue, Brooklyn, NY 11252-6700. This form must be received by the Division Engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the North Atlantic Division Engineer, ATTN: CENAD-ET-O, Fort Hamilton Military Community, Building 301, General Lee Avenue, Brooklyn, NY 11252-6700. This form must be received by the Division Engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the North Atlantic Division Engineer within 60 days of the date of this notice with a copy furnished to the New York District Engineer.

E. PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Richard L. Tomer U.S. Army Corps of Engineers, New York District Jacob K. Javits Federal Building New York, NY 10278-0090 (212) 264-9053 or 3996	If you only have questions regarding the appeal process you may also contact: Review Officer U.S. Army Engineer Division - North Atlantic Fort Hamilton Military Community Building 301, General Lee Avenue Brooklyn, NY 11252-6700 (718) 491-8728

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

______________________ Signature of appellant or agent.	Date:	Telephone number:

PLAN SHOWING SURVEY OF PROPERTY WITH WETLAND DELINEATIONS, REVISED 11/17/00 AND ACCEPTED FOR USACE JURISDICTIONAL DETERMINATION

BY:

JOHN NELTING, LAND SURVEYOR

PO BOX 17, JOHNSON, NY 10933

SEE OVERSIZE PLAN ROLL

Appendix R
Socioeconomic Study

APPENDIX R ECONOMIC IMPACT REPORT

I. Executive Summary

This report examines the impact on jobs, sales, income and government revenues resulting from the construction and operation of a 540-megawatt electric generating facility in the Town of Wawayanda, in Orange County, New York.

The purpose of the report is to provide an independent analysis of data that will inform elected and appointed officials and members of the public interested in the economic and fiscal impacts of the project. All analyses in this study employ standard economic methods and models widely used by economists and extensively reviewed in academic journals. All data used in the construction of models and in calculating impacts is public and available from federal and state government agencies.

Economic impacts were estimated for a region comprised of Orange County. This single-county region was chosen because it most closely matches the project's location with related economic impacts. To assess economic impacts on a larger region, a second analysis was conducted to measure how much of the economic activity associated with the project will benefit the remainder of the State of New York.

In addition to impacts on Orange County and the State of New York, the project will have impacts on other areas of the country as a result of manufacture of machinery and equipment needed to furnish and operate the generating facility, and the production of services and goods that are required for its construction that are not available, or are purchased outside the County and outside New York. Only the impacts on Orange County and The State of New York are analyzed in this study.

A detailed (528 industry sector) input-output model using data for Orange County was constructed for analyzing the economic impacts on the county. A total of 258 of 528 industry classifications available in the model have a presence in Orange County (a relatively high percentage for a single county region). A similar model was constructed using data for the entire State of New York (for which 494 of 528 industries are present) in order to estimate the portion of economic activity that the Wawayanda Energy Center will produce outside of Orange County but which will remain within New York.

Results show that the construction and operation of a 540-megawatt electric generating facility will provide substantial economic benefits to Orange County. In addition, the project will generate millions of dollars of revenue for state and local government.

Major Findings of Project Impacts:

- Project construction will take approximately 2 years and, less interest charges during construction, will cost approximately $331 million.

- The direct and indirect impacts of this Calpine investment over the construction period and first 20 years of operation will be about $545 million.

- The $545 million of economic impacts excludes specific local benefits such as property taxes paid by the Wawayanda Energy Center facility, and payments for infrastructure such as water or wastewater services.

- Of the $545 million in project impacts, $317 million will be direct labor and materials in Orange County over the construction and first 20 years operating periods.

- The remaining $228 million of project impacts ($545 total - $317 direct) represent indirect and induced economic impacts of the constructions and first 20 years of facility operation.

- Direct project expenditures of $125 million during construction will support 1,590 jobs over a 2-year period. Construction related employment will range from a high of 314 to a low of 29 per 3 month period. Total employment impacts, in all industries, will range from 685 to 64 over the two-year construction phase as a result of indirect and induced expenditures (multiplier effects)[1].

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1 Note: although total facility construction cost is $331 million, for purposes of this analysis, the cost of owner furnished equipment (boilers, turbines, etc.) and engineering costs are not included. In addition , some project expenditures are excluded from the impact analysis because it is not expected that local industries will supply the goods or services. These expenditures, totaling $206 million are not included in the analysis of construction spending impacts for either the Region or the State..

- The jobs created as a result of construction of the Wawayanda facility will increase income of workers in Orange County by over $109 million.

- The operation of the Wawayanda Energy Center will result in $10.5 million in additional annual output (sales) in the Orange County Region.

- Increases in regional output in response to operation of the Wawayanda Energy Center will support a total of 171 jobs in the region.

- New jobs in the electric and other industries resulting from plant operation will increase the income of workers by $6.8 million annually in Orange County.

- The permanent jobs created to operate the Wawayanda Energy facility will pay average annual wages that are approximately twice the average annual wages in the Orange County.

- Each new job at Wawayanda Energy will produce direct, indirect, and induced economic impacts that result in a total of: 6.8 jobs, $282,087 in labor income, and $90,470 in state and local tax revenue (13,304 in revenue for each of the 171 jobs created).

Table I.1

Summary Impacts of the Construction Phase of Wawayanda Energy

		Year 1				Year 2				
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	**Totals**
Sales	Orange County.	$24.6	$42.7	$49.1	$43.0	$30.7	$30.5	$23.3	$4.6	**$248.4**
Jobs	Orange County.	343	596	685	599	427	426	325	64	
Income	Orange County.	$10.8	$18.8	$21.6	$18.9	$13.5	$13.5	$10.2	$2.0	**$109.5**

Table I.2

Annual Impacts of Generating Facility Operations
$ Millions

		Annual
Sales	Orange County	**$10.5**
Jobs	Orange County.	**171**
Income	Orange County.	**$6.8**

Table I.3

Wawayanda Energy Center Economic Impacts
($Millions)

	Two (2) Year Const. Period	**First 20 Year Operating Period***	**Total of First 22 Years**
Direct Local Impact from Project: Labor + Goods & Services	**$125**	**$192**	**$317**
Indirect & Induced Impact of Project Expenditures	**$123**	**$105**	**$228**
Total of Direct + Indirect & Induced Impacts	**$248**	**$297**	**$545**

* Excludes: property tax; water purchase; wastewater service

II. Introduction

Calpine is proposing to construct and operate a 540-megawatt electric generation facility in Wawayanda, New York. Calpine Corporation contracted with Calypso Research to produce a report that analyzes the economic and fiscal impacts of the proposed project on an economic region consisting of Orange County.

Although commissioned by Calpine, this report was prepared independently of the Company. Calpine Corporation officials supplied Calypso with data on construction expenditures, their nature, and their timing. In addition, Calpine provided a projection of employment required to operate the electric generating facility on an annual basis as well as additional expenditures to organizations required to operate the facility. Calypso independently chose the economic methods, models and data used in the analysis and presented this report to Calpine without providing the Company advance notice of the results and without opportunity for editing results prior to its completion.

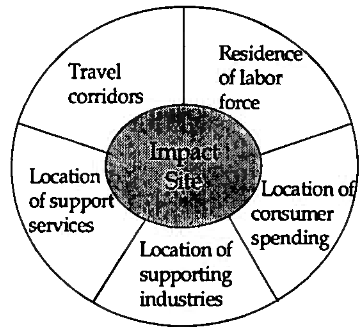
The purpose of this report is to provide an independent, quantitative assessment of the economic and fiscal impacts that will result from the construction and operation of the proposed electric generating facility. The report will help inform elected and appointed officials and members of the public interested in the economic and fiscal impacts of the project.

III. Selecting a Region for Analysis

Selecting a geographic area for analysis is a critical aspect of any economic impact study. Depending on how the area of study is defined, economic impacts will either be included or excluded from the calculation of project impacts. Defining a large area for study will capture a larger portion of the economic impacts of a project while a small geographic area captures a more limited portion of economic impacts.

The availability of economic data also influences the selection of a geographic area for study. For geographic areas smaller than the state level, with the exception of major cities, the richest and most complete economic data required to accurately calculate economic impacts is available at the county level. In general, it is best to choose the smallest area for study as is feasible in order to avoid overstating the economic impacts of a project.

Impacts Will be Determined by the Components of a Functional Economic Area



This study uses county level data in analyzing the economic impacts of the proposed project.

Construction industries serve primarily local markets and it is expected that most of the direct expenditures for facility construction will occur in the County. Where it is known that construction expenditures will go to firms outside the region, they are excluded from the impact analysis. In this case, it is estimated that a total of $206 million in expenditures will occur outside of the County and the State of New York.

A larger study region would be warranted if an examination of the data reveals significant backward (purchases from suppliers) and forward (worker expenditures) linkages exist with an adjacent area, or if is a strong connection is evident resulting from a common labor force or the linkage via major travel corridors.

Single County, Multiple County, or Metropolitan Statistical Area (MSA) Study Area?

The Wawayanda Energy Center presents two plausible regions for project analysis. Orange County is part of a larger economic region known as the Newburgh, NY/Pike County PA Metropolitan Statistical Area (MSA). MSA's are defined by the US Census Bureau and consist of multi-county economic regions that share economic linkages. Thus the inclusion of Pike County, PA with Orange County could be justified in the study region. In our view, however, Orange County's economic links to nearby counties do not appear to warrant their inclusion in the project's primary impact study area. We chose a single, Orange County region for analysis for the following reasons.

Within the Newburgh, NY/Pike County PA MSA, Orange County accounts for about 94% of the jobs located in the two-county region and Pike County only about 6 percent. In addition, a review of the commuting patterns of workers holding jobs in Orange County reveals that 82 percent were held by residents of Orange County, only 1,100 workers in Orange County came from Pike County (about 1% of the jobs in the County). The largest single source of worker in-migration to Orange County came from Ulster County, with 6,559 or 5.6% of all jobs. Most of the 18% of worker in-migration to Orange County come from numerous counties from where a few hundred workers or less commute.

Estimating the residency of workers who will be hired as a result of the Wawayanda project, along with where they spend the income earned from employment, is critical to assessing project impacts. Orange County is an industrialized county capable of supplying much of the workers, intermediate inputs, and also of capturing the induced expenditures from the income new economic activity created by the project. Increasing the size of the study area, by adding additional counties, will only serve to overstate economic impacts of the project. We believe the most appropriate area for analyzing the impacts of the Wawayanda Energy facility study is Orange County.

Adjustments to the Regional Model

In modeling the Orange County economy and in developing the tables that produce the "multipliers" used in calculating overall economic impacts, the "induced impacts" multipliers (the economic impacts that result from workers spending of the wages they earn) suggest that a high percentage of the consumer expenditures resulting from the project generated income will remain in Orange County. Both the direct construction expenditures (except for furnished equipment as noted) and the operation of the energy facility will obviously occur in the county. We recognize, however, that some percentage of project related jobs will go to the 18% of workers who commute into the County for jobs. Although these workers may be employed as a result of the project they will not spend all of the income they earn from project related wages within Orange County (much will be spent in their county of residence as well as elsewhere) and will not be captured by the region.

We have modified induced impacts of construction activity 12 percent, to account for a percentage of jobs and wages paid that may not be spent within the region (even workers residing outside of Orange

County will have expenditures within Orange County). Note that the original Orange County model allocates induced impacts based on the expenditure patterns within the county and the presence of and concentration of retail and other consumer expenditure industries (it does not assume that all income earned from the project will be spent in the county). The 12 percent model adjustment is a further reduction of model calculations that produces a more conservative estimate of induced construction project impacts.

Table III.1

Orange County Commuting Patterns (1990 Census)

Commute	Commute From	Commute to	Net Commute
Ulster County	6,559	1,745	4,814
Sullivan County	4,110	1,214	2,896
Dutchess County	2,287	5,634	-3,347
Rockland County	1,287	8,710	-7,423
Pike County	1,165	525	640
Sussex County	771	959	-188
Bergen County	234	8,175	-7,941
New York County	133	7,032	-6,899
Total	16,546	33,994	-17,448

Residents Living and Working in County	94,853
Pct. Orange County Jobs Held by County Residents:	82.1%
Pct. Employees Commuting Into Orange County:	17.9%

IV. The Regional Economy

According to the New York and U.S. Departments of Labor, total "covered employment" (covered by unemployment compensation insurance) was 117,436 in 1999, or about 1.5% of New York State's total employment. The distribution of employment among broad industry sectors in the region is presented in Table IV.1.

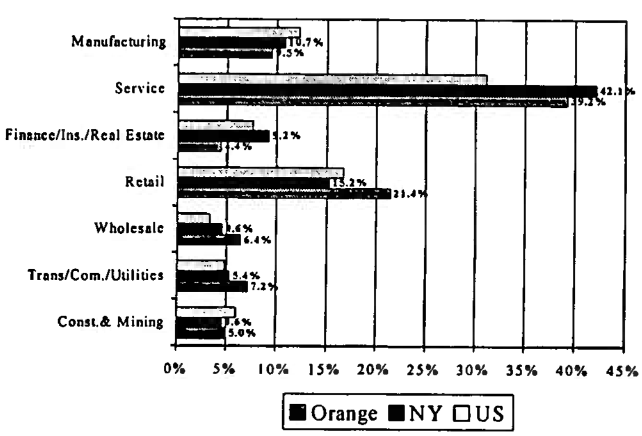
Table IV.1

Orange County Employment

	1994	1995	1996	1997	1998	1999	# Change	%Change '94-'99
Agric. & Mining	1,434	1,511	1,644	1,636	1,598	1,523	89	6.2%
Construction	3,268	3,470	3,576	3,700	3,937	4,332	1,064	32.6%
Manufacturing	12,180	12,138	11,717	11,455	11,583	11,186	-994	-8.2%
Trans/Comm./Utilities	7,763	7,751	7,856	7,678	8,194	8,512	749	9.6%
Wholesale Trade	5,500	5,851	6,075	6,164	7,032	7,479	1,979	36.0%
Retail Trade	22,860	23,566	24,225	24,991	24,889	25,148	2,288	10.0%
Finance/Ins./Real Estate	5,259	4,847	4,794	4,872	5,111	5,215	-44	-0.8%
Service	40,149	40,550	41,741	42,020	43,487	45,988	5,839	14.5%
Government	7,870	7,951	7,242	7,782	7,802	8,053	183	2.3%
Total	**106,283**	**107,635**	**108,870**	**110,298**	**113,632**	**117,436**	**11,153**	**10.5%**

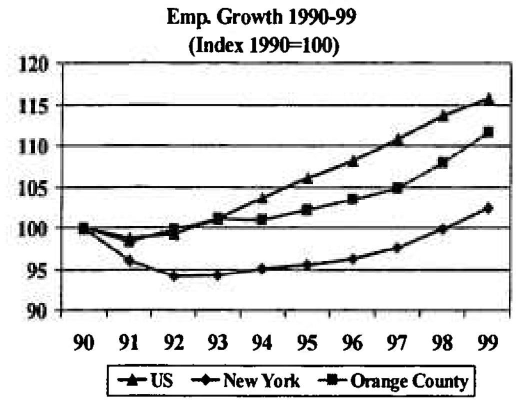
Examining the regional economy suggests several salient factors that will influence the magnitude of Wawayanda Energy's economic impacts on the region, as well as the economic context in which they occur.

