FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE CROTON WATER TREATMENT PLANT AT THE HARLEM RIVER SITE

7.10. NOISE ANALYSIS

7.10.1. Introduction

This noise analysis is divided into two types: mobile source and stationary source. Mobile source noise is analyzed because of the potential for noise generated from vehicles traveling on roadways near sensitive land uses. Included in this type of noise is construction traffic. Stationary source noise describes the noise level emanating from a property. Both mobile and stationary sources of noise were analyzed using the noise descriptor L_{eq}. L_{eq} is the continuous equivalent sound level, defined as the single sound pressure level that, if constant over the stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period. The noise descriptor L_{10} also was used for operations analysis. L_{10} is a percentile level, where 10 corresponds to the percentage of the measurement time that the stated sound level has been exceeded. The methodology used to prepare this analysis is presented in Section 4.10, Data Collection and Impact Methodologies, Noise.

7.10.1.2. Preliminary Noise Screening for Mobile Source Noise Analysis

As outlined in the methodologies section, and as the initial step in the mobile source noise analysis, a preliminary noise screening using passenger car equivalence (PCE) values was performed to determine whether receptors located near the identified noise-sensitive route segments would experience an increase in noise levels of 3 dBA or more as a result of the additional vehicular traffic generated by the project. Existing and future anticipated traffic data for the noise-sensitive route segments in the vicinity of the proposed Croton Water Treatment Plant (Croton project) site were analyzed to determine a PCE value for each segment for the morning peak hour, the afternoon peak hour, and the lowest traffic-volume off-peak (i.e. quietest) hour for the existing condition. The preliminary noise screening was performed by comparing the existing PCEs with existing PCEs plus the addition of the future project-generated PCEs. The equation shown below was used for this comparison. Future PCEs would be from additional traffic resulting from the proposed project.

$$\text{If } \frac{\text{Existing PCEs + Future Project-Generated PCEs}}{\text{Existing PCEs}} > 2.0 \text{ then an impact may occur.}$$

This comparative analysis of existing PCEs and future PCEs was used to determine whether the receptors near the identified noise-sensitive route segments would potentially experience a doubling or more of PCEs. Three decibels (dBA) is the threshold used for screening purposes since it correlates to an increase that is perceptible to human auditory sensitivity. This threshold is used as a guideline to determine whether anticipated project impacts warrant further field measurements and subsequent Traffic Noise Model (TNM) analysis. A doubling of PCEs corresponds to a noise increase of 3 dBA. CEQR has established a project-induced noise level increase threshold of 3-5 dBA at receptors. Route segments that did not experience a doubling of PCEs due to project-induced traffic, therefore, would not exceed this impact threshold.

The two time periods representing the largest increase in future PCEs resulting from the proposed operations and construction activities were used for the comparative analysis. The anticipated PCEs from normal operations for the Future With the Project year (2011) were used for the operations analysis. The anticipated construction-related peak truck traffic year (2009) was selected for the construction analysis. Following the preliminary noise screening using the comparative PCE analysis for the operations and construction years, it was determined that the route segments with sensitive receptors would not experience a doubling of PCEs and therefore would not experience a 3 dBA increase in noise level.

Tables 7.10-1 and 7.10-2, respectively, present the comparison of future PCEs to existing PCEs along route segments for project operations and construction.

7.10.2. Baseline Conditions

7.10.2.1. Existing Conditions

7.10.2.1.1. Mobile Source Noise.

The roadways considered for mobile source noise analysis at the proposed project site are presented in Table 7.10-3 and Figure 7.10-1. The roadways considered for analysis are the possible local transportation routes, which connect the major thoroughfares to the site. Sensitive receptors along these transportation routes were identified. Route segments that did not contain sensitive receptors along them were not considered for further noise analysis. The major access roads for construction vehicles to the site is the Major Deegan Expressway (I-87) and Grand Concourse Boulevard. In addition, the major thoroughfare that commuter traffic (i.e. passenger cars) could use to access the site is the Harlem River Drive in Manhattan. Therefore, the potential for noise impacts at sensitive receptors along those proposed transportation routes connecting Harlem River Drive and Grand Concourse to the Harlem River Site were evaluated. The Major Deegan Expressway, which would provide the major access to the site, runs adjacent to the east boundary of the proposed project site. There is only a short route segment next to the site that connects the Expressway accesses ramps to the site. This route segment does not contain any noise-sensitive receptors. Likewise, W. 207th Street between 10th Avenue in Manhattan and the site access ramp did not have noise-sensitive receptors.

TABLE 7.10-1: COMPARISON OF EXISTING PCES TO FUTURE PCES FROM OPERATIONS IN VICINITY OF THE HARLEM RIVER SITE (2011)

	Location	Period of Analysis (Weekday)	Existing PCEs	Time	New Passenger Car	New Trucks	New PCEs	PCE Ratio	Incremental Change in dbA	Further Analysis Required?
1	10th Ave btw West 207th St & Dyckman St	AM Peak	2166	07:45 - 08:45	0	0	0	1.00	0.00	No
		PM Peak	2115	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	1842	10:00 - 11:00	0	0	0	1.00	0.00	No
2	10th Ave. btw 207th and 218th Sts	AM Peak	1699	07:45-08:45	0	0	0	1.00	0.00	No
		PM Peak	1597	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	1450	10:00 - 11:00	0	0	0	1.00	0.00	No
3	Broadway btw 218th and 220th	AM Peak	9980	07:45-08:45	0	0	0	1.00	0.00	No
		PM Peak	7406	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	5899	13:00 - 14:00	0	0	0	1.00	0.00	No
4	Broadway btw 220th and 9th Ave.	AM Peak	11242	07:45 - 08:45	0	0	0	1.00	0.00	No
		PM Peak	6675	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	5997	15:00 - 16:00	0	0	0	1.00	0.00	No
5	Broadway btw 9th Ave. and 225th	AM Peak	7995	07:45-08:45	0	0	0	1.00	0.00	No
		PM Peak	6762	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	6122	13:00 - 14:00	0	0	0	1.00	0.00	No
6	Broadway btw west 225 St & West 230 St	AM Peak	6341	07:45-08:45	2	0	2	1.00	0.00	No
		PM Peak	5003	17:00 - 18:00	2	0	2	1.00	0.00	No
		Quietest Period	4243	11:00 - 12:00	0	0	0	1.00	0.00	No
7	West 225 St btw Broadway & Bailey Ave	AM Peak	3244	07:45 - 08:45	0	0	0	1.00	0.00	No
		PM Peak	2789	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	2591	11:00 - 12:00	0	0	0	1.00	0.00	No
8	West Fordham Rd btw Grand Concourse Blvd	AM Peak	4738	07:45 - 08:45	4	0	4	1.00	0.00	No
	& Jerome Ave	PM Peak	3613	17:00 - 18:00	2	0	2	1.00	0.00	No
		Quietest Period	3129	13:00 - 14:00	0	2	94	1.03	0.13	No
9	West Fordham Rd btw Jerome Ave & MLK Jr. Blvd	AM Peak	4877	07:45 - 08:45	7	0	7	1.00	0.01	No
		PM Peak	3543	17:00 - 18:00	4	0	4	1.00	0.00	No
		Quietest Period	3023	13:00 - 14:00	0	2	94	1.03	0.13	No
10	West Fordham Rd btw MLK Jr. Blvd & Sedgwick Ave	AM Peak	4314	07:45 - 08:45	9	0	9	1.00	0.01	No
		PM Peak	3516	17:00 - 18:00	8	0	8	1.00	0.01	No
		Quietest Period	3002	13:00 - 14:00	0	2	94	1.03	0.13	No
11	West Fordham Rd btw I87(NB) & Sedgwick Ave	AM Peak	6748	07:45 - 08:45	12	0	12	1.00	0.01	No
		PM Peak	4979	17:00 - 18:00	12	0	12	1.00	0.01	No
		Quietest Period	3962	13:00 - 14:00	0	2	94	1.02	0.10	No

Noise:
New PCEs = (no. of cars + no. of trucks(47))
PCE ratio = (Existing PCEs + Project generated PCEs) / Existing PCEs
Incremental change in dBA = 10 log (PCE ratio)

Methodology to establish AM/PM peak hour existing and project-induced PCEs discussed in Data Collection and Impact Methodologies, Section 4.10, Noise

Quietest hour existing PCEs calculated from traffic data (automatic traffic recorders, vehicle classifications, and turning movement counts). ATRs and VCs were used to establish traffic volume and mix along a route segment. Where ATRs were not available, the TMC count from the peak hour for the adjacent intersection was used to establish the trip assignment for the route segment. ATR and VC data from the nearest physically similar route sement for the quietest hour was used to establish volume and mix.

Quietest hour project-induced PCEs derived by assuming deliveries constant between 7 AM and 5 PM. Route segments established in Traffic Analysis Section.

TABLE 7.10-2: COMPARISON OF EXISTING PCES TO FUTURE PCES FROM CONSTRUCTION ACTIVITIES IN VICINITY OF THE HARLEM RIVER SITE (2009)

	Location	Period of Analysis (Weekday)	Existing PCEs	Time	New Passenger Car	New Trucks	New PCEs	PCE Ratio	Incremental Change in dbA	Further Analysis Required?
1	10th Ave btw West 207th St & Dyckman St	AM Peak	2166	07:45 - 08:45	0	0	0	1.00	0.00	No
		PM Peak	2115	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	1842	10:00 - 11:00	0	0	0	1.00	0.00	No
2	10th Ave. btw 207th and 218th Sts	AM Peak	1699	07:45-08:45	0	0	0	1.00	0.00	No
		PM Peak	1597	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	1450	10:00 - 11:00	0	0	0	1.00	0.00	No
3	Broadway btw 218th and 220th	AM Peak	9980	07:45 - 08:45	0	0	0	1.00	0.00	No
		PM Peak	7406	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	5899	13:00 - 14:00	0	0	0	1.00	0.00	No
4	Broadway btw 220th and 9th Ave.	AM Peak	11242	07:45 - 08:45	0	0	0	1.00	0.00	No
		PM Peak	6675	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	5997	15:00 - 16:00	0	0	0	1.00	0.00	No
5	Broadway btw 9th Ave. and 225th	AM Peak	7995	07:45 - 08:45	0	0	0	1.00	0.00	No
		PM Peak	6762	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	6122	13:00 - 14:00	0	0	0	1.00	0.00	No
6	Broadway btw west 225 St & West 230 St	AM Peak	6341	07:45 - 08:45	2	0	2	1.00	0.00	No
		PM Peak	5003	17:00 - 18:00	2	0	2	1.00	0.00	No
		Quietest Period	4243	11:00 - 12:00	0	0	0	1.00	0.00	No
7	West 225 St btw Broadway & Bailey Ave	AM Peak	3244	07:45 - 08:45	0	0	0	1.00	0.00	No
		PM Peak	2789	17:00 - 18:00	0	0	0	1.00	0.00	No
		Quietest Period	2591	11:00 - 12:00	0	0	0	1.00	0.00	No
8	West Fordham Rd btw Grand Concourse Blvd	AM Peak	4738	07:45 - 08:45	2	1	49	1.01	0.04	No
	& Jerome Ave	PM Peak	3613	17:00 - 18:00	2	1	49	1.01	0.06	No
		Quietest Period	3129	13:00 - 14:00	0	0	0	1.00	0.00	No
9	West Fordham Rd btw Jerome Ave & MLK Jr. Blvd	AM Peak	4877	07:45 - 08:45	4	1	51	1.01	0.05	No
		PM Peak	3543	17:00 - 18:00	4	1	51	1.01	0.06	No
		Quietest Period	3023	13:00 - 14:00	0	0	0	1.00	0.00	No
10	West Fordham Rd btw MLK Jr. Blvd & Sedgwick Ave	AM Peak	4314	07:45 - 08:45	5	1	52	1.01	0.05	No
		PM Peak	3516	17:00 - 18:00	4	1	51	1.01	0.06	No
		Quietest Period	3002	13:00 - 14:00	0	0	0	1.00	0.00	No
11	West Fordham Rd btw I87(NB) & Sedgwick Ave	AM Peak	6748	07:45 - 08:45	5	1	52	1.01	0.03	No
		PM Peak	4979	17:00 - 18:00	4	1	51	1.01	0.04	No
		Quietest Period	3962	13:00 - 14:00	0	0	0	1.00	0.00	No

