20.0 NOISE

20.1 INTRODUCTION

This chapter assesses the potential noise impacts of the proposed project. Project-generated noise sources include mobile sources from car and truck traffic, stationary sources such as ventilation equipment and operating equipment, and temporary construction sources.

Environmental noise is defined as the sound in a community emanating from man-made sources such as automobiles, trucks, buses, aircraft, trains, and fixed industrial sources, or from natural sources such as animals and wind. Sound levels are measured in logarithmic units called decibels (dB). An overall measurement of sound results in a single decibel value that describes the sound environment, taking all frequencies (pitches) into account. The human ear, however, does not sense all frequencies in the same manner. The "A"-weighted scale (expressed in dBA units) was developed to closely approximate the human sensory response from highway-related noise.

The ability of an average individual to perceive changes in noise levels is well documented. Generally, an increase of less than 3 dBA is barely perceptible to most listeners, a 5 dBA increase is readily noticeable, and a 10 dBA increase normally is perceived as a doubling of noise. A list of typical community sound levels is shown in Table 20-1.

Table 20-1. Noise Levels of Common Sources

Sound Source	Sound Pressure Level (dBA)
Air Raid Siren at 50 feet	120
Maximum Levels at Rock Concerts (Rear Seats)	110
On Platform by Passing Subway Train	100
On Sidewalk by Passing Heavy Truck or Bus	90
On Sidewalk by Typical Highway	80
On Sidewalk by Passing Automobiles with Mufflers	70
Typical Urban Area	60-70
Typical Suburban Area	50-60
Quiet Suburban Area at Night	40-50
Typical Rural Area at Night	30-40
Isolated Broadcast Studio	20
Audiometric (Hearing Testing) Booth	10
Threshold of Hearing	0
Source: CEQR Technical Manual, 2001 – Cowan, James P. Handbook of Environmental Acoustics, 1994 and Egan, M. David, Architectural Acoustics, 1988.	

Since an instantaneous noise measurement (measured in dBA) describes noise levels at just one moment of time, and since very few noises in a community area are constant, other descriptors are used to represent varying sound levels over extended periods of time. The equivalent noise level (L_{eq}) represents the time-varying noise level produced over a period of time, as a single number over a specified period of time. This represents the equivalent steady noise level, which, over a given period, contains the same energy as the time-varying noise during the same period. The most common time period is the noise over one hour, represented as $L_{eq}(h)$. This descriptor is commonly used to express results from noise measurements, predictions and impact assessments. Other descriptors often used in noise analyses are L_{10} and L_{dn}. L_{10} is defined as the sound pressure level exceeded 10 percent of the time and is often used to describe noise generated from traffic sources. It is also used as a noise descriptor for the CEQR Noise Exposure Guidelines described below. L_{dn} is the day-night equivalent sound level, defined as a 24-hour continuous L_{eq} with a 10dB adjustment added to all hourly noise levels recorded between the hours of 10 PM and 7 AM. L_{dn} is often used in the analysis of both aircraft and train noise. For the purposes of this analysis, the 1-hour L_{eq} will be used to describe traffic noise impacts.

20.2 METHODOLOGY AND NOISE STANDARDS

20.2.1 CEQR Noise Impact Thresholds

The noise impact assessment for this project was performed in accordance with the *CEQR Technical Manual.* This Manual describes the City's guidelines for noise exposure impact assessment at sensitive receptors resulting from the implementation of a project. These significance levels are based on a daytime threshold noise level (L_{eq}) of 65 dBA which should not be significantly exceeded. The impact thresholds are described below:

- A significant impact will occur if the daytime period noise level significantly exceeds 65 dBA.
- An increase of 5 dBA or greater over the Future No Build noise level would be an impact if the Future No Build noise level is 60 dBA or less.
- If the Future No Build noise level is 62 dBA or more, a 3 dBA increase or greater would be considered significant.
- A significant impact will occur during the nighttime period (defined by *CEQR* standards as being between 10 PM and 7 AM) if there is a change in noise levels of 3 dBA or more.

