6.12 NOISE

6.12.1 Introduction

Construction activities have the potential to produce noise levels that may be annoying or disturbing to humans. This Section describes existing noise conditions in the vicinity of the E. 59th Street/Second Avenue Shaft Site and assesses the potential for construction of Shaft 33B at the Shaft Site to result in noise impacts. The potential for noise impacts during operation of the Shaft is also discussed. The methodology used to prepare this Section is described in Section 3.12, "Noise," in Chapter 3, "Impact Methodologies."

In addition to the Shaft Site itself, this alternative would include construction of water mains that would travel from the Shaft Site and along the potential connection routes (First Avenue, Sutton Place, or E. 59th Street/E. 61st Street) assessed in Chapter 5, "Water Main Connections." Potential noise impacts associated with the water main connections would be similar to those described for construction of the water mains in Section 5.12, "Noise," of Chapter 5. That Section also provides a cumulative assessment of shaft and water main construction.

6.12.2 Existing Conditions

An ambient noise survey was conducted to establish baseline noise levels at sensitive receptors in the vicinity of the E. 59th Street/Second Avenue Shaft Site. The Shaft Site is located in a noisy area that is influenced by traffic noise from the adjacent Queensboro Bridge (Bridge), Second Avenue and E. 59th Street, which immediately border the site. Traffic on these roads is often heavy, particularly during the commuter rush hours. Second Avenue is also a primary commercial route for truck deliveries on the East Side. The surrounding neighborhood is a mix of high-density residential apartment buildings, retail stores and shops, restaurants and bars, and public areas.

Monitoring Locations

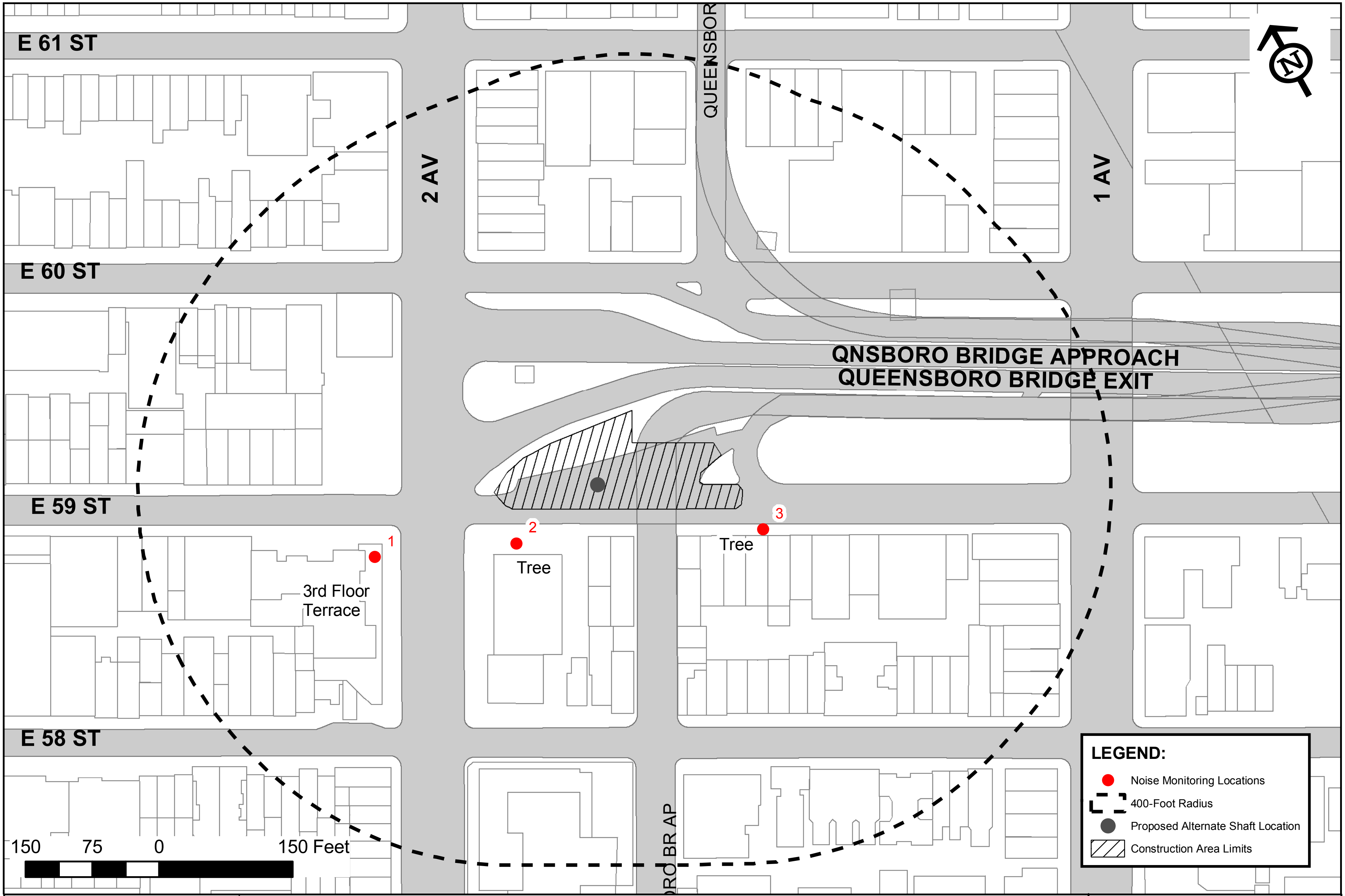
Ambient noise monitoring was performed at three monitoring locations between November 8 and 10, 2004 to assess the existing noise environment surrounding the E. 59th Street/Second Avenue Shaft Site. The three ambient noise monitoring locations near the Shaft Site are shown in Figure 6.12-1 and include:

