

December 22, 2021

Mr. Normand Martin
DSM Realty
881 East Street
Tewksbury, MA 01876

Ref. 4624

Re: 129 Parker Street, Maynard, MA – First Round of Waste Compactor Sound Compliance Monitoring

Dear Normand:

Tech Environmental, Inc. (Tech) performed the first round of sound compliance monitoring of the Market Basket waste compactor at the southern property line of the mixed-use development at 129 Parker Street and in the abutting Dettling Road neighborhood in Maynard, MA. Tech performed attended sound monitoring measurements on Tuesday, December 14, 2021, during the allowable waste compactor operation time of 7:00 a.m. to 9:00 p.m. A long-term sound meter was set up on Market Basket's property at up 66 feet away from the compactor and at 13 Dettling Road, representing the first floor, and was collected the following day on Wednesday, December 15, 2021. The results of the compliance demonstration reveal that the waste compactor sound levels comply with the Compactor Sound Limits set forth in Attachment 1 of the Planning Board decision dated July 27, 2021 (the "Decision").

Presented below is a summary of the attended sound monitoring procedures and results.

Applicable Waste Compactor Sound Limits

The Decision specifies the following requirements applicable to the compactor sound limits:

Compactor operations will be limited to 7 AM to 9 PM. The compactor sound limit at the site property line shall be at ANSI recommended height of 5 feet, or at any habitable elevation at the nearest residences (i.e. such as second floor window locations). Compliance measurements shall be made outside of the minimum distances from reflective surfaces as per ANSI requirements and extrapolated to the proper limit location to demonstrate:

1. *No broadband sound pressure level of more than 10 dBA above the ambient, and/or*
2. *No "pure tone" condition.*

Ambient is defined as the sound level that is not exceeded 90% of the time, or the L90 sound level, (i.e., conservatively assuming the quietest 6 minutes over any one hour) and the sound with the compactor operating with maximum potential usage rates over an hour as well.

A "pure tone" condition occurs when any octave band sound pressure level from the facility exceeds both of the two adjacent octave band sound pressure levels by 3 dB or more during the monitoring period.

Measurement Procedures and Results

On Tuesday, December 14, 2021, Tech performed attended sound measurements of the waste compactor over a fourteen- (14) hour period from 7:00 a.m. to 9:00 p.m. Unattended monitoring was performed for the remaining 10 hours of the 24-hour monitoring period. One long-term sound level analyzer was setup on the Market Basket side of the property at 66 feet away from the compactor. This location represents the property line without receiving reflective sound off the PVC fence at the property line and was in direct line of sight with the compactor. And a second long-term sound level analyzer was setup at 13 Dettling Road at a height of approximately 13 feet above ground level representing the first floor of the residence. Tech's acoustic engineer was stationed with the sound analyzer on the Market Basket side to observe and document operations of the waste compactor. Tech's acoustic engineer also documented other sources of sounds not related to waste compactor operations to be screened out from the data analysis on data log sheets. Weather conditions were acceptable for accurate acoustic measurements during the long-term monitoring session. Skies were clear to cloudy with no precipitation; the temperature was in the 30 to 50 °F, and wind speeds were calm to 11 mph. The long-term analyzers were then collected the following day, Wednesday, December 15, 2021.

Long-term sound level measurements were collected using two Larson Davis 831 ANSI Type 1 (high precision) real-time sound level analyzers, which were equipped with precision condenser microphones, windscreens, and frequency analyzers. These analyzers are equipped with a 1/2" precision condenser microphones and have an operating range of 5 dB to 140 dB, and an overall frequency range of 3.5 to 20,000 Hz. These analyzers meet or exceed all requirements set forth in the American National Standards Institute (ANSI) Type 1 Standards for quality and accuracy. Prior to and immediately following the measurement session, each sound analyzer was calibrated (no level adjustment was required; therefore, they were monitoring accurately) with an ANSI Type 1 calibrator, which has an accuracy traceable to the National Institute of Standards and Technology (NIST). For each long-term analyzer, the microphones were fitted with a 7-inch windscreens to negate the effect of air movement across microphone diaphragm.

