Dearborn, Michigan
NOISE-CON 2008
2008 July 28-30

Operational noise impact assessment for the Sunset Park material recycling facility in Brooklyn, NY

Benjamin H. Sachwald[a]
AKRF, Inc.
440 Park Avenue South
New York, NY 10016, USA

ABSTRACT

This paper discusses the operational noise impact analyses that were conducted by AKRF in 2007 for a proposed materials recycling and handling facility in Brooklyn, New York. When completed in 2009, the facility will receive scrap metal, metal/glass/plastic, and paper from all five New York City boroughs. The project was subject to New York City's Environmental Quality Review process, which requires City agencies to review proposed discretionary actions to identify and mitigate the effects those actions might have on the environment, including potential noise impacts. Additionally, the proposed project must satisfy criteria outlined in the New York City Noise Control Code and Zoning Resolution Performance Standards for Manufacturing Districts. The noise impact assessment focused on analyzing noise from the recycling facility's on-site processing operations and noise from vehicles traveling to and from the project site. To accurately estimate noise levels that are expected to result from the facility's on-site processing operations, a noise measurement program was conducted at two comparable facilities. CadnaA was used to model the proposed facility's stationary sources, and the FHWA Traffic Noise Model was run to model its mobile sources. In this paper, the applicable regulations and criteria are presented along with the analytical techniques and results of the project's noise impact assessment.

1. INTRODUCTION

An acoustical analysis was performed for a materials recycling and handling facility to be constructed in Brooklyn, New York, at a location that is currently a vehicle impoundment lot for the New York Police Department. The proposed facility will handle scrap metal, glass, and plastic and will facilitate achieving Citywide recycling goals set forth by local officials in the City's Solid Waste Management Plan. Additionally, the proposed facility will provide the following environmental benefits: 1) a reduction in the number of trucks by utilizing barge transport and allowing for potential rail transport in the future, 2) the creation of a new destination for DSNY trucks which will reduce the distance certain trucks are currently required to travel, 3) the development of a state-of-the-art recycling program to aid the City in achieving its goals, and 4) the expansion of the City's marine-based recycling infrastructure, which will allow the movement of materials and revitalize the Brooklyn waterfront as part of a NYC Economic Development Corporation initiative/goal. Materials will enter and egress the facility by means of two options: a barge via the Gowanus Bay, and a roadway via Department of Sanitation New York (DSNY) and private vehicles. An environmental assessment examining potential impacts of the proposed project on the surrounding environment was performed as part of the New York City environmental review

[a] Email address: bsachwald@akrf.com

process. According to the City Environmental Quality Review (CEQR) Technical Manual, an environmental assessment must be performed when discretionary action is required, in this case, the lease of a City pier from the Department of Small Business Services. The acoustical analysis examined the following two areas of potential environmental impact: noise due to the on-site processing operations and noise due to traffic generated by the proposed project.

This paper discusses the pertinent local regulations that were used for assessing environmental impacts as part of the CEQR analysis, the acoustical analytical techniques that were chosen for this important acoustical study, and the results of the analysis.

2. NOISE STANDARDS AND CRITERIA

Noise levels associated with the operation of the proposed project will be subject to the emission source provisions of the New York City Zoning Resolution Performance Standards for Manufacturing Districts (ZRMD) and the New York City Noise Control Code (NCC), and the noise criteria set forth in the CEQR Technical Manual.

A. Performance Standards for Manufacturing Districts

The proposed project site is zoned M3 (for heavy manufacturing uses, such as power plants, solid waste transfer facilities, recycling plants, and fuel supply depots). The City of New York's Zoning Resolution Section 42-213 states that in all manufacturing districts, the sound pressure level resulting from any activity, whether open or enclosed, shall not exceed, at any point on or beyond any lot line, the maximum permitted sound level for the designated octave band indicated in Table 1 for an M3 zone.

B. New York City Noise Control Code

The NCC contains prohibitions regarding unreasonable noise, requirements for noise due to construction activities, and specific noise standards, including plainly audible criteria for specific noise sources. The amended code specifies that no sound source operating in connection with any commercial or business enterprise may exceed the decibel levels in the designated octave bands shown in Table 2 at the specified receiving properties.

C. New York CEQR Noise Criteria

As recommended in the CEQR Technical Manual, the acoustical study conducted used the following criteria to define a significant noise impact:

- An increase of 5 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors (including residences, play areas, parks, schools, libraries, and houses of worship) over those calculated for the No Build condition, if the No Build levels are less than 60 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 4 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No Build condition, if the No Build levels are 61 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No Build condition, if the No Build levels are greater than 62 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.