Noise:

New PCEs = (no. of cars + no. of trucks(47))

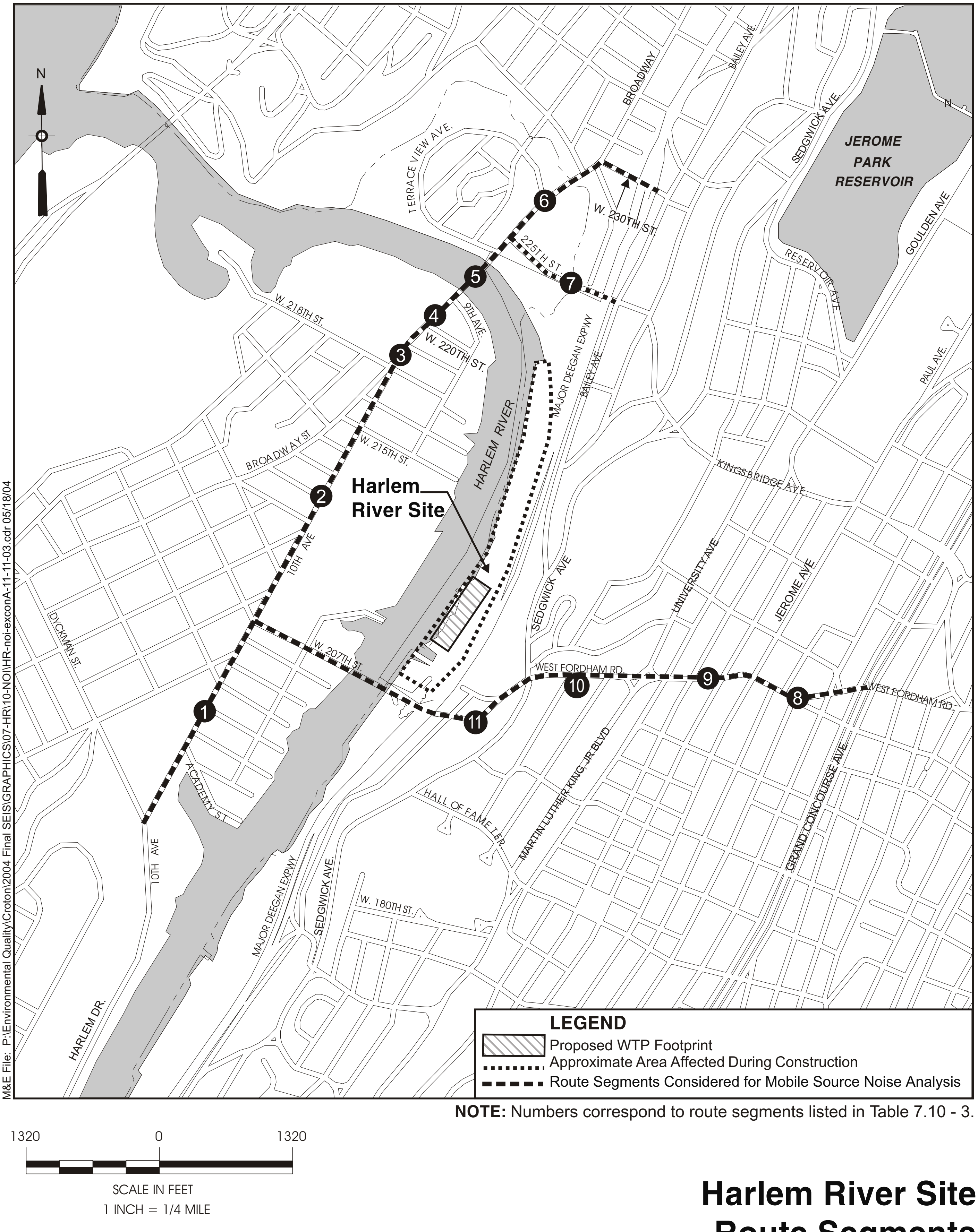
PCE ratio = (Existing PCEs + Project generated PCEs) / Existing PCEs

Incremental change in dBA = 10 log (PCE ratio)

Methodology to establish AM/PM peak hour existing and project-induced PCEs discussed in Data Collection and Impact Methodologies, Section 4.10, Noise

Quietest hour existing PCEs calculated from traffic data (automatic traffic recorders, vehicle classifications, and turning movement counts). ATRs and VCs were used to establish traffic volume and mix along a route segment. Where ATRs were not available, the TMC count from the peak hour for the adjacent intersection was used to establish the trip assignment for the route segment. ATR and VC data from the nearest physically similar route sement for the quietest hour was used to establish volume and mix.

Quietest hour project-induced PCEs derived by assuming deliveries constant between 7 AM and 5 PM. Route segments established in Traffic Analysis Section.



NOTE: Numbers correspond to route segments listed in Table 7.10 - 3.

Harlem River Site
Route Segments
Mobile Source Noise Analysis

TABLE 7.10-3. ROUTE SEGMENTS NEAR HARLEM RIVER SITE CONSIDERED FOR MOBILE SOURCE NOISE ANALYSIS

No.	Route Segment
1	10th Ave between West 207th St & Dyckman Street
2	10th Ave. between 207th and 218th Streets
3	Broadway between 218th and 220th Streets
4	Broadway between 220th and 9th Avenue
5	Broadway between 9th Ave. and 225th Street
6	Broadway between west 225 St & West 230th Street
7	West 225 St between Broadway & Bailey Avenue
8	West Fordham Rd between Grand Concourse Blvd & Jerome Avenue
9	West Fordham Rd between Jerome Ave & MLK Jr. Blvd/University Avenue
10	West Fordham Rd between MLK Jr. Blvd & Sedgwick Avenue
11	West Fordham Rd between Sedgwick Ave & 10th Avenue

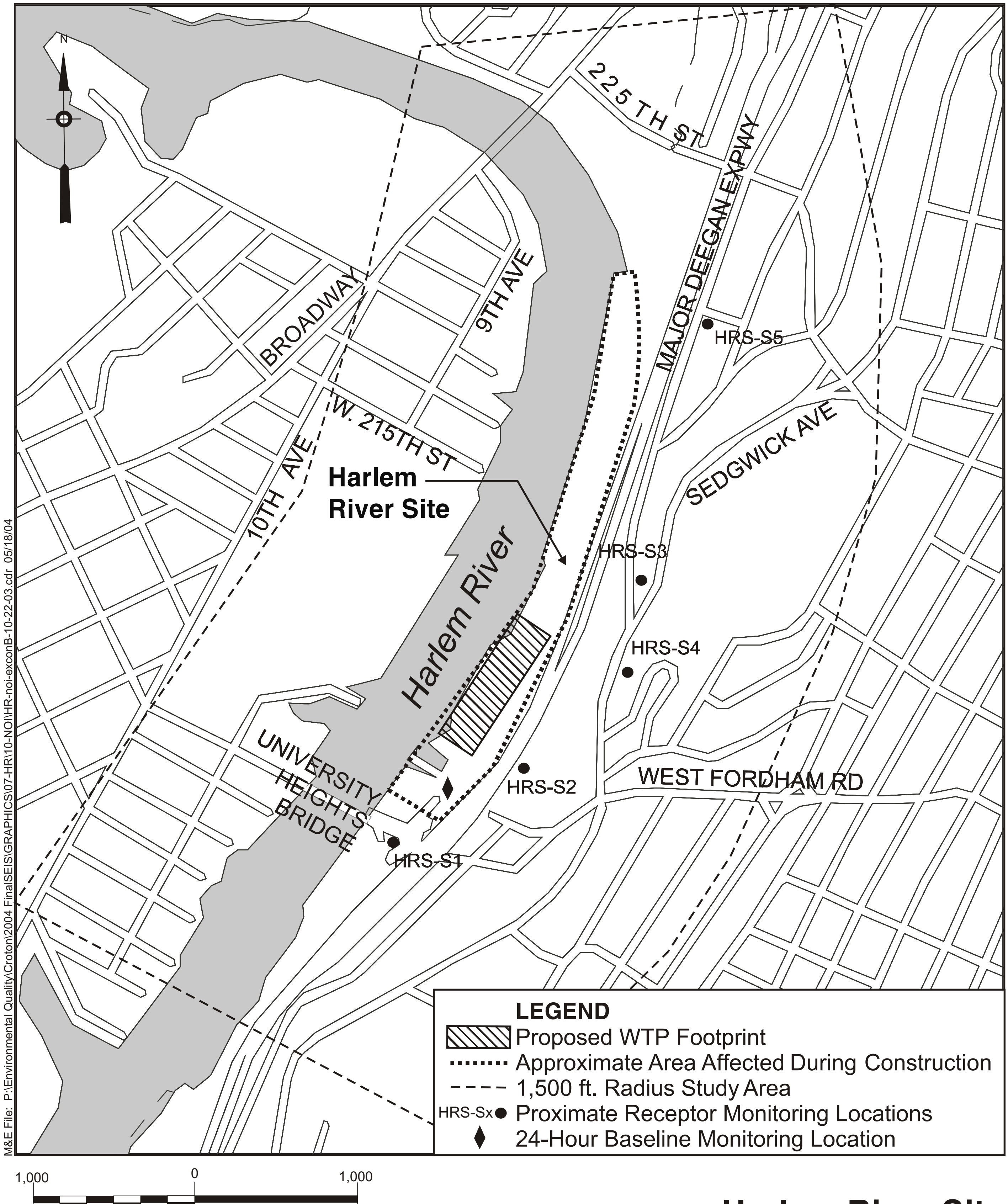
As shown above in Tables 7.10-1 and 7.10-2, none of the noise-sensitive route segments would experience a doubling of PCEs. It was concluded that the noise-sensitive route segments in the vicinity of the site would not exceed the 3-5 dBA impact threshold established under CEQR. Noise-sensitive route segments associated with the proposed plant site were not examined further.

7.10.2.1.2. Stationary Source Noise

Stationary source noise monitoring was performed at the proposed water treatment plant site in order to establish existing baseline conditions. Noise monitoring was performed to reflect the construction and completed-project operation times, and to account for the receptor types that were within 1,500 feet of the site. Twenty four-hour baseline noise monitoring was performed on the southeast corner of the proposed plant footprint (see Figure 7.10-2). This location was chosen because it was the closest point on the property to a sensitive receptor. The dominant noise source at this location was traffic from the adjacent Major Deegan Expressway.

Baseline noise level measurements were collected for 24 hours on a weekday (Tuesday through Thursday) and on a Sunday. This monitoring period was chosen to reflect the anticipated construction and operations schedules. Plant operations would be continuous (24-hours a day and seven days a week). Construction activities are anticipated to take place on Monday through Friday from 7:00 AM to 6:00 PM.