The Region Has a High Concentration of Retail, Wholesale, and Service Employment

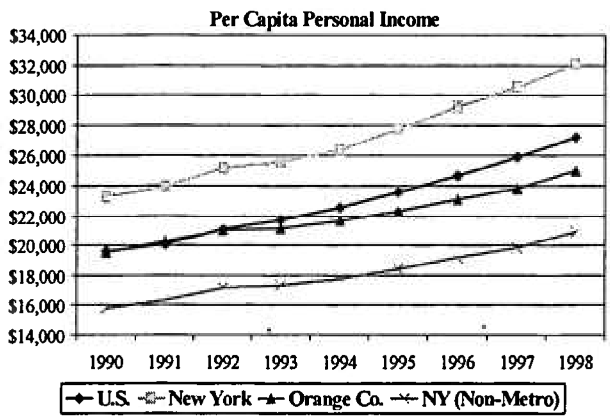


- Although Orange County is small relative to the overall size of the New York State economy in terms of overall

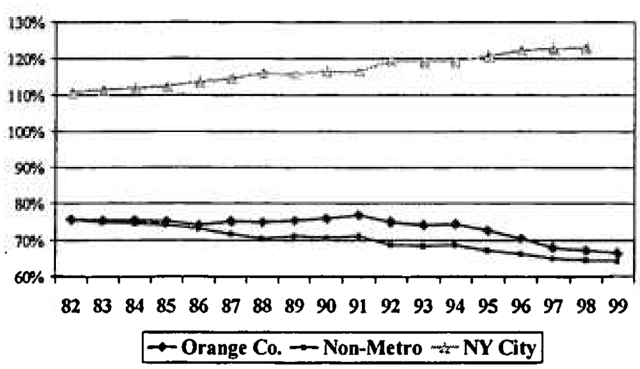
Emp. has Grown Faster than in NY State but Slower than the US



Orange Co. Per Capita Income Is Lower than the US and NY Average



As a % of New York State's Avg. Annual Wagė, Wages in Orange Co. Have Declining

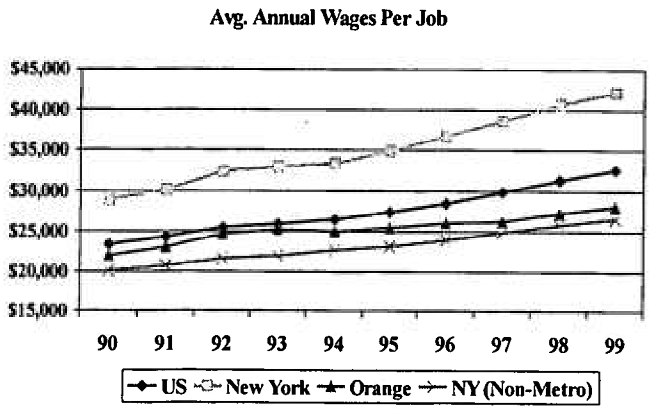


employment, it has a large population of over 300,000 residents with a labor force of over 170,000 capable of supplying the labor demands related to the project.

- The region is highly industrialized with most, if not all of the industries needed to supply inputs to the project. Of the 528 industries used by Calypso in constructing economic impact models, Orange County has 248, a relatively high percentage for a single, non-metropolitan county. This indicates that the regional economy is relatively self-sufficient and needs to import fewer of its goods and services. Project impacts will therefore have relatively high multiplier impacts on the region.
- The industry mix of employment in the region is different than that of the State of New York. Specifically, the County has a much higher

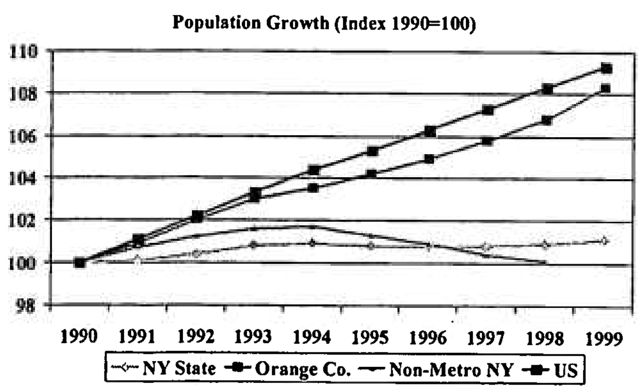
concentration of retail employment than either the State of New York or the nation. It also has higher concentrations of wholesale trade, and service industries that position the region to capture a high percentage of the project-induced expenditures resulting from economic multipliers.

Avg. Annual Pay Per Job has Grown More Slowly than the State Average



- The region has experienced faster employment growth than the State as a whole.
- Orange County also has lower per capita personal income than the State of New York, and the average annual pay per job in the County is significantly lower than the State average (but higher than the average of all non-metropolitan areas in New York State).
- Orange County has had the 4th highest rate of population growth in New York State (which ranked last among all states in rate of growth).

Orange County 's Population and Labor Force Growth Should Supply Adequate Labor



- Out of over 3,000 U.S. counties, Orange County ranked 1248th on its rate of population growth (8.3% compared to 1.1% for NY State). During the 1990's, the state added 25,477 residents, making it 223rd in the U.S. in absolute population change.
- In combination, these trends suggest that Orange County is an attractive place to reside with a growing population and employment base. Income and wage trends, however, suggest that some of that attraction is a result of the County's access to nearby opportunities rather than

growing, high wage opportunities in the County.

V. Analytical Approach

This study uses an input-output (I/O) methodology to determine the economic and fiscal impacts of the project on the regional economy. Input-output models trace the linkages of inter-industry purchases and sales within a given county, region, state or country. These models use information on the inputs required from all industries in order to produce a dollar of output for a specified industry, as well as how much of the required inputs from industries can be supplied locally within the study area.

Project expenditures in Orange County will have additional, secondary and tertiary impacts that are collectively known as "economic multipliers". The total economic impacts of a project are the result three types of impacts.

- **Direct impacts** – are changes in output (sales), jobs and income in businesses receiving the direct expenditures of the project. For the construction phase of the Wawayanda Project, this represents expenditures going to the construction and other industries to build the facility.
- **Indirect impacts** - are changes in output, jobs, and income that occur in businesses that supply goods and services to businesses that receive direct project expenditures.
- **Induced impacts** – result from expenditures on consumer goods and services that occur as a result of the additional jobs and payroll of businesses that are directly or indirectly affected by the project.

Input-output models yield "multipliers" that are used to calculate the total direct, indirect, and induced effect on jobs, income, and output resulting from a dollar of spending on goods and services in the study area.

The "IMPLAN" input-output model developed by the U.S. Government and the University of Minnesota (available from the Minnesota IMPLAN Group, Inc.) was used in this analysis to calculate economic impacts.[2] Along with the U.S. Department of Commerce's RIMSII model, IMPLAN is the most widely used input-output model used in the United States for calculating economic impacts. Appendix A contains references that that site IMPLAN and some that compare IMPLAN and RIMSII. Each model uses data from the U.S. Dept. of Commerce, U.S. Bureau of Labor Statistics, and other government agencies. The methodology used by each to calculate regional "multipliers" differs but the multipliers themselves are quite similar (although some comparisons have noted that for many industries, IMPLAN multipliers tend to be somewhat smaller).

The IMPLAN model was chosen because of its ability to construct a model using data from Orange County while maintaining rich detail on impacts for 528 industrial sectors. In addition, the IMPLAN model constructs a specific industry sector "New Utility Structures", combining data from several construction industries employed in utility construction that is not available in other models. In addition to being widely used in regional economic analysis, the model and its methodology have been extensively reviewed in professional and economic journals.

VI. Economic Impacts

Data from the U.S. Bureau of Economic Analysis, U.S. Census Bureau, and other sources, along with the IMPLAN model, were used to determine the inter-industry transactions in the region required for calculating the impact of Calpine's proposed project. Analytical results are reported for the economic measures of greatest interest to policy makers, elected and appointed officials, and the general public:

- **Output (sales)** – how will sales by businesses in the region be affected by construction and operating phase of the project. The direct, indirect, and induced sales impacts of both the construction and operating phases of the Wawayanda Energy project are reported.
- **Jobs** – how many jobs will be supported as a result of increased direct, indirect, and induced sales by businesses in the region.
- **Income** – how will payrolls and labor income in the region as a result of the additional direct, indirect, and induced jobs that result from project expenditures.

2. A description of the IMPLAN model and technical references are available to readers via the World Wide Web at ftp://www.Implan.com/documents/implan_io_system_description.pdf. A brief bibliography of studies referencing or using IMPLAN is presented in Appendix A (note there are hundreds of articles and studies which reference or use

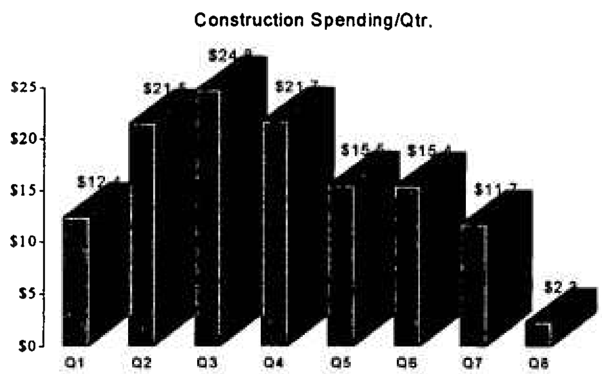
- **Revenue** – how much will government revenues change as a result of the total economic impacts (direct, indirect, and induced) of the project.

Impacts were modeled for both the construction and operating phase of the project. Impacts were modeled first for the County and a second impact analysis was performed after constructing a model using data for the entire State of New York. This analysis was used to determine if substantial additional economic impacts would be likely to occur outside of Orange County but remain within the State of New York. Substantial additional impacts will occur outside of the County and the State (as a result of manufacture of turbines, transformers and other equipment, or as a result of the manufacture of construction machinery for example), however these impacts are not included in this analysis.

For purposes of this report, the similarity between Orange County and New York multipliers (the total economic impact – direct, indirect, and induced – of direct project expenditures) suggests that "leakage" of the economic activity associated with Wawayanda Energy Project, out of the County but remaining within New York State will be insignificant. Calypso generally provides estimates of the leakage of economic impacts to the larger surrounding region or state. However, because the leakages from Orange County are smaller than the margin of error of their calculation they are not reportedly separately in this report.

Timing of Economic Impacts

$125 million of the $365 million Direct Project Expenditures Will Occur in Wawayanda and the Orange County Region



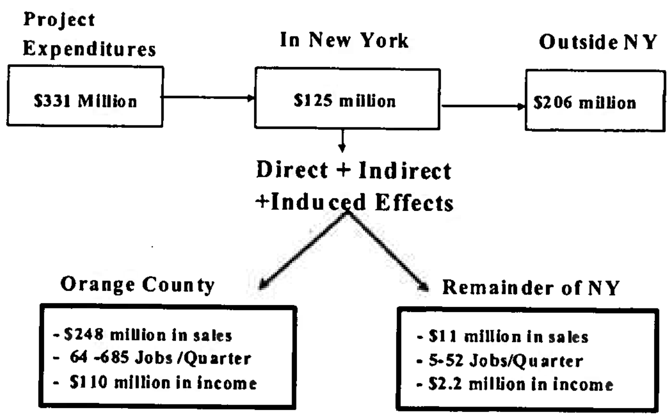
I/O models calculate the total economic impacts associated with a project but cannot determine their exact timing. Determining the timing of project impacts requires estimates of a project's timetable. The accompanying graphic presents, on a quarterly basis, the projected timing of Calpine's construction expenditures. The project is expected to take approximately two years to

IMPLAN in regional analysis, Appendix A provides only a sampling).

complete.

Results of the analysis suggest that Calpine's proposed project would yield large economic benefits to the region. Calpine's direct construction expenditures of $125 million will increase overall sales in the region by $248 million. Once constructed, the operation of the facility will increase regional sales by another $10.5 million.

Economic Impact of Construction: Flowchart



Impact on Output (Sales)

For analyzing the Wawayanda Energy project's impact on sales, jobs, and income in the region, only $125 million of project construction expenditures were used rather than the full $365 million project cost. As noted earlier, $206 million in equipment and engineering expenditures are expected to occur outside of the region and New York, and another $34 million are interest costs during construction.

Calypso's analysis indicates that the $125 million in direct construction expenditures will result in total output of $259 million, of which $248 will occur within Orange County and $11 million which will occur in surrounding areas. The project's impact on regional sales ranges from a high of $49.1 million to a low of $4.6 million.

In addition, the operation of the generating facility will result in $10.5 million in sales within the region. Sales in response to the operation of the facility will occur on an annual basis and will increase over time. Sales in response to construction activity will occur according to the project's timetable and are presented in Table V1.1.

Table VI.1

Impact of Construction on Output (Sales)

	Year 1				Year 2				
Orange County	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	**Total**
Direct	$12.4	$21.5	$24.8	$21.7	$15.5	$15.4	$11.7	$2.3	$125.4
Indirect	$3.9	$6.7	$7.8	$6.8	$4.8	$4.8	$3.7	$0.7	$39.3
Induced	$8.3	$14.4	$16.6	$14.5	$10.3	$10.3	$7.8	$1.5	$83.7
Total	$24.6	$42.7	$49.1	$43.0	$30.7	$30.5	$23.3	$4.6	$248.4

The breakdown of sales impacts according to direct, indirect and induced, is presented in the table above.

The indirect and induced sales impacts that result from the construction phase of the project will benefit a broad segment of the region's industries. Service and retail sectors will be the largest beneficiaries of the indirect and induced expenditures from construction. Orange County has a relatively high concentration of retail and service industry employment and a high percentage of disposable income earned in the County appears to be spent in the region as evidenced by the relatively high "induced" sales multiplier .

Although assessing a project's economic impacts always begins with focusing on changes in demand (sales), many economists argue that focusing on gross outputs is less important than focusing on the income impacts. Impacts on gross outputs or sales are always much larger than impacts on earnings but the size of income impacts in relation to sales impacts provides a good measure of the project's impacts on households in the region. Regional income and jobs impacts of the Wawayanda Energy Center were analyzed and found to be large. Results are reported below.

Job Impacts

The job impacts from construction activity will be large and will occur in a wide variety of industries. In addition to 1,590 jobs in construction and related industries from direct project expenditures, the indirect and induced expenditures related to the project will support another 1,877 jobs in the region. Once constructed, an additional 26 jobs (including 23 at the facility) will be created as a result of the direct expenditures of the facility. In addition, another 148 indirect and induced jobs will be supported in the region as a result of operation of the facility. Table VI.2 presents total job impacts that correspond with the project's construction timetable.

Job impacts will range from 514 to 48 per quarter as a result of facility construction and multiplier impacts

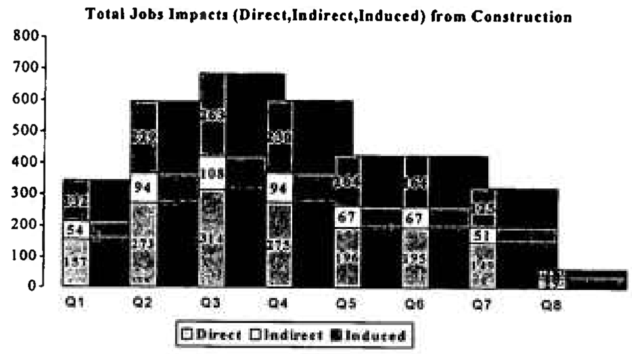
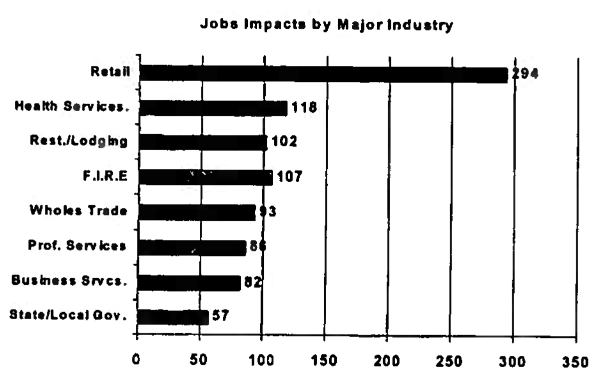


Table VI.2

Employment Impacts of Construction Phase

	Year 1				Year 2			
Orange County	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Direct	157	273	314	275	196	195	149	29
Indirect	54	94	108	94	67	67	51	10
Induced	132	229	263	230	164	164	125	25
Total	**343**	**596**	**685**	**599**	**427**	**426**	**325**	**64**

The indirect and induced sales from the construction project will create jobs in all industries



Impacts on Income

The direct, indirect, and induced sales and employment impacts of facility construction will increase the income of residents within the region by a total of $109.5.8 million over a two-year period.