- An increase of 3 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No Build condition, if the analysis period is a nighttime period (defined by the CEQR Technical Manual criteria as being between 10 PM and 7 AM).

Table 1: New York City Zoning Resolution Performance Standards for an M3 Manufacturing District

Current Octave Bands	
Octave Band (Hz)	**M3 District (dB)**
63	79
125	74
250	69
500	63
1000	57
2000	52
4000	48
8000	45
Source: ZRMDs	

Table 2: New York City Noise Control Code

Octave Band Frequency (Hz)	**Maximum Sound Pressure Levels (dB) as Measured Within a Receiving Property as Specified Below**	
	Residential receiving property for mixed-use building and residential buildings (as measured within any room of the residential portion of the building with windows open, if possible)	*Commercial receiving property (as measured within any room containing offices within the building with windows open, if possible)*
31.5	70	74
63	61	64
125	53	56
250	46	50
500	40	45
1000	36	41
2000	34	39
4000	33	38
8000	32	37
Source: Section 24-232 of the Administrative Code of the City of New York, as amended December 2005.		

D. Impact Definition Summary

In conclusion, the proposed project will have a significant noise impact if noise levels due to plant operation (i.e., the total noise generated by all mechanical equipment and operations including material deliveries) exceed either the octave band noise levels specified in the ZRMD and/or the NCC, or exceed the impact criteria defined by the CEQR Technical Manual.

3. NOISE PREDICTION METHODOLOGY

A. On-Site Processing Operations: Noise Monitoring

A library of acoustical data was created for this analysis through noise measurements that were performed at two materials recycling and handling facilities, both of which have on-site processing operations comparable to those of the proposed facility in Brooklyn. Two days of extensive noise measurements were executed at a facility in Claremont, New Jersey, and at a facility in the Bronx, New York. The noise monitoring program consisted of meeting with each of the facility operations' managers to gain a better understanding of each facility's operations and a guided tour to identify which of the current facility's activities are expected to occur at the proposed facility. Additionally, observations were made of the relevant

facility operations to identify which were acoustically significant (i.e., noise contributing operations), the octave band noise levels were measured for the acoustically significant on-site processing operations, and all field notes, pictures, distance measurements, etc. were recorded. The noise measurement data pertaining to the proposed scrap metal handling operations was gathered at the comparable facility in the Bronx, and the noise measurement data pertaining to all other operations, including metal/glass/plastic (MGP) handling, was gathered in Claremont.

Based on the results of the noise measurement data and observations made during the noise monitoring program, it is apparent that the scrap metal handling operations will be the dominant noise source at the proposed facility. Impact noises due to metal-on-metal contact were significantly higher when compared to impact noises resulting from the handling of non-scrap metal, glass and plastic. The scrap metal tipping, loading, and transfer operations resulted in substantial amounts of impact noises. Initial "back-of-the-envelope" calculations of the non-scrap metal operations (including the building attenuation provided by the proposed facility's structures, which is discussed in the next section) indicated that these operations are typically 20 dBA below the sound levels of the scrap metal operations.

Figure 1: Measuring a crane loading scrap metal into a barge with a B&K 2260 SLM (lower left).

B. Acoustical Design Considerations

An initial inspection of the proposed facility's architectural drawings revealed that the scrap metal storage and transfer shed was to be located closest to the eastern property line, and consequently, nearest to the adjacent noise sensitive receptor: a federal correctional facility. The initial project design was such that the scrap metal storage and transfer shed opened to the east, providing a direct line of sight from the metal handling operations to the correctional facility. Discussions were held with the client regarding this important acoustical design issue. After careful consideration, it was determined that relocating the shed farther from the correctional facility was not feasible without disrupting the flow of vehicular traffic to the proposed facility. As a compromise, the proposed project's design was modified such that the

scrap metal storage and transfer shed will have a solid wall with no openings on the eastern façade, and will instead be open to both the north and south (where there are manufacturing, or non-noise sensitive, uses). The updated scrap metal storage shed design inherently created a noise barrier that will shield noise created by the scrap metal handling operations from the correctional facility. The non-scrap metal, glass, plastic, and sorting operations will be located in a partially enclosed shed, similar to the scrap metal and transfer shed; these operations, however, are located on the western side of the project site and are therefore substantially farther from the eastern property line and the correctional facility. On-site operations located on the western portion of the site will be shielded in part by the other operations and their respective structures.