Location 1: 3rd floor terrace of the residential building on southwest corner of E. 59th Street and Second Avenue (245 E. 54th Street).

Location 2: Tree on southeast corner of E. 59th Street and Second Avenue.

Location 3: Tree on south side of E. 59th Street midway of block between First Avenue and Second Avenue.

Source:
-Primary Land Use Tax Lot Output (PLUTO) data files. City of New York Department of City Planning (DCP). December, 2003.



Map Document: (S:\Projects\2175158\GIS_Figures\Shaft_33B\Site&Traffic\33B_Alt_I(NOISE)_receptors(2).mxd)
10/19/2005 -- 2:07:54 PM

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
STAGE 2 - MANHATTAN LEG
E. 59TH STREET/2ND AVENUE SHAFT SITE
NOISE MONITORING LOCATIONS

FIGURE 6.12-1

Construction at the Shaft 33B site is expected to occur over two shifts—from 7:00 a.m. to 3:00 p.m. and from 3:00 p.m. to 11:00 p.m. Therefore, the ambient noise monitoring was performed during these periods as described in Section 3.12, "Noise," in Chapter 3, "Impact Methodologies."

Monitoring Results

Minimum hourly Leq(1) noise levels at each of the three monitoring locations, based on the noise monitoring results, are provided in Table 6.12-1. Minimum hourly Leq(1) levels are provided for each of the two assessment time periods—the first construction shift (7:00 a.m. to 3:00 p.m.) and second construction shift (3:00 p.m. to 11:00 p.m.).

Table 6.12-1
Baseline Ambient Noise Monitoring Results for the E. 59th Street/Second Avenue Shaft Site

Noise Monitoring Locations	1st Shift (7am to 3pm) Minimum L_{eq} (dBA)	2nd Shift (3pm to 11pm) Minimum L_{eq} (dBA)
Location 1: 3rd floor terrace of the residential building on southwest corner of E. 59th Street and Second Avenue (245 E. 59th Street).	71	69
Location 2: Tree on southeast corner of E. 59th Street and Second Avenue.	72	70
Location 3: Tree on south side of E. 59th Street midway of block between First Avenue and Second Avenue.	71	70

For the first shift time period (7:00 a.m. to 3:00 p.m.), at the ground level survey locations (Locations 2 and 3), the minimum hourly Leq(1) noise levels were 72 and 71 dBA, respectively. For the elevated survey location (Location 1), the minimum hourly Leq(1) noise level was 71 dBA. These noise levels are generally consistent and reflect the strong contribution that vehicular traffic plays in the ambient noise conditions surrounding this site. For the second shift time period (3:00 p.m. to 11:00 p.m.), the minimum hourly Leq(1) noise levels ranged from 69 to 70 dBA.

These ambient noise levels are above 65 dBA Leq(1) CEQR threshold of acceptability. The primary factor influencing the high existing ambient conditions is vehicular traffic. Detailed noise data recorded at the survey locations is provided in Appendix 12.

6.12.3 Future Conditions Without the Project

As described in Section 6.2, "Land Use and Community Facilities, Zoning, and Public Policy," no development projects are anticipated in the 400-foot Study Area in the Future Without the Project. Therefore, noise levels would be expected to be comparable to those currently existing in the vicinity of the E. 59th Street/Second Avenue Shaft Site.

6.12.4 Future Conditions With the Project

Construction

Blasting

Blasting would result in high instantaneous noise levels. Blasting would be necessary at the Shaft Site to enlarge the shaft and form the distribution chamber at the top of the shaft. Blasting would not occur at the ground surface since the bedrock at the site is more than 15 feet below the ground surface. As with the preferred Shaft Site, blasting would be expected to occur for roughly eight months under the raise bore method. Under the surface excavation method, blasting would occur over a 24 month period (18 months for the shaft and 6 months for the distribution chamber.) While the time period for blasting is longer with the surface excavation method, there would be one, rather than two, blasts per day for the shaft work and two per day for the distribution chamber work (as with the raise bore method).

Blasting has an instantaneous effect. Noise levels associated with blasting are dependent on the amount of explosive used, geological conditions between the blast site and the receptor, and the fact that blasting will take place at least 15 feet below the surface. Section 4.12, "Noise," in Chapter 4, "Preferred Shaft Site," discusses blasting procedures including protective measures that will be implemented to minimize potential construction-related noise impacts from blasting at the preferred Shaft Site. These same procedures would be put in place at the E. 59th Street/Second Avenue Shaft Site. However, despite these measures, blasting noise could result in startle effects and be intrusive and disturbing to humans.

