SOUND LEVEL ASSESSMENT REPORT

Central New York Raceway Park Project
Hastings, NY

Prepared for:

CHA
441 South Salina Street
Syracuse, NY 13202-4712

Prepared by:

Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250
Maynard, MA01754

November 20, 2013

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION AND SUMMARY

Central New York Raceway Park, Inc. (CNYRP) is proposing to construct a racetrack facility in the town of Hastings, Oswego County, New York. The proposed CNYRP (the Project), located on a 140 acre site between Route 11 and I-81, will consist of a one-half mile oval dirt racing track, a 2-mile paved road racing course, viewing for 7,250 spectators, concessions, and a restaurant. This sound level assessment conducted by Epsilon Associates, Inc. (Epsilon) included a baseline sound-monitoring program to measure existing ambient sound levels in the vicinity of the project, computer modeling to predict future sound levels when the raceway is operational, and a comparison of predicted sound levels with applicable noise criteria.

Sound level impacts associated with CNYRP events are predicted to be significantly lower than those from the nearby Brewerton Speedway and comply with relevant New York State Department of Environmental Conservation (NYSDEC) guidelines at all sensitive residential receptors during racing hours.

2.0 SOUND METRICS

There are several ways in which sound (noise) levels are measured and quantified, all of which use the logarithmic decibel (dB) scale to accommodate the wide range of sound intensities found in the environment. An interesting property of the logarithmic scale is that the sound pressure levels of two distinct sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total sound level is only a three-decibel increase (to 53 dB), not a doubling to 100 dB. Thus, every three dB change in sound level represents a doubling or halving of sound energy. A change in sound level of less than three dB is generally considered imperceptible to the human ear.

Another property of the decibel scale is that if one source of noise is 10 dB (or more) louder than another source, then the quieter source does not contribute significantly to the overall sound level which remains the same as that of the louder source. For example, a source of sound at 60 dB plus another source of sound at 47 dB is simply 60 dB.

The sound level meter used to measure noise is a standardized instrument.[1] It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various conditions. One network is the A-weighting network (there are also B- and C-weighting networks). The A-weighted scale (dBA) most closely approximates how the human ear responds to sound at various frequencies, and is typically used for community sound level measurements. Sounds are frequently reported as detected with the A-weighting network of the sound level meter. A-weighted sound levels emphasize the middle frequency (*i.e.,* middle pitched – around 1,000 Hertz sounds), and de-emphasize lower and higher frequency sounds. A-weighted sound levels are reported in decibels designated as "dBA." For reference, sound pressure levels for some common indoor and outdoor environments are shown in Figure 2-1.

Two methods exist for describing sounds in our environment that vary with time: these are exceedance levels and the equivalent level, both of which are derived from a large number of moment-to-moment A-weighted sound level measurements. Several sound level metrics that are commonly reported in community noise monitoring are described below.

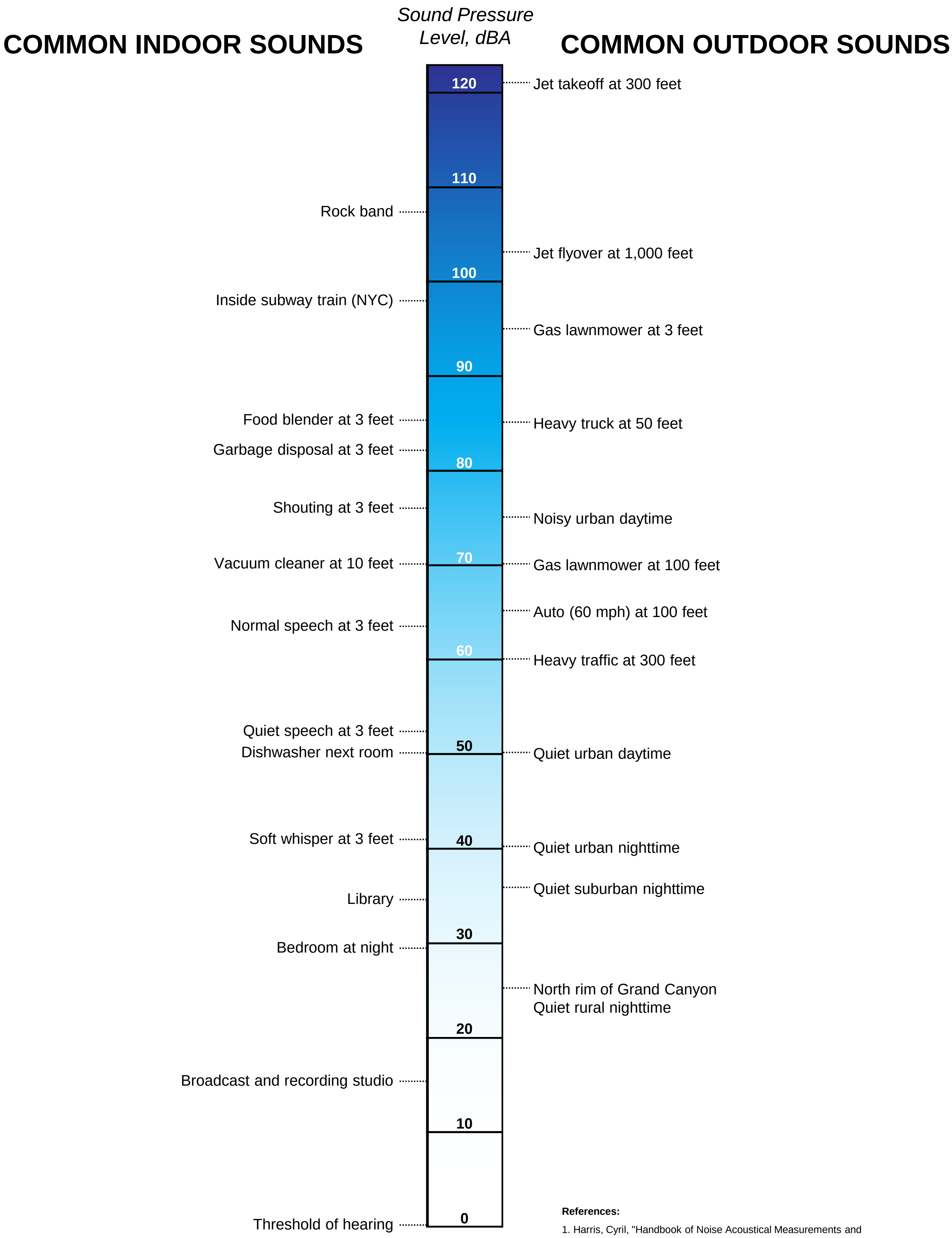
- Exceedance levels, designated L_n, where n can have a value of 0 to 100 percent, are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period and is close to the lowest sound level observed. It is essentially the residual sound level when there are no obvious nearby intermittent noise sources.

---

1 *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983, published by the Standards Secretariat of the Acoustical Society of America, Melville, NY.

- L_{eq}, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (*i.e.,* the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated L_{eq} and is also A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is mostly determined by occasional loud noises.