Table VI.3

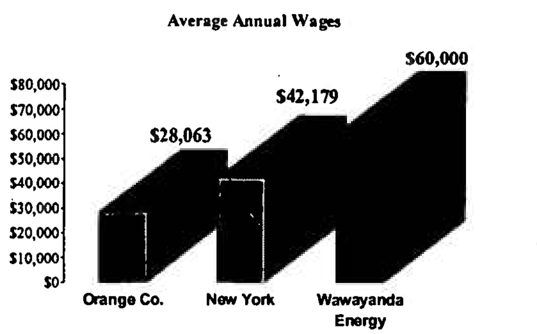
Impact of Construction Phase on Regional Wage and Salary Income

	Year 1				Year 2				
Orange County	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Total
Direct	$5.3	$9.2	$10.5	$9.2	$6.6	$6.6	$5.0	$1.0	**$53.4**
Indirect	$1.6	$2.8	$3.3	$2.9	$2.0	$2.0	$1.5	$0.3	**$16.5**
Induced	$3.9	$6.8	$7.8	$6.8	$4.9	$4.9	$3.7	$0.7	**$39.6**
Total	**$10.8**	**$18.8**	**$21.6**	**$18.9**	**$13.5**	**$13.5**	**$10.2**	**$2.0**	**$109.5**

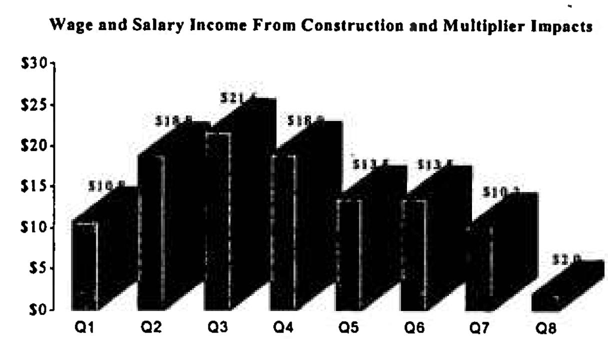
Operation of the facility will increase regional income (including benefits) of residents by another $6.8 million on an annual basis.

According to the NY State Department of Labor, the average annual wage in Orange County at the end of 1999 was $28,063 compared to the $42,179 average for all of New York. These data indicate that the average annual wage at the Wawayanda Energy Center will be approximately twice the regional average.

The jobs created at Wawayanda Energy will pay twice the average annual wage in the county



Construction and its multiplier impacts will add a total of $109 million in wages and salary income in Orange County over a two year period



VII. Tax Impacts

Data available with the IMPLAN model includes information on non-market monetary flows between households and government and between businesses and governments. These flows are in the form of tax payments and expenditures that can be used to estimate payments that will be made to governments as a result of changes in economic activity in a region. The data used to construct these flows comes from the Federal Government's Annual Survey of Government Finances.

IMPLAN models can be used to determine the changes in value-added in the region in response to the proposed project. This information can then be applied to the information on non-market monetary flows in the region (a social accounts matrix or SAM) to derive an estimate of the impact of various levels of government due to changes in economic activity. (A brief description of the methodology used to estimate tax impacts, "Using Social Accounts to Estimate Tax Impacts," is available on the World Wide Web at ftp://www.implan.com/documents/tax_impacts_report.pdf.)

The economic impacts that occur outside of Orange County but within the State of New York are included with Orange County impacts for purposes of the tax analysis. Using the economic impact analysis generated by the IMPLAN model and applying it to the regional social accounts matrix, results in estimates of increased state and local government revenue of over $16 million in response to the economic activity created by the construction phase of the project. In addition, the operating phase of the project will result in annual state and local government revenue of $1.9 million. The $1.9 million revenue estimate does not include real estate taxes paid by the facility to the community of Wawayanda, nor does it include and utility or franchise taxes paid by the electric industry to the State of NY

Tax Impacts Construction

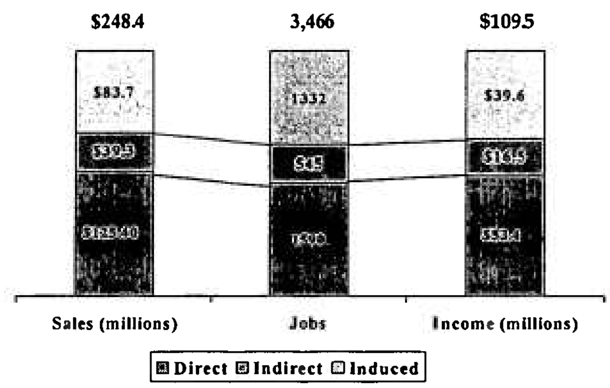
State & Local Government	
Corporate Profits Tax	
Indirect Bus Tax: Motor Vehicle License	50,194
Indirect Bus Tax: Other Taxes	36,731
Indirect Bus Tax: Property Tax	242,100
Indirect Bus Tax: S/L NonTaxes	3,422,451
Indirect Bus Tax: Sales Tax	2,437,255
Indirect Bus Tax: Severance Tax	2,993,632
Personal Tax: Estate and Gift Tax	34,803
Personal Tax: Income Tax	3,249,907
Personal Tax: Motor Vehicle License	146,099
Personal Tax: NonTaxes (Fines- Fees	188,776
Personal Tax: Other Tax (Fish/Hunt)	24,792
Personal Tax: Property Taxes	45,629
Social Ins Tax- Employee Contrib.	872,667
Social Ins Tax- Employer Contrib.	2,123,614
State/local Total	**16,324,336**
Federal Government	
Corporate Profits Tax	2,294,838
Indirect Bus Tax: Custom Duty	185,532
Indirect Bus Tax: Excise Taxes	563,222
Indirect Bus Tax: Fed NonTaxes	138,202
Personal Tax: Estate and Gift Tax	421,796
Personal Tax: Income Tax	12,964,644
Personal Tax: NonTaxes (Fines- Fees	37,302
Social Ins Tax- Employee Contrib.	5,625,552
Social Ins Tax- Employer Contrib.	5,893,546
FederalTotal	**28,124,633**
Total	**44,448,969**

Note: Results for the fiscal impact of facility operations due not include any utility or franchise tax payments. Estimates here are based on expected tax revenues that would be generated in response to a change in overall economic activity in the region and do not consider specific taxes unique to the electric utility industry.

VIII. Summary of Construction and Operating Phase Impacts

Calpine's proposed project in Wawayanda would lead to significant increases in jobs, sales, and income in the Orange County Region. Construction project impacts are summarized in the accompanying graphic. Once operational, the facility will employ 23 people directly at a wage that is twice the regional and State averages. Summary impacts for the annual impacts of the facility are presented in the graphic below.

Summary of Construction Impacts
$ Millions



IX. Long Term Impacts

Because of the magnitude of impacts of the construction phase of the Wawayanda Energy Center, it is tempting to view construction impacts as the primary economic benefits of the project. A more appropriate perspective, however, is to consider the impacts of the Wawayanda Energy Center over a longer time frame. Examining project impacts from its two-year construction phase, through the first twenty years of operation, shows that the operating phase of the project will provide a steady stream of economic benefits that will exceed the large, immediate, but shorter-term economic impacts the construction phase.

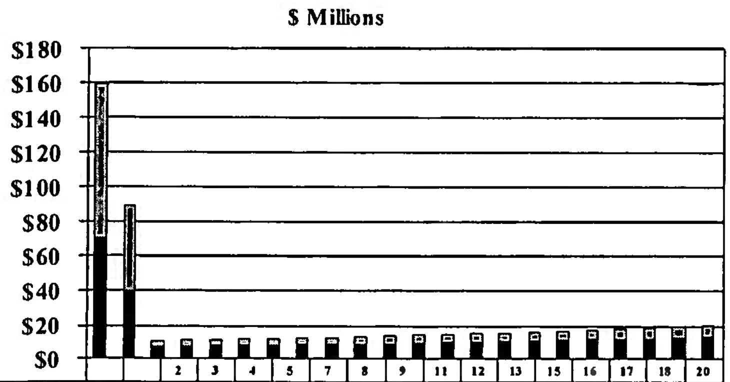
The table and chart below present the combined construction and operating impacts of the Wawayanda Energy Center. Excluding property tax payments, water purchases, and wastewater service payment to the City, over one-half of the $545 million in economic benefits occur as a result of the operating phase of the project.

Wawayanda Energy Center
Economic Impacts*

	Two (2) Year Construction Period	First 20 year Operating Period*	Total of First 22 year Impact
Direct Local Impact from project: Labor & Goods & Services	$125	$192	$317
Indirect Impact of Project Expenditures	$123	$105	$228
Total of Direct Plus Indirect Impacts	$248	$297	$545

*Excludes: property tax; water purchase; wastewater service

Twenty-two Year Impact of Wawayanda Energy on Orange County, New York



			2	3	4	5	7	8	9	11	12	13	15	16	17	18	20
Materials & Other Exp.	$89.1	$49.8	$3.8	$4.0	$4.1	$4.2	$4.5	$4.7	$4.9	$5.2	$5.4	$5.6	$6.0	$6.2	$6.4	$6.6	$7.1
Labor	$70.2	$39.2	$7.0	$7.3	$7.5	$7.8	$8.4	$8.7	$9.0	$9.6	$9.9	$10.3	$11.0	$11.4	$11.8	$12.2	$13.1

■ Labor ▩ Materials & Other Exp.

Appendix A

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Appendix B

Brian Gottlob, Director of Calypso Research

For 15 years Brian Gottlob has analyzed economic, demographic, labor market and industry trends for private sector, government and not-for-profit organizations. Brian specializes in identifying, understanding and communicating emerging economic and public policy trends. He concentrates on economics and impact analysis at the intersection of private sector activity and government policy, where public sector action or inaction can significantly impact the growth and development of individual businesses, industries, and geographic regions.

He is a regular commentator in the media and a frequently requested speaker on issues affecting the economy. For ten years, Brian was a Vice President of the Business and Industry Association of NH where he conducted research on the NH economy and where he guided the organization's fiscal and economic policy activities. During that time, he developed a solid reputation among lawmakers, public officials, and the business community for his ability to produce accurate forecasts and projections of the impacts of changes in tax, regulatory and other public policy actions.

Brian is on the Advisory Board of the New England Economic Project (NEEP); is a member of the Industrial Advisory Council of the College of Engineering and Physical Sciences at the University of NH, the Advisory Board of the NH Small Business Development Center and is a member of the National Association of Business Economists. He writes a regular column in the "NH Entrepreneur" section of the New Hampshire Business Review and is the author of numerous articles for business publications. Brian has a BA in Economics from the State University of New York and a Masters Degree from the University of New Hampshire.

Appendix S
Geotechnical Study

APPENDIX S GEOTECHNICAL INVESTIGATIONS

WAWA-1-LI-SPI-0001-RO

Preliminary Geotechnical Engineering Report
Wawayanda Energy Center
Dolsontown Road
Middletown, New York

(Schnabel Reference 00151175)

Schnabel
Engineering

Schnabel Engineering

Schnabel Engineering Associates, Inc.
510 East Gay Street
West Chester, PA 19380
610-696-6066 • Fax 610-696-7771

January 30, 2001

Parsons Energy & Chemicals Group, Inc.
2675 Morgantown Road
Reading, PA 19607

Attn: Mr. David R. Erali

Subject: Contract 00151175, Preliminary Geotechnical Engineering Services, Wawayanda Energy Center, Dolsontown Road, Middletown, New York (Parsons P.O. #537162-0580101)

Gentlemen:

We are pleased to submit our preliminary geotechnical engineering report for the above referenced project. These services were provided in accordance with our agreement dated November 1, 2000. We understand that a preliminary geotechnical investigation is necessary for a permit application for the State of New York.

Our services included: (A) Field Exploration and Sampling, (B) Coordination, Layout and Inspection of the Field Exploration, (C) Soil Laboratory Testing, and (D) a Preliminary Geotechnical Engineering Study. The Preliminary Geotechnical Engineering Study included the evaluation of site, test boring, geological, soil test, and related structural data to develop the following:

1. Estimated subsurface conditions and groundwater levels within the area explored.

2. Preliminary foundation recommendations including feasible foundation systems and estimated range of bearing pressures or capacities.

3. Recommendations for floor slab support, including a modulus of subgrade reaction for design.

4. General recommendations for excavation bracing, including parameters for use in design.

5. Earthwork recommendations for construction of load bearing fills, including an assessment of on-site soils to be excavated for use as fill, subgrade preparation, and compaction criteria.

6. Recommended lateral earth pressures, subdrainage, and backfill requirements for building walls below grade and cantilever retaining walls, if necessary.

7. Evaluation of rock excavation considerations including a sample definition for rock, if necessary.

8. Discussion of pertinent design and construction considerations, including requirements for foundation installation, recommendations for floor slab support, temporary dewatering, the need for rock removal, seismic site coefficients, parameters for earthwork and compaction, and scope of geotechnical observation and testing services necessary during construction.

Services not listed above, such as pavement design, horizontal or vertical lines and grades, quantity or cost estimates, or detailed plans and specifications, were not included in this agreement.

We have organized this report into several sections and two attachments. The first pages present our exploration program and laboratory results. The following sections include our geotechnical analyses and construction considerations. Two attachments are included: Attachment 1 contains laboratory data, and Attachment 2 contains subsurface exploration data.

DESCRIPTION OF SITE AND PROPOSED CONSTRUCTION

The site is located on Dolsontown Road, south of Middletown, near the intersection of Interstate 84 and US Traffic Route 6, as shown on Figure 1. The site is currently used as an agricultural field. Dolsontown Road is to the south of the site, an old railroad grade to the northeast, and a utility facility and private residence are to the northwest. There are also private residences at the southeast corner and the center south of the site.

The topography is generally sloping to the center of the site. The western side is between a 1V:10H and 1V:5H slope to the southeast, and the eastern side is a 1V:16H slope to the northwest. A drainage ditch oriented southeast, a small stream oriented southwest, and a small pond are located between the slopes with delineated wetlands surrounding them. At the time we visited the site there was tall vegetation near the ditch, stream, and pond; low vegetation in the agricultural field; and wooded areas to the northwest and northeast.

Schnabel personnel noted that gravel, cobbles and boulders were commonly seen on the ground surface at the site. Also, piles of cobbles and boulders were observed along the borders of the agricultural field and in the wooded areas.

The proposed energy center will include turbine generators, an administration building, tanks, transformers, underground utilities, and parking and drive lanes. Based on the site slopes, cutting and filling will be necessary. Typical mat foundation sizes range from 30 x 30 ft to 50 x 100

STRATUM B2 (GLACIAL TILL)	Below Stratum A or B1 to depths of 26.5 to 61.5 ft, which corresponds to the maximum depths explored in Borings B-1, B-2, B-4 through B-7, and B-9	Gray, fine to coarse CLAYEY SAND (SC), SANDY CLAYEY SILT (CL-ML), SILTY CLAYEY SAND (SC-SM), SILTY SAND (SM), and SILT (ML), contains gravel, cobbles and boulders; dense to very compact density and very stiff to hard consistency (N = 13 to 100/1"; Pocket Penetrometer values from 1.5 to > 4.5 tons/ft^2)
STRATUM C (NORMANSKILL FORMATION)	Below Stratum B2 to the maximum depth explored in Boring B-3 and B-8	Fresh, gray SHALE, moderately hard, moderately fractured, thin bedding approximately 30° to core axis, with calcite filled joints approximately 45° to core axis (RQD = 72%; REC = 97%)

Samples have been classified in accordance with ASTM D2488, and D2487 where laboratory tests were performed. The ASTM D2487, ASTM D2488, group symbols (e.g. SM), indicated above and on the boring logs, are based on visual observations and limited soil laboratory testing of recovered soil samples. Criteria for soil classification are given in Attachment 2. Some variation is likely to occur between the visual and laboratory classifications.

The above N values indicate the low and high Standard Penetration Test resistances encountered in a particular layer as determined from the number of blows required to drive a two inch outside diameter (O.D.), 1⅜ inch inside diameter (I.D.) sampling spoon one foot using a 140 pound hammer falling 30 inches. This test is conducted after seating the sampler six inches in the bottom of the hole according to ASTM D1586.

Coring was occasionally performed in borings when auger refusal was encountered. The auger and sampler refusal, was typically caused by boulders. The frequency at which cobbles and boulders were encountered varied throughout the site. Based on subsurface explorations completed at the site, it is our opinion that auger and sampler refusal is not indicative of massive bedrock, but rather is typically caused by boulders or cobbles within the glacial till. In Borings B-3 and B-8 bedrock was encountered.