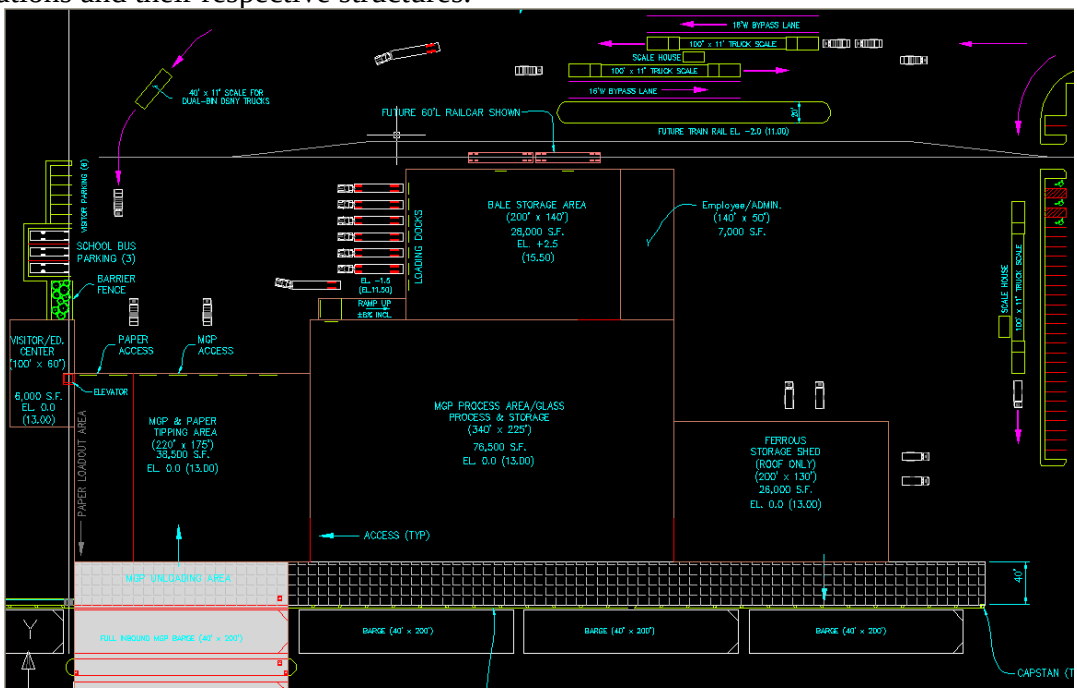

Figure 2: The proposed facility's layout (MGP building on the left, and the scrap metal building on the right).

C. On-Site Processing Operations: Noise Modeling

A stationary source noise analysis was performed using the CadnaA model (a computerized model developed by DataKustik for noise prediction and assessment), the aforementioned library of acoustical data that was gathered as part of the extensive noise monitoring program, GIS (geographic information system) data of the existing geometric conditions, and architectural drawings of the proposed project.

Noise generated by on-site processing operations was variable and dependent upon the characteristics of particular operations taking place. Consequently, the ZRMD does not specify a statistical descriptor for its octave band limits (shown in Table 1). For the on-site processing operations analysis regarding the ZRMD, the L_1 octave band sound pressure levels for the various on-site handling operations were chosen. The selection of the octave band's L_1 statistical descriptor is based on the fact that the dominant noise source at the proposed facility will be impact noises resulting from the handling and transferring of scrap metal. The resulting scrap metal impact noises will be both extremely loud and last for a relatively short duration (i.e., typically a couple of seconds). Other statistical descriptors were considered for the ZRMD analysis, such as the L_{10} and the L_{eq}, but after careful review of the data gathered during the extensive noise monitoring program, the L_1 was selected since it

will represent a worst-case scenario and provide a conservative assessment of potential impacts of the proposed facility. Since the on-site processing operational events represented by these L_1 statistical levels occurred isolated from one another, the L_1 octave bands were calculated along the proposed project site's property line, as per the definition of the ZRMD, and individually compared with the M3 octave band limits listed in the ZRMD. Similarly, the L_1 octave band sound pressure levels were chosen for the NCC comparison for reasons identical to their selection for the ZRMD comparison. Since the NCC standards are for interior noise levels (see Table 2) and the windows of the correctional facility are not operable, the level of composite building attenuation due to the structure of the correctional facility (which took into account the brick/concrete walls and the small, fixed, laminated-glass window in each of the cells) was used to calculate an estimation of interior sound levels due to on-site operations inside the federal correctional facility. To evaluate with respect to the CEQR impact criteria, hourly L_{eq} values for the on-site processing operations were conservatively calculated based on the assumption that the proposed facility's loudest hour of operations will occur for 24 hours each day at the nearest noise-sensitive use, the federal correctional facility.