Other Construction Activities

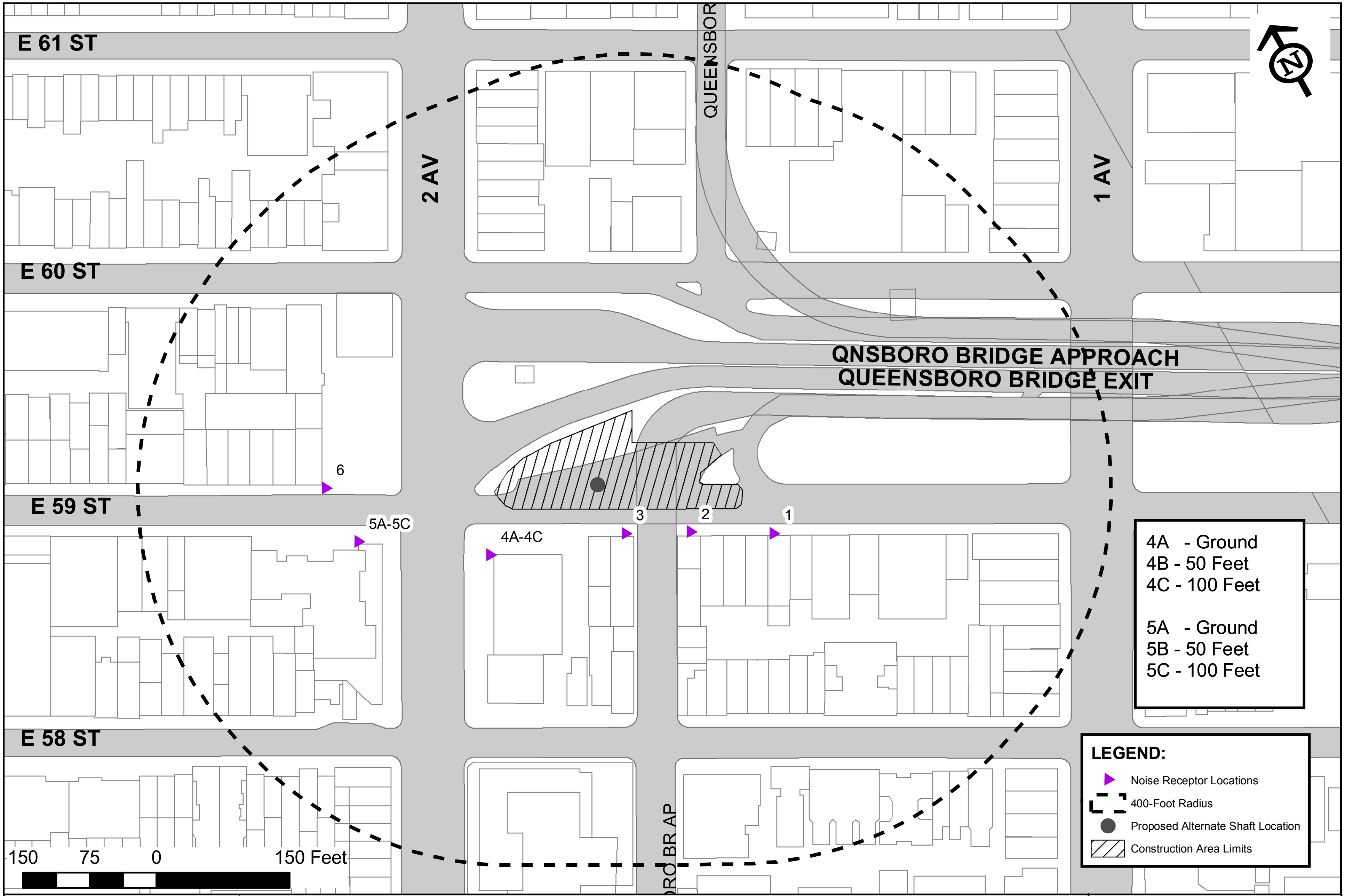
Sensitive Receptors Used in the Analysis

As shown in Table 6.12-2 and Figure 6.12-2, receptors were selected at six ground floor locations in the immediate vicinity of the Shaft Site to assess potential construction noise impacts. In addition, at two of the residential receptors (Receptors 4 and 5), a number of elevated receptors were selected to determine impacts to residences located on upper floors. These receptors are considered to be representative of other sensitive uses in the area. In several instances, the receptor locations were in the same locations as the ambient noise monitoring locations (see Section 6.12.2, "Existing Conditions," above).

Scenarios Analyzed

As detailed in the Section 6.1, "Project Description," construction of the shaft would occur in stages representing specific construction activities and equipment on the site. Therefore, an analysis was performed for each shift for each stage of construction

Source:
-Primary Land Use Tax Lot Output (PLUTO) data files. City of New York Department of City Planning (DCP). December, 2003.