The percentages shown after the rock stratum description indicate the variation in core recovery (REC), which is the length of rock core recovered expressed as a percentage of the total length cored. Rock Quality Designation (RQD) is also given for each core run drilled. RQD is defined as the sum of the lengths of rock core fragments recovered, which are greater than four inches in length discounting drilling breaks, expressed as a percentage of the total length cored.

RQD values are considered to be a better indication of the engineering properties of the rock than the percent recovery.

3. Groundwater

Groundwater levels presented in this section were obtained during drilling activities and after drilling at locations where monitoring wells were installed. Water levels were measured in Borings B-1 (Well), B-2, B-3 (Well), B-6, B-7, B-8 (Well) and B-9. Borings B-4 and B-5 were dry upon completion of drilling. The explorations show that both perched and static groundwater levels are present at the site.

Perched groundwater was encountered at depths of 6.0 to 8.0 ft below the existing ground surface during drilling activities in Borings B-1, B-2, and B-6 through B-9.

Monitoring wells with a 10 ft screened interval were installed in Borings B-1, B-3 and B-8.

Boring	Top of Casing (ft)	Screened Interval		Approximate Water Elevation(1) (ft)
		Elevation (ft)	Depth (ft)	
B-1	EL 504.2	450.8 to 440.8	50.7 to 60.7	498
B-3	EL 493.7	459.7 to 449.7	31.9 to 41.9	484
B-8(2)	EL 456.5	413.8 to 403.8	39.8 to 49.8	450.6(2) to 456.5

1. Water levels were measured between November 11 and 29, 2000.
2. Upon drilling to approximately EL 408 in Boring B-8, groundwater rose to the ground surface. After installation of the well casing, water trickled over the top of the casing.

Based on the elevations presented in the table above, it appears that the groundwater levels for Borings B-1 and B-3 may be a result of perched water, and not the groundwater table. This can result when leakage occurs around the bentonite seal in the well.

Water level readings that were obtained in the borings during and after completion are noted on the boring logs. Fluctuations in the water table should be expected with variations in precipitation, surface runoff, pumping, and evaporation occurring throughout the year.

4. Geology

Based on the Soil Survey of Orange County (1981), the surface soils (upper three feet) at the site are Mardin gravelly silt loam on 3 to 8% slopes (MdB), Hoosic gravelly sandy loam on 3 to 8% slopes (HoB), and the Wayland silt loam (Wd).

Glacial till was encountered below the surface soils. The region has been glaciated and the overburden material is generally glacial till. The glacial till was weathered (tan color, lower N values) and generally unweathered (gray, high N values). The glacial till contains cobbles and boulders. We observed boulders at the ground surface up to four feet in diameter.

Review of the regional geology indicates the bedrock underlying the site is the Normanskill Formation of the Ordovician Age Trenton Group. The Normanskill Formation consists of shale, siltstone, and argillite (a rock derived from shale or mudstone that is massive).

SOIL LABORATORY TESTING

Thirty jar samples were tested in the soils laboratory. Testing consisted of natural moisture content, Atterberg Limits and gradation analysis. These tests were performed to confirm our visual classifications and to provide additional guidance in the selection of strength parameters for design.

The natural moisture contents of selected soil samples are shown on the boring logs in Attachment 2. The results of the remaining laboratory tests are included in the Summary of Soil Laboratory Tests of Attachment 1.

GEOTECHNICAL ENGINEERING ANALYSIS

1. Discussion

The dense to very dense, gray glacial till (Stratum B2) is suitable for the shallow foundation systems presented in this section. In addition, the weathered glacial till and alluvial (Stratum B1 and Stratum A) may be acceptable for foundation support, if additional explorations and laboratory testing are completed to delineate the extent and the strength of these strata. For this report we assumed that the mat foundations will bear on the dense to very dense glacial till, and shallow spread footings on structural fill overlying dense to very dense glacial till. Based on the explorations, the dense to very dense, gray glacial till is at depths ranging from seven to 20 ft. The actual depth to reach suitable subgrade soils should be determined in the field based on observations by the Geotechnical Engineer.

If the excavation depths are too costly or if significant thicknesses of fill are necessary due to the sloping ground, deep foundation systems may be used at the site. We can evaluate the need for deep foundation systems once the site layout is established.

We understand that some of the proposed heavy equipment and structures are sensitive to long-term differential settlement. Therefore, we recommend that once the final building loads, locations and elevations are established, that settlement be estimated for each structure.

2. **Mat Foundation**

A 50 x 100 ft mat foundation bearing on the dense to very dense glacial till was evaluated for support of the proposed structures. The mat foundation may be designed for a distributed contact pressure of 3,000 to 4,000 psf. This range of bearing pressures provides a factor of safety of at least three against general shear failure. Based on this size and bearing pressure, we estimate the total settlement will be less than 1½ inches. Differential settlements are estimated to be half of the total settlements. Foundations should be designed such that angular distortions do not exceed 0.003.

We anticipate that the majority of the settlement will be immediate (as construction occurs). We estimated settlement by assuming the glacial till is 75 ft deep with an elastic modulus of 500 tsf. The very dense glacial tills may be stiffer than this assumed modulus, thus resulting in reduced settlements.

3. **Shallow Spread Footings**

Footings may be supported on the dense to very dense glacial till or structural fill overlying dense to very dense glacial till. Shallow spread footings were evaluated for column loads ranging from 40 to 800 kips.

Footings may be sized for a net allowable soil bearing pressure of 6,000 psf or 3,000 psf bearing on the dense to very dense glacial till or new compacted structural fill, respectively. These bearing pressures provide a factor of safety of at least three against general shear failure. The foundation settlements are expected to be less than 1½ inches based on the loading described above. Differential settlements between similarly loaded foundation elements should not exceed about half this value.

We anticipate that the majority of the settlement will be immediate (as construction occurs). We estimated settlement by assuming the fill is 20 ft thick overlying a 50 ft thick, very dense glacial till. The very dense glacial tills may be stiffer than this assumed modulus, thus resulting in reduced settlements. We used an elastic modulus of 150 tsf for the structural fill.

Interior footing grades in climate controlled areas may be set at nominal depths below the floor slab. Perimeter footings exposed to climatic variations should be founded at least 42 inches below the final exterior grades for frost protection. Footings should be a minimum of 18 inches wide for shear consideration.

The bearing pressures discussed above can be increased by 25% for a temporary overload condition such as seismic or wind loading.

4. Storage Tanks

A shallow ring wall foundation was evaluated for support of the proposed storage tanks and is recommended. The ring wall foundation may be designed for an allowable bearing pressure of 3,000 psf bearing on the dense glacial till or structural fill. The bearing grades for the ring wall foundation should be at least 42 inches below final exterior surface grades for frost protection. The actual depth to reach suitable subgrade soils should be determined in the field based on observations by the Geotechnical Engineer. Considering the contact pressure of 3,000 psf from a full tank, total settlement at the center of the tank is expected to be less than two inches, with differential settlement of about half the total settlement between the center and edge of the tank. The bearing pressure can be increased by 25% for a temporary overload condition such as seismic or wind loading.

We anticipate that the majority of the settlement will be immediate (as construction occurs). We estimated settlement by assuming the fill is 20 ft thick overlying a 50 ft thick, very dense glacial till. We used an elastic modulus of 150 and 500 tsf for the dense glacial till and structural fill, respectively. The very dense glacial tills may be stiffer than this assumed modulus, thus resulting in reduced settlements.

5. Deep Foundations

The need for a deep foundation system depends on the final site grades. If some areas need to be filled significantly, settlements may increase to values unacceptable for structural design. In areas where there is a thick layer of weathered glacial till that is unsuitable for a particular structure, it may not be cost effective to remove all the material to reach the dense to very dense glacial till. If deep foundations are needed, the glacial till and underlying rock are acceptable as bearing layers for deep foundations.

Various deep foundations are feasible at this site, such as drilled piers and driven, non-displacement piles. Displacement piles such as pipes or timber piles would require predrilling due to the presence of dense materials and cobbles and boulders. Drilled piles, such as augercast and caissons, may be more cost effective. Presence of cobbles and boulders may present difficulties during installation of deep foundations.

6. Floor Support

Floor slabs may be supported on suitable natural soils in-cut, or on new compacted structural fill. Proofrolling and observation of subgrades should be performed as described for compacted structural fill subgrades prior to new fill or moisture barrier placement.

A four inch crushed stone or washed gravel capillary moisture barrier should underlie all floor slabs on-grade. Moisture barrier material should meet the gradation requirements of AASHTO Size No. 57 aggregate, and should be tamped in place by at least two passes with vibratory compaction equipment. Floor slabs may be designed using a modulus of subgrade reaction, k, of 300 pci and 125 pci, for dense to very dense glacial till (Stratum B2) and structural fill, respectively. If floor slabs are constructed on the weathered glacial till (Stratum B1), a k equal to the structural fill may be used.

7. Compacted Structural Fill

Compacted structural fill subgrades should be stripped of topsoil and other organic material prior to placement of new fill. Subgrades should be proofrolled with a loaded dump truck or minimum 10 ton smooth-drum roller under the observation of the Geotechnical Engineer. Areas which exhibit excessive pumping or weaving, in the opinion of the Geotechnical Engineer, should be excavated and replaced with compacted structural fill. No fill material should be placed until subgrades have been observed and are considered suitable by the Geotechnical Engineer.

Material used as compacted structural fill for foundation support should classify as SC, SM, GC, GP, or GM in accordance with ASTM D2487, with a Plasticity Index less than 20 and a maximum particle size of six inches. Compacted structural fill should be placed in lifts not exceeding ten inches in loose thickness and compacted to at least 95 percent of maximum dry density per ASTM D1557, Modified Proctor. Structural fill should be compacted to 90% in areas where no structures are present. Compacted structural fill should extend at least five feet beyond the limits of the structures; then be sloped as required to meet final grades.

8. Use of On-Site Soils for Structural Fill

Some of the on-site soils meet the classification requirements above and are expected to be suitable for reuse, provided adequate compaction can be obtained and moisture contents can be controlled.

The surface soils contain organic material and therefore may not be used for structural fill. The on-site soils beneath the organic layer contain a high percentage of fines and may be difficult to compact under wet weather conditions. In addition, perched groundwater was encountered at the site. Materials within the perched zone will be wet of optimum moisture for compaction. This will require that the excavated soil be moisture conditioned before placement. The glacial till also contains cobbles and boulders which will need to be screened.

Because of the nature of the on-site soils, we recommend that the suitability of on-site soils for use as structural fill be determined in the field during excavation and construction activity. The contractor may need to segregate soils identified as suitable for re-use, from soils that are determined in the field to be unsuitable.

9. Walls Below Grade

The following soil parameters can be used to determine lateral earth pressure for design of below grade walls, assuming glacial till material is utilized. These values are based on a friction angle of 28 degrees for the soil fill when compacted as described in the Compacted Structural Fill Section. Walls below grade should be designed for the triangular earth pressure distributions having a maximum pressure at the base of the wall as shown on Figures 2 and 3. The earth pressure distribution shown on Figure 2 is based on the use of the on-site soils as described above, while Figure 3 assumes the use of open graded crushed stone.

	Compacted Structural Fill (On-Site Material)	**AASHTO No. 57 Aggregate**
K_a	0.36	0.24
K_o	0.53	0.38
K_p	2.7	4.2
γ_t	130 pcf	115 pcf

A permanent subdrain should be provided around the exterior perimeter of walls below grade to drain any water that develops behind the walls. Details of the drain are shown on Figures 2 and 3. The drain should consist of drainage panels and a four inch diameter slotted corrugated pipe surrounded by a minimum six inch thick AASHTO Size No. 57 aggregate filter. This aggregate should be wrapped in a drainage filter fabric. The pipes should drain by gravity to tie into a drainage system which connects to an adjacent storm sewer or an off-site drainage system. Drainage panels are not required where open graded crushed stone is used as backfill.

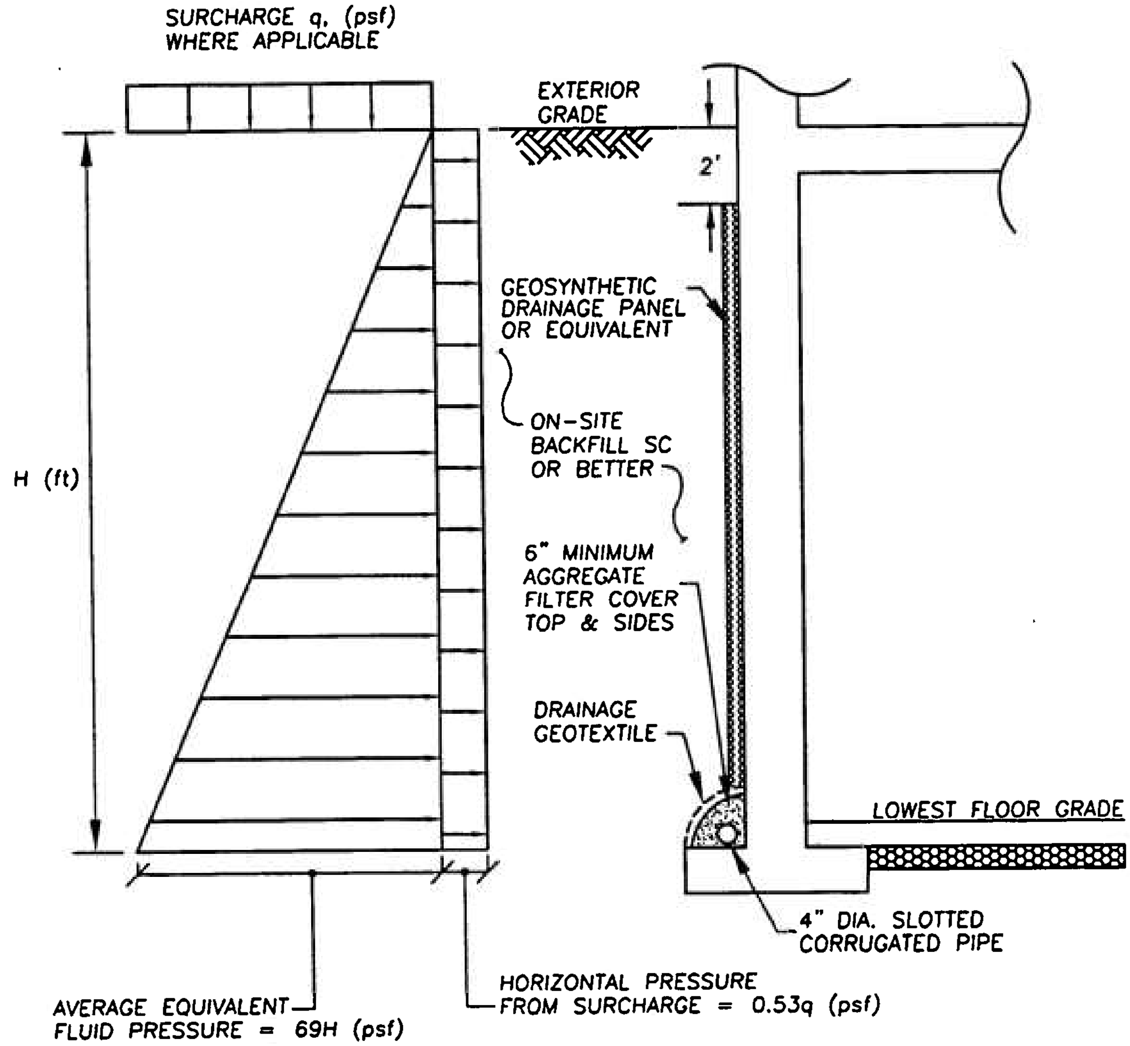
Backfill should be placed in loose lifts not exceeding eight inches in thickness and should be compacted to at least 95 percent of maximum dry density per ASTM D1557, Modified Proctor, or as described for compacted structural fill. Only light hand-operated equipment should be used within three feet of the walls.

10. Seismic Site Coefficient

The soils encountered during our subsurface exploration have a soil profile type of S_1, which corresponds to a site coefficient of S = 1.0 for seismic activity. Information pertinent to seismic activity was obtained from the 1999 Building Officials and Code Administrators International, Inc. (BOCA) National Building Code.

