6.16 MITIGATION MEASURES

6.16.1 Introduction

CEQR and SEQRA require that identified potential significant adverse impacts be minimized or avoided to the fullest extent practicable and that mitigation measures be identified and evaluated in an EIS. Where no mitigation is available, the EIS must disclose the potential for unmitigable significant adverse impacts.

This Section presents mitigation measures for potential significant adverse impacts from construction of Shaft 33B at the E. 59th Street/Second Avenue Shaft Site. Significant adverse impacts were identified for noise. Potential significant noise impacts would not be fully mitigable. These unavoidable impacts are disclosed in this Section and in Section 6.17, "Unavoidable Adverse Impacts." In addition, temporary adverse impacts were identified for traffic for construction of the water main connections at this Shaft Site. While no significant adverse air quality impacts requiring mitigation were found for mobile sources, a mobile source analysis of the traffic mitigation measures was also undertaken.

6.16.2 Traffic

While adverse traffic impacts were identified for all three potential water main connection routes, and extensive queuing and potential traffic diversions were identified for substantial portions of the First Avenue and the E. 59th Street/E. 61st Street routes, these conditions would be temporary and not persist beyond the respective construction periods. Therefore, construction of the water mains from any of the Shaft Sites would not result in potential significant adverse traffic impacts. Nevertheless, Section 5.16 describes potential mitigation measures and traffic management strategies that could be implemented to alleviate predicted temporary adverse traffic impacts, as well as an analysis of the potential effects of traffic diversions under the First Avenue.

6.16.3 Air Quality

As described in Section 6.11, the potential air quality impacts from the construction of the water main connections at the E. 59th Street/Second Avenue Shaft Site, and the combined construction of the water main connections and the E. 59th Street/Second Avenue Shaft Site, are expected to be similar to those analyzed in detail for the reasonable worst-case route from the preferred Shaft Site (see Section 6.11). Traffic mitigation for the water main construction period under this alternative would result in improvements in traffic conditions, compared to those undertaken in the air quality analyses. Therefore, no potential significant adverse air quality impacts from the construction of water main connections for the E. 59th Street/Second Avenue Shaft Site, or the combined construction of water main connections and the E. 59th Street/Second Avenue Shaft Site, with traffic mitigation would be expected.

6.16.4 Noise

Introduction

As assessed in Section 6.12, "Noise," potential significant noise impacts would be expected to occur during construction at the E. 59th Street/Second Avenue Shaft Site. This conclusion is based on the increases and duration of the noise levels due to the construction activities at the Shaft Site. The potential increases in noise levels are not permanent environmental changes and no changes in the noise levels will occur from this project after it has been constructed.

Blasting would result in high instantaneous noise levels. NYCDEP has investigated all feasible protective measures and will be committing to them as part of the project.

During other construction activities at the E. 59th Street/Second Avenue Shaft Site, based on the range of analysis conducted, there is the potential for adverse noise impacts on the upper floors of the residential apartment building located directly across E. 59th Street from the site during all stages with the exception of Stage 2A, 2C, and 3. Potential adverse noise impacts at this location would range from 3.9 to 7.6 dBA during Shift 1 (7:00 a.m. to 3:00 p.m.) and from 3.1 to 9.3 dBA during Shift 2 (3:00 p.m. to 11:00 p.m.). These impacts would range from marginally to readily noticeable, based on the results of the noise modeling and the predicted noise level changes from this project. In addition, at the closest retail/residential building to the south of this apartment building, there could be readily noticeable noise impacts during Stage 4B, and the residential building located on the southeast corner of E. 59th Street could be marginally affected during Stages 1 and 4B. At all locations further from the construction site, the estimated construction noise levels would be less than 3 dBA.

If surface excavation were to be used, the peak hour noise levels during Stage 2 generated by construction equipment would be comparable to the raise bore method because similar types of equipment would be used, but the equipment would be used for a greater number of hours and the duration of noise impacts would be longer on a given day. In addition, noise levels would also be expected to be higher due to the higher level of construction activity associated with moving rock at the surface, rather than below ground.

Based on a through evaluation, NYCDEP is committed to implement a wide range of measures to minimize potential significant impacts, as presented in Section 4.12, "Noise" of Chapter 4, "Preferred Shaft Site. In general, noise mitigation measures fall into three categories: source treatments, path treatments and receiver treatments as discussed below.