In short, by using various noise metrics it is possible to separate prevailing, steady sounds (the L_{90}) from occasional, louder sounds (L_{10}) in the noise environment or combined equivalent levels (L_{eq}). This analysis of sounds expected from the proposed Project treats all noises as though they will be steady and continuous.



References:

1. Harris, Cyril, "Handbook of Noise Acoustical Measurements and Noise Control", p 1-10., 1998
2. "Controlling Noise", USAF, AFMC, AFDTC, Elgin AFB, Fact Sheet, August 1996
3. California Dept. of Trans., "Technical Noise Supplement", Oct, 1998

Epsilon ASSOCIATES INC.

Figure 2-1

Common Indoor and Outdoor Sound Levels

3.0 NOISE REGULATIONS

Noise is officially defined as "unwanted sound". The principal feature of this definition is that there must be sound energy and that there must be someone hearing it who considers it unwanted. Noise impact is judged on two bases: the extent to which governmental regulations or guidelines may be exceeded, and the extent to which it is estimated that people may be annoyed or otherwise adversely affected by the sound. Regulatory authority for assessing and controlling noise is contained in both the State Environmental Quality Review Act (SEQRA) and specific Department program policy documents. Specific regulatory references are discussed below.

3.1 Federal Regulations

Epsilon is not aware of any federal noise regulations applicable to these race tracks.

3.2 New York State Regulations

Noise is an aspect of the environment under SEQRA (see 6 NYCRR 617.2(1)), and a substantial adverse change in existing noise levels can be (if not mitigated to the maximum extent practicable) among the indicators of significant adverse impacts on the environment.

3.3 Local Regulations

Epsilon is not aware of any applicable county or municipal noise standards relating to race tracks.

3.4 Community Response to Change in Sound Levels

The NYS DEC has published a guidance document for assessing noise impacts (NYS DEC, 2001). The guidance document states that the addition of any noise source, in a non-industrial setting, should not raise the ambient noise level above a maximum of 65 dBA.

This guidance document also states that L_{eq} sound level increases from 0-3 dBA should have no appreciable effect on receptors, increases from 3-6 dBA may have potential for adverse noise impact only in cases where the most sensitive of receptors are present, and increases of more than 6 dBA may require a closer analysis of impact potential depending on existing sound levels and the character of surrounding land use and receptors. An increase in L_{eq} of 10 dBA deserves consideration of avoidance and mitigation measures in most cases.

The typical ability of an individual to perceive changes in noise levels is summarized in Table 3-1. These guidelines allow direct estimation of an individual's probable perception of a change in community noise levels.

Table 3-1 Thresholds for L_{eq} Sound Pressure Level Increases

Increase in Sound Pressure (dBA)	Reaction
0-3	No appreciable effect
3-6	Potential effect for sensitive receptors
Over 6	Closer analysis required
Source: NYS DEC, "Assessing and Mitigating Noise Impacts", Division of Environmental Permits, February 2, 2001.	

4.0 EXISTING SOUND LEVELS

4.1 Overview

The Central New York Raceway Park, located in the town of Hastings, Oswego County, New York, will consist of a one-half mile oval dirt racing track, a 2-mile paved road racing course, a go-kart track, viewing for 7,250 spectators, concessions, and a restaurant. The 140 acre site lies between Route 11 and I-81. Figure 4-1 shows the extent of the Project.

4.2 Ambient Sound Level Environment

An ambient sound level survey was conducted to characterize the existing acoustical environment in the vicinity of the Project. Current noise sources include: traffic on local roads and Interstate 81, Brewerton Speedway races, insects, birds, and rustling vegetation.

4.3 Ambient Sound Level Measurement Locations

The selection of the sound monitoring locations was intended to include locations representative of nearby residences in various directions around the race park. The monitoring locations were reviewed and agreed upon in advance of the testing by the Town Engineer - Mr. John Donohue, Barton and Loguidice, and Epsilon Associates, Inc.

An aerial photograph of the Project site is shown in Figure 4-1, identifying the project property line, nearby roads, and the sound measurement locations. The coordinates listed in Table 4-1 for the actual sound level measurement locations described below were obtained by Epsilon staff in the field using a Global Positioning System (GPS) instrument with an accuracy of approximately three meters. All distances shown are rounded to the nearest 10 feet.

- **Location L1** –Southeast corner of property (Dewey Dr. Residents)

  Continuous broadband sound level data were collected at this location, approximately 310 feet west of I-81 at the southeast property corner, representative of the setback for the closest residences along the east side of I-81 southeast of the Project along Dewey Drive.

- **Location L2** –Eastern side of property (Swamp Rd. Residents)

  Continuous 1/3 octave-band and broadband sound level data were collected at this location, approximately 400 feet west of I-81, representative of the setback for the residences east of I-81along Swamp Road.

- **Location L3 –** Southwest corner of property (South Rt. 11 Residents)

  Continuous 1/3 octave-band and broadband sound level data were collected at this location, approximately 530 feet east of Route 11 and 660 feet north of Brewerton Speedway, representative of residences southwest of the Project along Route 11.

- **Location L4 –** Northwest corner of property (North Rt. 11 Residents)

  Continuous 1/3 octave-band and broadband sound level data were collected at this location, approximately 70 feet east of Route 11 at the northwest corner of the Project boundary, representative of residences northwest of the Project along Route 11.

- **Location L5 –** Northern property line (Central Square Middle School)

  Continuous 1/3 octave-band and broadband sound level data were collected at this location, approximately 220 feet south of Central Square Middle School and 1,770 feet to the west of I-81 along the northern Project property line, representative of the Central Square Middle School.

- **Location L6 –**Northern property line (Athletic Fields)

  Continuous broadband sound level data were collected at this location, approximately 90 feet south of the Central Square Middle School athletic fields and 1,220 feet west of I-81 along the northern Project property line, representative of the athletic fields and their activity.