WAWAYANDA ENERGY CENTER
DOLSONTOWN ROAD
MIDDLETOWN, NEW YORK
00151175

DESIGN DETAILS FOR BUILDING WALLS BELOW GRADE
(ON-SITE BACKFILL)
NO SCALE



NOTES:
1) The above earth pressure distribution considers the use of suitable on-site soils as compacted backfill. At rest conditions.
2) See text for additional design details.

Schnabel Engineering

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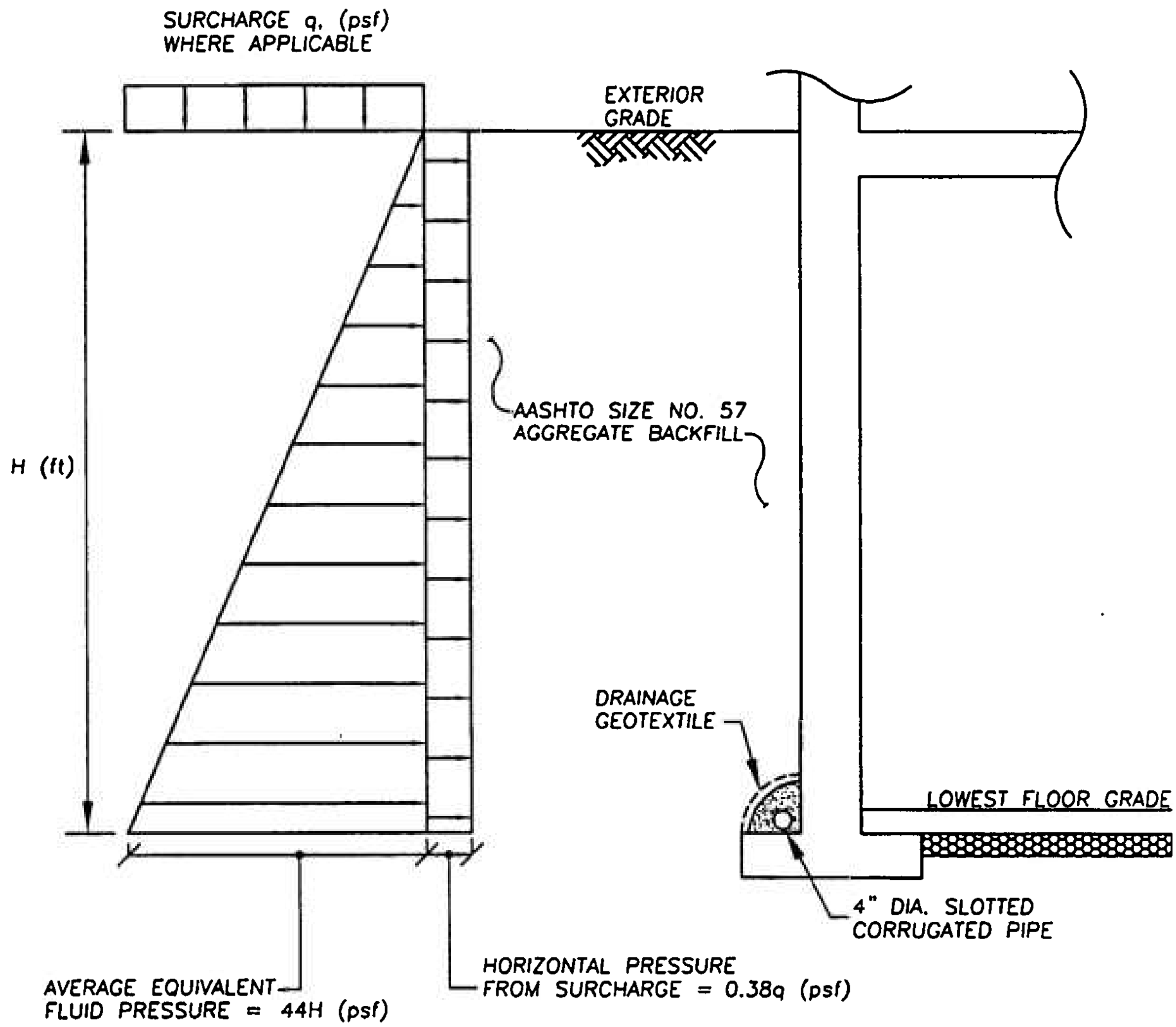
WAWAYANDA ENERGY CENTER
DOLSONTOWN ROAD
MIDDLETOWN, NEW YORK
00151175

DESIGN DETAILS FOR BUILDING WALLS BELOW GRADE
(AASHTO SIZE NO. 57 AGGREGATE)

NO SCALE



NOTES: 1) The above earth pressure distribution considers the use of suitable on-site soils as compacted backfill. At rest conditions.

2) See text for additional design details.

Schnabel Engineering

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CONSTRUCTION CONSIDERATIONS

1. Foundations

Care should be exercised during excavation for shallow foundation systems in natural soils so that as little disturbance as possible occurs at the foundation level. Loose or soft soils should be carefully cleaned from the bottom of the excavation prior to placing concrete. Actual footing grades should be observed by a Geotechnical Engineer from this firm during construction to verify that the subgrade soils meet the requirements as specified in this report.

Foundation system subgrades should be undercut as recommended by the Geotechnical Engineer to remove unsuitable soil. Replace the excavated material with concrete or compacted dense graded aggregate for foundation systems requiring an allowable bearing capacity of 6,000 psf. Replace the excavated material to original design subgrade elevation with an open graded crushed stone such as AASHTO Size No. 57 aggregate or compacted structural fill for foundation systems with allowable bearing pressures of 3,000 psf.

All footing and utility excavations must be backfilled with compacted fill since floors will be a slab-on-grade. Compaction requirements are the same as for compacted fill for floor support.

2. Dewatering

Construction may require excavations to depths below the perched groundwater level. Therefore, dewatering is likely to be required. A dewatering plan should be established by the contractor and implemented prior to the start of excavation. Dewatering within the excavation with sump pumps is likely to be effective. Note that artesian conditions may be encountered if cuts or foundation elements extend to bedrock.

3. Earthwork

We expect that most of the groundwater encountered in excavations will be perched on the glacial till, with a lesser potential for encountering static groundwater during excavations.

Proper grading to provide positive drainage away from working areas should always be maintained to avoid unnecessary excavation due to softening of the subgrade soils by water and/or construction equipment.

It should be noted that the on-site soils are highly susceptible to moisture changes and disturbance and may become difficult to compact under wet weather conditions. Earthwork should generally be performed during the warmer, drier months to avoid wet and freezing conditions. Construction during wet weather may also create unnecessary delays and undercutting of subgrades due to disturbance by construction traffic. The contractor should be advised of his responsibility to prevent disturbance to otherwise stable subgrades. Final subgrade observations should be made by the Geotechnical Engineer just prior to placing of moisture barrier or base course materials to verify that excessive subgrade disturbance has not occurred.

The test boring data indicates the approximate depth of topsoil as indicated by our visual identification procedures. The depth of stripping necessary to provide a suitable base for placement and compaction of earthwork or for pavement subgrade preparation may include topsoil and other softer surficial layers with or without organic matter. The depth of required stripping should be determined by the excavation contractor prior to construction using test pits, probes, or other means that the contractor wishes to employ, and this determination should be the excavation contractor's responsibility.

4. Rock Excavation

Test boring data indicate that rock will not be encountered within depths of at least 36 ft below the existing ground surface. We understand that the proposed structures will not require cuts of this depth.

5. Observation and Testing

Regardless of the thoroughness of a geotechnical engineering exploration, there is always a possibility that conditions between borings will be different from those at the boring locations, that conditions are not as anticipated by the designers, or that the construction process has altered the subsurface conditions. Therefore, geotechnical engineering construction observation should be performed under the supervision of a Geotechnical Engineer from our office who is familiar with the intent of the recommendations presented herein. This observation is recommended to evaluate whether the conditions anticipated in the design actually exist or whether the recommendations presented herein should be modified where necessary.

GENERAL

This report is preliminary and should not be considered adequate for final design. Once the project layout and loads are established, further geotechnical engineering can be completed. We would welcome the opportunity to provide recommendations for the final site layout and loads, to review the final foundation plans and earthwork specifications as they pertain to this phase of the project, and to submit our comments based on this review. Any substantial change in location and in grade should be brought to our attention so that we may determine how this may affect our recommendations.

The conclusions and recommendations of this report are based on the information revealed by this exploration. An attempt has been made to provide for normal contingencies, but the possibility remains that unexpected conditions may be encountered during construction. An allowance should be established to account for possible additional costs that may be required to construct foundations and earthwork as recommended herein. Additional costs may be incurred for various reasons including undercutting of unsuitable existing soils, inability to use on-site soils during the period earthwork proceeds, variation of soil between test borings.

This study should be made available to prospective bidders for informational purposes. We would recommend that the project specifications contain the following statement:

> "A geotechnical engineering report has been prepared for this project by Schnabel Engineering Associates. This report is for informational purposes only and should not be considered part of the contract documents. The opinions expressed in this report are those of the Geotechnical Engineer and represent his interpretation of the subsoil conditions, tests, and the results of analyses which he has conducted. Should the data contained in this report not be adequate for the Contractor's purposes, the Contractor may make, prior to bidding, his own investigation, tests and analyses. This report may be examined by bidders at the office of the Engineer or copies may be procured from the Engineer at nominal charge."

Soil samples will be held until April 1, 2001, and will then be discarded unless further storage is requested.

We have endeavored to prepare this report in accordance with generally accepted geotechnical engineering practice and make no warranties, either express or implied, as to the professional advice provided under the terms of our agreement and included in this report.

We appreciate the opportunity to be of service for this project. Please contact either of the undersigned if clarification is needed for any aspect of this report.

Very truly yours,

SCHNABEL ENGINEERING ASSOCIATES, INC.

Iliana Alvarado, E.I.T.
Project Engineer

Richard H. Wargo, P.E.
Principal

MAP:IA:AWC:RHW:hcf

Attachments

(1) Laboratory Data
- Summary of Soil Laboratory Tests (3)
- Gradation Curves (2)
- Atterberg Limits (1)

(2) Subsurface Exploration Data
- General Notes for Test Boring Logs
- Identification of Soil
- Water Observation Well Readings
- Test Boring Logs, B-1 through B-9
- Test Boring Location Plan, Sheet 1

cc: Parsons Energy & Chemicals Group, Inc. (4)
Attn: David R. Erali, P.E.

ATTACHMENT 1

Laboratory Data

Schnabel Engineering Associates

Attachment 1
Contract 00151175

SUMMARY OF SOIL LABORATORY TESTS

Boring No.	Sample Depth / Elev.	Sample Type	Description of Soil Specimen	Stratum	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Natural Moisture (%)	% Passing No. 200 Sieve	Remarks
B-1	5.0-6.2' / 496.5-495.3	JAR	Fine to coarse SANDY CLAYEY SILT, trace gravel – brown (CL-ML)	B1	--	--	--	15.2	51	
B-1	19.8-20.6' / 482.5-481.7	JAR	Fine to coarse SILTY SAND, trace gravel – gray (SM)	B2	--	--	--	--	45	
B-2	6.0-8.0' / 494.8-492.8	JAR	Fine to coarse SANDY CLAYEY SILT, trace gravel – brown-gray (ML)	B1	--	--	--	--	57	
B-3	30.0-32.0' / 461.6-459.6	JAR	SILTY CLAY WITH SAND, trace gravel – gray (CL-ML)	B2	--	--	--	11.4	83	

Notes:
1. Soil tests in accordance with applicable ASTM Standards
2. Soil classifications in accordance with ASTM D2487
3. Key to abbreviations: LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; NP = Non-Plastic
4. Soil tests were conducted by: JY, BG & DM

Attachment 1
Contract 00151175

SUMMARY OF SOIL LABORATORY TESTS

Boring No.	Sample Depth / Elev.	Sample Type	Description of Soil Specimen	Stratum	Atterberg Limits			Natural Moisture (%)	% Passing No. 200 Sieve	Remarks
					LL	PL	PI			
B-4	15.0-16.5' / 462.7-461.2	JAR	Fine to coarse SILTY CLAYEY SAND, trace gravel – tan (SC-SM)	B1	24	18	6	14.2	50	
B-5	20.0-21.5' / 452.5-451.0	JAR	SILTY CLAY WITH SAND, trace gravel - gray (CL-ML)	B2	22	16	6	11.6	79	
B-5	25.0-26.5' / 447.5-446.0	JAR	SILTY CLAY WITH SAND, trace gravel - gray (CL-ML)	B2	--	--	--	9.2	71	
B-5	50.0-57.5' / 422.5-421.0	JAR	SILT, trace sand and gravel - gray (ML)	B2	--	--	--	13.6	94	

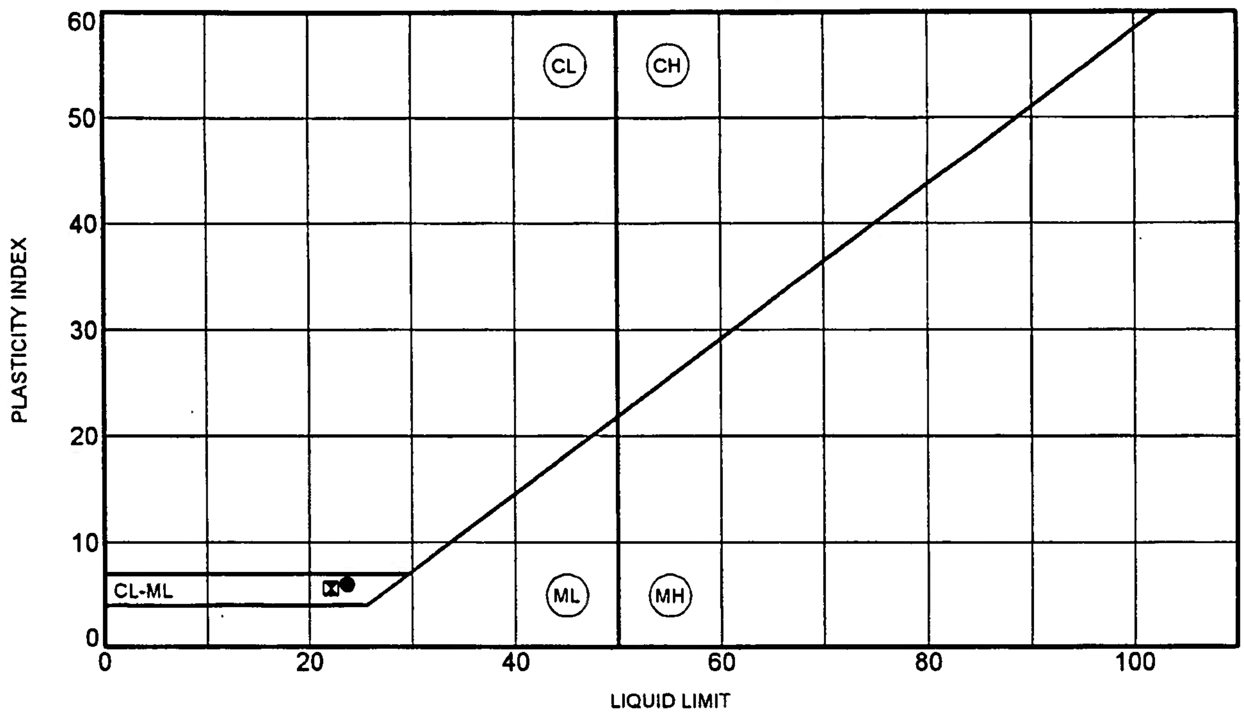
Notes:
1. Soil tests in accordance with applicable ASTM Standards
2. Soil classifications in accordance with ASTM D2487
3. Key to abbreviations: LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; NP = Non-Plastic
4. Soil tests were conducted by: JY, BG & DM

Attachment 1
Contract 00151175

SUMMARY OF SOIL LABORATORY TESTS

Boring No.	Sample Depth / Elev.	Sample Type	Description of Soil Specimen	Stratum	Atterberg Limits			Natural Moisture (%)	% Passing No. 200 Sieve	Remarks
					LL	PL	PI			
B-6	29.0-30.5' / 436.8-435.3	JAR	SILTY CLAY WITH SAND - gray (CL-ML)	B2	--	--	--	13.3	81	
B-7	20.0-22.0' / 437.7-435.7	JAR	Fine to coarse SANDY LEAN CLAY – gray (CL)	B2	--	--	--	9.8	67	
B-8	25.0-25.5' / 428.6-427.1	JAR	Fine to coarse SANDY LEAN CLAY, trace gravel – gray (CL)	B2	--	--	--	8.2	65	
B-8	30.0-30.5' / 423.6-422.1	JAR	Fine to coarse SILTY CLAYEY SAND, trace gravel –gray (SC-SM)	B2	--	--	--	5.9	45	
B-9	10.0-12.0' / 440.8-438.8	JAR	Fine to coarse SANDY SILT – brown (ML)	A	--	--	--	19.4	52	