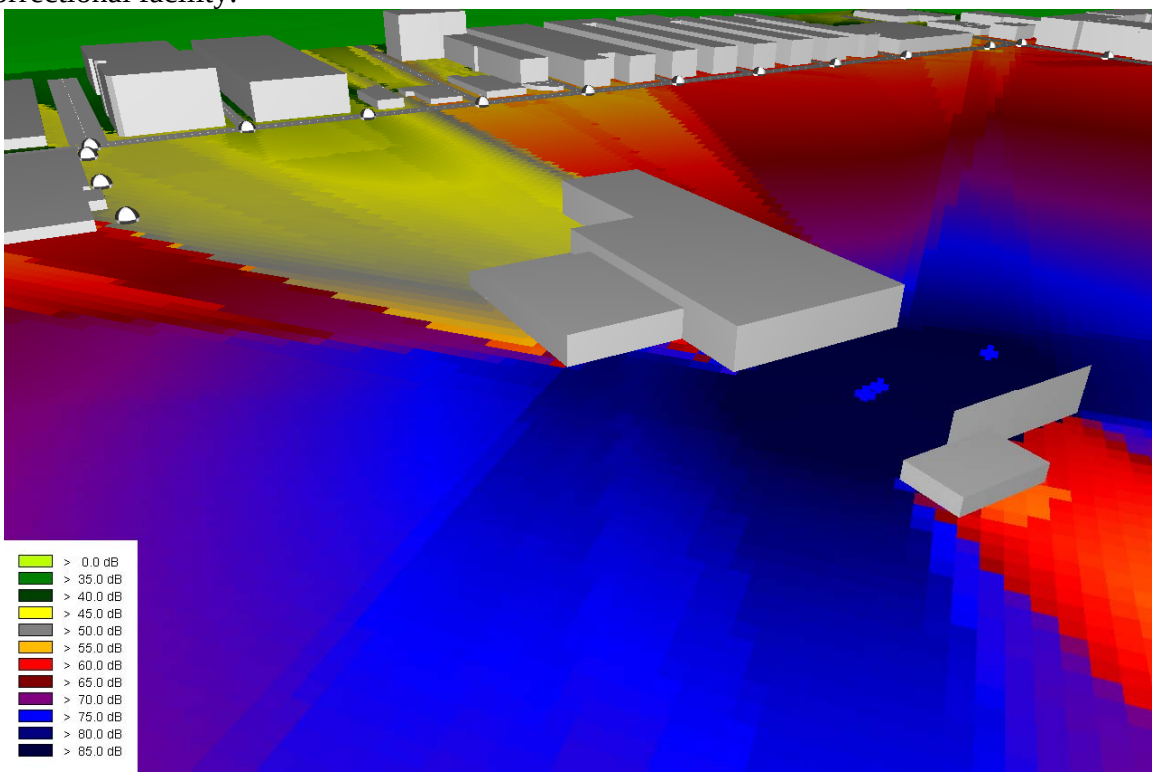

Figure 3: 3-D view of the proposed project in CadnaA with noise contours (looking southeast).

D. Mobile Source: Noise Modeling

At locations near the project site, noise levels will increase due to noise generated by a combination of on-site processing operations and project-generated vehicular traffic. At locations away from the project site, the potential for significant noise impacts from the project will be a result of project-generated vehicular noise sources. Noise due to vehicular sources was determined using a proportional modeling screening analysis technique and, where appropriate, detailed modeling using the Traffic Noise Model, or TNM (the Federal Highway Administration's [FHWA] *Traffic Noise Model* version 2.5). Both of these analysis tools for mobile source noise are discussed in more detail below.

PROPORTIONAL MODELING

Proportional modeling was used as a screening analysis tool to determine noise sensitive-locations that will potentially result in a significant noise impact from traffic generated by the proposed project. The proportional modeling methodology is one of the analysis techniques recommended in the CEQR Technical Manual for mobile source analysis. Using the proportional modeling technique, the prediction of noise levels in the future, where vehicular traffic is the dominant noise source, is based on a calculation using measured existing noise levels and predicted changes in traffic volumes to determine the future without the proposed project (i.e., "No Build") and the future with the proposed project (i.e., "Build") levels. Vehicular traffic volumes are converted into Passenger Car Equivalent (PCE) values, for which one medium-duty truck (typically two axels and six tires, having a gross weight between 9,900 and 26,400 pounds) is assumed to generate the noise equivalent of 13 cars, and one heavy-duty truck (typically three or more axels, having a gross weight of more than 26,400 pounds) is assumed to generate the noise equivalent of 47 cars, and one bus (vehicles designed to carry more than nine passengers) is assumed to generate the noise equivalent of 18 cars. Future noise levels are calculated using the following equation:

$$F\,NL - E\,NL = 10 * LOG\,(F\,PCE / E\,PCE) \qquad (1)$$

where:

F NL = Future Noise Level
E NL = Existing Noise Level
F PCE = Future PCEs
E PCE = Existing PCEs