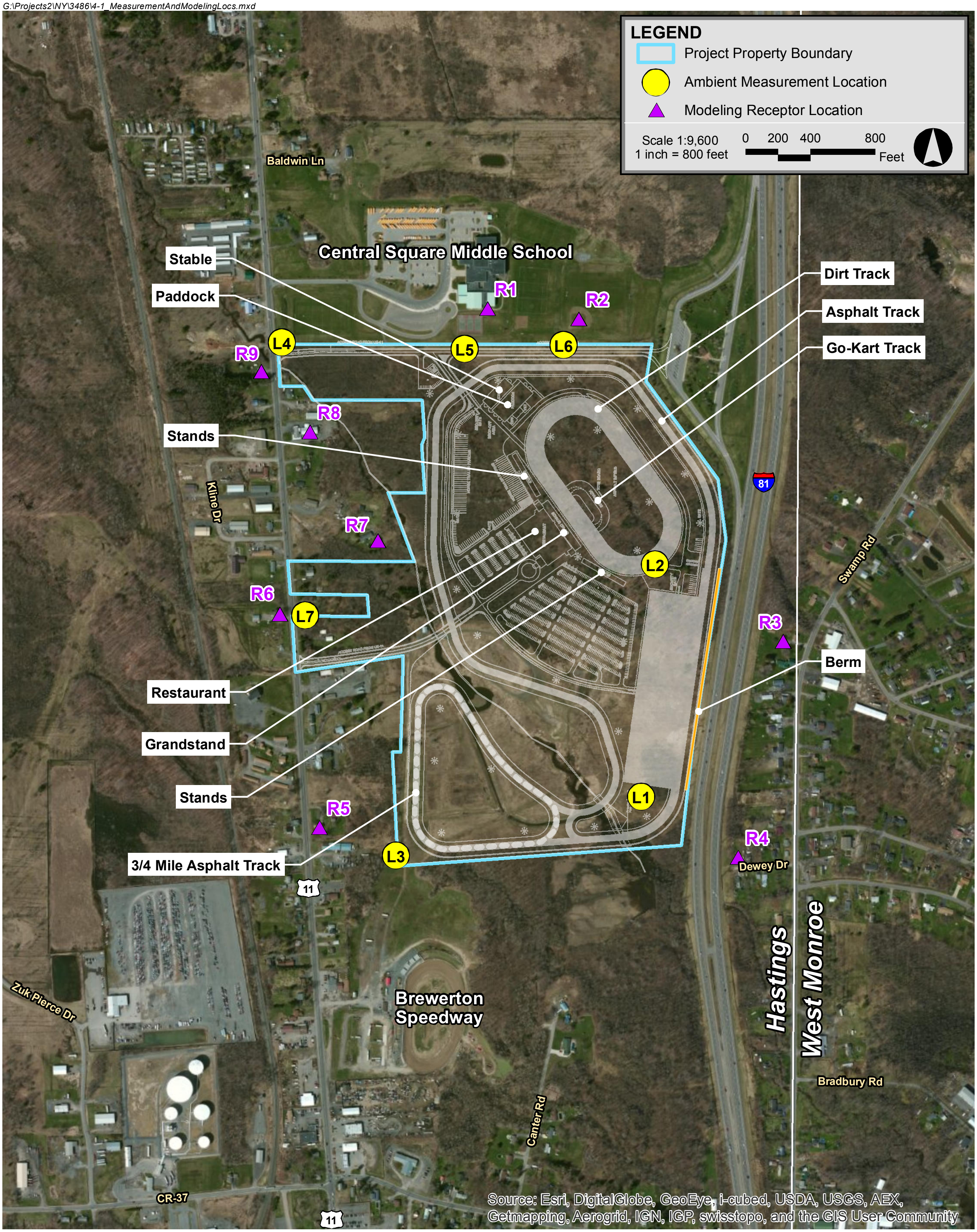
- **Location L7 –**Western property line (Rt. 11 Residents)

  Continuous broadband sound level data were collected at this location, approximately 60 feet east of Route 11 along the west Project property boundary, representative of the residents to the west of the Project along Route 11 near the main CNYRP site entrance.

Table 4-1 GPS Coordinates – Sound Level Measurement Locations

Measurement Location	Latitude (N)	Longitude (W)
L1 – Southeast corner of property (Dewey Dr. Residents)	43.24907	76.13378
L2 – Eastern side of property (Swamp Rd. Residents)	43.25301	76.13353
L3 – Southwest corner of property (South Rt. 11 Residents)	43.24802	76.13945
L4 – Northwest corner of property (North Rt. 11 Residents)	43.25669	76.14225
L5 – Northern property line (Central Square Middle School)	43.25662	76.13801
L6 – Northern property line (Athletic Fields)	43.25671	76.13572
L7 – Western property line (Rt. 11 Residents/site entrance)	43.25208	76.14162

G:\Projects2\NY\3486\4-1_MeasurementAndModelingLocs.mxd



Central New York Raceway Project Hastings, NY

Epsilon ASSOCIATES INC.

Figure 4-1

Sound Level Measurement & Modeling Locations

4.4 Ambient Sound Measurement Methodology

A comprehensive sound level measurement program was developed to quantify the existing ambient sound levels around the Project. Approximately three full days of ambient sound level measurements were taken from Wednesday, August 21, 2013 to Saturday, August 24, 2013. Continuous broadband sound level measurements were made at all seven locations, and 1/3 octave-band measurements were made at four locations (L2, L3, L4, L5).

Sound levels were measured at a height of approximately five feet above the ground at locations where there were no large reflective surfaces to affect the measured levels. Field personnel checked on the integrity of the equipment during the first day, second day, second night, third day, and final morning of the measurement program.

4.5 Ambient Sound Level Measurement Equipment

Three Larson Davis model 831 integrating sound level meters (Locations L2, L3, L5), three Larson Davis model 820 integrating sound level meters (Locations L1, L6, L7), and one Norsonic model Nor140 integrating sound level meter (Location L4) were used during the field program. All instrumentation met the "Type 1 - Precision" requirements set forth in American National Standards Institute (ANSI) S1.4-1983 (sound level meter standard). The Larson Davis model 831 and Norsonic model Nor140 sound level meters also meet ANSI S1.11-2004 (octave filter standard) for acoustical measuring devices. Each long-term meter was housed in an environmental suitcase, connected to a microphone mounted on a tripod at a height of approximately five feet (1.5 meters) above ground, and fitted with the manufacturer's environmental windscreen.

The measurement equipment was calibrated in the field before and after the surveys with the manufacturer's acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984. All calibrations were within $\pm$ 0.5 dB from the most recent calibration. The meters were calibrated and certified as accurate to standards set by the National Institute of Standards and Technology by an independent laboratory within the past 12 months. The Larson Davis 831, Larson Davis 820, and the Norsonic Nor140 measure broadband A-weighted sound levels. The Larson Davis 831 and Norsonic Nor140 also measure one-third octave band sound levels. All instruments have data logging capability and were programmed to log statistical data every one hour for the following parameters: L_1, L_{10}, L_{50}, L_{90}, L_{max}, and L_{eq}.

4.6 Measured Ambient Sound Levels

One-hour sound level data from the continuous ambient measurements are presented in Figures A1and A2 of Appendix A, and a brief description of the measured sound levels and noise sources from each location are provided below. Sound levels collected between the hours of 8AM – 4PM, and 6PM – 11PM, corresponding to the proposed daytime and evening racing periods at CNYRP, are summarized in Tables 4-2 and 4-3, respectively. Data corresponding to a single one-hour period of significant precipitation between 5PM – 6PM on Thursday, August 22, 2013 has been excluded from the analysis. Data taken during Brewerton Speedway races during 7 PM to 10 PM Friday August 23 have also been excluded.

4.6.1 Location L1 – Southeast corner of property (Dewey Dr. Residents)

Sound levels at this location were influenced by insects and traffic on I-81.The continuous 1-hour steady-state (L_{90}) measurements ranged from 42 to 62 dBA, while the continuous 1-hour equivalent (L_{eq}) measurements ranged from 54 to 66 dBA.

4.6.2 Location L2 – Eastern side of property (Swamp Rd. Residents)

Sound levels at this location were influenced by insects and traffic on I-81.The continuous 1-hour steady-state (L_{90}) measurements ranged from 47 to 63 dBA, while the continuous 1-hour equivalent (L_{eq}) measurements ranged from 52 to 66 dBA.