Notes:
1. Soil tests in accordance with applicable ASTM Standards
2. Soil classifications in accordance with ASTM D2487
3. Key to abbreviations: LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; NP = Non-Plastic
4. Soil tests were conducted by: JY, BG & DM



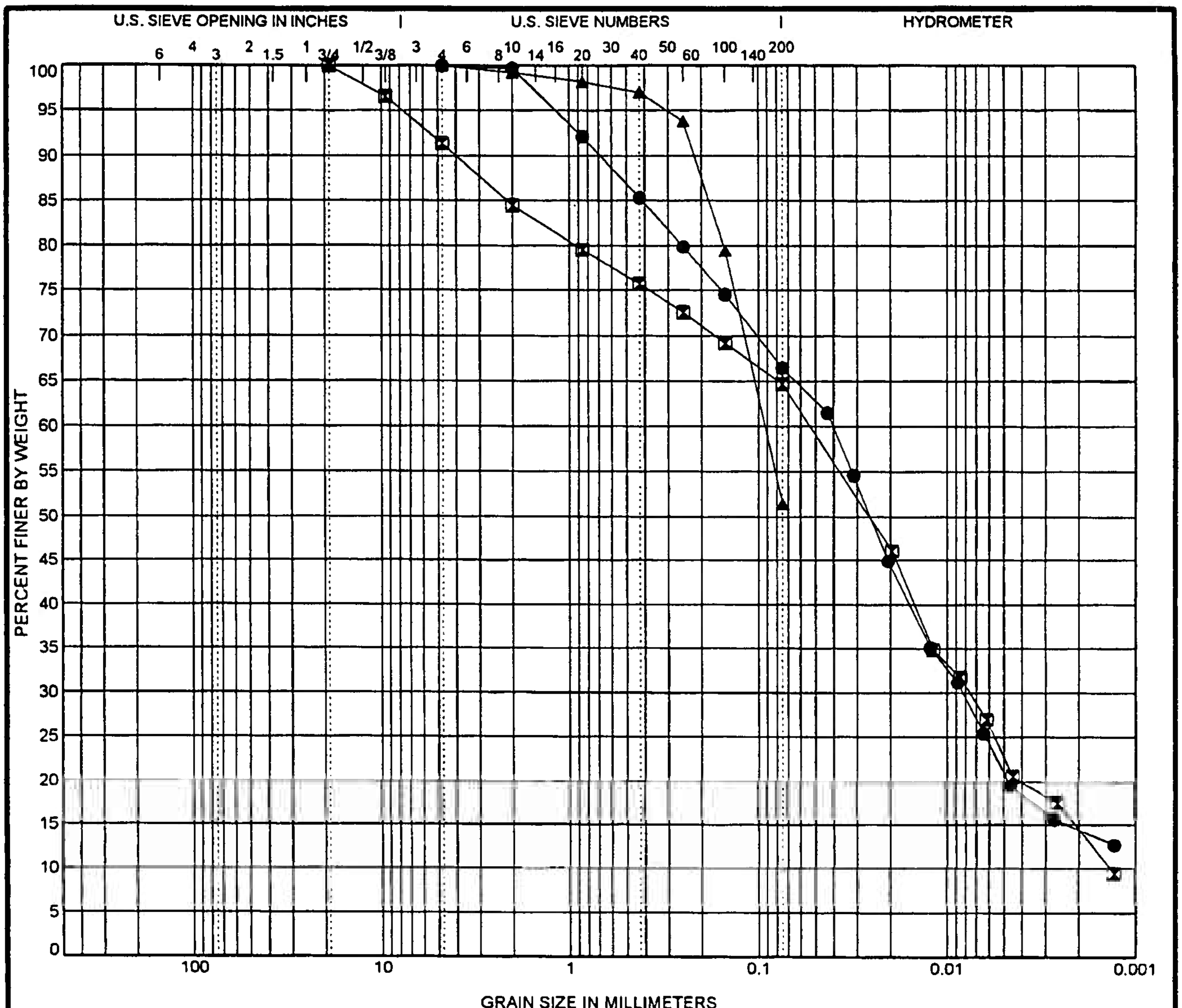
Specimen		LL	PL	PI	Fines	Classification
● B-4	15.0 ft	24	18	6	49	Fine to coarse SILTY CLAYEY SAND, trace gravel - tan (SC-SM)
⊠ B-5	20.0 ft	22	16	6	79	SILTY CLAY WITH SAND, trace gravel - gray (CL-ML)

Schnabel Engineering

ATTERBERG LIMITS

Project: WAWAYANDA ENERGY CENTER
DOLSONTOWN ROAD
MIDDLETOWN, NEW YORK

Contract: 00151175



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen		Classification	LL	PL	PI	Cc	Cu
●	B-7	20.0 ft	Fine to coarse SANDY LEAN CLAY - gray (CL)					
⊠	B-8	25.0 ft	Fine to coarse SANDY LEAN CLAY, trace gravel - gray (CL)				0.79	39.36
▲	B-9	10.0 ft	Fine to coarse SANDY SILT - brown (ML)					

	Specimen		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-7	20.0 ft	4.75	0.04	0.008		0.0	33.5	66.5	
⊠	B-8	25.0 ft	19	0.053	0.008	0.001	8.6	26.7	64.7	
▲	B-9	10.0 ft	4.75	0.093			0.0	48.5	51.5	

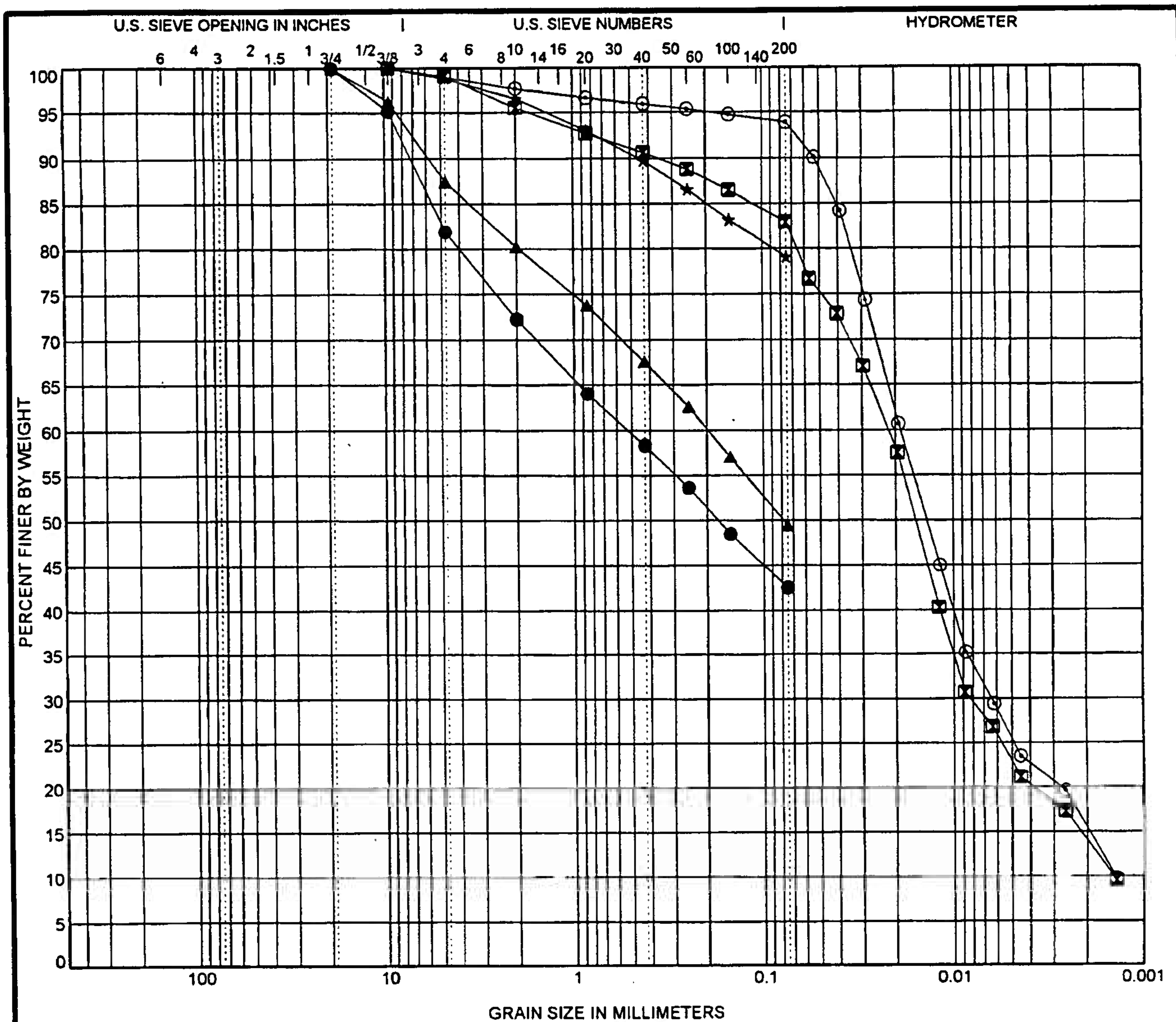
US GRAIN SIZE 00151175.GPJ SCHNABEL.GDT 1/30/01

Schnabel Engineering

GRADATION CURVES

Project: WAWAYANDA ENERGY CENTER
DOLSONTOWN ROAD
MIDDLETOWN, NEW YORK

Contract: 00151175



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen		Classification	LL	PL	PI	Cc	Cu
●	B-1	19.8 ft	Fine to coarse SILTY SAND, trace gravel - gray (SM)					
⊠	B-3	30.0 ft	SILTY CLAY WITH SAND, trace gravel - gray (CL-ML)				2.19	15.04
▲	B-4	15.0 ft	Fine to coarse SILTY CLAYEY SAND, trace gravel - tan (SC-SM)	24	18	6		
★	B-5	20.0 ft	SILTY CLAY WITH SAND, trace gravel - gray (CL-ML)	22	16	6		
⊙	B-5	50.0 ft	SILT, trace sand and gravel - gray (ML)				1.54	13.32

	Specimen		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	19.8 ft	19	0.521			18.1	39.4	42.5	
⊠	B-3	30.0 ft	9.5	0.022	0.008	0.001	0.9	16.1	83.0	
▲	B-4	15.0 ft	19	0.197			12.6	38.0	49.5	
★	B-5	20.0 ft	9.5				1.1	19.8	79.1	
⊙	B-5	50.0 ft	9.5	0.019	0.006	0.001	1.0	5.1	93.9	

Schnabel Engineering

GRADATION CURVES

Project: WAWAYANDA ENERGY CENTER
DOLSONTOWN ROAD
MIDDLETOWN, NEW YORK

Contract: 00151175

US GRAIN SIZE 00151175.GPJ SCHNABEL.GDT 1/30/01

ATTACHMENT 2

Subsurface Exploration Data

Schnabel Engineering Associates

SUBSURFACE EXPLORATION DATA

General Notes for Test Boring Logs

Identification of Soil

Water Observation Well Readings

Test Boring Logs, B-1 through B-9

Test Boring Location Plan, Sheet 1

TEST BORINGS

Test borings were drilled using two methods. Hollow stem auger equipment was used when large boulders were not encountered. A compressed air roller bit was used when boulders were encountered. The Standard Penetration Test (SPT) was performed at the depths indicated on the test boring logs. A pocket penetrometer was used whenever possible on the samples recovered in the split spoon and this data is recorded on the logs. Water level data is indicated on the logs; although with the compressed air roller bit method, short-term water level data is generally not obtainable. Test borings were backfilled upon completion with cuttings.

ROCK CORING

Rock was cored with NX size core barrels. Recovery (REC) and Rock Quality Designation (RQD) are noted on the test boring logs, as applicable.

WATER OBSERVATION WELL

Piezometers were installed in Borings B-1, B-3, and B-8 by inserting a 1½ inch PVC pipe into the boring. A ten foot screened pipe was placed at the bottom of each of these borings. Coarse sand was placed around the screened zone; bentonite and cuttings were used to backfill the hole. A six inch metal pipe was placed around the PVC pipe with a stick up of approximately three feet. This metal pipe was closed with a locking cap and painted orange. A cement pad was placed around the pipe.

BORING LOCATION AND ELEVATIONS SURVEY

Test borings were surveyed by others and marked with wooden stakes before our arrival at the site. The actual test boring locations are the same as were staked except for Borings B-1 and B-8 which were offset due to boulders encountered in the near subsurface. These locations were re-surveyed after the borings were completed and the locations shown on Sheet 1 are the actual locations.

GENERAL NOTES FOR TEST BORING LOGS

1. NUMBERS IN SAMPLING DATA COLUMN (3+6+27) INDICATE BLOWS REQUIRED TO DRIVE A 2 INCH O.D., 1⅜ INCH I.D. SAMPLING SPOON 6 INCHES USING A 140 POUND HAMMER FALLING 30 INCHES ACCORDING TO ASTM D1586.

2. VISUAL CLASSIFICATION OF SOIL IS IN ACCORDANCE WITH TERMINOLOGY SET FORTH IN "IDENTIFICATION OF SOIL". THE GROUP CLASSIFICATION SYMBOLS SHOWN IN THE CLASSIFICATION COLUMN ARE BASED ON VISUAL INSPECTION AND AVAILABLE LABORATORY DATA.

3. GROUNDWATER OBSERVATIONS: THE DEPTH OF WATER BELOW GRADE WAS MEASURED AT THE TIMES INDICATED. THE DEPTHS MAY VARY WITH PRECIPITATION, POROSITY OF THE SOIL, SITE TOPOGRAPHY, ETC.

4. REFUSAL AT THE SURFACE OF ROCK, BOULDER, OR OBSTRUCTION IS DEFINED AS A RESISTANCE OF 100 BLOWS FOR 2 INCHES PENETRATION OR LESS.

5. THE BORING LOGS AND RELATED INFORMATION DEPICT SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS AND AT THE PARTICULAR TIME WHEN DRILLED. SOIL CONDITIONS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THESE BORING LOCATIONS. ALSO, THE PASSAGE OF TIME MAY RESULT IN A CHANGE IN THE SUBSURFACE SOIL AND GROUNDWATER CONDITIONS AT THESE BORING LOCATIONS.

6. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL AND ROCK TYPES AS DETERMINED FROM THE DRILLING AND SAMPLING OPERATION. SOME VARIATION MAY ALSO BE EXPECTED VERTICALLY BETWEEN SAMPLES TAKEN. THE SOIL PROFILE, WATER LEVEL OBSERVATIONS, AND PENETRATION RESISTANCES PRESENTED ON THESE BORING LOGS HAVE BEEN MADE WITH REASONABLE CARE AND ACCURACY AND MUST BE CONSIDERED ONLY AS AN APPROXIMATE REPRESENTATION OF SUBSURFACE CONDITIONS TO BE ENCOUNTERED AT THE PARTICULAR LOCATION.

7. TEST BORINGS DRILLED BY **PARRATT-WOLFF, INC., EAST SYRACUSE, NEW YORK,** UNDER THE INSPECTION OF **SCHNABEL ENGINEERING ASSOCIATES**.