20.2.2 CEQR Noise Exposure Standards

The NYCDEP has also issued guidelines that apply to assessing a proposed project if it is also a sensitive receptor such as a residence, hospital, school, or office. The NYCDEP has established four categories of acceptability based on receptor type and land use for vehicular traffic, rail, and aircraft related noise sources. The guidelines are shown in Table 20-2.

As this project is defined as predominantly garage space, the new facility would not be classified as a sensitive receptor, and would not require analysis of the Noise Exposure Guidelines.

20.2.3 New York City Noise Code

The New York City Noise Code establishes ambient noise quality zone (ANQZ) criteria and standards based on existing zoning designations (refer to Table 20-3). The project site is located in an area zoned as M2-4 and borders areas zoned M1-5, M1-6 and C6-2A. Commercial and manufacturing zones are designated as noise quality zone N-3 in the New York City Noise Code. These standards apply to noise emitted directly from stationary activities within the boundaries of a project. The standards do not apply to noise occurring off the site, such as traffic noise and aircraft noise, and also do not apply to construction noise.

20.2.4 Mobile Source Analysis

The noise impact assessment for this project was performed in accordance with the *CEQR Technical Manual.* An initial *de minimis* screening analysis was performed to identify whether a potential exists for the Proposed Action to generate a significant noise impact at a receptor, or be significantly affected by high ambient sound levels. For vehicular noise, if the PCE values are at least doubled between the Future No Build and Future Build conditions along any affected roadway link, then a detailed noise analysis is warranted. A doubling of PCEs would increase sound levels by 3 dBA. Consequently, if a doubling of PCEs does not occur, there would be no potential for significant impacts, and further analysis would not be required.

Table 20-2. Noise Exposure Guidelines for Use In City Environmental Impact Review[1]

Receptor type	Time period	Acceptable General External Exposure	Airport Exposure[3]	Marginally Acceptable General External Exposure	Airport Exposure[3]	Marginally Unacceptable General External Exposure	Airport Exposure[3]	Clearly Unacceptable General External Exposure	Airport Exposure[3]
1. Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	---------- $L_{dn} \leq 60$ dBA ----------		---------- $60 < L_{dn} \leq 65$ dBA ----------		-- (I) $65 < L_{dn} \leq 70$ dBA, (II) 70 dBA $\leq L_{dn}$ --------		---------- $L_{dn} \geq 75$ dBA ----------
2. Hospital, Nursing Home		$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 65$ dBA		$65 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
3. Residence, residential hotel or motel	7AM – 10PM	$L_{10} \leq 65$ dBA		$65 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
	10PM – 7AM	$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
4. School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, out-patient health facility		Same as Residential Day (7 AM – 10 PM)		Same as Residential Day (7 AM – 10 PM)		Same as Residential Day (7 AM – 10 PM)		Same as Residential Day (7 AM – 10 PM)	
5. Commercial or office		Same as Residential Day (7 AM – 10 PM)		Same as Residential Day (7 AM – 10 PM)		Same as Residential Day (7 AM – 10 PM)		Same as Residential Day (7 AM – 10 PM)	
6. Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

Notes:

(I) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more:

1. Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by ANSI Standards; all values are for the worst hour in the time period.
2. Tracts of land where serenity and quiet are extraordinarily important and serve an important public need and where the preservation of these qualities is essential of the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and old-age homes.
3. One may use FAA-approved Land contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.
4. External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

Source: New York City Department of Environmental Protection (adopted by NYCDEP for use in CEQR-1983)

Table 20-3. New York City Ambient Noise Quality Zone Criteria

Ambient Noise Quality Zone	Day-time standards (7am - 10pm)	Night-time standards (10pm - 7am)
Noise quality zone N-1 (Low density residential RL; land-use zones R-1 to R-3)	L_{eq}=60 dB(A) measured for any one hour	L_{eq}=50 dB(A) measured for any one hour
Noise quality zone N-2 (High density residential RH; land-use zones R-4 to R-10)	L_{eq}=65 dB(A) measured for any one hour	L_{eq}=55 dB(A) measured for any one hour
Noise quality zone N-3 (All Commercial and manufacturing land-use zones)	L_{eq}=70 dB(A) measured for any one hour	L_{eq}=70 dB(A) measured for any one hour
Source: New York City Department of Environmental Protection Noise Code, 2005.		