4.6.3 Location L3 – Southwest corner of property (South Rt. 11 Residents)

Sound levels at this location were influenced by I-81 traffic, Route 11 traffic, insects, some birds, occasional construction equipment operation on the CNYRP property (i.e. dumping, loading, etc. of slag [melted steel waste]), and occasional distant dog barks. The spike in sound levels from a race at Brewerton Speedway is evident at this location from 7 PM to 10 PM Friday August 23 in Figure A1. The continuous 1-hour steady-state (L_{90}) measurements ranged from 40 to 54 dBA, while the continuous 1-hour equivalent (L_{eq}) measurements ranged from 45 to 67 dBA.

4.6.4 Location L4 – Northwest corner of property (North Rt. 11 Residents)

Sound levels at this location were influenced by traffic from Route 11 and insects. The continuous 1-hour steady-state (L_{90}) measurements ranged from 37 to 52 dBA, while the continuous 1-hour equivalent (L_{eq}) measurements ranged from 47 to 65 dBA.

4.6.5 Location L5 – Northern property line (Central Square Middle School)

Sound levels at this location were influenced by traffic from I-81 and insects. Route 11 traffic noise was inaudible due to the levels of I-81. The school was not in session during the measurement program however personal vehicles were at the facility, presumably faculty. The continuous 1-hour steady-state (L_{90}) measurements ranged from 39 to 54 dBA, while the continuous 1-hour equivalent (L_{eq}) measurements ranged from 44 to 57 dBA.

4.6.6 Location L6 – Northern property line (Athletic Fields)

Sound levels at this location were influenced by traffic from I-81, insects, and some birds. No sport or recreation activity was observed on the athletic fields during the measurement program. The continuous 1-hour steady-state (L_{90}) measurements ranged from 43 to 60 dBA, while the continuous 1-hour equivalent (L_{eq}) measurements ranged from 45 to 63 dBA.

4.6.7 Location L7 – Western property line (Rt. 11 Residents)

Sound levels at this location were influenced by Route 11 traffic, some birds, insects, and occasional construction equipment operation from CNYRP employees. The continuous 1-hour steady-state (L_{90}) measurements ranged from 38 to 54 dBA, while the continuous 1-hour equivalent (L_{eq}) measurements ranged from 48 to 64 dBA.

Table 4-2 Existing Daytime Ambient L_{eq} Sound Levels (8:00 AM - 4:00 PM)

Location	Minimum L_{eq} (dBA)	Maximum L_{eq} (dBA)	Median L_{eq} (dBA)	Average L_{eq} (dBA)	Minimum L_{90} (dBA)	Maximum L_{90} (dBA)	Median L_{90} (dBA)	Average L_{90} (dBA)
L1	56	62	58	58	52	58	55	55
L2	52	61	54	55	48	57	50	51
L3	46	62	51	51	44	50	46	46
L4	60	63	62	61	45	51	48	48
L5	45	55	49	49	42	51	46	46
L6	47	58	52	52	44	55	48	48
L7	61	63	61	61	44	51	47	47

Table 4-3 Existing Evening Ambient L_{eq} Sound Levels (6:00 PM - 11:00 PM); excluding data during Brewerton Racing (August 23, 6:00 PM– 11:00 PM)

Location	Minimum L_{eq} (dBA)	Maximum L_{eq} (dBA)	Median L_{eq} (dBA)	Average L_{eq} (dBA)	Minimum L_{90} (dBA)	Maximum L_{90} (dBA)	Median L_{90} (dBA)	Average L_{90} (dBA)
L1	56	64	60	60	52	59	56	56
L2	52	61	58	57	50	57	56	55
L3	45	54	53	51	40	51	50	47
L4	56	65	59	60	42	50	49	48
L5	44	53	52	50	39	51	49	47
L6	45	59	57	55	43	55	54	52
L7	54	62	59	59	42	51	48	48

5.0 FUTURE CONDITIONS

5.1 Modeling Scenarios

This sound level assessment predicts impacts from several raceway park events as requested by the Town of Hastings Codes Officer, Engineer, and Counsel, including the following:

- **Road Circuit Auto Racing,** consisting of Ferrari, Maserati, and Corvette-class vehicles, will occur during daytime hours (8AM – 4PM) primarily along the full 2-mile asphalt track, typically in heats consisting of approximately 15 vehicles.

- **Go-kart Racing** will occur during daytime hours (8AM – 4PM) primarily along the go-kart/sprint bike track in events, typically consisting of approximately 15 vehicles.

- **Drift Racing,** consisting of street-legal 4-cylinder vehicles with '85 dB mufflers', will occur during evening hours (6PM – 11PM) primarily along either the ¾ mile asphalt track or the dirt track, typically in time trials consisting of 2-3 vehicles.

- **Snowmobile Racing** will occur during evening hours (6PM-11PM) primarily along either the ¾ mile asphalt track or the dirt track, typically in heats consisting of approximately 15 snowmobiles.

- **Dirt Track Auto Racing** will occur during evening hours (6PM – 11PM) primarily along the dirt track in heats typically consisting of approximately 15 vehicles. Only 6-8 events of this class will be scheduled per year.

Other events not considered in this analysis include: **Drag racing**, which is not proposed for the CNYRP and **Horse Racing** which is assumed to have sound levels significantly lower than the other events involving internal combustion engines. Although the DEIS Scoping document mentioned **Music Concerts** as a potential event at the CNYRP, they are not under consideration now and therefore not evaluated in this noise study. Additionally, sound levels from the proposed CNYRP public address (PA) system are will be volume-controlled during events to ensure compliance with NYSDEC noise guidelines at all sensitive community receptors. The rail-mounted PA system speakers will be focused directly toward the stands where shielding from structures including the 100 foot tall restaurant tower will provide significant attenuation. A summary of the modeling scenarios and assumptions are provided below in Table 5-1.

Table 5-1 Summary of Modeling Scenarios

Modeling Scenario	Race Type	Track Type	Typical # Vehicles per Race	Event Period
1	Road Circuit Auto Racing	Full Asphalt Track	15	8AM - 4PM
2	Go-Kart Racing	Go-Kart Track	15	8AM - 4PM
3	Drift Racing	3/4 mile Asphalt Track	3	6PM - 11PM
4	Drift Racing	Dirt Track	3	6PM - 11PM
5	Snowmobile Racing	3/4 mile Asphalt Track	15	6PM - 11PM
6	Snowmobile Racing	Dirt Track	15	6PM - 11PM
7	Dirt Track Auto Racing	Dirt Track	15	6PM - 11PM

Sound impacts associated with the proposed events at CNYRP were predicted using Cadna/A noise calculation software (DataKustik Corporation, 2005). This software, which implements the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation), offers a refined set of computations accounting for local topography, ground attenuation, drop-off with distance, barrier shielding, and atmospheric absorption of sound from multiple sound sources. The model was calibrated using ambient and reference field measurements made by Epsilon on-site, and at Brewerton Speedway in August and October, 2013. As per ISO 9613-2, the model assumes favorable conditions for sound propagation, corresponding to a moderate, well-developed ground-based temperature inversion, as might occur on a calm, clear night.