8. KEY TO SYMBOLS AND ABBREVIATIONS:

	3+6+27	STANDARD PENETRATION TEST, ASTM D1586 DESIGNATION
	3T 24/18	2" OR 3" UNDISTURBED TUBE SAMPLE, ASTM D1587 (LENGTH SAMPLED INCHES/SAMPLE RECOVERED INCHES)
	REC RQD	NQ2, NX OR 2 INCH O.D. ROCK CORE RUN, ASTM D2113 (RECOVERY AND RQD AS SHOWN)

DO	=	DITTO
RQD	=	ROCK QUALITY DESIGNATION
REC	=	RECOVERY (%) (LENGTH RECOVERED/ LENGTH SAMPLED)
w	=	NATURAL MOISTURE CONTENT (%)
*	=	NO SAMPLE RECOVERY

SCHNABEL ENGINEERING ASSOCIATES
Consulting Geotechnical Engineers
IDENTIFICATION OF SOIL

I. DEFINITION OF SOIL GROUP NAMES ASTM D2487-93

			Symbol	Group Name
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels - More than 50% of coarse fraction retained on No. 4 sieve Coarse, ¾ to 3" Fine, No. 4 to ¾"	Clean Gravels Less than 5% fines	GW	Well graded gravel
			GP	Poorly graded gravel
		Gravels with Fines More than 12% fines	GM	Silty gravel
			GC	Clayey gravel
	Sands - 50% or more of coarse fraction passes No. 4 sieve Coarse, No. 10 to No. 4 Medium, No. 40 to No. 10 Fine, No. 200 to No. 40	Clean Sands Less than 5% fines	SW	Well graded sand
			SP	Poorly graded sand
		Sands with Fines More than 12% fines	SM	Silty sand
			SC	Clayey sand
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays - Liquid Limit less than 50 Low to medium plasticity	Inorganic	CL	Lean clay
			ML	Silt
		Organic		Organic clay
			OL	Organic silt
	Silts and Clays - Liquid Limit 50 or more Medium to high plasticity	Inorganic	CH	Fat clay
			MH	Elastic silt
		Organic		Organic clay
			OH	Organic silt
Highly Organic Soils	Primarily organic matter, dark in color, and organic odor		PT	Peat

II. DEFINITION OF MINOR COMPONENT PROPORTIONS

Minor Component Adjective Form	Approximate Percentage of Fraction by Weight
Gravelly, Sandy	30% or more coarse grained
With	
Sand, Gravel	15% or more coarse grained
Silt, Clay	5% to 12% fine grained
Trace	
Sand, Gravel	Less than 15% coarse grained
Silt, Clay	Less than 5% fine grained

III. GLOSSARY OF MISCELLANEOUS TERMS

SYMBOLS: Unified Soil Classification Symbols are shown above as group symbols. Use A Line Chart for laboratory identification. Dual symbols are used for borderline classifications.

BOULDERS & COBBLES: Boulders are considered rounded pieces of rock larger than 12 inches, while cobbles range from 3 to 12 inch size.

DISINTEGRATED ROCK: Residual rock material with Standard Penetration Resistance (SPT) of more than 60 blows per foot, and less than refusal. Refusal is defined as a SPT of 100 blows for 2" or less penetration.

ROCK FRAGMENTS: Angular pieces of rock, distinguished from transported gravel, which have separated from original vein or strata and are present in a soil matrix.

QUARTZ: A hard silica mineral often found in residual soils.

IRONITE: Iron oxide deposited within a soil layer forming cemented deposits.

CEMENTED SAND: Usually localized rock-like deposits within a soil stratum composed of sand grains cemented by calcium carbonate or other materials.

MICA: A soft plate of silica mineral found in many rocks, and in residual or transported soil derived therefrom.

ORGANIC MATERIALS (Excluding Peat):
- Topsoil - Surface soils that support plant life and which contain considerable amounts of organic matter;
- Organic Matter - Soil containing organic colloids throughout its structure;
- Lignite - Hard, brittle decomposed organic matter with low fixed carbon content (a low grade of coal).

FILL: Man-made deposit containing soil, rock and often foreign matter.

PROBABLE FILL: Soils which contain no visually detected foreign matter but which are suspect with regard to origin.

LENSES: 0 to ½ inch seam of minor soil component.

LAYERS: ½ to 12 inch seam of minor soil component.

POCKET: Discontinuous body of minor soil component.

COLOR SHADES: Light to dark to indicate substantial difference in color.

MOISTURE CONDITIONS: Wet, moist, or dry to indicate visual appearance of specimen.

Water Observation Well (WOW) Readings
Wawayanda Energy Center
Dolsontown Road
Middletown, New York

January 30, 2001
Contract 00151175

	B-1	B-3	B-8
Ground Surface Elevation:	501.5 ft	491.6 ft	453.6 ft
Casing Stick-Up:	3.0 ft	1.9 ft	2.5 ft
Top of Casing Elevation:	504.5 ft	493.5 ft	456.1 ft

B-1					
Date	**Time**	**Depth from G.S.(ft)**	**Depth from T.O.C. (ft)**	**GW Elev. (ft)**	**Comments**
11/21	11:15 AM	6.5	NA	495.0	Measurement During Drilling
11/27	11:00 AM	3.2	6.2	498.3	
11/28	4:00 PM	3.4	6.4	498.1	
11/29	3:00 PM	3.2	6.2	498.3	

B-3					
Date	**Time**	**Depth from G.S.(ft)**	**Depth from T.O.C. (ft)**	**GW Elev. (ft)**	**Comments**
11/22	8:01 AM	18.6	20.5	473.0	No groundwater encountered during drilling on 11/21
11/27	11:00 AM	7.9	9.8	483.7	
11/28	4:00 PM	7.8	9.7	483.8	
11/29	3:00 PM	8.1	10	483.5	

B-8					
Date	**Time**	**Depth from G.S.(ft)**	**Depth from T.O.C. (ft)**	**GW Elev. (ft)**	**Comments**
11/15	2:30 PM	6.8	NA	446.8	Measurement During Drilling
11/16	7:25 AM	7.2	NA	446.4	Measurement During Drilling
11/16	12:00 PM	0	NA	453.6	Upon drilling to 46', water came up hole to the ground surface
11/17	9:30 AM	-2.5	0	456.1	Water trickling over the top of the casing
11/20	9:45 AM	3.7	6.2	449.9	
11/21	9:45 AM	1.2	3.7	452.4	
11/22	10:00 AM	1.7	4.2	451.9	
11/27	11:00 AM	3.4	5.9	450.2	
11/28	4:00 PM	3	5.5	450.6	
11/29	3:00 PM	3.3	5.8	450.3	

Notes:

1. G.S. - Ground surface
2. T.O.C - Top of casing
3. GW - Groundwater
4. Refer to borings logs for additional information.

Schnabel Engineering Associates

Schnabel Engineering — TEST BORING LOG

Project: WAWAYANDA ENERGY CENTER, DOLSONTOWN ROAD, MIDDLETOWN, NEW YORK

Boring Number: **B-1**
Contract Number: 00151175
Sheet: 1 of 2

Boring Contractor: PARRATT-WOLFF, INC., EAST SYRACUSE, NEW YORK
Boring Foreman: J. LANSING
Drilling Method: 4¼" HOLLOW STEM AUGER
Drilling Equipment: CME 850
SEA Representative: A. BAXTER & M. PAINTER
Dates Started: 11/21/00 Finished: 11/27/00
Location: SEE TEST BORING LOCATION PLAN

Ground Surface Elevation: 501.5 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/21	11:15	6.5'	5.0'	---
WOW	11/27	10:50	3.2'	---	---
	11/28	4:00	3.4'	---	---
	11/29	3:00	3.2'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	10" TOPSOIL					2+9+11		
0.8	FINE TO COARSE SILTY SAND, TRACE GRAVEL, CONTAINS ROOTS, MOIST - ORANGE-BROWN AND GRAY	SM	500.7			10+15+14		PP = 2.0 to 2.5 tsf
4.5	DO, NO ROOTS							
	SANDY CLAYEY SILT, TRACE GRAVEL, MOIST - BROWN	CL-ML	497.0		5	6+7+50/2"	w=15.2%	PP = 1.5 to 2.0 tsf Perched groundwater.
	DO, WET			B1				WEATHERED GLACIAL TILL
						8+6+8*		
	DO, MOIST				10	6+11+18	w=11.4%	
13.0	FINE TO COARSE SILTY SAND, TRACE GRAVEL, MOIST - BROWN AND GRAY	SM	488.5					
14.0	FINE TO COARSE SILTY SAND, TRACE GRAVEL, MOIST - GRAY	SM	487.5		15	27+35+50/2"		
					20	54+50/2"		PP > 4.5 tsf
				B2				GLACIAL TILL
					25	50/2"		
					30	71		

continued on next page

Comments:
1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.
3. WATER OBSERVATION WELL (WOW) SCREENED FROM 50.7 TO 60.7 FT.

Schnabel Engineering	TEST BORING LOG	Project: WAWAYANDA ENERGY CENTER DOLSONTOWN ROAD MIDDLETOWN, NEW YORK	Boring Number: B-1 Contract Number: 00151175 Sheet: 2 of 2

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO COARSE SILTY SAND, TRACE GRAVEL, MOIST - GRAY *(continued)*	SM						
	DO, DRY				35	75/2"		
						75/4"		
					40			
						49+55+47		
					45			
	DO, WET			B2				GLACIAL TILL Wet from coring through boulder in till from 46.7 to 49.2 ft.
					50	50/0"		
	DO, DRY - MOTTLED TAN-GRAY AND GRAY				55	35+52+59		PP > 4.5 tsf PP > 4.5 tsf PP > 4.5 tsf
					60	26+33+50	w=11.7%	PP > 4.5 tsf
60.7	BOTTOM OF BORING @ 60.7 FT.		440.8					

TEST BORING LOG 00151175.GPJ SCHNABEL.GDT 1/15/01

Comments:

1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.
3. WATER OBSERVATION WELL (WOW) SCREENED FROM 50.7 TO 60.7 FT.

Schnabel Engineering TEST BORING LOG

Project: WAWAYANDA ENERGY CENTER
DOLSONTOWN ROAD
MIDDLETOWN, NEW YORK

Boring Number: **B-2**
Contract Number: 00151175
Sheet: 1 of 1

Boring Contractor: PARRATT-WOLFF, INC.
EAST SYRACUSE, NEW YORK
Boring Foreman: J. LANSING
Drilling Method: 3¼" HOLLOW STEM AUGER
Drilling Equipment: CME 850
SEA Representative: M. PAINTER
Dates Started: 11/29/00 Finished: 11/29/00
Location: SEE TEST BORING LOCATION PLAN

Ground Surface Elevation: 500.8 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/29	---	N/E	---	---
Completion	11/29	2:30	2.3'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	6" TOPSOIL		500.3			1+1+2+4		PP = 2.25 tsf
	SILT, TRACE SAND, CONTAINS ORGANIC MATTER, MOIST - TAN	ML						
	DO, WITH SAND, CONTAINS GRAVEL					8+11+14+20		
	DO, NO ORGANIC MATTER							PP > 4.5 tsf
4.0	DO, MOTTLED ORANGE AND TAN		496.8	B1				WEATHERED GLACIAL TILL
	FINE TO COARSE SILTY SAND, TRACE GRAVEL, DRY - MOTTLED TAN, ORANGE AND GRAY	SM			5	11+14+19+15	w=10.2%	PP = 1.5 tsf
6.0	SANDY CLAYEY SILT, TRACE GRAVEL, MOIST - MOTTLED TAN, ORANGE AND GRAY	ML	494.8			10+14+10+10		PP = 3.25 tsf
8.0	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, MOIST - GRAY	SC-SM	492.8			5+5+12+14	w=14.1%	
	DO, WET				10			
	DO, DRY				15	12+26+26	w=7.3%	
				B2				GLACIAL TILL
					20	23+25+24		PP > 4.5 tsf
					25	13+15+18		PP = 4.5 tsf
					30	12+21+22		PP > 4.5 tsf
30.5	BOTTOM OF BORING @ 30.5 FT.		470.3					

TEST BORING LOG 00151175.GPJ SCHNABEL.GDT 1/15/01

Comments:
1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.

Schnabel Engineering	TEST BORING LOG	Project: WAWAYANDA ENERGY CENTER DOLSONTOWN ROAD MIDDLETOWN, NEW YORK	Boring Number: B-3 Contract Number: 00151175 Sheet: 1 of 2

Boring Contractor: PARRATT-WOLFF, INC.
EAST SYRACUSE, NEW YORK

Boring Foreman: J. LANSING

Drilling Method: 4¼" HOLLOW STEM AUGER

Drilling Equipment: CME 850

SEA Representative: A. BAXTER

Dates Started: 11/20/00 Finished: 11/21/00

Location: SEE TEST BORING LOCATION PLAN

Ground Surface Elevation: 491.6 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/20	—	N/E	—	—
WOW	11/22	8:01	18.6'	41.9'	—
	11/27	11:00	7.9'	—	—
	11/28	4:00	7.8'	—	—
	11/29	3:00	8.1'	—	—

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	6" TOPSOIL		491.1			1+3+6+12	w=13.9%	
	FINE TO COARSE SILTY SAND, TRACE GRAVEL, CONTAINS ROOTS, MOIST - ORANGE AND BROWN	SM		B1				
	DO, MOTTLED ORANGE, BROWN AND GRAY				5	12+12+12+12	w=13.1%	WEATHERED GLACIAL TILL PP = 2.0 to 3.5 tsf
8.0	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, MOIST - GRAY	SC-SM	483.6	B2	10	50/2"		
					15	57+54+62 +50/3"		PP > 5.0 tsf
					20	18+36+45+52		GLACIAL TILL
23.0	FINE TO COARSE SILTY SAND, TRACE GRAVEL, MOIST - GRAY	SM	468.6		25	25+42+40+55		
30.0	SILTY CLAY WITH SAND, TRACE GRAVEL, MOIST - GRAY	CL-ML	461.6		30	18+21+28+24	w=10.9%	

continued on next page

Comments:
1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.
3. WATER OBSERVATION WELL (WOW) SCREENED FROM 31.9 TO 41.9 FT.

Schnabel Engineering	TEST BORING LOG	Project: WAWAYANDA ENERGY CENTER DOLSONTOWN ROAD MIDDLETOWN, NEW YORK	Boring Number: B-3 Contract Number: 00151175 Sheet: 2 of 2

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	SILTY CLAY WITH SAND, TRACE GRAVEL, MOIST - GRAY *(continued)*	CL-ML		B2	35	27+36+56/1"		GLACIAL TILL
36.1	GRAY SHALE		455.5	C	40			NORMANSKILL FM.
41.9	BOTTOM OF BORING @ 41.9 FT.		449.7					

Comments:

1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.
3. WATER OBSERVATION WELL (WOW) SCREENED FROM 31.9 TO 41.9 FT.

Schnabel Engineering — TEST BORING LOG

Project:	WAWAYANDA ENERGY CENTER DOLSONTOWN ROAD MIDDLETOWN, NEW YORK	Boring Number: B-4 Contract Number: 00151175 Sheet: 1 of 1

Boring Contractor: PARRATT-WOLFF, INC.
EAST SYRACUSE, NEW YORK

Boring Foreman: J. LANSING

Drilling Method: 3¼" HOLLOW STEM AUGER

Drilling Equipment: CME 850

SEA Representative: M. PAINTER

Dates Started: 11/28/00 Finished: 11/28/00

Location: SEE TEST BORING LOCATION PLAN

Ground Surface Elevation: 477.7 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/28	---	N/E	---	---
Completion	11/28	---	N/E	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.7	8" TOPSOIL		477.0			2+4+5	w=13.8%	PP = 3.5 tsf
	FINE TO COARSE SILTY SAND, TRACE GRAVEL, CONTAINS ROOTS, MOIST - BROWN	SM						
	DO, MOTTLED ORANGE AND BROWN							
	DO, DRY - TAN				5	18+13+14		
				B1				WEATHERED GLACIAL TILL
					10	13+23+18*		
15.0	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, MOIST - TAN	SC-SM	462.7		15	24+36+40	w=14.2% LL=24 PL=18	PP > 4.5 tsf
16.0	FINE TO COARSE SILTY CLAYEY SAND, CONTAINS GRAVEL, DRY - GRAY	SC-SM	461.7					
					20	24+36+50/5"		PP > 4.5 tsf
				B2	25	19+62+44		GLACIAL TILL
					30	13+34+36		
					35	27+56		
36.5	BOTTOM OF BORING @ 36.5 FT.		441.2					

Comments:
1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.