Weekday Baseline Monitoring. The 24-hour baseline noise levels measured on a weekday are presented in Table 7.10-4. For proposed operating hours (i.e. 24 hours), the existing noise level during the quietest period (between 1:00 AM and 2:00 AM) had a Leq of 58.3 dBA and the noisiest period (between 10:00 AM and 11:00 AM) had a Leq of 69.9 dBA. For proposed construction hours (between 7:00 AM



Harlem River Site Stationary Source Noise Monitoring Locations

and 6:00 PM) existing noise level during the quietest period (3:00 PM through 4:00 PM) was 65.4 dBA and the noisiest period (between 10:00 AM and 11:00 AM) had a Leq of 69.9 dBA.

TABLE 7.10-4. MEASURED BASELINE 24-HOUR NOISE LEVELS (Leq) AT HARLEM RIVER SITE ON A WEEKDAY

Hourly Leq (dBA)												
TIME	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
AM	63.6	**58.3**	59.2	61.1	61.2	64.1	65.2	68.3	69.7	66.0	**69.9**	65.8
PM	69.0	67.4	67.6	**65.4**	65.8	65.5	66.3	60.0	64.2	63.8	68.0	61.1

Sunday Baseline Monitoring. The 24-hour baseline noise levels measured on a Sunday are presented in Table 7.10-5. This monitoring period corresponded only with the proposed plant operating hours as construction activities would not occur on weekends. The quietest period (between 2:00 AM and 3:00 AM) had a Leq of 59.8 dBA, and the noisiest period (between 4:00 PM and 5:00 PM) had a Leq of 69.3 dBA.

TABLE 7.10-5. MEASURED BASELINE 24-HOUR NOISE LEVELS (Leq) AT HARLEM RIVER SITE ON A SUNDAY

Hourly Leq (dBA)												
TIME	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
AM	63.5	62.4	**59.8**	62.5	60.0	61.4	64.6	65.7	64.4	60.7	67.9	67.0
PM	64.6	67.1	65.3	68.3	**69.3**	68.1	67.8	67.4	63.2	65.4	62.1	66.8

Following the initial 24-hour baseline monitoring, 20-minute measurements were taken at sensitive receptors proximate to the site that may experience a noise impact due to construction and/or operations activities (see Figure 7.10-2). Table 7.10-6 presents the noise sensitive receptors that were analyzed as part of the stationary noise analysis. Receptors HRS-S3, HRS-S4, and HRS-S5 are residences and therefore susceptible to noise disturbances at all times.

Measurements were conducted at each receptor during those hours that the receptor was sensitive to noise contributions. Residences were assumed to be occupied (and therefore sensitive to noise contributions) at all times. Table 7.10-6 presents details concerning the proximate receptors.

TABLE 7.10-6. DESCRIPTION OF NOISE SENSITIVE RECEPTORS FOR STATIONARY SOURCE NOISE ANALYSIS

Receptor Name	Description of Receptor
HRS-S1	Fordham Landing Apartments (proposed)
HRS-S2	Fordham Landing Park
HRS-S3	Residence at intersection of Bailey and Sedgwick Avenues
HRS-S4	Apartment complex on Sedgwick Avenue
HRS-S5	Apartment complex on Bailey Avenue

Weekday Monitoring at Receptors. Twenty-minute measurements were performed at the receptors during the noisiest and quietest times as determined by the initial 24-hour baseline measurements. The noisiest and quietest time periods refer to those periods as established by the 24-hour baseline monitoring. Noise levels at proximate receptor locations during weekdays are presented in Table 7.10-7.

TABLE 7.10-7. TWENTY-MINUTE MEASURED NOISE LEVELS AT SENSITIVE RECEPTORS ON A WEEKDAY

Monitoring Location	Monitoring Period	Monitoring Time	Leq (dBA)
HRS-S1	Noisiest	10-11 AM	69.9
	Quietest Daytime	3-5 PM	65.4
	Quietest Evening	1-3 AM	58.3
HRS-S2	Noisiest	10-11 AM	70.8
	Quietest Daytime	3-5 PM	66.3
	Quietest Evening	7-8 PM	66.3
HRS-S3	Noisiest	10-11 AM	67.4
	Quietest Daytime	3-5 PM	68.9
	Quietest Evening	1-3 AM	61.3
HRS-S4	Noisiest	10-11 AM	67.1
	Quietest Daytime	3-5 PM	68.3
	Quietest Evening	1-3 AM	63.7
HRS-S5	Noisiest	10-11 AM	73.3
	Quietest Daytime	3-5 PM	72.1
	Quietest Evening	7-8 PM	71.7

Sunday Monitoring at Receptors. Twenty-minute noise levels during the noisiest and quietest period on a Sunday are presented in Table 7.10-8.

TABLE 7.10-8. TWENTY-MINUTE MEASURED NOISE LEVELS AT SENSITIVE RECEPTORS ON A SUNDAY

Monitoring Location	Monitoring Period	Monitoring Time	Leq (dBA)
HRS-S1	Quietest Daytime	2-3 AM	59.8
	Noisiest	3-5 PM	69.3
HRS-S2	Quietest Daytime	9-10 AM	65.8
	Noisiest	3-5 PM	67.1
HRS-S3	Quietest Daytime	2-3 AM	61.3
	Noisiest	3-5 PM	64.0
HRS-S4	Quietest Daytime	2-3 AM	63.2
	Noisiest	3-5 PM	66.4
HRS-S5	Quietest Daytime	2-3 AM	69.7
	Noisiest	3-5 PM	70.5

7.10.2.2. Future Without the Project

The Future Without the Project considerations included the anticipated year of operation (2011) for the proposed Croton project, and the anticipated year of peak construction for mobile source noise (2009) and stationary source noise (2006).[1]

7.10.2.2.1. Mobile Source Noise

Based on the results of the PCE screening analysis previously discussed (Table 7.10-1 and Table 7.10-2 above), it was determined that none of the identified noise-sensitive route segments in the site vicinity would experience a 3 dBA or more increase in noise levels due to the project. As a result, the Future Without the Project year traffic volumes and related noise levels along the transportation roadways leading to and from the site did not require further analysis.

7.10.2.2.2. Stationary Source Noise

Future baseline noise levels at proximate receptor locations for the construction and operation phases of the proposed project were determined for the year of peak construction (2006) and the build year (2011). A review of future planned developments in the vicinity of the proposed plant site for the years ending 2006 and 2011 revealed no new additional stationary

[1] Construction trucks are the types of trucks that would generate the greatest incremental change in noise levels along noise-sensitive route segments. The year with the month that had the greatest number of construction trucks traveling the roads to and from the Harlem River site therefore was selected for the mobile source analysis. Based on engineering resource projections, the months with the highest volume of truck traffic would be August through October 2009. 2009, therefore, was selected as the peak year for construction-related mobile source analysis. The anticipated year of construction for the stationary noise source analysis was determined by analyzing noise levels at receptors based on engineering projections of monthly construction-equipment loading. The year with the greatest noise levels resulting from construction activities at the proposed site (2006) was used as the analysis year for stationary construction noise. This is discussed in greater detail in the Potential Construction Impacts section below.

noise sources that would be expected to increase the existing background noise levels at proximate receptor locations. Therefore, the future baseline noise levels for both 2005 and 2010 at stationary source receptors located near the Harlem River Site were not anticipated to change from the existing noise levels measured during the noise-monitoring program.

7.10.3. Potential Impacts

7.10.3.1. Potential Project Impacts

The anticipated year of operation for the proposed plant is 2011. Therefore, potential project-induced noise level increases were assessed by comparing the Future With the Project conditions against the Future Without the Project conditions for the year 2011.

The potential additional noise generated by the proposed plant during normal operations was analyzed at sensitive receptor locations in the vicinity of the proposed plant site. As part of the mobile and stationary source analysis, future noise levels for the Future With the Project year (2011) were projected by adding the noise contribution from truck deliveries and equipment used during operations to the future baseline noise level. The analysis year for operations at the proposed plant site was 2011.

7.10.3.1.1. Mobile Source Noise

Potential impacts from mobile noise sources resulting from the proposed plant operations were assessed. As discussed above, 2011 was selected as the peak year for this analysis. The preliminary PCE screening analysis previously discussed was used to determine whether project-induced traffic would result in a doubling or more of the existing PCEs present along the noise-sensitive route segments identified in the vicinity of the site. In accordance with the provisions outlined in the *CEQR Technical Manual*, a doubling of PCEs along a noise study route segment corresponds to an increase of 3 dBA. This increase would prompt a detailed analysis. On the basis of the preliminary PCE analysis (Table 7.10-1 above), it was determined that none of the identified noise-sensitive route segments would experience a doubling of PCEs. Therefore, it was concluded that the contribution from mobile sources to the total project-generated noise experienced at sensitive receptors would not result in a 3 dBA or more increase in noise levels.

7.10.3.1.2. Stationary Source Noise

The Future With the Project noise levels at each of the receptors was established by adding the noise contribution from operations to the baseline noise levels for the future analysis year (2011). Potential impacts from noise generated by the equipment used during normal operations at the proposed plant were determined for the sensitive receptors identified near the water treatment plant. Figure 7.10-2 shows the location of the sensitive receptors.

Engineering drawings were used to determine the location of each piece of equipment within the plant. The distance from the equipment to each receptor was thereby established. Also considered in this analysis was the attenuation that resulted from the thickness and composition of proposed plant walls through which noise from operations would travel. Walls within the proposed plant would serve as a noise barrier.[2]

A noise prediction algorithm[3] was used to calculate the noise levels resulting from plant operations at each of the receptors. The noise algorithm considered the noise levels of operations equipment, the distance from the equipment to the receptor, and the noise attenuation resulting from walls within the plant. The algorithm is presented and discussed in greater detail in Section 4.10, Data Collection and Impact Methodologies, Noise. Equipment that generated more than 55 dBA was considered in this analysis.

For the purpose of this analysis, it was assumed that the plant was running at maximum capacity, which would correspond to the maximum possible operations noise. Table 7.10-9 presents the proposed plant operations equipment, including the associated noise level and quantity of each equipment, which would be used at the proposed plant. For each piece of equipment, the noise level under normal operating conditions was established from manufacturer's specifications.

TABLE 7.10-9. OPERATIONS EQUIPMENT DATA FOR HARLEM RIVER SITE

Equipment Name	Number of Equipment[1]	Equipment Noise Level (dBA)[2]	Reference Distance (feet)[3]
MAIN TREATMENT PROCESS			
Raw Water Pumps at water treatment plant	6	85	3
Rapid Mixers (1st Stage)	8	80	3
First Stage Vertical Flocculators	96	75	3
DAF Recycle Pumps	10	75	3.3
DAF Air Compressors	6	68	3.3
Filter Air Scour Blowers	8	85	3.3
Filter Backwash Pumps	6	74	3.3
RESIDUALS TREATMENT			
Filter to Waste Recycle Pumps	8	85	3
Waste Backwash Pumps	8	85	3
Floated Solids Buffer Tank Pumps	8	57	3.3
Waste Backwash water solids Pumps	8	85	3
Floated Solids Buffer Tanks Mixers	8	85	3
Centrifuge Feed Pumps	6	80	3
Centrate Pumps	3	80	3
Centrate Recirculation Pumps	2	85	3
Screw Conveyor	4	64	3.3
Odor Control Blowers	3	78	10
GATES/VALVES/ METERS			
Sodium Hypochlorite Pump	8	65	3.3

[2] U.S. Department of Housing and Urban Development. June 2002. The Noise Guidebook.
[3] City of New York. October 2001. CEQR Technical Manual.