Inputs and significant parameters employed in the model are described below:

- Project Layout: The location of the proposed race tracks along with other structures and features considered in the model were provided by CNYRP in a site plan on October 23, 2013.

- Sensitive Receptors: Sound levels were evaluated at nine (9) modeling locations, shown in Figure 5-1, representing the closest noise-sensitive receptors surrounding the project. All receptors were modeled with a height of 1.5 meters AGL to mimic the ears of a typical standing observer.

- Terrain Elevation: Elevation contours for the modeling domain were directly imported into Cadna/A which allowed for consideration of terrain shielding where appropriate. These contours were generated from elevation information derived from the National Elevation Database (NED) developed by the U.S. Geological Survey.

- **Source Sound Levels & Controls:** Sound power levels for each event, presented in Table 5-3, were derived from measured reference sound pressure levels for each vehicle class or calculated using published data. A summary of the noise control features assumed in this analysis can be found in Section 6.0.

- **Meteorological Conditions:** A temperature of 10ºC (50ºF) and a relative humidity of 70% were assumed in the model to minimize atmospheric attenuation in the 500 Hz and 1 kHz octave-bands where the human ear is most sensitive.

- **Ground Attenuation:** Spectral ground absorption was calculated using a global G-factor of 0.5 to represent a moderately reflective surface, with areas of low ground absorption (G = 0) representing parking lots and other asphalt surfaces as appropriate within the site.

5.2 Equipment and Operating Conditions

Reference sound level data for Road Circuit Auto, Go-Kart, and Drift Racing vehicles provided by CNYRP were based on recent measurements collected at several existing racetracks of vehicles and conditions similar to those proposed for CNYRP. It should be noted that modeling results based on reference data collected through measurements for which Epsilon was not present are subject to greater uncertainty.

Reference sound data for Snowmobile vehicles were obtained from data published in the Noise Control Engineering Journal. The snowmobile reference data included the effect of an exhaust muffler. Reference data for Dirt Track Auto Racing vehicles (Big Block Modifieds) were measured by Epsilon on August 23, 2013 and October 10, 2013 at the Brewerton Speedway in Central Square, NY. L_{eq} sound levels of the stock-muffler DIRTcar Racing™ vehicles proposed for CNYRP, as measured by Epsilon at Brewerton during racing, were approximately 4 dBA quieter than the defectively-muffled "Outlaw Modifieds" which currently race at Brewerton. Additionally, measurements of the Road Circuit Auto vehicles provided by CNYRP represent sound levels which do not adhere to the '96 dBA muffler' rule proposed at CNYRP. To account for this, an attenuation of 4 dBA was applied to the input sound power levels included in the model for Scenario 1, assuming a reduction similar to the difference between DIRTcar vehicles and "Outlaw Modifieds." To the extent that tire squeal was present during the measurements, both tire squeal and engine noise were captured in the reference data, and will be used in the future predictive modeling. It was not possible to accurately separate out tire squeal from engine noise in the total sound measurements.

A summary of the reference sound pressure levels obtained through measurement or from published data are provided in Table 5-2, along with the associated speed, reference distance, and number of vehicles.

Table 5-3 presents a summary of the sound power levels used as input to the model, as calculated from the reference data. These sound power levels assume hemispherical spreading based on the distance from the measurement location to the centerline of the track at the closest point to the meter, and are scaled to the typical number of vehicles proposed for each type of race. The Cadna/A model applied these sound power levels as line sources and applied a correction factor which was determined to obtain agreement between modeled results and measured data at Locations L1 and L3 from Brewerton Raceway on August 23.

Table 5-2 Raw Sound Pressure Level Data by Vehicle Type

				Sound Pressure Level at Reference Distance (dBA)									
Vehicle Type	# Vehicles	Speed (mph)	Ref. Dist (feet)	Broad-Band	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
Road Circuit Auto[1]	2	100	135	79	-	-	-	-	-	-	-	-	-
Go-Kart[2]	15	70	150	72	-	-	-	-	-	-	-	-	-
Drift Auto[3]	4	80-100	100	73	-	-	-	-	-	-	-	-	-
Snow-mobile[4]	1	40	50	77	-	59	64	72	71	67	69	63	56
Dirt Track Auto[5]	10	100	100	97	47	65	85	87	92	91	90	84	73

1. Reference sound level data, provided by CNYRP, were measured at Watkins Glen, NY on September 12, 2013 at a distance of 135 feet.
2. Reference sound level data, provided by CNYRP, were measured at Cherry Valley Motorsports Park, NY on September 8, 2013 at a distance of 150 feet.
3. Reference sound level data, provided by CNYRP, were measured at Myrtle Beach Speedway, SC on August 20, 2013 at a distance of 100 feet.
4. Reference sound levels were obtained from Hastings, Aaron L., Cynthia Lee, Paul Gerbi, and Gregg G. Fleming. "Development of a tool for modeling snowmobile and snowcoach noise in Yellowstone and Grand Teton National Parks." Noise Control Engineering Journal 58.6 (2010): 591-600.
5. Reference sound level data were measured by Epsilon personnel at Brewerton Speedway, NY on October 10, 2013 at a distance of 100 feet at edge of track.

Table 5-3 Reference Sound Power Levels by Vehicle Type

		Reference Sound Power Level (dBA)									
Vehicle Type	Typical # Vehicles	Broad-Band	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
Road Circuit Auto[1]	15	129	-	-	-	-	-	-	-	-	-
Go-Kart[2]	15	114	-	-	-	-	-	-	-	-	-
Drift Auto[3]	3	111	-	-	-	-	-	-	-	-	-
Snowmobile[4]	15	124	-	106	111	119	118	114	116	110	103
Dirt Track Auto[5]	15	138	88	107	126	128	133	132	131	126	115

1. Reference sound level data, provided by CNYRP, were measured at Watkins Glen, NY on September 12, 2013 at a distance of 135 feet.
2. Reference sound level data, provided by CNYRP, were measured at Cherry Valley Motorsports Park, NY on September 8, 2013 at a distance of 150 feet.
3. Reference sound level data, provided by CNYRP, were measured at Myrtle Beach Speedway, SC on August 20, 2013 at a distance of 100 feet.
4. Reference sound levels were obtained from Hastings, Aaron L., Cynthia Lee, Paul Gerbi, and Gregg G. Fleming. "Development of a tool for modeling snowmobile and snowcoach noise in Yellowstone and Grand Teton National Parks." Noise Control Engineering Journal 58.6 (2010): 591-600.
5. Reference sound level data were measured by Epsilon personnel at Brewerton Speedway, NY on October 10, 2013 at a distance of 100 feet at edge of track.

5.3 Sound Level Results

A summary of the modeling results for each of the seven scenarios described in Section 5.1 are presented in Tables 5-4 through 5-10 below. Modeled project-only noise levels during races are provided along with the measured background noise levels at the representative ambient monitoring locations. Tabulated sound level impacts from combined future levels as they compare to the existing ambient are evaluated against the NYDEC guidelines here and discussed in Section 6.0.