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
STAGE 2 - MANHATTAN LEG
E. 59TH STREET/2ND AVENUE SHAFT SITE
NOISE RECEPTOR LOCATIONS

FIGURE 6.12-2

Map Document: (S:\Projects\21751581GIS_Figures\Shaft_33B\Site&Traffic\33B_Alt_I(NOISE)_receptors.mxd)
10/19/2005 -- 2:07:49 PM

Table 6.12-2
Identification and Description of Selected Shaft Receptor Locations

Receptor Number	Receptor Identification and Description	Approximate Horizontal Distance to Center of Shaft 33B
1	324 E. 59th Street	194
2	316 E. 59th Street	121
3	308. E. 59th Street	66
4	*300 E. 59th Street (Receptors 4A,4B,4C: Elevated receptors at ground floor, 50 feet, 100 feet)*	141
5	245 E. 58th Street (building extends to 59th Street) *(Receptors 5A,5B,5C: Elevated receptors at ground floor, 50 feet, 100 feet)*	282
6	243 E. 59th Street	308

Construction at the Shaft 33B site is expected to occur over two shifts—from 7:00 a.m. to 3:00 p.m. and from 3:00 p.m. to 11:00 p.m. and both shifts were analyzed as discussed above under Section 6.12.2, “Existing Conditions.” Raise boring the shaft, which would be a 24-hour operation for less than 3 months, would have minimal noise impacts since it takes place below ground and requires little surface activity.

In addition, as described in detail in Section 3.12, “Noise,” in Chapter 3, “Impact Methodologies,” an 8-hour “average period” analysis and reasonable worst case “peak period” analysis were performed for each stage of construction. The average period analysis is based on average equipment utilization rates over an average 8-hour shift. The peak period analysis is based on a smaller mix of equipment that would typically operate for a greater percentage of time during one or more hours of a shift. See Appendix 12 for average and peak period equipment utilization rates. The average and peak analyses are performed for each shift, for a total of 4 scenarios per stage.

At the E. 59th Street/Second Avenue Shaft Site, there is the potential that shaft construction would be undertaken using the surface excavation method, rather than the raise bore method (see Chapter 2, “Purpose and Need and Project Overview” for a discussion of these methods). The differences between the two methods in relation to potential noise impacts is discussed in “Potential Noise Impacts-Surface Excavation Method,” below.

Measures to Reduce Noise at the Site

The analysis includes several measures that would be provided at the Shaft Site to minimize potential noise impacts from construction. These include a prefabricated 20-foot concrete wall to be constructed around the perimeter of the Shaft Site. The wall will be covered with a sound absorptive fabric on the inside to reduce reflective noise. Since concrete operations during Stages 2C, 3, and 4A are among the noisiest operations, the concrete mixing trucks will also be enclosed in an acoustical sound enclosure providing 15 dBA attenuation.

While not assumed in the quantitative assessment, NYCDEP will undertake a number of other measures to minimize noise impacts from the project. The contractor will also be required to have a noise monitoring program in place during all construction activities. A high quality muffler will be used 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 soundproof housings or enclosures for noise producing machines and other facilities; 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.

Through NYCDEP's authority under the construction contract, the Tunneling Permit, and the New York City Noise Code, NYCDEP can send inspectors to the site, enforce against the contractor, and require further attenuation measures or shutdown construction on the site if noise is too excessive.

Potential Noise Impacts—Introduction

Table 6.12-3 and Table 6.12-4 present the results of the modeling for the average and peak periods respectively. For each stage and each shift, the existing ambient noise levels, noise levels generated by the construction equipment, and total combined existing and construction-generated noise levels are provided at each of the ground and elevated receptor locations. Also provided is the increase between the combined level and existing conditions. To determine potential noise impacts, this increase is compared to the 3 dBA CEQR impact threshold; those instances where the 3 dBA threshold is exceeded are shaded on the tables. In addition to the impacts discussed below, pavement cutters and pavers would be used for only a few days during shaft construction. During these short periods, noise levels would be slightly higher than those discussed below; however, the potential impacts would be very short-term and temporary.

Potential Noise Impacts—Average Period Analysis

The average period analysis shows that incremental noise levels from construction would be 3 dBA or less for all stages of construction, with the exception of Stages 1 and 4B. In these stages, the apartment building directly across E. 59th Street (Receptor 4) would be impacted (see Figure 6.12-2 for a map of receptor sites). In Stage 4B only, the apartment building to the south along E. 59th Street (Receptor 3) would also be affected. At the lower floors of these receptors, which

Table 6.12-3
Noise Levels - Average Workday

Stage 1 Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	60.2	71	0.3	1	70	60.2	70	0.4
2	71	62.2	72	0.5	2	70	62.2	71	0.7
3	71	63.4	72	0.7	3	70	63.4	71	0.9
4A	72	60.1	72	0.3	4A	70	60.1	70	0.4
4B	72	73.7	76	3.9	4B	70	73.7	75	5.2
4C	72	71.8	75	2.9	4C	70	71.8	74	4.0
5A	71	46.4	71	0.0	5A	69	46.4	69	0.0
5B	71	65.4	72	1.1	5B	69	65.4	71	1.6
5C	71	66.7	72	1.4	5C	69	66.7	71	2.0
6	71	53.3	71	0.1	6	69	53.3	69	0.1