TABLE 7.10-9. OPERATIONS EQUIPMENT DATA FOR HARLEM RIVER SITE

Equipment Name	Number of Equipment[1]	Equipment Noise Level (dBA)[2]	Reference Distance (feet)[3]
Sulfuric Acid Pump	8	65	3.3
Polymer - Coagulant Pump	52	65	3.3
Corrosion Inhibitor Pump	6	65	3.3
Sodium Hydroxide Pump	6	65	3.3
Hydrofluosilicic Acid Pump	6	83	3.3
Ammonia Pump	3	83	3.3
FeCl Metering Pumps	6	83	3.3
Polymer Blending Unit	4	70	3
Polymer Metering Pump	6	65	3.3
Sodium Hypochlorite Meter	6	83	3.3
Corrosion Inhibitor Meter	2	83	3.3
Sodium Hydroxide Meter	2	83	3.3
Hydrofluosilicic Acid Meter	2	83	3.3
Ferric Chloride Transfer Pump	2	83	3.3
Polymer Transfer Pump	2	60	3
Sulfuric Acid Pump	4	70	3
Sodium Hydroxide Pump	4	70	3
Dilution Water Pumps	6	85	3
MAIN SUB-STATION BUILDING			
Service Transformers	4	76	3
Current Limiting Reactor	4	70	3
Dry Type Transformer, 45 KVA	2	45	3
ADMINISTRATION BUILDING			
Dry Type Transformers, 45 KVA	2	45	3
Emergency Generator	2	95	23
FIRE PROTECTION			
Fire Pumps	2	85	3
Sewage Ejectors	4	30	3
Sump Pumps	10	30	3
Duplex Sewage Ejectors	2	30	3
Potable Water Booster Pumps	1	60	3
Flushing Water System Booster Pumps	1	60	3
HVAC			
Heating and Ventilating Units	18	81	3.3
Heating and Ventilating Units	1	78	3.3
Heating and Ventilating Units	3	82	3.3
Heating and Ventilating Units	2	105	3.3
Air Conditioning	6	80	3.3
Exhaust Fans	28	78	3.3
Chillers	2	85	3
Fire Tube Boilers	3	85	3

TABLE 7.10-9. OPERATIONS EQUIPMENT DATA FOR HARLEM RIVER SITE

Equipment Name	Number of Equipment[1]	Equipment Noise Level (dBA)[2]	Reference Distance (feet)[3]
Hot Water Pumps	3	74	3
Chilled Water Pumps	2	79	3
HOISTS			
Pump Station	1	70	3
Residuals, Mixer Area	1	23	10
OUTSIDE SOURCES			
Truck Chemical uploading Bay South	2	80	50
Truck Loading Bay North	2	80	50

Notes: [1] Equipment usage at water treatment plant established from engineering drawings.
[2] Noise levels established by contacting manufacturers.
[3] Reference distance from contacting manufacturer.

Normal operations at the completed water treatment plant are not anticipated to vary significantly over the course of a day. Noise levels from normal operations equipment, therefore, also are not expected to vary due to equipment noise levels. Since the proposed plant would operate continuously (24 hours a day and 7 days a week), both daytime and nighttime analyses were conducted. However, trucks are anticipated to make deliveries only during weekdays between the hours of 7:00 AM and 5:00 PM. Idling trucks and off-loading activities would represent an additional noise contribution that would not be present during the evening and on weekends. In order to account for this additional noise contribution, three separate possible scenarios were analyzed as described below:

- The first scenario considered normal operations with the addition of delivery trucks for the hours of 7:00 AM to 5:00 PM on weekdays.

- The second scenario considered normal operations for weekdays outside expected truck delivery hours (i.e. from 5:00 PM to 7:00 AM). The contribution of trucks to the noise level was not included in this scenario.

- The third scenario considered normal operations for weekends. Truck deliveries are not expected on weekends. The contribution of trucks to the noise level was not included in this scenario.

Following the calculation of noise levels from operations experienced at sensitive receptors, the contribution from operations was added to the baseline noise level for the future analysis year (2011) in order to derive the future with operations noise level.

Table 7.10-10 compares future baseline with the future anticipated operations noise levels at sensitive receptors during the noisiest and quietest weekday truck delivery hours (between 7:00 AM to 5:00 PM) at each receptor. Figure 7.10-2 shows the location of the sensitive receptors. It is anticipated that the apartments on Bailey Avenue (HRS-S5) would have the highest noise level of 73.3 dBA during 10:00 AM – 11:00 AM. No incremental change greater than 0.4 dBA over future baseline noise levels due to operations noise was anticipated for any location. Therefore, it was concluded that the noise contribution from stationary sources during weekday truck delivery hours to the total project-generated noise would not exceed the 3-5 dBA threshold used to define significance using established *CEQR* criteria.

TABLE 7.10-10. MAXIMUM NOISE LEVELS AT SENSITIVE RECEPTORS FROM OPERATIONS DURING WEEKDAY TRUCK-DELIVERY HOURS (Leq, dBA)

Proximate Receptor	Monitoring Period	Future Without Project Noise Level (2011)	Predicted Operations Noise Level	Total Future Operations Noise Level	Incremental Change	Exceed Threshold (Yes/No)
HRS-S1	3-5 PM (Quietest)	65.4	50.9	65.5	0.1	No
	10-11 AM (Noisiest)	69.9	50.9	70.0	0.1	No
HRS-S2	3-5 PM (Quietest)	66.3	60.6	67.3	1.0	No
	10-11 PM (Noisiest)	70.8	60.6	71.2	0.4	No
HRS-S3	3-5 PM (Quietest)	68.9	52.0	69.0	0.1	No
	10-11 AM (Noisiest)	67.4	52.0	67.5	0.1	No
HRS-S4	3-5 PM (Quietest)	68.3	55.2	68.5	0.2	No
	10-11 AM (Noisiest)	67.1	55.2	67.4	0.3	No
HRS-S5	3-5 PM (Quietest)	72.1	44.5	72.1	0	No
	10-11 AM (Noisiest)	73.3	44.5	73.3	0	No

Total Noise Level During Operation = logarithmic addition of Future Without Project and Predicted Operations Noise Levels

Table 7.10-11 compares future baseline noise levels with the future with operations noise levels at each receptor during the quietest weekday non-delivery hours (between 5:00 PM to 7:00 AM). It is anticipated that receptor HRS-S5 would have the highest noise level of 71.7 dBA during 1:00 – 2:00 AM. The greatest incremental change for any receptor location over future baseline noise levels due to operations noise was 0.1 dBA. Therefore, it was concluded that the noise contribution from stationary sources to the total project-generated noise would not exceed the 3-5 dBA threshold used to define significance using established CEQR criteria.

TABLE 7.10-11. MAXIMUM NOISE LEVELS AT SENSITIVE RECEPTORS FROM OPERATIONS DURING WEEKDAY NON-DELIVERY HOURS (Leq, dBA)

Proximate Receptor	Monitoring Period	Future Without Project Noise Level (2011)	Predicted Operations Noise Level	Total Future Operations Noise Level	Incremental Change	Exceed Threshold (Yes/No)
HRS-S1	1-3 AM (Quietest)	58.3	33.3	58.3	0	No
HRS-S2	7-8 PM (Quietest)	66.3	51.3	66.4	0.1	No
HRS-S3	1-3 AM (Quietest)	61.3	40.1	61.3	0	No
HRS-S3	1-3 AM (Quietest)	63.7	43.7	63.8	0.1	No
HRS-S5	7-8 PM (Quietest)	71.7	33.0	71.7	0	No

Total Noise Level During Operation = logarithmic addition of Future Without Project and Predicted Operations Noise Levels

Table 7.10-12 compares future baseline noise levels with operations noise levels at each receptor during the noisiest and quietest Sunday hours (i.e. no truck deliveries on weekends). It is anticipated that receptor HRS-S5 would have the highest noise level of 70.5 dBA during 3:00 – 5:00 PM. No incremental change greater than 0.2 dBA over future baseline noise levels was anticipated for any of the sensitive receptors. Therefore, it was concluded that the noise contribution from stationary sources to the total project-generated noise would not exceed the 3-5 dBA threshold used to define significance using established *CEQR* criteria.

Noise at Proposed Public Open Space. As part of the proposed project, the area immediately to the north and south of the proposed plant would be redeveloped and provided to the public as open space. The redeveloped area is proposed to consist of playgrounds, sports fields, and walking areas. Once completed, this area would itself be considered a sensitive receptor. Because the area would not exist as a sensitive receptor until after the proposed plant is scheduled for completion, existing conditions could not be established and therefore no incremental change in noise level could be calculated. As a result, absolute noise limits were used to assess potential impacts at this sensitive receptor. The Noise Exposure Guidelines as promulgated under CEQR set absolute noise levels for this analysis.[4] Table 7.10-13 presents those limits from the Noise Exposure Guidelines relevant to this analysis. The full guidelines are presented in Table 4.10-2 in the Methods section

[4] City of New York. October 2001. CEQR Technical Manual.

TABLE 7.10-12. MAXIMUM NOISE LEVELS AT SENSITIVE RECEPTORS FROM OPERATIONS ON A SUNDAY (Leq, dBA)

Proximate Receptor	Monitoring Period	Future Without Project Noise Level (2011)	Predicted Operations Noise Level	Total Future Operations Noise Level	Incremental Change	Exceed Threshold (Yes/No)
HRS-S1	2-3 am (Quietest)	59.8	33.3	59.8	0	No
	3-5 pm (Noisiest)	69.3	33.3	69.3	0	No
HRS-S2	9-10 am (Quietest)	65.8	51.3	66.0	0.2	No
	3-5 pm (Noisiest)	67.1	51.3	67.2	0.1	No
HRS-S3	2-3 am (Quietest)	61.3	40.1	61.3	0	No
	3-5 pm (Noisiest)	64.0	40.1	64.0	0	No
HRS-S4	2-3 am (Quietest)	63.2	43.7	63.2	0	No
	3-5 pm (Noisiest)	66.4	43.7	66.4	0	No
HRS-S5	2-3 am (Quietest)	69.7	33.0	69.7	0	No
	3-5 pm (Noisiest)	70.5	33.0	70.5	0	No

Total Noise Level During Operation = logarithmic addition of Future Without Project and Predicted Operations Noise Levels

TABLE 7.10-13. CEQR NOISE EXPOSURE GUIDELINES

Time Period	Acceptable	Marginally Acceptable	Marginally Unacceptable	Clearly Unacceptable
7 AM to 10 PM	$L_{10} \leq 65$ dBA	$65 < L_{10} \leq 70$ dBA	$70 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA
10 PM to 7 AM	$L_{10} \leq 55$ dBA	$55 < L_{10} \leq 70$ dBA	$70 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA

Source: *CEQR Technical Manual, 2001*

It was assumed that the open space area would be open from 6:00 AM – 10:00 PM on weekdays and weekends. Baseline monitoring established noise levels (using the L_{10} descriptor) for the noisiest and quietest periods during opening hours. Future noise levels (L_{10}) were calculated and compared to the CEQR Noise Exposure Guidelines. Table 7.10-14 compares projected noise levels from future operations to the noise exposure guidelines. For a weekday, an L_{10} of 61.3 dBA was anticipated for the quietest period (7:00 – 8:00 PM), and an L_{10} of 68.4 dBA was anticipated for the noisiest period (10:00 – 11:00 AM). For a Sunday, an L_{10} of 61.5 dBA was anticipated for the quietest period (9:00 – 10:00 AM), and an L_{10} of 70.6 dBA was anticipated for the noisiest period (4:00 – 5:00 PM).