Table 5-4 Modeling Results – Scenario 1: Road Circuit Auto Racing (Full Asphalt Track)

Receptor ID	Representative Background ID	Evaluation Period	Measured Background Noise Level	Modeled Project-Only Noise Level	Combined Project + Background Noise Level	Project Impact[1]	Meets NYSDEC Noise Policy?
			dBA	dBA	dBA	dBA	
R1	L5	8AM-4PM	49	51	53	4	YES
R2	L6	8AM-4PM	52	55	57	5	YES
R3	L1	8AM-4PM	58	47	59	1	YES
R4	L1	8AM-4PM	58	47	59	1	YES
R5	L7	8AM-4PM	61	46	61	0	YES
R6	L7	8AM-4PM	61	38	61	0	YES
R7	L3	8AM-4PM	51	48	53	2	YES
R8	L7	8AM-4PM	61	33	61	0	YES
R9	L4	8AM-4PM	61	27	61	0	YES

1. Calculation of increase over background performed using data rounded to nearest whole decibel

Table 5-5 Modeling Results – Scenario 2: Go-Kart Racing (Go-Kart Track)

Receptor ID	Representative Background ID	Evaluation Period	Measured Background Noise Level	Modeled Project-Only Noise Level	Combined Project + Background Noise Level	Project Impact[1]	Meets NYSDEC Noise Policy?
			dBA	dBA	dBA	dBA	
R1	L5	8AM-4PM	49	31	49	0	YES
R2	L6	8AM-4PM	52	34	52	0	YES
R3	L1	8AM-4PM	58	30	58	0	YES
R4	L1	8AM-4PM	58	22	58	0	YES
R5	L7	8AM-4PM	61	19	61	0	YES
R6	L7	8AM-4PM	61	13	61	0	YES
R7	L3	8AM-4PM	51	24	51	0	YES
R8	L7	8AM-4PM	61	18	61	0	YES
R9	L4	8AM-4PM	61	14	61	0	YES

1. Calculation of increase over background performed using data rounded to nearest whole decibel

Table 5-6 Modeling Results – Scenario 3: Drift Racing (3/4-Mile Asphalt Track)

Receptor ID	Representative Background ID	Evaluation Period	Measured Background Noise Level	Modeled Project-Only Noise Level	Combined Project + Background Noise Level	Project Impact[1]	Meets NYSDEC Noise Policy?
			dBA	dBA	dBA	dBA	
R1	L5	6-11PM	50	17	50	0	YES
R2	L6	6-11PM	55	16	55	0	YES
R3	L1	6-11PM	60	21	60	0	YES
R4	L1	6-11PM	60	26	60	0	YES
R5	L7	6-11PM	59	36	59	0	YES
R6	L7	6-11PM	59	28	59	0	YES
R7	L3	6-11PM	51	20	51	0	YES
R8	L7	6-11PM	59	10	59	0	YES
R9	L4	6-11PM	60	7	60	0	YES

1. Calculation of increase over background performed using data rounded to nearest whole decibel

Table 5-7 Modeling Results – Scenario 4: Drift Racing (Dirt Track)

Receptor ID	Representative Background ID	Evaluation Period	Measured Background Noise Level	Modeled Project-Only Noise Level	Combined Project + Background Noise Level	Project Impact[1]	Meets NYSDEC Noise Policy?
			dBA	dBA	dBA	dBA	
R1	L5	6-11PM	50	33	50	0	YES
R2	L6	6-11PM	55	37	55	0	YES
R3	L1	6-11PM	60	30	60	0	YES
R4	L1	6-11PM	60	20	60	0	YES
R5	L7	6-11PM	59	16	59	0	YES
R6	L7	6-11PM	59	11	59	0	YES
R7	L3	6-11PM	51	24	51	0	YES
R8	L7	6-11PM	59	16	59	0	YES
R9	L4	6-11PM	60	11	60	0	YES

1. Calculation of increase over background performed using data rounded to nearest whole decibel

Table 5-8 Modeling Results – Scenario 5: Snowmobile Racing (3/4-Mile Asphalt Track)

Receptor ID	Representative Background ID	Evaluation Period	Measured Background Noise Level	Modeled Project-Only Noise Level	Combined Project + Background Noise Level	Project Impact[1]	Meets NYSDEC Noise Policy?
			dBA	dBA	dBA	dBA	
R1	L5	6-11PM	50	35	50	0	YES
R2	L6	6-11PM	55	34	55	0	YES
R3	L1	6-11PM	60	41	60	0	YES
R4	L1	6-11PM	60	50	60	0	YES
R5	L7	6-11PM	59	57	61	2	YES
R6	L7	6-11PM	59	49	59	0	YES
R7	L3	6-11PM	51	42	52	1	YES
R8	L7	6-11PM	59	32	59	0	YES
R9	L4	6-11PM	60	29	60	0	YES

1. Calculation of increase over background performed using data rounded to nearest whole decibel

Table 5-9 Modeling Results – Scenario 6: Snowmobile Racing (Dirt Track)

Receptor ID	Representative Background ID	Evaluation Period	Measured Background Noise Level	Modeled Project-Only Noise Level	Combined Project + Background Noise Level	Project Impact[1]	Meets NYSDEC Noise Policy?
			dBA	dBA	dBA	dBA	
R1	L5	6-11PM	50	52	54	4	YES
R2	L6	6-11PM	55	56	59	4	YES
R3	L1	6-11PM	60	49	60	0	YES
R4	L1	6-11PM	60	38	60	0	YES
R5	L7	6-11PM	59	35	59	0	YES
R6	L7	6-11PM	59	32	59	0	YES
R7	L3	6-11PM	51	42	52	1	YES
R8	L7	6-11PM	59	36	59	0	YES
R9	L4	6-11PM	60	32	60	0	YES

1. Calculation of increase over background performed using data rounded to nearest whole decibel

Table 5-10 Modeling Results – Scenario 7: Dirt Track Auto Racing (Dirt Track)

Receptor ID	Representative Background ID	Evaluation Period	Measured Background Noise Level	Modeled Project-Only Noise Level	Combined Project + Background Noise Level	Project Impact[1]	Meets NYSDEC Noise Policy?
			dBA	dBA	dBA	dBA	
R1	L5	6-11PM	50	66	66	16	NO
R2	L6	6-11PM	55	71	71	16	NO
R3	L1	6-11PM	60	64	65	5	YES
R4	L1	6-11PM	60	53	61	1	YES
R5	L7	6-11PM	59	49	59	0	YES
R6	L7	6-11PM	59	44	59	0	YES
R7	L3	6-11PM	51	55	57	6	YES
R8	L7	6-11PM	59	48	59	0	YES
R9	L4	6-11PM	60	44	60	0	YES

1. Calculation of increase over background performed using data rounded to nearest whole decibel

6.0 EVALUATION OF SOUND LEVELS

With the exception of Dirt Track Auto Racing (Scenario 7), the predicted sound levels for each modeling location shown in Tables 5-4 through 5-10 indicate Project compliance with the NYSDEC 65 dBA limit and threshold for sound pressure level increase of '6 dBA above ambient' which would otherwise recommend a "closer analysis of impact potential. "Sound level impacts from Dirt Track Auto Racing, presented in Table 5-10, predict increases above the recommended 6 dBA threshold at locations R1 and R2 representing the Central Square Middle School building and athletic fields, respectively. However, given that all Dirt Track Auto Racing will be scheduled for evening events between 6PM – 11PM when the school will not be in session, the increases at R1 and R2 would not result in any adverse impacts on noise-sensitive receptors. It should also be noted that the NYSDEC criteria are suggested guidelines and not noise regulations.