Stage 3 Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	52.7	71	0.1	1	70	52.7	70	0.1
2	71	54.5	71	0.1	2	70	54.5	70	0.1
3	71	55.9	71	0.1	3	70	55.9	70	0.2
4A	72	52.6	72	0.0	4A	70	52.6	70	0.1
4B	72	65.4	73	0.9	4B	70	65.4	71	1.3
4C	72	63.4	73	0.6	4C	70	63.4	71	0.9
5A	71	39.1	71	0.0	5A	69	39.1	69	0.0
5B	71	55.8	71	0.1	5B	69	55.8	69	0.2
5C	71	58.3	71	0.2	5C	69	58.3	69	0.4
6	71	45.7	71	0.0	6	69	45.7	69	0.0

Stage 2A Construction*

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	27.2	71	0.0	1	70	27.2	70	0.0
2	71	30	71	0.0	2	70	30	70	0.0
3	71	32	71	0.0	3	70	32	70	0.0
4A	72	27.8	72	0.0	4A	70	27.8	70	0.0
4B	72	43.5	72	0.0	4B	70	43.5	70	0.0
4C	72	42.3	72	0.0	4C	70	42.3	70	0.0
5A	71	13.8	71	0.0	5A	69	13.8	69	0.0
5B	71	37.7	71	0.0	5B	69	37.7	69	0.0
5C	71	37.3	71	0.0	5C	69	37.3	69	0.0
6	71	23	71	0.0	6	69	23	69	0.0

Stage 4A Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	54.1	71	0.1	1	70	54.1	70	0.1
2	71	56.2	71	0.1	2	70	56.2	70	0.2
3	71	57.7	71	0.2	3	70	57.7	70	0.2
4	72	52.9	72	0.1	4A	70	52.9	70	0.1
4A	72	64.9	73	0.8	4B	70	64.9	71	1.2
4B	72	63.3	73	0.5	4C	70	63.3	71	0.8
5	71	40	71	0.0	5A	69	40	69	0.0
5A	71	57.5	71	0.2	5B	69	57.5	69	0.3
5B	71	58.5	71	0.2	5C	69	58.5	69	0.4
6	71	45.8	71	0.0	6	69	45.8	69	0.0

Stage 2B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	56.5	71	0.2	1	70	56.5	70	0.2
2	71	59.1	71	0.3	2	70	59.1	70	0.3
3	71	61.4	71	0.5	3	70	61.4	71	0.6
4A	72	56.2	72	0.1	4A	70	56.2	70	0.2
4B	72	67.7	73	1.4	4B	70	67.7	72	2.0
4C	72	66.4	73	1.1	4C	70	66.4	72	1.6
5A	71	46.2	71	0.0	5A	69	46.2	69	0.0
5B	71	61	71	0.4	5B	69	61	70	0.6
5C	71	61.3	71	0.4	5C	69	61.3	70	0.7
6	71	49.2	71	0.0	6	69	49.2	69	0.0

Stage 4B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	62.8	72	0.6	1	70	62.8	71	0.8
2	71	67.1	72	1.5	2	70	67.1	72	1.8
3	71	76	77	6.2	3	70	76	77	7.0
4A	72	66.9	73	1.2	4A	70	66.9	72	1.7
4B	72	75.7	77	5.2	4B	70	75.7	77	6.7
4C	72	73.6	76	3.9	4C	70	73.6	75	5.2
5A	71	49.3	71	0.0	5A	69	49.3	69	0.0
5B	71	64.9	72	1.0	5B	69	64.9	70	1.4
5C	71	68.1	73	1.8	5C	69	68.1	72	2.6
6	71	56.3	71	0.1	6	69	56.3	69	0.2

Stage 2C Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	51.9	71	0.1	1	70	51.9	70	0.1
2	71	54.2	71	0.1	2	70	54.2	70	0.1
3	71	56.5	71	0.2	3	70	56.5	70	0.2
4A	72	52.3	72	0.0	4A	70	52.3	70	0.1
4B	72	64.5	73	0.7	4B	70	64.5	71	1.1
4C	72	62.6	72	0.5	4C	70	62.6	71	0.7
5A	71	40.6	71	0.0	5A	69	40.6	69	0.0
5B	71	55	71	0.1	5B	69	55	69	0.2
5C	71	57.4	71	0.2	5C	69	57.4	69	0.3
6	71	45.3	71	0.0	6	69	45.3	69	0.0

Stage 4C Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	51.5	71	0.0	1	70	51.5	70	0.1
2	71	54	71	0.1	2	70	54	70	0.1
3	71	56.4	71	0.1	3	70	56.4	70	0.2
4A	72	50	72	0.0	4A	70	50	70	0.0
4B	72	60.8	72	0.3	4B	70	60.8	70	0.5
4C	72	59.6	72	0.2	4C	70	59.6	70	0.4
5A	71	37.8	71	0.0	5A	69	37.8	69	0.0
5B	71	54.7	71	0.1	5B	69	54.7	69	0.2
5C	71	55	71	0.1	5C	69	55	69	0.2
6	71	43.5	71	0.0	6	69	43.5	69	0.0

*Numbers for Stage 2A have changed from the Draft EIS.

