7.16 MITIGATION MEASURES

7.16.1 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. 61st Street Shaft Site. Significant adverse impacts were identified for noise and land use. Potential significant noise and land use impacts would not be fully mitigable. These unavoidable impacts are disclosed in this Section and in Section 7.17, "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.

7.16.2 Land Use and Community Facilities, Zoning, and Public Policy

As described in Section 7.2, the potential significant adverse noise impacts that would occur to the Manhattan Center for Early Education and Manhattan Center for Early Intervention, directly north of the alternative Shaft Site, for the duration of the construction period would result in a significant conflict with this noise-sensitive land use that could interfere with the proper functioning of the land use. Described below in Section 7.16.5, "Noise," are the measures NYCDEP has investigated to reduce noise impacts; however, certain noise impacts would remain unmitigated. Therefore, a potential significant adverse land use impact would occur to this facility and would remain unmitigated throughout the construction period.

7.16.3 Traffic

While potential 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.

7.16.4 Air Quality

As described in Section 7.11, the potential air quality impacts from the construction of the water main connections at the E. 61st Street Shaft Site, and the combined construction of the water main connections and the E. 61st Street 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 5.11). 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. 61st Street Shaft Site, or the combined construction of water main connections and the E. 61st Street Shaft Site, with traffic mitigation would be expected.

7.16.5 Noise

Introduction

As assessed in Section 7.12, "Noise," potential significant noise impacts would be expected to occur during construction at the E. 61st Street 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. 61st Street Shaft Site, based on the range of analysis conducted, there is the potential for adverse noise impacts during most stages of construction at several of the receptors analyzed. At the affected receptors, potential adverse noise impacts during average conditions would range from 3.3 dBA to 17.1 dBA during Shift 1 (7:00 a.m. to 3:00 p.m.) and from 3.1 dBA to 19.1 dBA during Shift 2 (3:00 p.m. to 11:00 p.m.). Potential adverse noise impacts during peak conditions would range from 3.1 dBA to 20.0 dBA during Shift 1 and from 3.3 dBA to 22.0 dBA during Shift 2. Potential impacts would extend to additional receptor locations beyond those modeled. During several stages of construction, it is estimated that potential noticeable noise impacts could extend to the backs of several buildings located between the Shaft Site and First Avenue and to buildings located along E. 61st Street between the Shaft Site and midblock to First Avenue.

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.

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. As explained in Section 7.12, "Noise," during Stage 4B only, the southern end of the Site would have a 10 foot wall. 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 adjacent to and on the southern side of the shaft. This work would be conducted by the New York City Department of Design and Construction (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 7.16-1 (Noise) presents a comparison of noise levels with and without the 15 dBA acoustical enclosure for Stage 4B at the E. 61st Street Shaft Site. As can be seen from the table, for average conditions without the 15 dBA attenuating enclosure, potential significant noise levels at the affected receptors would range from 3.3 to 15.9 dBA during Shift 1 and from 4.4 to 17.9 dBA during Shift 2. With the 15 dBA attenuating enclosure, potential significant noise levels at the affected receptors would drop to between 4.1 and 12.5 dBA during Shift 1 and from 5.6 to 14.5 dBA during Shift 2. The 15 dBA enclosure would achieve noise reductions, at times below the 3dBA impact threshold, at a number of the affected residences; however, noise level increases would still be above 3 dBA, 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 affected receptors would range from 4.3 to 20.0 dBA during Shift 1 and from 3.3 to 22.0 dBA during Shift 2. With the 15 dBA attenuating enclosure, potential significant noise levels at the affected receptors would drop to between 4.3 and 15.7 during Shift 1 and between 5.7 and 17.7 dBA during Shift 2. The 15 dBA enclosure would achieve noise reductions, at times below the 3dBA impact threshold, at a number of the affected residences; however, noise level increases would still be above 3 dBA, particularly at elevated receptors located above the height of the site perimeter wall.

In addition, NYCDEP will work with NYCDDC to see whether the wall that would be constructed during Stage 4B within the streetbed of E. 61st Street could be 20 feet high, as compared to the 10-foot-high walls more typically installed for construction projects.

There are a number of other measures that NYCDEP will continue to evaluate to determine whether they can be feasibly implemented at this 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 site 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 a closed window condition can be maintained throughout the year to attenuate noise. In addition, existing air conditioners currently installed within windows could be installed in the masonry. 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.

Table 7.16- 1
Comparison of Noise Levels With and Without 15 dBA Acoustical Enclosure

With 15 dBA enclosure for concrete operations

Average Workday

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
1A	70	60.2	70	0.4	1A	67	60.2	68	0.8	1A	70	56.3	70	0.2	1A	67	56.3	67	0.4
1B	70	75.4	77	6.5	1B	67	75.4	76	9.0	1B	70	71.9	74	4.1	1B	67	71.9	73	6.1
2A	63	63.5	66	3.3	2A	61	63.5	65	4.4	2A	63	60.8	65	2.0	2A	61	60.8	64	2.9
2B	63	78.8	79	15.9	2B	61	78.8	79	17.9	2B	63	75.3	76	12.5	2B	61	75.3	75	14.5
3A	65	68.1	70	4.8	3A	63	68.1	69	6.3	3A	65	67.2	69	4.2	3A	63	67.2	69	5.6
3B	68	76.1	77	8.7	3B	67	76.1	77	9.6	3B	68	75.6	76	8.3	3B	67	75.6	76	9.2
4A	65	58.5	66	0.9	4A	63	58.5	64	1.3	4A	65	53.9	65	0.3	4A	63	53.9	64	0.5
4B	68	64.4	70	1.6	4B	67	64.4	69	1.9	4B	68	60.3	69	0.7	4B	67	60.3	68	0.8
5A	65	61.9	67	1.7	5A	63	61.9	65	2.5	5A	65	61.3	67	1.5	5A	63	61.3	65	2.2
5B	68	65.8	70	2.0	5B	67	65.8	69	2.5	5B	68	65.6	70	2.0	5B	67	65.6	69	2.4

Peak Hour

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
1A	70	64.2	71	1.0	1A	67	64.2	69	1.8	1A	70	58.8	70	0.3	1A	67	58.8	68	0.6
1B	70	79.7	80	10.1	1B	67	79.7	80	12.9	1B	70	75.4	77	6.5	1B	67	75.4	76	9.0
2A	63	68.2	69	6.3	2A	61	68.2	69	8.0	2A	63	65.3	67	4.3	2A	61	65.3	67	5.7
2B	63	83	83	20.0	2B	61	83	83	22.0	2B	63	78.6	79	15.7	2B	61	78.6	79	17.7
3A	65	67.3	69	4.3	3A	63	67.3	69	5.7	3A	65	61.9	67	1.7	3A	63	61.9	65	2.5
3B	68	76.8	77	9.3	3B	67	76.8	77	10.2	3B	68	75.4	76	8.1	3B	67	75.4	76	9.0
4A	65	61.7	67	1.7	4A	63	61.7	65	2.4	4A	65	50	65	0.1	4A	63	50	63	0.2
4B	68	67.5	71	2.8	4B	67	67.5	70	3.3	4B	68	56.6	68	0.3	4B	67	56.6	67	0.4
5A	65	58.4	66	0.9	5A	63	58.4	64	1.3	5A	65	49.8	65	0.1	5A	63	49.8	63	0.2
5B	68	61	69	0.8	5B	67	61	68	1.0	5B	68	59.5	69	0.6	5B	67	59.5	68	0.7

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. 61st Street 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.

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