TABLE 7.10-14. NOISE LEVELS AT PROPOSED PUBLIC OPEN SPACE AREA (L_{10}, dBA)

Monitoring Period	Future With Operations Noise Level[1]	CEQR Noise Exposure Guideline
Weekdays		
7-8 PM (Quietest)	61.3	Marginally Acceptable
10-11 AM (Noisiest)	68.4	Marginally Acceptable
Sundays		
9-10 AM (Quietest)	61.5	Marginally Acceptable
4-5 PM (Noisiest)	70.6	Marginally Unacceptable

Notes: [1] As was the case with L_{eq}, future L_{10} values were assumed to be the same as measured existing L_{10}. See Future Without the Project section above.

The monitoring period during the noisiest period for Sunday was in the marginally unacceptable range. However, the baseline noise level at this location already would be high due to its close proximity to the Major Deegan Expressway.

Combined Mobile and Stationary Source Noise. The proposed Fordham Landing Apartments (HRS-S1) could be exposed to the combined effect of both mobile and stationary noise generated by the proposed water treatment plant. The greatest incremental change at this receptor due to stationary source noise for any of the three operations scenarios presented above would be 0.1 dBA during weekday truck delivery hours (between 7:00 AM – 5:00 PM). Based on the PCE screen presented in Table 7.10-1, the potential incremental change in noise level for the route segment along which the receptor is located also would be approximately 0.1 dBA. The combined effect of these noise sources due to operations activities would not produce an increase in noise levels that would exceed the 3-5 dBA significance threshold.

7.10.3.2. Potential Construction Impacts

Potential noise impacts due to construction activities at the proposed plant site were analyzed for mobile and stationary source sensitive receptors in the vicinity of the site. Peak construction noise levels were compared to noise levels for the Future Without the Project year. The anticipated year of peak mobile source noise during construction for the proposed plant is 2009 (see footnote on page 10).

The anticipated year of peak stationary source noise during construction for the proposed plant was 2006 (see footnote on page 10). Construction activities at the water treatment plant site are scheduled to take place between May 2006 and November 2011. The work is anticipated to take place between 7:00 AM and 6:00 PM on weekdays.

The proposed plant site falls within the jurisdiction of the City. Standards to determine significant adverse impacts as established by CEQR also used to evaluate noise impacts to this site. Applicable standards relating to single-family residences were applied to the area surrounding the site, which is zoned as high density residential. As discussed previously, a project-generated increase of five dBA or more over the baseline noise level recorded at a sensitive receptor during the daytime may be a significant impact if the existing noise level is less than 60 dBA. If the existing noise level is 62 dBA or more, a three dBA or more incremental change may constitute a significant impact. A more restrictive (three dBA incremental) threshold applies during the nighttime.[5]

7.10.3.2.1. Mobile Source Noise

Potential impacts from project-related mobile sources during the construction phase of the proposed project were determined for the analysis year (2009) along noise-sensitive route segments in the site vicinity. As previously discussed, on the basis of the PCE screening analysis (Table 7.10-2 above), it was determined that none of the identified noise-sensitive route segments in the vicinity of the proposed project site would experience a 3 dBA or more incremental change in noise levels due to construction activities. Therefore, it was concluded that the contribution of mobile source noise to the total construction-generated noise would not result in noise levels exceeding the 3-5 dBA threshold.

7.10.3.2.2. Stationary Source Noise

Potential noise impacts at the proximate receptors resulting from the use of on-site equipment during construction activities were assessed. 2006 was used as the analysis year as it represented the month with the maximum construction-related noise levels. The maximum projected noise level for the peak month from construction activities was added to the future baseline value in order to determine the noise impacts for the worst-case scenario. Analysis of potential construction-induced noise took into account the variability of noise emissions over the course of the construction due to changing construction conditions. Noise levels from construction related equipment would vary over the course of the construction schedule. Construction equipment use would be intermittent and variable during a normal workday. In addition, the location of equipment would vary during the day as equipment would move between areas on the site. Finally, the precise equipment tally would vary from period to period as the phases of construction change over the entirety of the project.

A noise prediction algorithm (that considered equipment noise levels, usage factors, and distances from source to receptor discussed above) was used to calculate the average noise level at a proximate receptor for a typical hour for each month of construction. The algorithm is presented and discussed in greater detail in Section 4.10, Data Collection and Impact Methodologies, Noise.

[5] City of New York. October 2001. CEQR Technical Manual.

A monthly breakdown of anticipated equipment for the duration of the project was obtained from engineering construction plans. Relevant equipment noise levels for construction equipment were determined from industry and governmental publications. Usage factors were used to account for the fact that construction equipment use is intermittent throughout the course of a normal work-day. A random-number generator was employed to account for equipment location being variable. Certain pieces of equipment that only would be used within the footprint of the proposed plant (e.g. pile drivers) were restricted to placement within that area of the site. The remaining construction equipment was randomly placed over the entire site. In this manner, horizontal and vertical distances from construction equipment to the receptors being studied were established for each month in order to calculate the line-of-sight distance between the noise source and the sensitive receptor. Table 7.10-15 presents construction equipment, including associated noise levels and usage factors, anticipated for use over the course of construction at the site. Equipment noise levels (at their associated reference distances) and the usage factors are standard values established through noise studies. The reference for this study is provided at the bottom of the table.

TABLE 7.10-15. NOISE LEVELS AND USAGE FACTORS FOR CONSTRUCTION EQUIPMENT USED AT HARLEM RIVER SITE [1]

Equipment	Equipment Noise Level (dBA)	Reference Distance (feet)	Usage Factor				
			Clearing	Excavation	Foundation	Erection	Finishing
Grader	85	50	0.05				0.02
Asphaltic Paver	89	50	[3]				0.12
Aggregate Spreader[2]	89	50					0.12
Roller	74	50					0.1
Crane 100-Ton Hydraulic	83	50				0.08	0.04
Crane 250-Ton Hydraulic	88	50				0.04	0.02
Crane 50-Ton Hydraulic	83	50				0.08	0.04
Crane 70-Ton Hydraulic	83	50				0.08	0.04
Crane 90-Ton Hydraulic	83	50				0.08	0.04
Wood Chipper[2]	93	30	0.05				
Backhoe	85	50	0.04	0.16			0.04
Loader	84	50	0.16	0.16			0.04
Truck[4]	80	50	0.16	0.16			0.16
Compactor-Vibratory	82	50	0.05				
Fence Post Hole Digger[2]	82	50	0.05				
Concrete Floor Finisher	76	50			0.4		0.08
Concrete Vibrator[2]	76	50			0.4		0.08
Concrete Pump	82	50			0.4		0.08
Welding Machine[2]	70	50				0.4	
Pile Driver	101	50			0.04		
Air Compressor- 600 C	81	50		1.0	0.4	0.4	0.4

TABLE 7.10-15. NOISE LEVELS AND USAGE FACTORS FOR CONSTRUCTION EQUIPMENT USED AT HARLEM RIVER SITE [1]

Equipment	Equipment Noise Level (dBA)	Reference Distance (feet)	Usage Factor				
			Clearing	Excavation	Foundation	Erection	Finishing
Rock Drill	98	50		0.04			0.05
Rock Crusher[2]	93	50		0.04			0.05

Source:
[1] Bolt, Beranek, and Newman, Inc. December 1971. Noise from Construction Equipment and Operations, Buildings Equipment and Home Appliances.
[2] No usage factors available. Usage factors from similar equipment were applied.
[3] Blanks indicate no or very rare usage.
[4] Bolt, Beranek, and Newman, Inc. December 1971 Noise from Construction Equipment and Operations, Buildings Equipment and Home Appliances with attenuation for exhaust mufflers applied.

Figures 7.10-3 through 7.10-7 present monthly total noise levels during construction activities (as calculated by the noise prediction algorithm) at each identified sensitive receptor for the full duration of the construction phase. For Receptor HRS-S2, the Major Deegan Expressway serves as a noise berm between the site and the receptor by breaking the line-of-sight. The expressway overpass that separates the site and Fordham Landing Park (Receptor HRS-S2) at this location is approximately 17 feet above grade and is built on a solid earth and concrete structure. Noise level reductions of 11 dBA were factored into the noise prediction algorithm for this receptor. The noise-reduction was calculated on the basis of noise attenuation guidance from the U.S. Department of Housing and Urban Development.[6]

Following the calculation of monthly noise levels during construction activities, an analysis was performed for the anticipated peak noise month during construction (2006). The analysis determined whether construction would result in noise increasing to levels that exceed the 3-5 dBA threshold for this worst-case scenario. The maximum projected noise level for the peak month from construction activities was added to the future baseline value in order to predict the greatest noise level changes. Potential noise impacts were assessed only for weekdays during construction hours (7:00 AM- 6:00 PM) since no construction-related noise was anticipated outside of these hours. The following is a summary of the predicted total noise levels due to stationary construction sources at each of the noise sensitive receptors. Table 7.10-16 presents maximum construction noise level data for the peak construction-noise year (2006).

[6] U.S. Department of Housing and Urban Development, Office of Community Planning and Development. June 2002. Noise Guidebook. Washington, D.C.

FIGURE 7.10-3. PREDICTED CONSTRUCTION NOISE LEVELS BY MONTH AT MONITORING LOCATION HRS-S1 (WITHOUT MITIGATION) (Leq, dBA)