Table 6.12-4
Noise Levels - Peak Hour

Stage 1 Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	60.5	71	0.4	1	70	60.5	70	0.5
2	71	62.7	72	0.6	2	70	62.7	71	0.7
3	71	65.8	72	1.1	3	70	65.8	71	1.4
4A	72	63.6	73	0.6	4A	70	63.6	71	0.9
4B	72	76.7	78	6.0	4B	70	76.7	78	7.5
4C	72	74.9	77	4.7	4C	70	74.9	76	6.1
5A	71	49.9	71	0.0	5A	69	49.9	69	0.1
5B	71	67.9	73	1.7	5B	69	67.9	71	2.5
5C	71	69.7	73	2.4	5C	69	69.7	72	3.4
6	71	55.6	71	0.1	6	69	55.6	69	0.2

Stage 2A Construction*

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	27.2	71	0.0	1	70	27.2	70	0.0
2	71	30	71	0.0	2	70	30	70	0.0
3	71	32	71	0.0	3	70	32	70	0.0
4A	72	27.8	72	0.0	4A	70	27.8	70	0.0
4B	72	43.5	72	0.0	4B	70	43.5	70	0.0
4C	72	42.3	72	0.0	4C	70	42.3	70	0.0
5A	71	13.8	71	0.0	5A	69	13.8	69	0.0
5B	71	37.7	71	0.0	5B	69	37.7	69	0.0
5C	71	37.3	71	0.0	5C	69	37.3	69	0.0
6	71	23	71	0.0	6	69	23	69	0.0

Stage 2B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	58.3	71	0.2	1	70	58.3	70	0.3
2	71	62	72	0.5	2	70	62	71	0.6
3	71	65.6	72	1.1	3	70	65.6	71	1.3
4A	72	61.2	72	0.3	4A	70	61.2	71	0.5
4B	72	71.7	75	2.9	4B	70	71.7	74	3.9
4C	72	70.4	74	2.3	4C	70	70.4	73	3.2
5A	71	52.3	71	0.1	5A	69	52.3	69	0.1
5B	71	61.3	71	0.4	5B	69	61.3	70	0.7
5C	71	64.9	72	1.0	5C	69	64.9	70	1.4
6	71	52.3	71	0.1	6	69	52.3	69	0.1

Stage 2C Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	54.3	71	0.1	1	70	54.3	70	0.1
2	71	55.7	71	0.1	2	70	55.7	70	0.2
3	71	56.2	71	0.1	3	70	56.2	70	0.2
4A	72	55.6	72	0.1	4A	70	55.6	70	0.2
4B	72	68.9	74	1.7	4B	70	68.9	72	2.5
4C	72	66.6	73	1.1	4C	70	66.6	72	1.6
5A	71	41.4	71	0.0	5A	69	41.4	69	0.0
5B	71	57.3	71	0.2	5B	69	57.3	69	0.3
5C	71	61.3	71	0.4	5C	69	61.3	70	0.7
6	71	48.5	71	0.0	6	69	48.5	69	0.0

Stage 3 Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	54.3	71	0.1	1	70	54.3	70	0.1
2	71	55.7	71	0.1	2	70	55.7	70	0.2
3	71	56.2	71	0.1	3	70	56.2	70	0.2
4A	72	55.6	72	0.1	4A	70	55.6	70	0.2
4B	72	68.9	74	1.7	4B	70	68.9	72	2.5
4C	72	66.6	73	1.1	4C	70	66.6	72	1.6
5A	71	41.4	71	0.0	5A	69	41.4	69	0.0
5B	71	57.3	71	0.2	5B	69	57.3	69	0.3
5C	71	61.3	71	0.4	5C	69	61.3	70	0.7
6	71	48.5	71	0.0	6	69	48.5	69	0.0

Stage 4A Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	58.3	71	0.2	1	70	58.3	70	0.3
2	71	61.4	71	0.5	2	70	61.4	71	0.6
3	71	65	72	1.0	3	70	65	71	1.2
4	72	59.9	72	0.3	4A	70	59.9	70	0.4
4A	72	71.8	75	2.9	4B	70	71.8	74	4.0
4B	72	70.2	74	2.2	4C	70	70.2	73	3.1
5	71	47.4	71	0.0	5A	69	47.4	69	0.0
5A	71	62.6	72	0.6	5B	69	62.6	70	0.9
5B	71	65.2	72	1.0	5C	69	65.2	71	1.5
6	71	51.9	71	0.1	6	69	51.9	69	0.1

Stage 4B Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	62	72	0.5	1	70	62	71	0.6
2	71	64.2	72	0.8	2	70	64.2	71	1.0
3	71	67.4	73	1.6	3	70	67.4	72	1.9
4A	72	65.6	73	0.9	4A	70	65.6	71	1.3
4B	72	78.8	80	7.6	4B	70	78.8	79	9.3
4C	72	76.9	78	6.1	4C	70	76.9	78	7.7
5A	71	51.7	71	0.1	5A	69	51.7	69	0.1
5B	71	67.1	72	1.5	5B	69	67.1	71	2.2
5C	71	71.4	74	3.2	5C	69	71.4	73	4.4
6	71	59.1	71	0.3	6	69	59.1	69	0.4