To provide comparison with the existing Brewerton Speedway facility due south of the proposed CNYRP, ambient sound level data collected within the surrounding project area are presented in Table 6-1 during periods with and without Dirt Track Auto Racing heats observed at Brewerton. Measurement locations L1 and L3 are approximately 700 and 1600 feet from the closest point on the centerline of the Brewerton racetrack, respectively.

Table 6-1 Sound Levels from Existing Brewerton Speedway Racetrack

Measurement Location	Distance to Brewerton[1] (feet)	Operational Sound Level[2] (dBA)	Background Sound Level[3] (dBA)	Brewerton-Only Sound Level[4] (dBA)	Brewerton Impact[5] (dBA)
L3	700	74	61	74	13
L1	1600	66	61	65	5

1. Distance from CNYRP ambient measurement location to the closest point on the centerline of Brewerton track
2. Average LAeq sound levels measured over three Brewerton 'Outlaw Modified' heats on August 23, 2013 (8:47-8:50PM, 8:52-8:55PM, 8:58-9:00PM)
3. Average LAeq background sound levels measured before Brewerton heats on August 23, 2013 (8:41-8:45 PM)
4. Logarithmic difference between measured 'operational' and 'background' LAeq sound levels
5. Arithmetic difference between measured 'operational' and 'background' LAeq sound levels, calculated using values rounded to the nearest whole number decibel.

Sound levels from CNYRP at similar distances are expected to be at least 8 dBA lower than those from Brewerton, accounting only for: (a) differences between the size of the tracks at CNYRP and Brewerton, (b) differences in the number of vehicles measured at Brewerton (24) and proposed at CNYRP (15), and (c) the difference in attenuation between the 'Outlaw' mufflers used at Brewerton and the stock mufflers proposed at CNYRP.

Several additional features incorporated in the design of CNYRP, not present at Brewerton Speedway, provide significant noise reduction to nearby sensitive receptors. Many of these mitigating factors which were included in the model are highlighted in Figure 4-1, and listed below:

- Structures to the west, northwest, and southwest of the CNYRP Dirt Track will provide shielding to residential receptors along Route 11, and will include:
    - Stands to the northwest and southwest (26 feet tall)
    - Grandstands to the west (24 feet tall)
    - Restaurant building to the west (60 feet tall)
    - Stable/Paddock buildings to the north (24 feet tall)
- An earthen berm approximately 1,400 feet long and 18 feet tall will be installed along the eastern/southeastern property line adjacent to I-81, providing shielding to residential receptors along Swamp Road.
- The CNYRP Dirt Track is designed with a 3 degree pitch on straights and a 5 degree pitch in turns, providing some terrain shielding, along with an effective 6.5-foot tall barrier at the track's outside edge, measured from the top of the retaining wall to the bottom of the recessed track.
- The CNYRP Asphalt Track will have a 4-foot tall barrier wall along the entire length, 30 feet from both sides
- A 1,200-foot long strip of tall, dense tree cover along the northeast property line will provide modest attenuation to residences northeast of the project along Swamp Road.

The distances from modeling receptors R1 and R8 to CNYRP (740 and 1,370 feet, respectively) are similar to those from measurement locations L3 and L1 to Brewerton Speedway. For comparison, predicted impacts at these receptors, shown in Table 5-10, from CNYRP during Dirt Track Racing events (Scenario 7) are 8 – 18 dBA lower than current impacts from Brewerton at measurement locations L3 and L1, as shown in Table 6-1. These reductions include the effects of all the structures, barriers, and berms proposed for CNYRP.

In summary, sound level impacts from CNYRP are predicted to be significantly lower than those currently experienced from Brewerton Speedway, primarily as a result of the following:

- Barrier walls, buildings, earthen berms, and dense tree cover which provide attenuation.
- Increased setbacks from the majority of sensitive residential receptors
- A 'muffler rule' of 96 dBA at 50 feet required for all vehicles

7.0 CONCLUSIONS

A comprehensive sound level assessment was conducted for the proposed Central New York Raceway Project. Baseline ambient sound levels were measured to characterize the existing background in and around the Project area in Hastings, NY. Project-only sound levels were then predicted at nearby residences, so as to determine the future sound levels expected for each proposed racing scenario.

Results indicate that sound levels from the project will meet the relevant NYDEC noise guidelines at all sensitive residential receptors during racing hours. Additionally, sound level impacts from the CNYRP are predicted to be significantly lower than those currently experienced by residents from the existing Brewerton Speedway due to shielding from barriers, berms, and buildings, quieter vehicles, and increased setbacks.