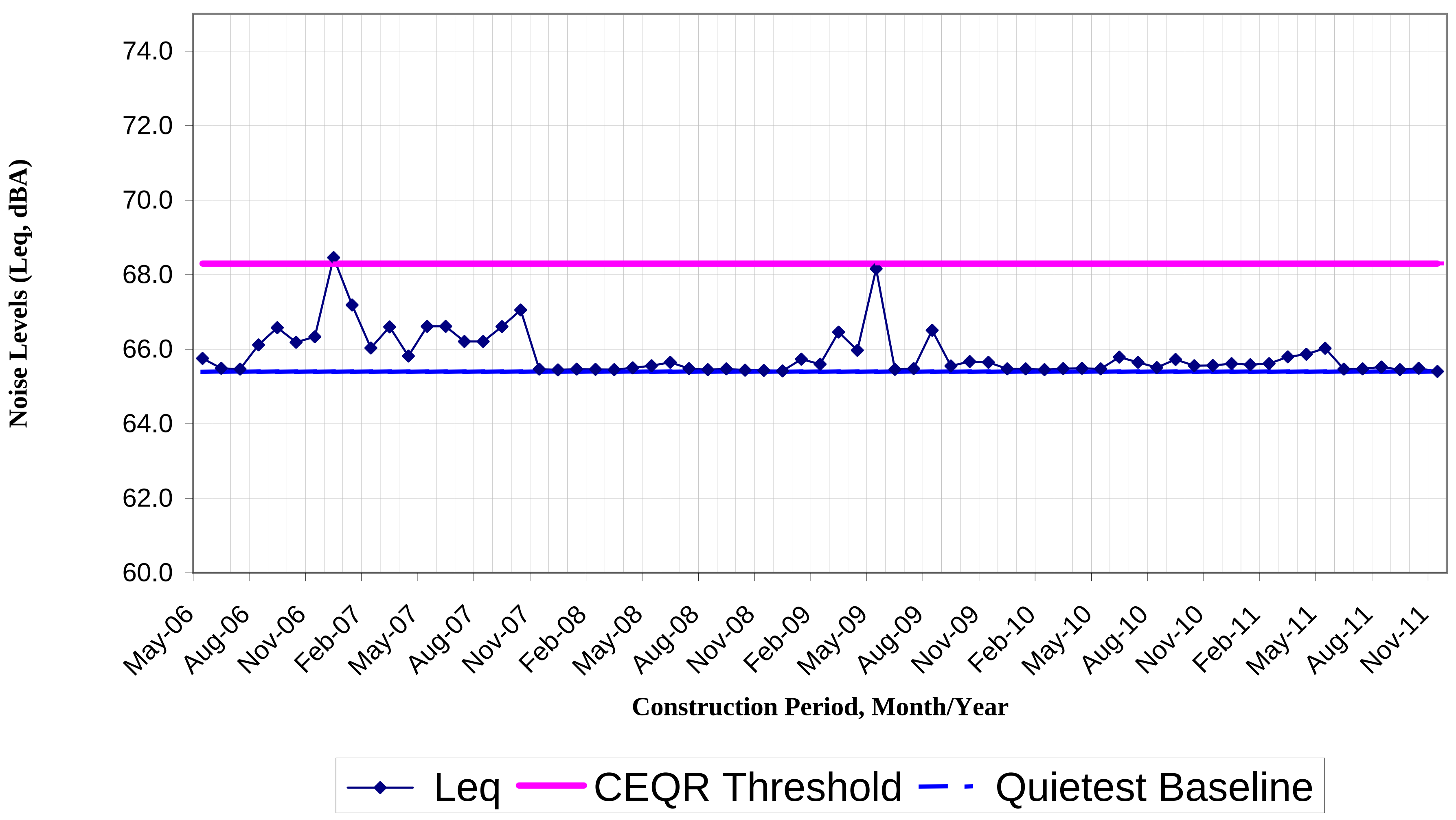


FIGURE 7.10-4. PREDICTED CONSTRUCTION NOISE LEVELS BY MONTH AT MONITORING LOCATION HRS-S2 (WITHOUT MITIGATION) (Leq, dBA)

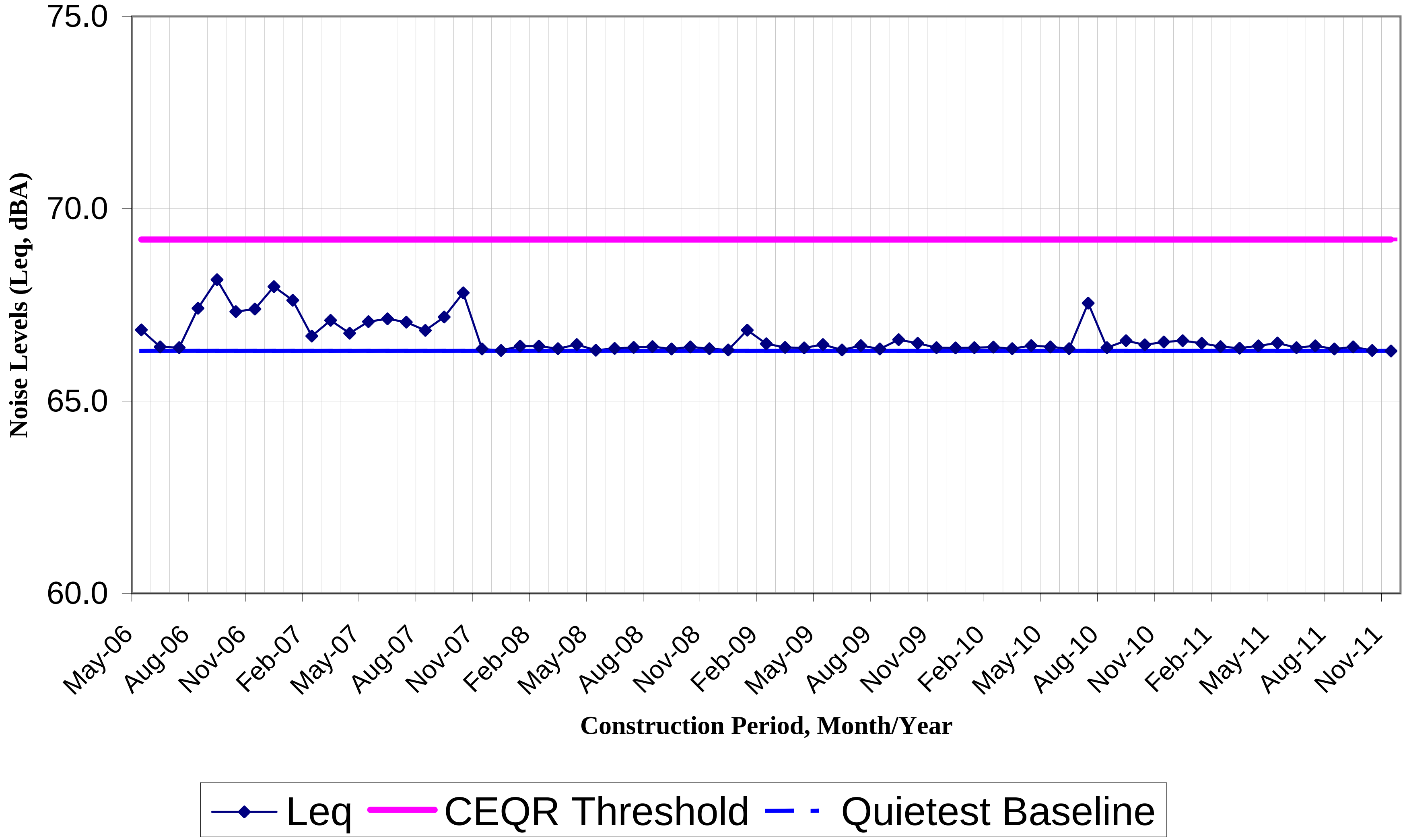
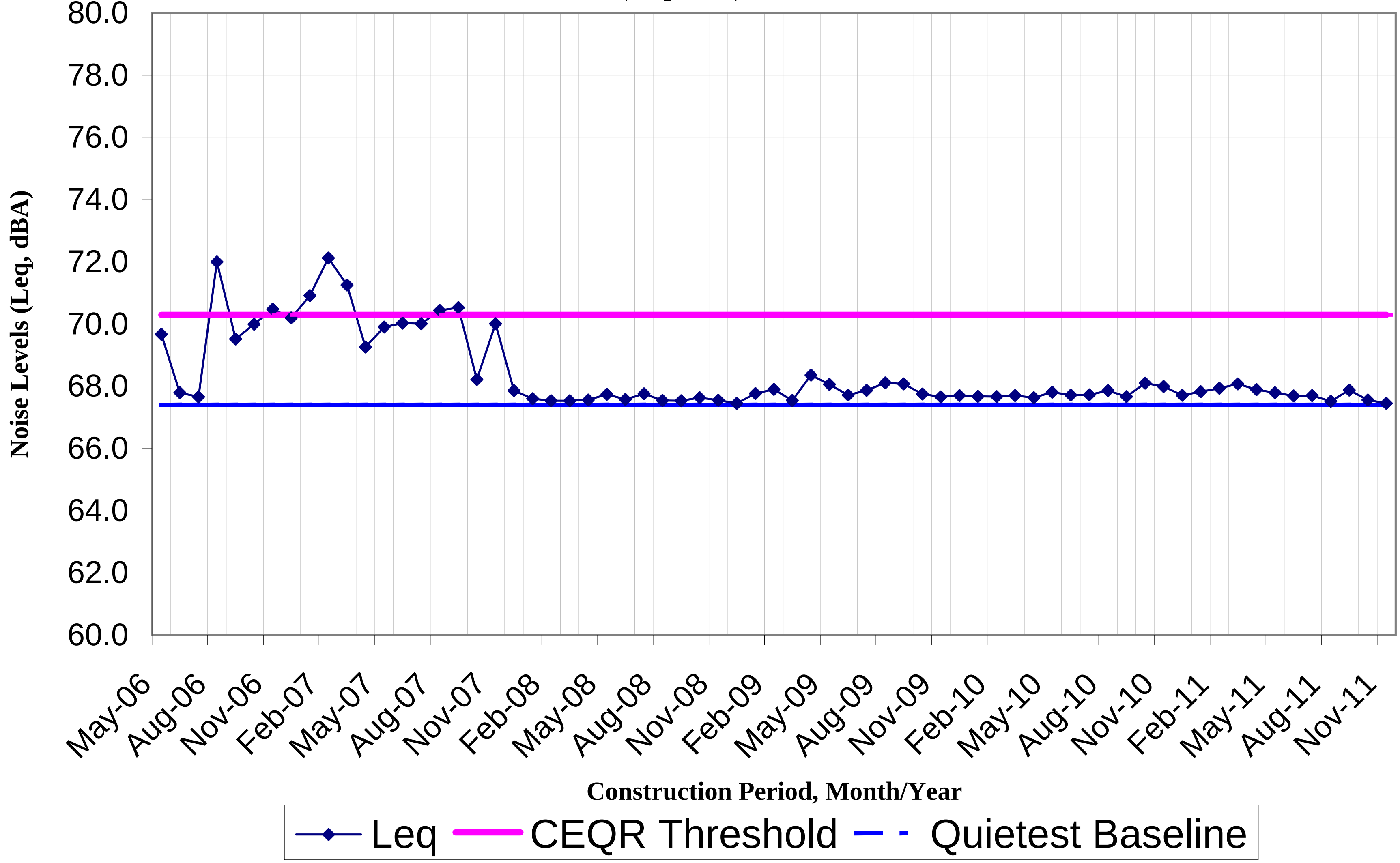


FIGURE 7.10-5. PREDICTED CONSTRUCTION NOISE LEVELS BY MONTH AT MONITORING LOCATION HRS-S3 (WITHOUT MITIGATION) (Leq, dBA)