Stage 4C Construction

Shift 1					Shift 2				
Receptor	Baseline	Construction	Combined	Increase	Receptor	Baseline	Construction	Combined	Increase
1	71	58.3	71	0.2	1	70	58.3	70	0.3
2	71	61.4	71	0.5	2	70	61.4	71	0.6
3	71	65	72	1.0	3	70	65	71	1.2
4A	72	59.9	72	0.3	4A	70	59.9	70	0.4
4B	72	71.8	75	2.9	4B	70	71.8	74	4.0
4C	72	70.2	74	2.2	4C	70	70.2	73	3.1
5A	71	47.4	71	0.0	5A	69	47.4	69	0.0
5B	71	62.6	72	0.6	5B	69	62.6	70	0.9
5C	71	65.2	72	1.0	5C	69	65.2	71	1.5
6	71	51.9	71	0.1	6	69	51.9	69	0.1

*Numbers for Stage 2A have changed from the Draft EIS.

would be protected by the Site's concrete wall, noise levels would generally be less than 3 dBA. At all locations further from the construction site, the estimated construction noise levels would be less than 3 dBA. The following discussion addresses only those receptors with impacts above the 3 dBA CEQR impact threshold.

Stage 1 (4 months) would include site preparation, initial excavation, and installation of excavation supports and work slabs. The telescoping crane and pile drill rig are the primary noise contributors during this stage. During Stage 1, the noise analysis indicates that, on the upper floors of Receptor 4 (Receptor 4B) noise levels would increase by 3.9 dBA during Shift 1 and at Receptors 4B and 4C by 5.2 and 4.0 dBA, respectively during Shift 2. These increases would be marginally noticeable. Additional floors at could be impacted. The total construction ambient noise levels (construction source plus baseline ambient) at these receptor locations would be between 74 and 76 dBA.

Stage 4B (3 months) would include construction of the regulator and valve chambers. The concrete truck, backhoe, and jackhammer, are the primary noise contributors during this stage. During this stage, the noise analysis indicates that noise levels would increase on the upper floors of Receptor 4 (Receptors 4B, 4C) by between 3.9 and 5.2 dBA during Shift 1 and between 5.2 and 6.7 dBA during Shift 2. These increases would be marginally to readily noticeable. At Receptor 3, noise levels would increase by 6.2 dBA during Shift 1 and 7.0 dBA during Shift 2. These increases would be readily noticeable. Additional floors at could be impacted. The total construction ambient noise levels (construction source plus baseline ambient) at Receptors 3, 4B, and 4C would be between 75 and 77 dBA.

During this stage, shaft construction activities may occur concurrently with construction of the first stage of water mains with venturi chamber. As presented in Table 6-12.3 and Table 5.12-6, the noise analyses show that the noise produced by the water main construction activities would be dominant. Increases in noise levels at nearby receptors can be expected to be equal to the noise levels predicted for the first stage of the water main with venturi chamber. These noise levels would be expected to last for 20 weeks.

Potential Noise Impacts—Peak Period Analysis

The peak period analysis shows that incremental noise levels from construction would be greater than 3 dBA for all stages of construction with the exception of Stages 2A, 2C, and 3. In these stages, the apartment building directly across E. 59th Street (Receptor 4) would be impacted. In Stages 1 and 4B only, the apartment building on the southwest corner of E. 59th and Second Avenue (Receptor 5) would also be affected. At the lower floors of these receptors, which would be protected by the site's concrete wall, noise levels would generally be less than 3 dBA. At all locations further from the construction site, the estimated construction noise levels would be less than 3 dBA. The following discussion addresses only those receptors with impacts above the 3 dBA CEQR impact threshold. Note that no impacts are expected during Stage 2A, which consists of the raise bore operations. During a few days of this stage, additional equipment including a front end loader, dump truck, flatbed truck, derrick crane, welder, and saw would be used to support the raise bore operations such as pilot hole drilling activities. During these few days, noise levels would be slightly higher than those presented, but would be well below 3 dBA.

Stage 1 (4 months) would include site preparation, initial excavation, and installation of excavation supports and work slabs. The pile drill rig, excavator, and front end loader are the primary noise contributors during this stage. During Stage 1, the noise analysis indicates that noise levels at Receptor 4 (Receptors 4B, 4C) would increase by 4.7 to 6.0 dBA during Shift 1 and by 6.1 to 7.5 dBA during Shift 2. These increases are in the range of marginally to readily noticeable. In addition, noise levels would increase on the upper floors at Receptor 5 (Receptor 5C) by 3.4 dBA during Shift 2. This increase would be marginally noticeable. Additional floors at could be impacted. The total construction ambient noise levels (construction source plus baseline ambient) at these receptor locations would be between 72 and 78 dBA.

Stage 2B (2 months) would include excavation of the distribution chamber. The front end loader is the primary noise contributors during this stage. During Stage 2B, the noise analysis indicates that, on the upper floors of Receptor 4 (Receptors 4B and 4C), noise levels would increase over existing conditions by between 3.2 and 3.9 dBA during Shift 2. These increases would be marginally noticeable. The total construction ambient noise levels (construction source plus baseline ambient) at these receptors would be between 73 and 74 dBA.