Two noise-sensitive locations were identified as having the potential for a significant noise impact resulting from vehicular traffic generated by the proposed project (see Figure 4). These locations are the federal correctional facility (Site 1) on Second Avenue between 29th and 30th Streets; and a row of residential buildings (Site 2) on 39th Street between Third and Fourth Avenues. Sites 1 and 2 are both located along the route on which project-generated vehicles, the majority of which will be trucks, will access and egress the proposed facility. The proportional modeling screening level analysis showed that project-generated traffic will not be substantial enough to result in a significant noise impact at Site 2. At Site 1, however, the results of the proportional modeling screening level analysis indicated that a detailed analysis using the TNM was warranted. The more detailed analysis, performed using the TNM, is discussed below.

TRAFFIC NOISE MODEL

Since the proposed facility will operate 24 hours a day, six days a week, the detailed analysis involved creating a TNM to model the existing, No Build, and Build scenarios for every hour of a typical 24 hour workday. Using detailed traffic data (volumes, vehicle classifications, speeds, trip assignments, etc.) from the results of the environmental assessment's traffic analysis, the TNM was used to more precisely determine the magnitude of noise level increases due to on- and off-site project-generated vehicular traffic and to determine whether there will be a significant noise impact at Site 1.

Figure 4: Noise sensitive locations with the potential for a significant noise impact.

E. Analysis Year

The future analysis year used for purposes of determining operational noise impacts is 2009, when the proposed facility will be completed and fully operational. The proposed project was anticipated to reach maximum operating conditions in the year 2029. For a conservative mobile source noise analysis, project-generated traffic volumes associated with the maximum operating conditions in 2029 were assumed to occur in 2009. This creates an analysis that will produce the maximum potential for significant noise impacts due to operations of the proposed project.

4. EXISTING CONDITIONS

A. Site Description

The project site in Brooklyn is located in an area that is predominantly industrial and comprised mostly of manufacturing, parking, and storage facilities, and the aforementioned federal correctional facility. The ambient noise levels are primarily a function of vehicular traffic on adjacent streets and nearby manufacturing activities, although vehicular traffic is the existing dominant noise source.

B. Selection of Noise Receptor Locations

Site 1, as discussed above, will represent a noise-sensitive use that is immediately adjacent to the proposed facility and will therefore experience the effects of the noise of on-site processing operations and project generated vehicular traffic.

C. Noise Monitoring

Since the proposed facility will operate 24 hours a day, 6 days a week, a 24-hour continuous noise measurement was performed to determine existing noise levels at Site 1. This measurement was started on November 20 and was completed on November 21, 2006.

D. Equipment Used During Noise Monitoring

Measurements were performed using a Brüel & Kjær (B&K) sound level meter (SLM) type 2260, sound level calibrator type 4231, and a 1.27 centimeter (0.5 inch) microphone type 4189. The SLM was mounted on a tripod at a height of approximately 1.5 meters (5 feet) above the ground, and calibrated before and after the reading using the calibrator with the appropriate adaptors. The data were digitally recorded by the SLM and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq}, L_1, L_{10}, L_{50}, L_{90}, L_{min}, and L_{max}. A B&K outdoor microphone kit with a windscreen, bird spikes, and water-proof enclosure was used during all sound measurements except for calibration. All measurement procedures conformed to the requirements of ANSI Standard S1.13-2005.

E. Results of Baseline Measurements

Table 3 summarizes the results of the baseline measurements at Site 1. Values are shown for the specific monitored weekday time period. As indicated earlier in this paper, noise levels are directly related to the volume of traffic on the immediately adjacent streets and activities occurring at the surrounding manufacturing buildings. Traffic noise levels on Second Avenue are low to moderate during most hours, but truck volumes can reach substantial levels during peak hours of manufacturing activity.

Table 3: Site 1—Continuous Measurement Results (in dBA)