Source Treatments

Source treatments would include reducing the noise of the construction equipment itself. NYCDEP is committing to using a high quality muffler on the crane engine. NYCDEP will also require the contractor to use newer equipment (2003 or later for most equipment) and minimize idling. Other noise abatement measures that the contractor may be required to take as necessary include use of electrically operated hoists and compressor plants; silencers on air intakes and exhaust mufflers on internal combustion engines; maximum sized intake and exhaust mufflers on internal combustion engines; gears on machinery designed to reduce noise to a minimum; hoppers and storage bins lined with sound deadening material; possible prohibition of the use of air or gasoline driven saws and similar equipment; and delivering and removing materials, and

the loading and unloading of materials into or from various conveyances in such a manner that will keep noise to a minimum. In addition, as per the NYCDEP Tunneling Permit, new noise abatement technologies developed during the course of the contract should be employed. At this time, no other known source treatment measures are anticipated to be practicable and feasible.

Path Treatments

Path treatment measures include sound barriers and enclosures that interrupt the path between the noise source and receiver, thereby reducing noise levels at the receiver. For a sound barrier to be effective, the barrier must be high enough to break the line-of-sight between the receptor and the noise source. Consequently, sound barriers will be most effective in reducing in noise levels in lower level receptors, and less effective for elevated receptors consistent with the analysis results for this EIS.

As part of the project, NYCDEP will construct a prefabricated 20-foot concrete wall around the perimeter of the Shaft Site. The wall will be covered on the inside with a sound absorptive fabric to reduce reflective noise. In addition, since concrete operations during Stages 2C, 3, and 4A are among the noisiest operations, the construction plans for the site will include an acoustical sound enclosure providing 15 dBA attenuation for the concrete mixing trucks.

There is the potential that additional mitigation measures could be implemented during Stage 4B for the short duration of 3 months, which, based on the noise modeling would produce among the highest noise levels of all construction stages. Stage 4B would include construction of the regulator and valve chambers. This work would be conducted by NYCDDC. NYCDEP will work with NYCDDC to ensure that to the extent practicable, noise attenuation measures will be included in NYCDDC's construction contract when it is issued several years from now. Since the concrete trucks are among the primary noise contributors during this stage, enclosing them in an acoustical sound enclosure providing 15 dBA attenuation, as will be done for Stages 2C, 3, and 4A for the shaft construction, will substantially reduce noise levels.

Table 6.16-1 presents a comparison of noise levels with and without the 15 dBA acoustical enclosure for Stage 4B at the E. 59th Street/Second Avenue Shaft Site. As can be seen from the table, for average conditions without the 15 dBA attenuating enclosure, potential significant noise levels at the two affected receptors would range from 3.9 to 6.2 dBA during Shift 1 and from 5.2 to 7.0 dBA during Shift 2. With the 15 dBA attenuating enclosure, potential significant noise levels at the two affected receptors would drop to between 3.4 and 6.1 dBA during Shift 1 and between 3.3 and 6.9 dBA during Shift 2. The 15dBA enclosure would achieve noise reductions at a number of the affected residences, however, noise level increases would still be above 3dBA, particularly at elevated receptors located above the height of the site perimeter wall.

For peak conditions without the 15 dBA attenuating enclosure, potential significant noise levels at the two affected receptors would range from 3.2 to 7.6 dBA during Shift 1 and from 4.4 to 9.3 dBA during Shift 2. With the 15 dBA attenuating enclosure, there would be no potential significant impacts at Receptor 5 and potential significant noise levels at Receptor 4 would drop to 3.9 during Shift 1 and to between 3.9 and 5.2 during Shift 2. The 15dBA enclosure would

Table 6.16-1
Comparison of Noise Levels With and Without 15 dBA Acoustical Enclosure