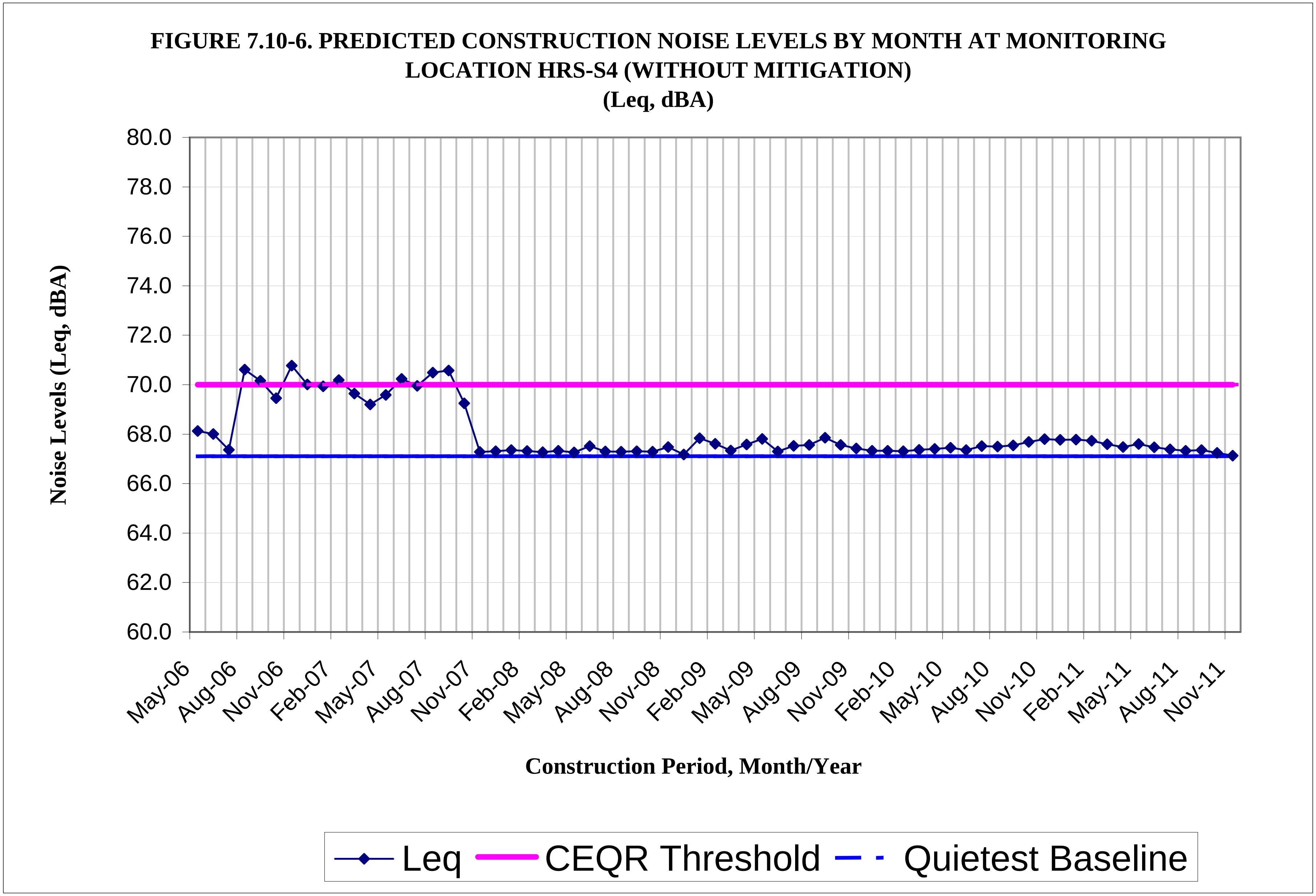


FIGURE 7.10-6. PREDICTED CONSTRUCTION NOISE LEVELS BY MONTH AT MONITORING LOCATION HRS-S4 (WITHOUT MITIGATION)
(Leq, dBA)
Noise Levels (Leq, dBA)
80.0
78.0
76.0
74.0
72.0
70.0
68.0
66.0
64.0
62.0
60.0
May-06
Aug-06
Nov-06
Feb-07
May-07
Aug-07
Nov-07
Feb-08
May-08
Aug-08
Nov-08
Feb-09
May-09
Aug-09
Nov-09
Feb-10
May-10
Aug-10
Nov-10
Feb-11
May-11
Aug-11
Nov-11
Construction Period, Month/Year
Leq
CEQR Threshold
Quietest Baseline

FFIGURE 7.10-7. PREDICTED CONSTRUCTION NOISE LEVELS BY MONTH AT MONITORING LOCATION HRS-S5 (WITHOUT MITIGATION) (Leq, dBA)

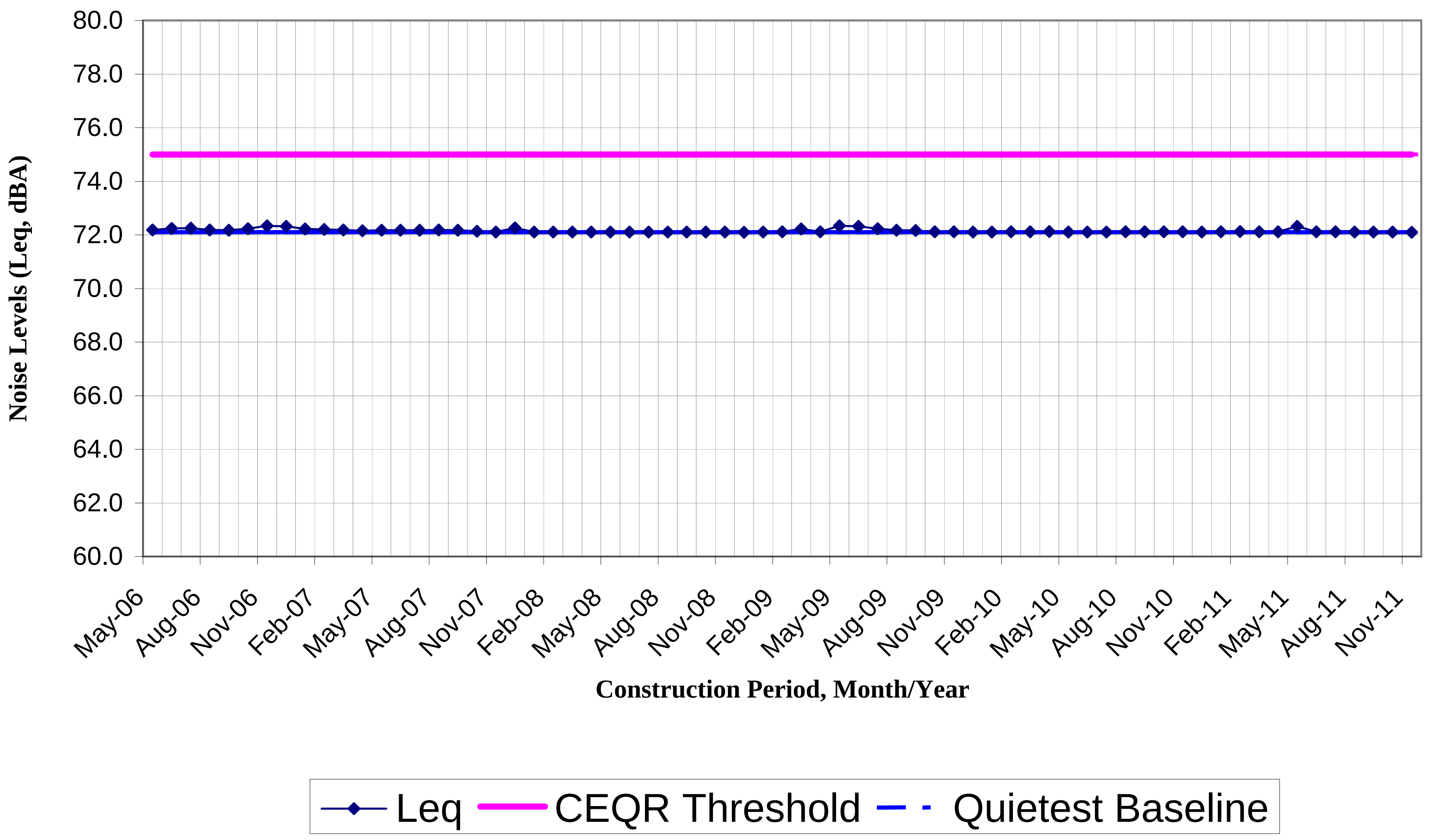


TABLE 7.10-16. MAXIMUM NOISE LEVELS FROM CONSTRUCTION ACTIVITIES AT RECEPTORS NEAR HARLEM RIVER SITE WITHOUT MITIGATION (Leq, dBA) (2006 ANALYSIS YEAR)

Proximate Receptor	Monitor Period	Future Without Project Noise Level[1]	Predicted Construction Noise Level[2]	Total Noise Level During Construction[3]	Incremental Change[4]	CEQR Threshold[5]	Reduction Required to Reach Goal[6]	Exceed CEQR Threshold? (Y/N)
HRS-S1	3-5 PM (Quietest)	65.4	65.5	68.5	3.1	68.3	0.2	Y
	10-11 AM (Noisiest)	69.9	65.5	71.2	1.3	72.8	0	N
HRS-S2	3-5 PM (Quietest)	66.3	63.6	68.2	1.9	69.2	0	N
	10-11 PM (Noisiest)	70.8	63.6	71.6	0.8	73.7	0	N
HRS-S3	3-5 PM (Quietest)	68.9	70.3	72.7	3.8	71.8	0.9	Y
	10-11 AM (Noisiest)	67.4	70.3	72.1	4.7	70.3	1.8	Y
HRS-S4	3-5 PM (Quietest)	68.3	68.3	71.3	3.0	71.2	0.1	Y
	10-11 AM (Noisiest)	67.1	68.3	70.8	3.7	70.0	0.8	Y
HRS-S5	3-5 PM (Quietest)	72.1	59.5	72.3	0.2	75.0	0	N
	10-11 AM (Noisiest)	73.3	59.5	73.5	0.2	76.2	0	N

[1]Future Without Project Noise = measured existing
[2]Predicted Construction Noise from on-site construction equipment as experienced at receptors.
[3]Total Noise Level During Construction = logarithmic addition of Future Without the Project Noise Level plus Predicted Construction Noise Level
[4]Incremental Change = Total Noise Level minus the Future Without the Project Noise Level.
[5]CEQR Threshold: The maximum allowable noise level = Future Without the Project plus maximum allowable decibels according to CEQR 3-5 dBA rule: <60 dBA, 5 dBA increase acceptable
60-61 dBA, >=4 dBA increase acceptable
>61 dBA, >=3 dBA increase unacceptable
[6]Reduction Required to Reach Goal: The reduction needed to bring Total Noise Level below the CEQR threshold

Proposed Fordham Landing Apartments (HRS-S1). Noise levels predicted to occur as a result of the proposed project at the proposed apartments (HRS-S1) located to the south of the proposed site would exceed the 3 - 5 dBA threshold used to define significance. The largest incremental change at this receptor (located to the south of the proposed site) over the Future Without the Project level would be 3.1 dBA. Predicted noise levels would exceed the acceptable threshold for a single month (December 2006). However, due to the short duration of these construction-related noise level increases, these noise levels would be considered temporary and not significant.

An analysis was performed to determine the total distance beyond the proposed apartments (and further to the south) that noise levels exceeding the 3-5 dBA threshold would extend. This was performed to determine the distance that the noise levels would extend and to what extent local noise-sensitive receptors would be affected. Noise levels that exceed the 3-5 dBA threshold would extend from the south of the site to a maximum distance of approximately 20 feet to the south of the proposed apartments. This area would still be within the proposed apartment complex (see Figure 7.10-8).

Fordham Landing Park (HRS-S2). Noise levels predicted to occur as a result of the proposed project at the Fordham Landing Park (HRS-S2) located directly east of the site would not exceed the 3-5 dBA threshold used to define significance.

An analysis was performed to determine the total distance beyond the park (and further to the east) that noise levels exceeding the 3-5 dBA threshold would extend. This was performed to determine the distance that the noise levels would extend and to what extent local noise-sensitive receptors would be affected. Predicted noise levels at the park would not exceed the threshold during construction because this receptor is shielded by an elevated section of the Major Deegan Expressway that acts as a noise barrier. The elevated roadway enabled a noise reduction of 11 dBA to be factored into the overall noise algorithm for this receptor. Receptors lying further to the east may are not similarly shielded. Therefore, this 11 dBA reduction was not assumed when calculating the lateral extent of the construction-related noise levels.

Noise levels that exceed the 3-5 dBA threshold would extend from the east end of the site to a maximum distance of approximately 560 feet to the east of the park intermittently for a period from approximately September 2006 until October 2007. This area to the east is characterized by businesses that border the Major Deegan Expressway and West Fordham Road. Both of these roadways are significant sources of area noise. No significant adverse impacts are predicted as a result of the temporary nature of the construction activities (see Figure 7.10-8).

Residences at Intersection of Sedgwick and Bailey Avenues (HRS-S3). Noise levels predicted to occur as a result of the proposed project at residences at the intersection of Sedgwick and Bailey Avenues (HRS-S3) located to the east of the site would exceed the 3-5 dBA threshold used to define significance. The largest incremental change at this receptor (located to the east of the proposed site) over the Future Without the Project level would be 4.7 dBA. Predicted noise levels would exceed the acceptable threshold sporadically from approximately August 2006 until September 2007. However, due to the short duration and sporadic nature of these construction-related noise level increases, these increased noise levels would be considered temporary and not significant.