Appendix A

Continuous Sound Level Measurements

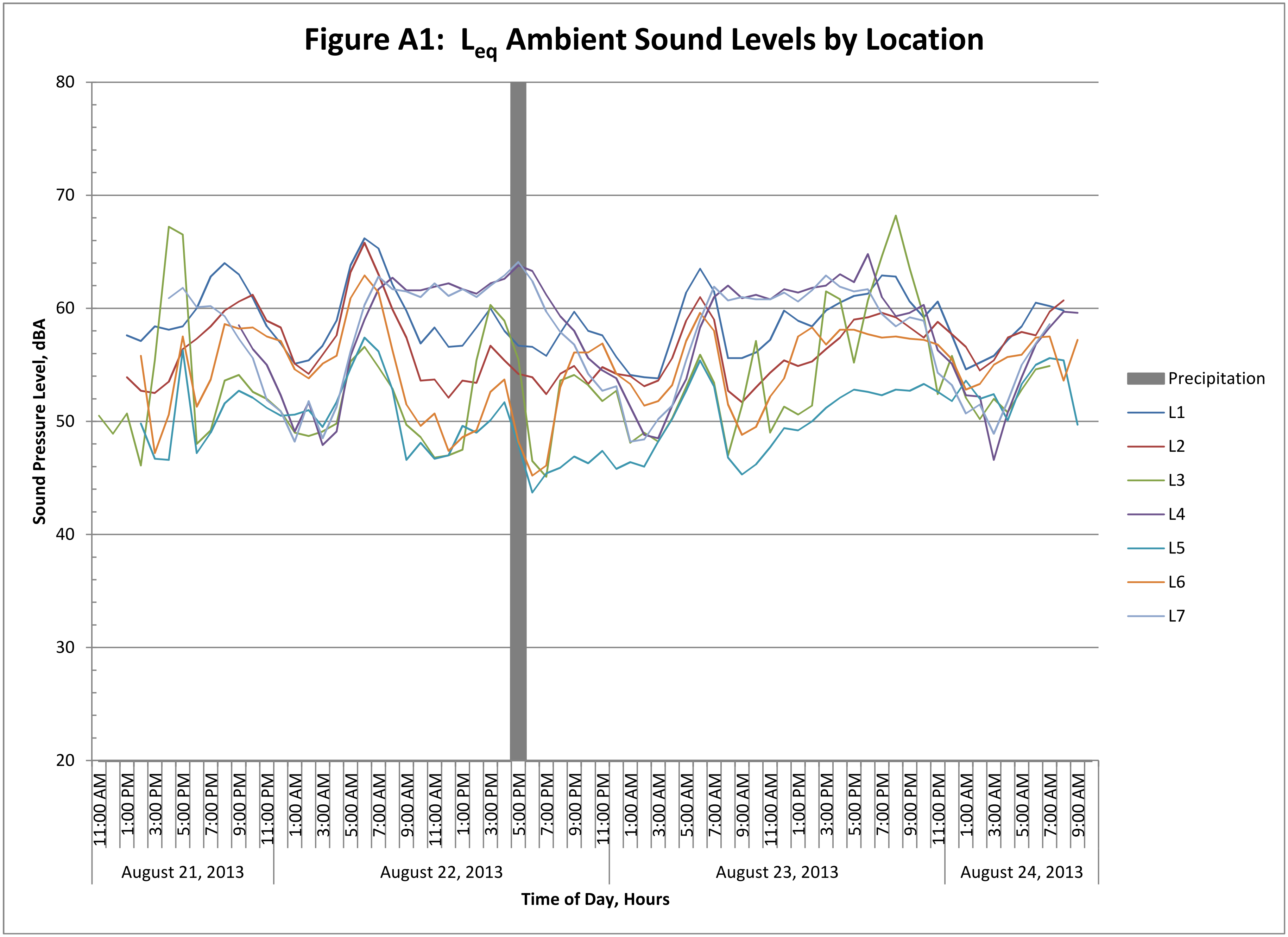


Figure A1: L_{eq} Ambient Sound Levels by Location
Sound Pressure Level, dBA
80
70
60
50
40
30
20
11:00 AM
1:00 PM
3:00 PM
5:00 PM
7:00 PM
9:00 PM
11:00 PM
1:00 AM
3:00 AM
5:00 AM
7:00 AM
9:00 AM
August 21, 2013
August 22, 2013
August 23, 2013
August 24, 2013
Time of Day, Hours
Precipitation
L1
L2
L3
L4
L5
L6
L7

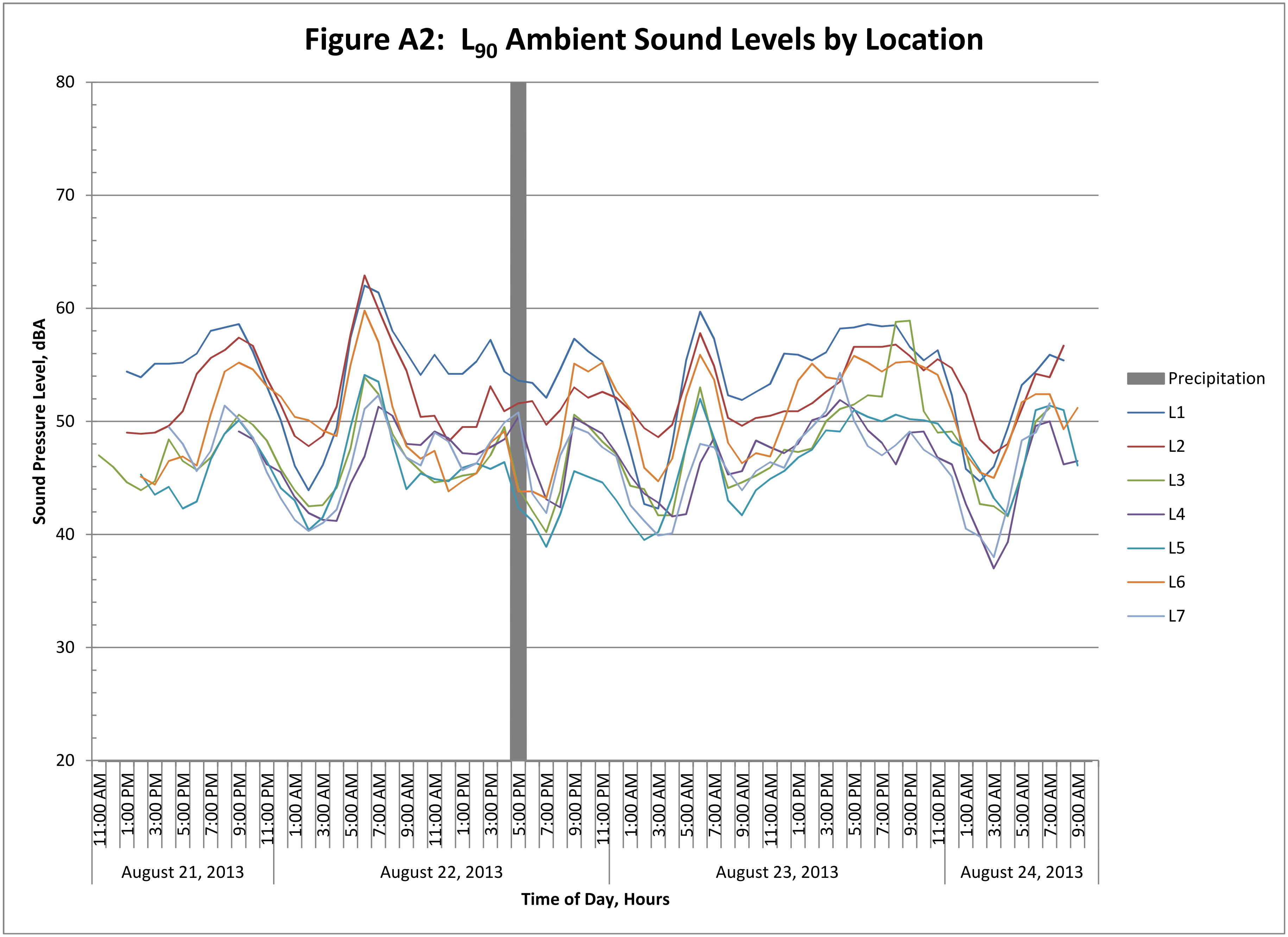


Figure A2: L_{90} Ambient Sound Levels by Location
80
70
60
50
40
30
20
Sound Pressure Level, dBA
11:00 AM
1:00 PM
3:00 PM
5:00 PM
7:00 PM
9:00 PM
11:00 PM
1:00 AM
3:00 AM
5:00 AM
7:00 AM
9:00 AM
11:00 AM
1:00 PM
3:00 PM
5:00 PM
7:00 PM
9:00 PM
11:00 PM
1:00 AM
3:00 AM
5:00 AM
7:00 AM
9:00 AM
11:00 AM
1:00 PM
3:00 PM
5:00 PM
7:00 PM
9:00 PM
11:00 PM
1:00 AM
3:00 AM
5:00 AM
7:00 AM
9:00 AM
August 21, 2013
August 22, 2013
August 23, 2013
August 24, 2013
Time of Day, Hours
Precipitation
L1
L2
L3
L4
L5
L6
L7