Without 15 dBA enclosure for concrete operations										With 15 dBA enclosure for concrete operations									
Average Workday										**Average Workday**									
Stage 4B Construction										**Stage 4B Construction**									
Shift 1					Shift 2					Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	62.8	72	0.6	1	70	62.8	71	0.8	1	71	61.8	71	0.5	1	70	61.8	71	0.6
2	71	67.1	72	1.5	2	70	67.1	72	1.8	2	71	66.5	72	1.3	2	70	66.5	72	1.6
3	71	76	77	6.2	3	70	76	77	7.0	3	71	75.9	77	6.1	3	70	75.9	77	6.9
4A	72	66.9	73	1.2	4A	70	66.9	72	1.7	4A	72	66.1	73	1.0	4A	70	66.1	71	1.5
4B	72	75.7	77	5.2	4B	70	75.7	77	6.7	4B	72	72.8	75	3.4	4B	70	72.8	75	4.6
4C	72	73.6	76	3.9	4C	70	73.6	75	5.2	4C	72	70.6	74	2.4	4C	70	70.6	73	3.3
5A	71	49.3	71	0.0	5A	69	49.3	69	0.0	5A	71	47.2	71	0.0	5A	69	47.2	69	0.0
5B	71	64.9	72	1.0	5B	69	64.9	70	1.4	5B	71	62.9	72	0.6	5B	69	62.9	70	1.0
5C	71	68.1	73	1.8	5C	69	68.1	72	2.6	5C	71	65.3	72	1.0	5C	69	65.3	71	1.5
6	71	56.3	71	0.1	6	69	56.3	69	0.2	6	71	52.5	71	0.1	6	69	52.5	69	0.1
Peak Hour										**Peak Hour**									
Stage 4B Construction										**Stage 4B Construction**									
Shift 1					**Shift 2**					**Shift 1**					**Shift 2**				
Receptor	**Baseline**	**Construction**	**Combined**	**Increase**	**Receptor**	**Baseline**	**Construction**	**Combined**	**Increase**	**Receptor**	**Baseline**	**Construction**	**Combined**	**Increase**	**Receptor**	**Baseline**	**Construction**	**Combined**	**Increase**
1	71	62	72	0.5	1	70	62	71	0.6	1	71	56.8	71	0.2	1	70	56.8	70	0.2
2	71	64.2	72	0.8	2	70	64.2	71	1.0	2	71	58.9	71	0.3	2	70	58.9	70	0.3
3	71	67.4	73	1.6	3	70	67.4	72	1.9	3	71	61	71	0.4	3	70	61	71	0.5
4A	72	65.6	73	0.9	4A	70	65.6	71	1.3	4A	72	60.4	72	0.3	4A	70	60.4	70	0.5
4B	72	78.8	80	7.6	4B	70	78.8	79	9.3	4B	72	73.6	76	3.9	4B	70	73.6	75	5.2
4C	72	76.9	78	6.1	4C	70	76.9	78	7.7	4C	72	71.7	75	2.9	4C	70	71.7	74	3.9
5A	71	51.7	71	0.1	5A	69	51.7	69	0.1	5A	71	46.8	71	0.0	5A	69	46.8	69	0.0
5B	71	67.1	72	1.5	5B	69	67.1	71	2.2	5B	71	62.2	72	0.5	5B	69	62.2	70	0.8
5C	71	71.4	74	3.2	5C	69	71.4	73	4.4	5C	71	66.6	72	1.3	5C	69	66.6	71	2.0
6	71	59.1	71	0.3	6	69	59.1	69	0.4	6	71	48.7	71	0.0	6	69	48.7	69	0.0

achieve noise reductions at a number of the affected residences, however, noise level increases would still be above 3dBA, particularly at elevated receptors located above the height of the site perimeter wall.

There are a number of other measures that NYCDEP will continue to evaluate to determine whether they can be feasibly implemented at the Shaft Site. These include vinyl/movable curtains to hang in the vicinity of stationary equipment such as pile drilling rigs and cranes. These drapes have certain safety concerns, particularly on a small-scale site, because they limit the line of sight for construction workers. In addition, three-sided noise tents can reduce noise from certain pieces of equipment such as jackhammers and NYCDEP will further explore their use on the site, where appropriate.

Receiver Treatments

Receiver treatment measures include measures that reduce the noise intensity at the receiver such as building insulation, window treatment, and alternative ventilation. NYCDEP investigated window-wall attenuation to mitigate impacts on affected residences. These measures would include the installing double paned windows on those residences that have only single paned windows; however, many apartment buildings in the areas surrounding the project site already have double paned windows. Apartments without unit air conditioners or central air conditioning could be provided with air conditioning so closed window conditions can be maintained throughout the year to attenuate noise. However, these measures are more practicable for a construction project that would result in permanent increases in noise level impacts. Further, the cost of these measures, lead time for installation, and the uncertainty of negotiating with private property owners may make this potential measure not practicable.

Conclusions

NYCDEP will continue to investigate noise mitigation and attenuation measures and will work with NYCDDC to ensure the implementation of measures during their phase of construction (4B for 3 months) to further reduce noise at the Shaft Site. However, despite a thorough evaluation of measures to reduce noise at the site, noise level increase during construction would be noticeable and significant during the 52 month construction period (65 months for the surface excavation method). Despite noise attenuation measures that have been included as part of the project, and the further investigations that will be conducted to identify other practicable and feasible noise mitigation strategies, potential significant noise impacts at the E. 59th Street/Second Avenue Shaft Site would remain unmitigated during construction. Typically, noise impacts during construction are not classified as potential significant adverse impacts but because the construction of Shaft 33B will take 52 months, NYCDEP considers this to be an issue that will be considered in its final decision making.

◆