Start Time	L_{eq}	L_1	L_{10}	L_{50}	L_{90}	L_{min}	L_{max}
6 PM	60.1	67.3	61.5	58.8	57.8	56.7	74.4
7 PM	63.1	70.5	64.3	62.3	60.6	58.0	76.4
8 PM	61.4	66.6	64.1	59.9	58.4	57.1	74.5
9 PM	58.6	64.8	59.5	57.8	57.1	56.2	73.1
10 PM	58.4	65.6	59.6	57.2	56.6	55.8	71.5
11 PM	58.1	63.1	58.9	57.7	56.9	56.0	68.0
Midnight	57.1	60.2	57.8	56.8	56.1	55.0	68.5
1 AM	60.0	67.1	60.3	59.4	57.5	55.4	76.0
2 AM	59.6	60.9	60.0	59.5	59.0	58.4	64.8
3 AM	59.7	61.7	60.2	59.6	59.1	58.2	67.2
4 AM	65.1	71.8	70.1	60.7	59.3	58.5	74.2
5 AM	62.5	71.3	63.4	60.6	59.3	58.6	80.6
6 AM	64.5	72.8	66.5	61.7	60.3	58.6	78.6
7 AM	70.5	74.3	72.5	71.3	63.6	59.3	77.8
8 AM	64.8	71.5	67.4	63.1	61.2	59.3	81.5
9 AM	67.0	74.8	70.4	64.6	61.9	59.1	81.2
10 AM	63.7	72.9	65.9	61.4	60.0	58.8	78.2
11 AM	62.9	69.4	64.2	62.0	60.7	59.6	79.2
Noon	62.1	69.5	64.2	60.7	58.9	57.7	78.0
1 PM	62.4	70.4	64.6	60.6	59.2	57.9	78.8
2 PM	63.1	73.0	65.0	60.3	58.8	56.8	79.5
3 PM	62.5	70.3	64.3	60.4	59.1	58.1	80.9
4 PM	65.0	75.1	67.0	61.7	59.0	57.8	83.5
5 PM	63.3	73.4	64.6	60.2	59.1	58.0	82.0

Notes: Field measurements were performed by AKRF, Inc. on November 20 and 21, 2006.

5. FUTURE NOISE LEVELS WITHOUT THE PROPOSED PROJECT

Using the methodology previously described for mobile source noise, future noise levels without the proposed project were calculated for Site 1 in the 2009 analysis year. These values are shown in Table 4.

In 2009, at most locations, it was discovered that the increase in $L_{eq(1)}$ noise levels will be less than 1.0 dBA, an imperceptible change. The maximum increase in $L_{eq(1)}$ noise levels, comparing 2009 future noise levels without the proposed project to existing noise levels, will be 1.4 dBA. This will occur at the noise receptor location from 2–3 AM. A change of this magnitude will be barely perceptible.

Table 4: 2009 Future Noise Levels Without the Proposed Project at Site 1 (in dBA)

Start Time	Existing $L_{eq(1\text{-}Hour)}$	No Build $L_{eq(1\text{-}Hour)}$	Increase
6 PM	60.1	60.5	0.4
7 PM	63.1	63.4	0.3
8 PM	61.4	61.8	0.4
9 PM	58.6	59.0	0.4
10 PM	58.4	58.5	0.1
11 PM	58.1	58.5	0.4
Midnight	57.1	57.5	0.4
1 AM	60.0	60.4	0.4
2 AM	59.6	61.0	1.4
3 AM	59.7	59.9	0.2
4 AM	65.1	66.3	1.2
5 AM	62.5	62.6	0.1
6 AM	64.5	65.0	0.5
7 AM	70.5	71.0	0.5
8 AM	64.8	65.2	0.4
9 AM	67.0	67.5	0.5
10 AM	63.7	64.1	0.4
11 AM	62.9	63.2	0.3
Noon	62.1	62.3	0.2
1 PM	62.4	62.8	0.4
2 PM	63.1	63.5	0.4
3 PM	62.5	62.9	0.4
4 PM	65.0	65.4	0.4
5 PM	63.3	63.7	0.4

6. 2009 FUTURE NOISE LEVELS WITH THE PROPOSED PROJECT

A. CEQR Criteria

Using the methodology previously described for both stationary and mobile noise sources, future noise levels with the proposed project were calculated for Site 1 in the 2009. The scrap metal processing operations are scheduled to be phased in after the completion of the proposed facility's construction. However, for the purposes of this analysis, it was assumed that the scrap metal processing facility will be in operation at the commencement of project operations. These calculated values for the future with the proposed project are shown in Table 5 and represent noise levels from a combination of both on-site processing operations and project-generated vehicular traffic levels. To be conservative, the analysis assumed that the hour with the highest noise levels due to on-site non-scrap metal operations may occur during each hour over the 24-hour analysis period.

In 2009, during most hours and at most locations, the increase in $L_{eq(1)}$ noise levels will be less than 1.5 dBA, an imperceptible change. The maximum increase in $L_{eq(1)}$ noise levels, comparing 2009 Build noise levels with 2009 No Build noise levels, will be 2.3 dBA. This will occur at the noise receptor location during the Noon to 1 PM and 9 PM to 10 PM analysis periods. This is due to the fact that the Noon to 1 PM hour has the most project-generated vehicles out of any hour during a 24-hour period, and the 9 PM to 10 PM hour has a low ambient noise level. A change of this magnitude will barely be perceptible. In addition, based upon CEQR impact criteria, the increase in noise due to operation of the proposed facility will not result in a significant increase in noise levels.