20.3 EXISTING CONDITIONS

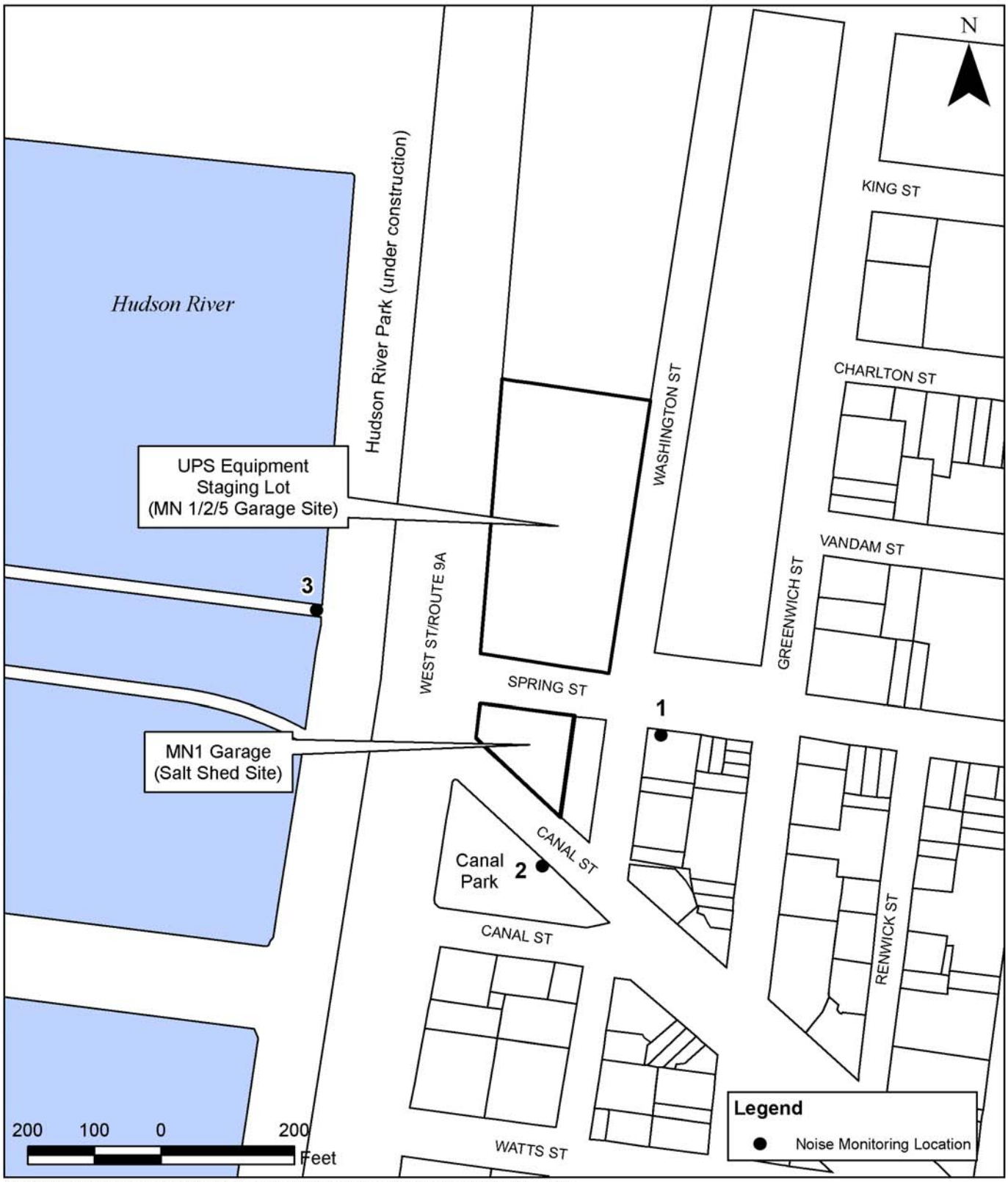
The area surrounding the project sites (UPS Staging Lot and the MN 1 Garage) is predominantly characterized by industrial/ manufacturing and commercial land uses, with multi-family residential uses primarily south of Spring Street. Land uses adjacent to the roadways – West Street/Route 9A, Washington Street and Spring Street - that are anticipated to be used to access the new garage include mixed residential/commercial, multi-unit residential, open space/recreation, commercial, industrial, and parking.