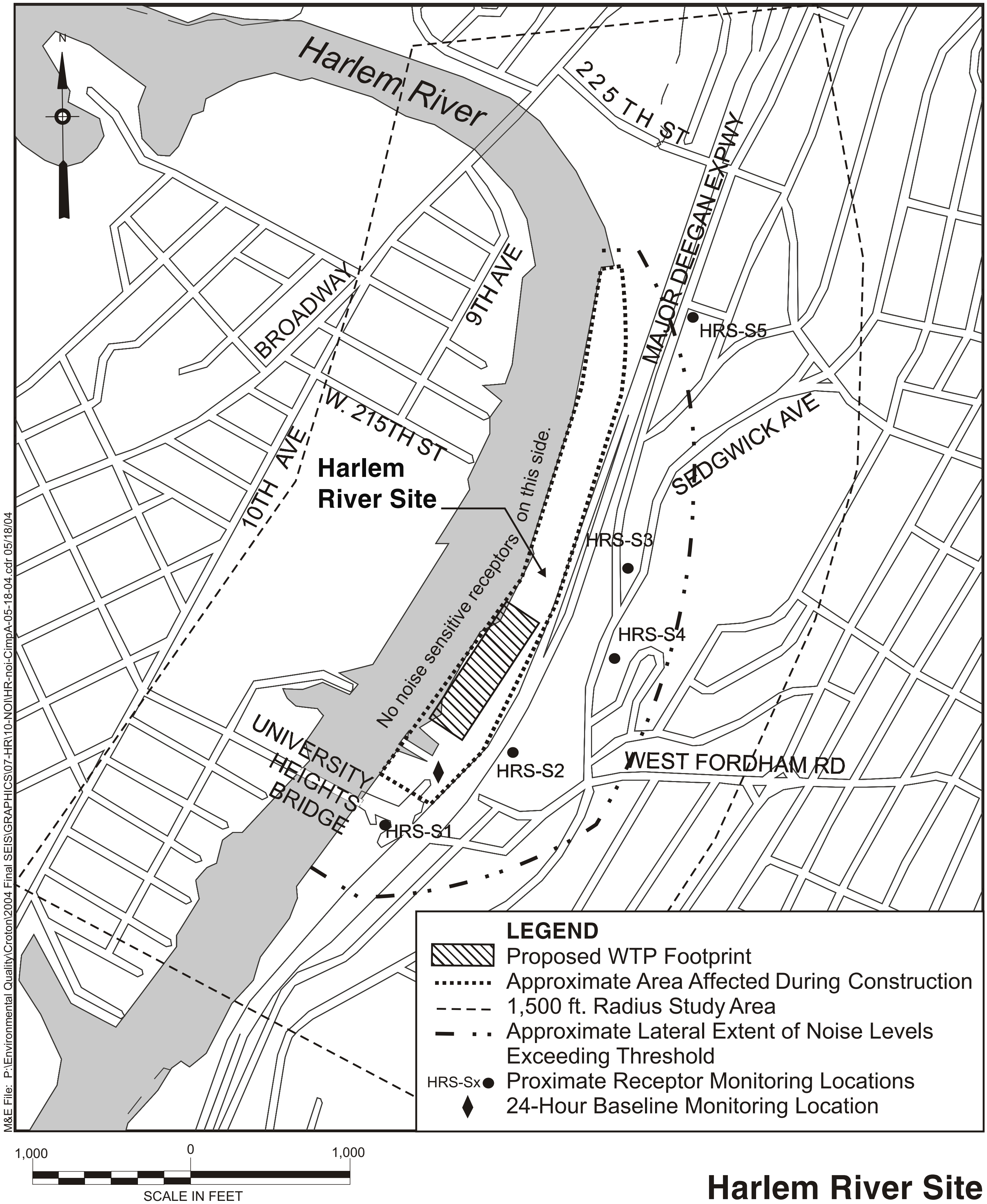
An analysis was performed to determine the total distance beyond the residences (and further to the east) that noise levels exceeding the 3-5 dBA threshold would extend. This was performed to determine the distance that the noise levels would extend and to what extent local noise-sensitive receptors would be affected. Noise levels that exceed the 3-5 dBA threshold would extend from the east of the site to a maximum distance of approximately 220 feet to the east of the residences. This area would still be within the residences that line Bailey Road (see Figure 7.10-8).

Apartments on Sedgwick Avenue (HRS-S4). Noise levels predicted to occur as a result of the proposed project at the apartments on Sedgwick Avenue (HRS-S4) located to the east of the site would exceed the 3 - 5 dBA threshold used to define significance. The largest incremental change at this receptor (located to the east of the proposed site) over the Future Without the Project level would be 3.7 dBA. Predicted noise levels would exceed the acceptable threshold sporadically from approximately August 2006 until September 2007. However, due to the short duration and sporadic nature of these construction-related noise level increases, these increased noise levels would be considered temporary and not significant.

An analysis was performed to determine the total distance beyond the apartments (and further to the east) that noise levels exceeding the 3-5 dBA threshold would extend. This was performed to determine the distance that the increased noise levels would extend and to what extent local noise-sensitive receptors would be affected. Noise levels that exceed the 3-5 dBA threshold would extend from the east of the site to a maximum distance of approximately 115 feet to the east of the apartments . This area would still be within the apartment complex (see Figure 7.10-8).

Apartment Complex on Bailey Avenue (HRS-S5). Noise levels predicted to occur as a result of the proposed project at the apartments located to the northeast of the site on Bailey Avenue (HRS-S5) would not exceed the 3-5 dBA threshold used to define significance. This is due to the apartments' close proximity to the Major Deegan Expressway, which is itself a significant noise source.

Facilities such as residences, health care facilities, schools, libraries, and parks are considered sensitive noise receptors. If noise reduction measures were not implemented as part of the project, sensitive receptors within the area of noise levels that exceed the 3-5 dBA threshold could be exposed to these increased levels sporadically from approximately August 2006 until September 2007 as a result of construction-related noise. However, due to the short duration and sporadic nature of these construction-related noise levels, these increased noise levels would be considered temporary and not significant.



Harlem River Site
Lateral Extent of Noise Levels Exceeding Threshold (Before Mitigation)

Combined Mobile and Stationary Source Noise. The proposed Fordham Landing Apartments could be exposed to the combined effects of both mobile and stationary noise generated by construction activities at the proposed water treatment plant. The greatest incremental change from mobile sources is predicted to occur in 2009 and the greatest incremental change from stationary sources is predicted to occur in 2006. Although these years are different, the two peak years were combined in order to predict the worst-case scenario. This is the most conservative approach and could over-estimate combined noise levels. Based on the PCE screen presented in Table 7.10-2, the potential incremental change in mobile source noise levels due to construction activities for the route segments along which these sensitive receptors are located is less than half a decibel. Receptors at this site already would have noise levels in excess of the CEQR impact threshold used to determine significance due to contributions from stationary source noise. The contribution from mobile sources to the total noise would not appreciably change predicted noise levels.

However, due to the short duration of these construction-related noise level increases, the impacts would be considered temporary and not significant. Section 9.0, Mitigation of Potential Impacts, presents possible mitigations measures that could be implemented should they be necessary.

7.10.3.2.3. Vibration from Construction

Due to the magnitude of this project, it is possible that excavation activities may cause vibrations. Vibrations could occur due to rock blasting activities and from tunnel boring machine (TBMs). The shafts of the proposed water treatment plant will be cut with TBMs. It is possible that blasting may be utilized in a minor way for some of the shaft work.

Rock Blasting. Blasting is a method of removing large quantities of rock. Modern blasting techniques incorporate delay blasting, which consists of reducing a single blast to a series of smaller blasts through the use of millisecond delays. As an example, if a total charge (W) is detonated using five delays, the effective vibration-generating charge is only one-fifth of W, but the demolition effect is the same as the total charge W fired instantaneously. This technique is an effective vibration control method. Blasting is conducted underground within the bedrock (a major noise attenuating material in itself).

Prior to the commencement of a blasting program, a preblast survey and test blasting would be conducted at the site identified for rock removal. This exercise would establish actual site conditions as they relate to the rock blasting and would aide the blasting contractor in having an appropriate blast design. The blast design would consider such factors as rock type, rock fracturing, spacing of charges, topography, type of explosives, etc. It is in this manner that potential impacts of blasting would be kept within acceptable limits.

There are four key potential impacts from blasting. Proper preblast testing and blast design would mitigate each of these issues:

- Flyrock.. Flyrock is controlled through proper blast design (which in turn is a result of preblast surveying and test blasting) and the use of blast mats. Blast mats are thick mats (metal or metal-reinforced rubber) that are placed directly on top of the rock body to be blasted. A blast safety zone area also would be established. The actual extent of this area would be established by the blasting contractor on the basis of the preblast survey and test blasting. As an extra precaution, it is common practice to stop traffic traveling on roads in the immediate vicinity of the blast for the few seconds that the blast is detonated. Potentially affected roads would be the Major Deegan Expressway and W. 207th Street.

- <u>Ground Vibration.</u> Ground vibration is controlled with proper blast design. Maximum acceptable vibration is strictly controlled so as to avoid any potential damage to nearby structures.

- <u>Airblast (noise).</u> Airblast is usually caused by poor blast design resulting in uncovered surface detonation. It can be a cause of complaints but is unlikely to cause physical damage. Under normal conditions, noise generated by a blast is analogous to a distant rumble of thunder: it may be noticeable to the individual but would not itself be a major source of noise. On a large construction site, equipment such compressors and rock drilling would constitute the largest sources of noise. These sources would occur with regularity over the course of a work day whereas blasting would last a few seconds for two to three times a day. The instantaneous noise level itself would be attenuated due to the fact that the charges would be detonated within the rock mass, which is itself an effective noise attenuator.

- <u>Dust</u>**.** Dust would be suppressed with the use of blast mats. Blasting contractors also frequently spray water on the hauling roads to prevent dust.

Rock blasting is not anticipated at the Harlem River Site.

The potential areas of concern listed above each can be effectively controlled so as to produce no demonstrable public disturbance through the use of proper blast design. A certified blasting contractor would be engaged by the construction manager. There are strict industry standards that govern and limit acceptable noise and vibration resulting from blasting. These limits are a part of the contract specifications to which the blasting contractor will be obligated to adhere. In addition, the New York City Fire Department has Guidelines for Blasting Contractors that govern the safe operation of explosives regarding, among other things, their storage, use, and transportation. These guidelines also are included in the detailed specifications and must be adhered to by the blasting contractor.

Facilities identified as sensitive receptors would be notified prior to the commencement of blasting. Monitoring would be conducted adjacent to the receptor by specialty contractor. All complaints received would be investigated thoroughly.

Tunnel Boring Machines. Vibrations from advancing TBMs may affect sensitive electronic equipment. The tunneling subcontractor would develop a vibrations monitoring program during the engineering phase of the project. Prior to any boring activities, the location of the bore path would be reviewed to identify any businesses, hospitals, residences, or other facilities located in the vicinity of the planned boring. Soil conditions, structural conditions of neighboring buildings, and sensitive uses will be identified. Although TBMs have been used on a number of projects within the City of New York and vibration has seldom caused any impacts during these operations, any potential impacts on people or property due to vibration would be addressed for the proposed project. The impact of the vibrations would be reduced to levels permitted by applicable local, state, and federal regulations and codes.