B. New York City Zoning Resolution Performance Standards for Manufacturing Districts

Using the methodology previously described for on-site processing operations, future noise levels with the proposed project were calculated at the northern property line along 29th street, the eastern property line along Second Avenue, and the southern property line along

39th street for the 2009 analysis year to determine compliance with the ZRMD. Figure 5 shows the L_1 levels of the loudest on-site processing operations in comparison with the ZRMD maximum allowable sound levels for an M3 zoned site. The results in Figure 5 represent noise levels at the property line along Second Avenue (immediately adjacent to the federal correctional facility) resulting from the on-site processing operations. Noise levels resulting from on-site operations along the proposed project's property line will not exceed the ZRMD in any of the listed octave bands. As a result, the proposed project will not result in a significant impact based on the ZRMD.

Table 5: 2009 Future Noise Levels with the Proposed Project at Site 1 (in dBA)

Start Time	No Build	Build			Increase (Build Total vs. No Build)
		On Site $L_{eq(1)}$	Mobile $L_{eq(1)}$	Total $L_{eq(1)}$	
6 PM	60.5	54.0	60.7	61.5	1.0
7 PM	63.4	54.0	63.7	64.1	0.7
8 PM	61.8	54.0	62.5	63.1	1.3
9 PM	59.0	54.0	60.4	61.3	2.3
10 PM	58.5	54.0	58.9	60.1	1.6
11 PM	58.5	54.0	58.7	60.0	1.5
Midnight	57.5	54.0	57.5	59.1	1.6
1 AM	60.4	54.0	60.4	61.3	0.9
2 AM	61.0	54.0	61.0	61.8	0.8
3 AM	59.9	54.0	59.9	60.9	1.0
4 AM	66.3	54.0	66.3	66.5	0.2
5 AM	62.6	54.0	62.6	63.2	0.6
6 AM	65.0	54.0	65.0	65.3	0.3
7 AM	71.0	54.0	71.3	71.4	0.4
8 AM	65.2	54.0	65.4	65.7	0.5
9 AM	67.5	54.0	67.6	67.8	0.3
10 AM	64.1	54.0	65.5	65.8	1.7
11 AM	63.2	54.0	64.9	65.2	2.0
Noon	62.3	54.0	64.2	64.6	2.3
1 PM	62.8	54.0	63.7	64.1	1.3
2 PM	63.5	54.0	64.4	64.8	1.3
3 PM	62.9	54.0	63.3	63.8	0.9
4 PM	65.4	54.0	65.6	65.9	0.5
5 PM	63.7	54.0	63.9	64.3	0.6

C. New York City Noise Control Code

Using the methodology previously described, future noise levels with the proposed project were calculated in the 2009 analysis year for the interior of a cell located at the westernmost part of the correctional facility with a direct line of site to the proposed project to determine compliance with the NCC. Figure 6 shows the interior L_1 levels of the loudest on-site processing operations in comparison with the NCC, with attenuation based on the structure of the correctional facility (brick/concrete walls, small fixed laminated glass window in the cells) taken into account. The proposed project will not result in a significant impact based on the NCC.

7. CONCLUSION

The proposed project will not exceed the noise impact evaluation criteria set forth in the ZRMD, the NCC, or the CEQR Technical Manual. Therefore, the proposed project will not result in any significant adverse noise impacts.

ACKNOWLEDGEMENTS

I would like to thank Stephen Rosen (AKRF, Inc.) and Martin Alexander (Brüel & Kjær) for their combined efforts and guidance throughout the duration of this acoustical study.