Noise monitoring was conducted on March 10, 2007 at three noise sensitive locations in the vicinity of the UPS Staging Lot, the MN 1 Garage and local roadways (Figure 20-1). These are locations which would be the most likely to be affected by operations at the proposed facility and the project-generated traffic. Following procedures outlined in the *CEQR Technical Manual*, 20-minute measurements, representative of a 1-hour L_{eq}, were taken during the Saturday AM peak period (5 AM to 7 AM) at street level.

A Bruel & Kjaer Type 2236 Precision Integration Sound Level meter was used to measure existing sound levels. This meter is microprocessor-based and measures noise levels in accordance with all current noise exposure criteria. During the noise-monitoring period the meter was tripod-mounted and equipped with a windscreen to eliminate noise associated with wind blowing across the microphone. The sound meter was calibrated with an acoustical calibrator before and after each measurement. Weather conditions on the days of monitoring were noted. The recommended meteorological conditions for noise monitoring are:

- Wind speed under 12 mph.
- Relative humidity under 90 percent.
- Temperature above 14^{o} and below 122^{o} F.

The weather conditions during noise monitoring fell within these parameters.



Base Map Copyrighted by the New York City Department of Information Technology and Telecommunications, 2004
Parcel DataSource: NYC Department of City Planning
Site descriptions provided in Table 20-4.

HydroQual
1200 MacArthur Blvd.
Mahwah, New Jersey 07430
(201) 529-5151 f: (201) 529-5728

Manhattan Districts 1/2/5 Garage and Salt Shed

City of New York
Department of Sanitation

Figure 20-1

Noise Monitoring Locations

November 2007

Traffic and classification counts at each location were conducted concurrently with the noise monitoring. Traffic and classification counts are used to calculate the hourly PCEs that correspond with the monitored sound level. PCEs are used to account for the different types of motor vehicles (i.e., cars, trucks etc.) and their varying levels of sound. According to the *CEQR Technical Manual*, the relationships used for calculating PCEs are as follows: 1 automobile is equivalent to 1 PCE; 1 medium truck is equivalent to 13 PCEs; 1 bus is equivalent to 18 PCEs; and 1 heavy truck, including a DSNY collection truck, is equivalent to 47 PCEs. In other words, the noise level produced by a medium truck would be the same as that from 13 cars and, the noise level from a heavy truck would be equivalent to that of 47 cars. The results of the noise monitoring program are shown in Table 20-4.

Table 20-4. Monitored Sound Levels (Saturday AM)

Location	Volume (PCEs)	L_{eq} (dBA)	L_{10} (dBA)
Site 1 – Residences on Spring Street (The Glass House)	674	67	70
Site 2 – Canal Park	1737	67	69
Site 3 – West Side of Hudson River Park	1531	71	75

The ambient noise conditions of the area surrounding the two sites are heavily influenced by local traffic on Canal Street, West Street/Route 9A and the adjoining roadways. As discussed in Chapter 3, trucking operations of DSNY, UPS and Federal Express operations are all located in proximity to the two sites and affect local noise conditions.