Schnabel Engineering — TEST BORING LOG

Project: WAWAYANDA ENERGY CENTER, DOLSONTOWN ROAD, MIDDLETOWN, NEW YORK

Boring Number: **B-5**
Contract Number: 00151175
Sheet: 1 of 2

Boring Contractor: PARRATT-WOLFF, INC. EAST SYRACUSE, NEW YORK
Boring Foreman: J. LANSING
Drilling Method: 3¼" HOLLOW STEM AUGER
Drilling Equipment: CME 850
SEA Representative: M. PAINTER
Dates Started: 11/28/00 Finished: 11/29/00
Location: SEE TEST BORING LOCATION PLAN

Ground Surface Elevation: 472.5 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/28	---	N/E	---	---
Completion	11/29	9:40	N/E	---	---
Casing Pulled	11/29	10:30	N/E	---	42.0'

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	6" TOPSOIL		472.0			3+3+7		PP = 1.0 tsf PP = 2.75 tsf
	FINE TO COARSE SILTY SAND, CONTAINS ROOTS, TRACE GRAVEL, MOIST - MOTTLED ORANGE, GRAY AND TAN	SM						
5.0	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, MOIST - TAN	SC-SM	467.5	B1	5	3+10+13	w=16.5%	PP = 3.75 tsf WEATHERED GLACIAL TILL
	DO, DRY				10	14+14+22	w=12.5%	PP = 3.5 tsf
15.0	FINE TO COARSE SILTY CLAYEY SAND, CONTAINS GRAVEL, DRY - GRAY	SC-SM	457.5		15	16+25+21		
20.0	SILTY CLAY WITH SAND, TRACE GRAVEL, DRY - GRAY	CL-ML	452.5	B2	20	15+22+25	w=11.6% LL=22 PL=16	PP = 4.5 tsf
					25	22+25+24	w=9.2%	PP = 3.5 tsf GLACIAL TILL
					30	30+27+48	w=11.5%	

continued on next page

TEST BORING LOG 00151175.GPJ SCHNABEL.GDT 1/15/01

Comments:
1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.

Schnabel Engineering — TEST BORING LOG

Project: WAWAYANDA ENERGY CENTER, DOLSONTOWN ROAD, MIDDLETOWN, NEW YORK

Boring Number: **B-5**

Contract Number: 00151175

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	SILTY CLAY WITH SAND, TRACE GRAVEL, DRY - GRAY *(continued)*	CL-ML						
					35	25+50/3"		
					40	25+45+50/4"		PP > 4.5 tsf
					45	17+40+52		PP > 4.5 tsf
				B2				GLACIAL TILL
50.0	SILT, TRACE SAND AND GRAVEL, DRY - GRAY	ML	422.5		50	28+32+56	w=13.6%	
					55	19+29+24		
60.0	SILTY CLAY WITH SAND, TRACE GRAVEL, DRY - GRAY	CL-ML	412.5		60	13+32+42		PP > 4.5 tsf
61.5	BOTTOM OF BORING @ 61.5 FT.		411.0					

TEST BORING LOG 00151175.GPJ SCHNABEL.GDT 1/15/01

Comments:
1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.

Schnabel Engineering — TEST BORING LOG

Project:	WAWAYANDA ENERGY CENTER DOLSONTOWN ROAD MIDDLETOWN, NEW YORK
Boring Number:	B-6
Contract Number:	00151175
Sheet:	1 of 1

Boring Contractor: PARRATT-WOLFF, INC.
EAST SYRACUSE, NEW YORK

Boring Foreman: J. LANSING

Drilling Method: 3¼" HOLLOW STEM AUGER

Drilling Equipment: CME 850

SEA Representative: M. PAINTER

Dates Started: 11/28/00 Finished: 11/28/00

Location: SEE TEST BORING LOCATION PLAN

Ground Surface Elevation: 465.8 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/28	7:15	8.0'	---	---
Completion	11/28	9:50	30.0'	---	---

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.7	8" TOPSOIL		465.1			4+5+6		
	FINE TO COARSE SILTY SAND, CONTAINS ROOTS, TRACE GRAVEL, MOIST - BROWN	ML						
5.0	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, MOIST - BROWN AND MOTTLED ORANGE AND GRAY ∇	SC-SM	460.8		5	6+6+7	w=11.5%	PP = 3.0 tsf
								Perched groundwater. WEATHERED GLACIAL TILL
	DO, BROWN			B1	10	3+8+9		PP = 1.0 tsf
	DO, MOTTLED TAN AND GRAY				15	13+16+27		PP > 4.5 tsf
19.0	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, MOIST - GRAY	SC-SM	446.8		20	16+16+17		PP = 3.5 tsf
	DO, DRY				25	12+13+22		PP > 4.5 tsf
				B2				GLACIAL TILL
29.0	SILTY CLAY WITH SAND, TRACE GRAVEL, DRY - GRAY	CL-ML	436.8		30	15+23+24	w=13.3%	PP = 3.75 tsf
34.0	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, DRY - GRAY	SC-SM	431.8		35	19+33+36		PP > 4.5 tsf
35.5	BOTTOM OF BORING @ 35.5 FT.		430.3					

Comments:
1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.

TEST BORING LOG 00151175.GPJ SCHNABEL.GDT 1/15/01

Schnabel Engineering	TEST BORING LOG	Project: WAWAYANDA ENERGY CENTER, DOLSONTOWN ROAD, MIDDLETOWN, NEW YORK	Boring Number: B-7 Contract Number: 00151175 Sheet: 1 of 1

Boring Contractor: PARRATT-WOLFF, INC.
EAST SYRACUSE, NEW YORK

Boring Foreman: J. LANSING

Drilling Method: 3¼" HOLLOW STEM AUGER

Drilling Equipment: CME 850

SEA Representative: A. BAXTER & M. PAINTER

Dates Started: 11/17/00 Finished: 11/20/00

Location: SEE TEST BORING LOCATION PLAN

Ground Surface Elevation: 457.7 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/17	3:20	6.0'	---	---
Completion	11/20	11:50	20.7'	26.5'	26.5'

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	12" TOPSOIL					3+3+5+8	w=18.7%	
1.0	FINE TO COARSE CLAYEY SILTY SAND, TRACE GRAVEL, MOIST - MOTTLED TAN, ORANGE AND GRAY	SC	456.7			10+12+15+11		PP = 2.75 tsf
	DO, WET - BROWN				5	7+6+5+5	w=15.9%	
6.0	FINE SILTY SAND, WET - BROWN	SM	451.7	A		5+8+10+10		Perched groundwater. ALLUVIAL
8.0	FINE TO COARSE CLAYEY SILTY SAND, TRACE GRAVEL, WET - BROWN	SC	449.7			6+5+7+9		
					10			
14.0	SANDY LEAN CLAY, MOIST - GRAY	CL	443.7		15	5+6+7+15		PP = 1.5 tsf
				B2	20	12+17+16+25	w=9.8%	GLACIAL TILL
	DO, TRACE GRAVEL				25	17+26+52		PP = 3.5 to 4.5 tsf
26.5	BOTTOM OF BORING @ 26.5 FT.		431.2			50/0"		Auger refusal at 26.5 ft.

Comments:
1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.

Schnabel Engineering	TEST BORING LOG	Project: WAWAYANDA ENERGY CENTER DOLSONTOWN ROAD MIDDLETOWN, NEW YORK	Boring Number: B-8 Contract Number: 00151175 Sheet: 1 of 2

Boring Contractor: PARRATT-WOLFF, INC. EAST SYRACUSE, NEW YORK

Boring Foreman: J. LANSING

Drilling Method: 3¼" HOLLOW STEM AUGER

Drilling Equipment: CME 850

SEA Representative: M. PAINTER

Dates Started: 11/15/00 Finished: 11/16/00

Location: SEE TEST BORING LOCATION PLAN

Ground Surface Elevation: 453.6 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/16	7:25	7.2'	—	—
Completion	11/16	12:00	46.0'	—	—
Casing Pulled	11/16	2:30	6.8'	—	—
WOW	11/17	7:30	7.6'	—	—
	11/21	9:45	1.2'	—	—
	11/29	3:00	3.3'	—	—

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.5	6" TOPSOIL		453.1			1+3+4+5		
	SANDY SILT, MOIST - MOTTLED GRAY AND ORANGE	SM						
2.0	FINE TO COARSE SILTY CLAYEY SAND, CONTAINS MICA, TRACE GRAVEL, MOIST - TAN	SC-SM	451.6			3+8+11+8		
					5	3+6+10+9	w=18.6%	PP = 2.75 tsf PP = 3.0 tsf PP = 3.25 tsf
	▽					11+12+9+11		PP = 3.0 tsf PP = 2.5 tsf
						11+17+20 +50/5"		
				B1	10			WEATHERED GLACIAL TILL
15.0	FINE TO COARSE CLAYEY SAND, CONTAINS GRAVEL, WET - TAN	SC	438.6		15	22+34+26+21		
20.0	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, MOIST - GRAY	SC-SM	433.6		20	32+90+30/1"		PP > 4.5 tsf
25.0	SANDY LEAN CLAY, TRACE GRAVEL, DRY - GRAY	CL	428.6	B2	25	87	w=8.2%	WEATHERED GLACIAL TILL
30.0	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, DRY - GRAY	SC-SM	423.6		30	78	w=5.9%	

continued on next page

TEST BORING LOG 00151175.GPJ SCHNABEL.GDT 1/15/01

Comments:
1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.
3. WATER OBSERVATION WELL (WOW) SCREENED FROM 39.8 TO 49.8 FT.
4. ADDITIONAL WELL READINGS IN TEXT.

Schnabel Engineering — TEST BORING LOG

Project:	WAWAYANDA ENERGY CENTER DOLSONTOWN ROAD MIDDLETOWN, NEW YORK
Boring Number:	B-8
Contract Number:	00151175
Sheet:	2 of 2

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, DRY - GRAY *(continued)*	SC-SM			35	100/5"		
				B2	40	73		WEATHERED GLACIAL TILL PP > 4.5 tsf
						70/1"*		
44.8	FRESH, GRAY SHALE, MODERATELY HARD, MODERATELY FRACTURED, THINLY BEDDED, CALCITE FILLED JOINTS		408.8	C	45	NX REC = 97% RQD = 72%		NORMANSKILL FM.
49.8	BOTTOM OF BORING @ 49.8 FT.		403.8					Auger refusal at 44.8 ft.

Comments:

1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.
3. WATER OBSERVATION WELL (WOW) SCREENED FROM 39.8 TO 49.8 FT.
4. ADDITIONAL WELL READINGS IN TEXT.

Schnabel Engineering	TEST BORING LOG	Project: WAWAYANDA ENERGY CENTER DOLSONTOWN ROAD MIDDLETOWN, NEW YORK	Boring Number: B-9 Contract Number: 00151175 Sheet: 1 of 1

Boring Contractor: PARRATT-WOLFF, INC.
EAST SYRACUSE, NEW YORK

Boring Foreman: J. LANSING

Drilling Method: 3¼" HOLLOW STEM AUGER

Drilling Equipment: CME 850

SEA Representative: M. PAINTER

Dates Started: 11/17/00 **Finished:** 11/17/00

Location: SEE TEST BORING LOCATION PLAN

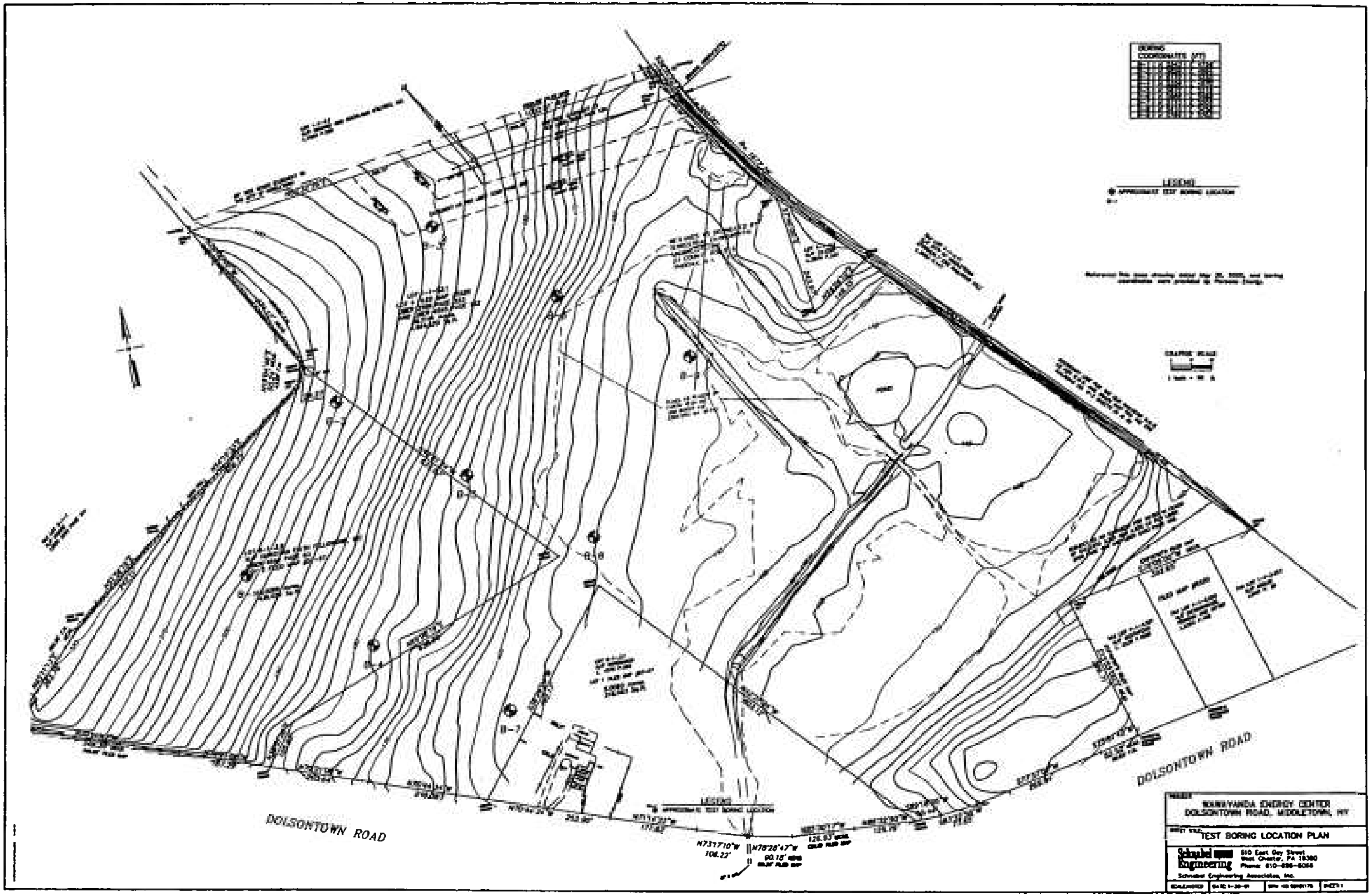
Ground Surface Elevation: 450.8 (feet)

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/17	10:30	6.0'	—	—

DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	9" TOPSOIL							
0.8	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, MOIST - TAN AND MOTTLED GRAY, ORANGE AND BLACK	SC-SM	450.0	A				
	DO, WET - TAN ▽				5	4+5+15+19	w=16.7%	PP = 0.75 tsf PP = 2.0 tsf Perched groundwater. ALLUVIAL
10.0	FINE TO COARSE SANDY SILT, WET - BROWN	ML	440.8		10	5+9+9+12	w=19.4%	PP = 0.25 tsf
	DO, GRAY							
15.0	FINE TO COARSE SILTY CLAYEY SAND, TRACE GRAVEL, WET - GRAY	SC-SM	435.8	B2	15	46+12+17+28		
	DO, DRY				20	50/0"* 100/1"		PP > 4.5 tsf GLACIAL TILL
					25	35+20+21 +50/3"		PP > 4.5 tsf
					30	80+57+35+38		PP > 4.5 tsf
32.0	BOTTOM OF BORING @ 32.0 FT.		418.8					

Comments:
1. BACKFILLED UPON COMPLETION.
2. COBBLES AND BOULDERS ENCOUNTERED IN GLACIAL TILL.


DOLSONTOWN ROAD
DOLSONTOWN ROAD
LEGEND
TEST BORING LOCATION PLAN
Schnabel Engineering
Schnabel Engineering Associates, Inc.