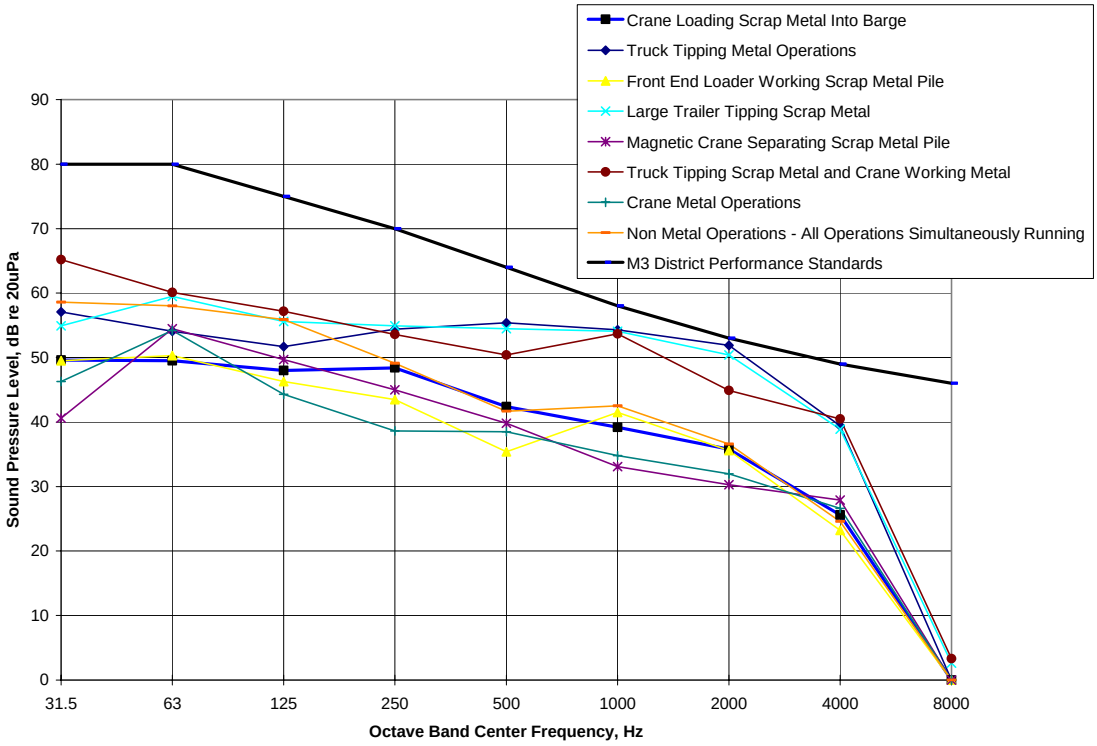

Figure 5: Octave Band Sound Pressure Level Spectra at Property Line, Based Upon L_1 Statistical Octave Band Spectra Measured for On-Site Processing Operations at Proposed Facility

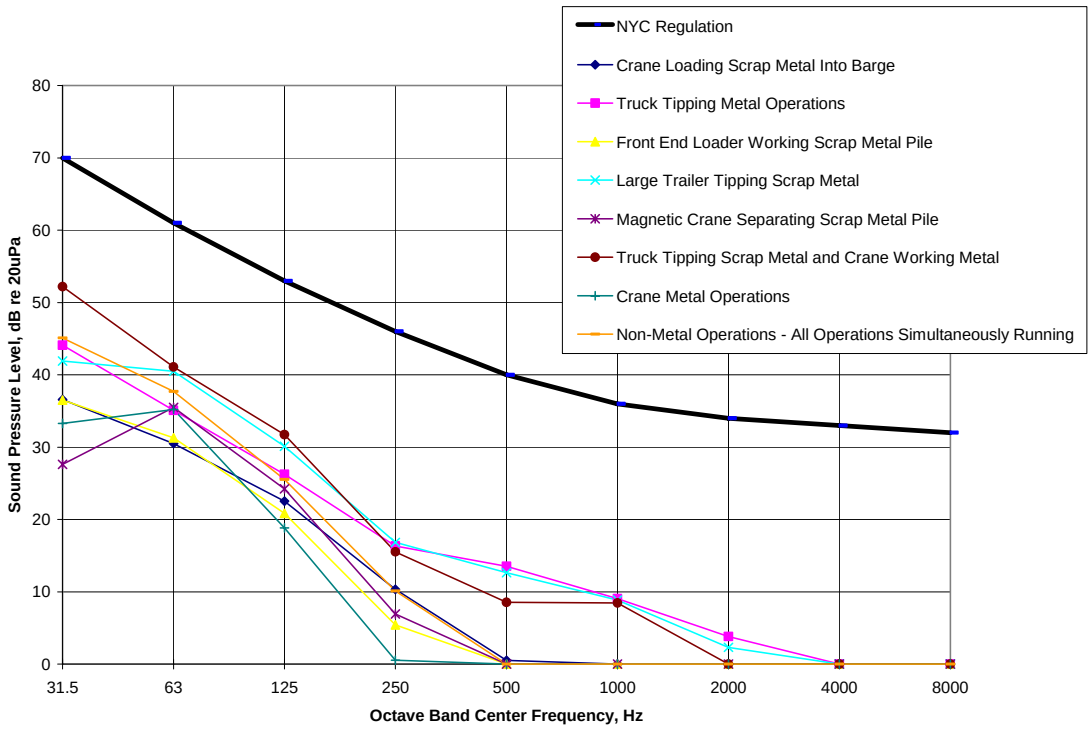

Figure 6: Octave Band Sound Pressure Level Spectra Inside Correctional Facility, based upon L_1 Statistical Octave Band Spectra Measured for On-Site Processing Operations at Proposed Facility