Stage 4A and Stage 4C have similar potential impacts. Stage 4A (12 months) would include installation of distribution pipes and valves, completion of riser/distribution chambers, and installation of other piping. Stage 4C (2 months) would include site clean-up and restoration. The front end loader and dump truck are the primary noise contributors during these stages. During these Stages, the noise analysis indicates that, on the upper floors of Receptor 4 (Receptors 4B and 4C), noise levels would increase over existing conditions by 3.1 to 4.0 dBA during Shift 2. These increases would be marginally noticeable. Additional floors at could be impacted. The total construction ambient noise levels (construction source plus baseline ambient) at these receptors would be between 73 and 74 dBA.

Stage 4B (3 months) would include construction of the regulator and valve chambers adjacent to and on the eastern side of the shaft. The concrete truck and backhoe are the primary noise contributors during this stage. During Stage 4B, the noise analysis indicates that noise levels would increase over existing conditions on the upper floors of Receptor 4 (Receptors 4B and 4C) by 6.1 to 7.6 dBA during Shift 1 and by 7.7 to 9.3 dBA during Shift 2. These increases would be readily noticeable. In addition, noise levels would increase on the upper floors at Receptor 5 (Receptor 5C) by 3.2 dBA during Shift 1 and by 4.4 dBA during Shift 2. These increases would be marginally noticeable. Additional floors at could be impacted. The total construction ambient noise levels (construction source plus baseline ambient) at these receptors would be between 73 and 80 dBA.

Potential Noise Impacts—Surface Excavation Method

Under the surface excavation method, the shaft would be constructed from the surface downward. In contrast to the raise bore method, where most of the work to excavate the shaft and distribution chamber would occur underground, under the surface excavation method, this work would occur at the surface of the Site. Only Stage 2 would be different between the two methods; Stages 1, 3, and 4 would be similar.

In addition to longer periods of blasting, as discussed above, the surface excavation method would require longer periods of controlled drilling and other excavation techniques to create the shaft from the surface level (24 months under the surface excavation method for Stage 2 as compared to 11 months under the raise bore method).

Heavier, and potentially louder, construction activities and equipment would be required during Stage 2 to excavate and move the heavy rock out of the shaft to the surface. The excavator, derrick crane and dump trucks would be used more extensively for longer hours as indicated in the average period equipment utilization tables in Appendix 12. In addition, a diesel compressor would likely be required on-site. During this Stage, the peak hour noise levels 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.

The excavated soil and rock would be removed from the site by trucks for the entire shaft excavation during Stage 2. In addition to the trucks arriving at and departing from the site each day bring materials, including concrete, an additional 5 to 10 trucks per day would haul away excavated rock from the site during Stage 2 using surface excavation. However, the total number of trucks in Stage 2 would not result in a doubling of passenger car equivalents (PCEs) in the vicinity of the site during the peak hour and a mobile source analysis is not warranted.

Conclusions

Blasting would result in high instantaneous noise levels. As described in Section 4.12, “Noise,” of Chapter 4, “Preferred Shaft Site,” NYCDEP would implement a number of protective measures during blasting to minimize noise impacts. Blasting would occur over a period of eight months for the raise bore method and 24 months for the surface excavation method and it is highly unlikely that more than one or two blasts would occur on a given day.

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 and from 3.1 to 9.3 dBA during Shift 2. These impacts would range from marginally to readily noticeable. The modeling also predicts that at the retail/residential building (Receptor 3) to the south, there could be readily noticeable noise impacts during Stage 4B and that 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.

Due to the extended duration that potential noise impacts could occur throughout the construction period, these impacts are considered to be significant. Section 5.12, "Noise," of Chapter 5, "Water Main Connections," discusses the temporary noise impacts generated by construction of the water main connections and venturi chambers. In the event of concurrent construction of the shaft, water main connections, and venturi chambers, no additional receptors would experience potential significant adverse impacts, but the receptors that are in the immediate vicinity of both construction projects would experience higher noise levels than they would experience if only the shaft would be constructed for the relatively short time (20 weeks) that both construction projects were under way at the same time.

These conclusions are 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. As discussed in Section 6.16, "Mitigation Measures," NYCDEP is exploring potential mitigation measures that could attenuate noise levels at the affected receptors.

Operation

None of the activities associated with the activation or operation of the shaft would cause potential significant noise impacts, as there would be no loud machinery associated with these activities. Shaft activation would occur for a very short period of time (approximately one month), would not include the use of pumps or other noise-generating equipment, and would require a maximum of one truck delivery per day for a period of approximately three to five days. Due to these short-term and temporary effects, shaft activation would not have the potential to significantly impact noise within the Study Area. All equipment, including pumps and movable valves, associated with operation of the shaft would be located below ground and the facility would be unmanned. Maintenance activities would occur intermittently and generally for not more than a few hours per week. Therefore, no potential significant adverse noise impacts would be expected during activation and operation of the shaft.

◆