20.4 FUTURE WITHOUT THE PROPOSED ACTION (FUTURE NO BUILD)

In accordance with the noise guidelines established in the *CEQR Technical Manual*, a significant impact is identified based upon the increase of the Future Build condition over the Future No Build condition. Therefore, the analysis for this condition, the Future No Build, is addressed in Subchapter 20.5 where a comparison of noise increments is provided.

20.5 FUTURE WITH THE PROPOSED ACTION (FUTURE BUILD)

20.5.1 Mobile Source

Noise sensitive receptors within the study area were identified and the traffic anticipated to pass each receptor was calculated for the Existing, Future No Build, and Future Build conditions to determine the expected increase in PCE values (Table 20-5), using the peak hour traffic data for each condition discussed in Chapter 17.

The greatest increase in PCEs would occur during the Saturday AM period at Site 1 – Residences on Spring Street. The Future Build PCEs would be 60 percent greater than the Future No Build (Future Without the Proposed Action) PCEs. Since this would be less than the 100 percent increase (doubling) of the *de minimis* screening threshold, the traffic associated with the Proposed Action would not have the potential to cause a significant noise impact, and according to Chapter 3R (Section 200) of the *CEQR Technical Manual*, a detailed noise analysis is not warranted.

Table 20-5. Increase Between Future No Build and Future Build PCEs

Location	Existing PCEs	Future No Build PCEs	Future Build (Proposed Action) PCEs	Percent Increase Between Future No Build and Future Build
Weekday AM				
Site 1 – Residences on Spring St.*	2510	2606	3217	23%
Site 2 – Canal Park**	6163	6388	6337	-1%
Site 3 – West Side of Hudson River Park	15463	16015	16081	0%
Weekday PM				
Site 1 – Residences on Spring St.*	2969	3070	4253	39%
Site 2 – Canal Park**	2480	2567	3567	39%
Site 3 – West Side of Hudson River Park	12618	13065	13226	1%
Saturday AM				
Site 1 – Residences on Spring St.*	528	533	853	60%
Site 2 – Canal Park**	2012	2066	2858	38%
Site 3 – West Side of Hudson River Park	2828	2898	3716	28%
Saturday PM				
Site 1 – Residences on Spring St.*	1871	1913	2820	47%
Site 2 – Canal Park**	1778	1823	2298	26%
Site 3 – West Side of Hudson River Park	7892	8091	8482	5%

Future Build PCEs include traffic mitigation.
*PCEs include total traffic at the intersection of Spring Street and Washington Street.
**PCEs include traffic from eastbound and westbound Canal Street.
Source: Jacobs Edwards and Kelcey, 2007.

20.5.2 Stationary Sources

The existing sound level of the residences near the proposed MN 1/2/5 Garage is 67 dBA. According to the *CEQR Technical Manual*, an increase of 3 dBA or more, to 70 dBA would be considered a significant impact. Under the New York City Noise Code, the average hourly noise levels emanating from the project sites cannot exceed 70 dBA (Leq). To satisfy both of these standards, sound levels emanating from the project sites should not exceed 69 dBA. The proposed MN 1/2/5 Garage would be enclosed, which would attenuate noise associated with indoor garage activities. HVAC equipment would be located on the roof. This equipment would be positioned to minimize sound levels at the neighboring residences and ensure Noise Code

compliance. The proposed truck washing/refueling facility would also be in the enclosed garage building. The proposed salt shed would not be a fully enclosed building; however, the activities that would occur at this site are not predicted to generate a significant amount of noise. Additionally, this area would only be used during, or in preparation for winter storm emergencies, and not on a regular basis.

For the proposed MN 1/2/5 Garage, noise attenuation measures, such as silencers or acoustic barriers, would be used as necessary to ensure that the sound of the operating equipment inside the building would not exceed 69 dBA at the property line.

The increase in traffic associated with the Proposed Action would not double the PCEs and the facilities would be designed to ensure that no significant stationary source noise impacts would occur. Therefore, no significant noise impacts from the Proposed Action are predicted and no mitigation is required.