The long-term sound level analyzers were setup to collect one-minute measurements over a 24-hour period (1,440 measurements). Tech downloaded the data at our office for analysis and complied the 1-minute L_{90} sound levels into hourly L_{90} sound levels. Tech's acoustic engineers document both uncontaminated and contaminated (e.g., delivery trucks, cars etc.) one-minute waste compactor operations on field log sheets.

Tech's acoustic engineers identified 104 one-minute waste compactor operations during the fourteen-hour period. Out of those 104 waste compactor operations, 52 one-minute events were waste compactor only and 52 one-minute events were both the waste compactor and another sound source (e.g., delivery trucks, cars etc.) combined. The 104 one-minute waste compactor operations represent 12 percent of the 840 one-minute measurements collected over fourteen hours. The compactor is allowed to operate between 7:00 a.m. to 9:00 p.m. Tech observed the compactor operating between 7:00 a.m. to 8:00 p.m.

Table 1 presents the ambient and waste compactor only sound levels at Market Basket for each hour during the 24-hour monitoring period. The ambient L₉₀ sound levels ranged from 44 to 71 dBA and the waste compactor only L₉₀ sound levels ranged from 46 to 50 dBA. Please note that a landscaping crew was using leaf blowers on the Market Basket side during the 2:00 to 3:00 p.m. hour, which significantly increased ambient L₉₀ sound levels. The uncontaminated waste compactor L₉₀ sound level increase above ambient on the Market Basket side ranged from 0 to 1 dBA.

Table 2 presents the ambient and waste compactor only sound levels at 13 Dettling Road for each hour during the 24-hour monitoring period. The ambient L₉₀ sound levels ranged from 41 to 61 dBA and the waste compactor only L₉₀ sound levels ranged from 44 to 49 dBA. Please note that a landscaping crew was using leaf blowers on the Market Basket side during the 2:00 and 3:00 p.m. hour, which significantly increased ambient L₉₀ sound levels. The L₉₀ sound level increase above ambient at 13 Dettling Road ranged from 0 to 1 dBA.

Tech also reviewed the octave band sound levels with the waste compactor only operations. Figures 1 and 2 show there were no pure tone sound levels measured on the Market Basket side or at the first-floor level of 13 Dettling Road, respectively. Figures 1 and 2 present bar graphs of the octave band sound levels for both the lowest and highest waste compactor only sound levels at both locations. Both graphs clearly show that there is no “spike” of sound levels 3 dB higher than two adjacent octave bands due to waste compactor only operations; thus, there are no pure tone conditions.

Findings:

In summary, the first round of sound compliance monitoring of the waste compactor operations demonstrates that the compactor fully complies with the sound limits set forth in the Decision. As required in Condition (a) of the Decision, we will perform one additional sound study in approximately 12 months' time.

If you have any questions, please call me at (781) 890-2220.

Sincerely yours,

TECH ENVIRONMENTAL, INC.



Marc C. Wallace, QEP, INCE

Vice President

4624/Compliance Monitoring Report Round 1 – December 2021

TABLE 1
SUMMARY OF LONG-TERM SOUND LEVELS (L₉₀, dBA)
MARKET BASKET
December 14, 2021- December 15, 2021

Hour	Ambient Sound Levels without Compactor at Market Basket* L ₉₀ (dBA)	Uncontaminated Compactor Sound Levels at Market Basket L ₉₀ (dBA)	Sound Level Increase (dBA)
7:00 a.m. – 8:00 a.m.	49	47	0
8:00 a.m. – 9:00 a.m.	48	47	0
9:00 a.m. – 10:00 a.m.	50	47	0
10:00 a.m. – 11:00 a.m.	49	46	0
11:00 a.m. – 12:00 p.m.	62	46	0
12:00 p.m. – 1:00 p.m.	49	47	0
1:00 p.m. – 2:00 p.m.	58	47	0
2:00 p.m. – 3:00 p.m.	71	50	0
3:00 p.m. – 4:00 p.m.	49	48	0
4:00 p.m. – 5:00 p.m.	48	47	0
5:00 p.m. – 6:00 p.m.	47	46	0
6:00 p.m. – 7:00 p.m.	47	47	0
7:00 p.m. – 8:00 p.m.	45	46	1
8:00 p.m. – 9:00 p.m.**	45	-	-
9:00 p.m. – 10:00 p.m.	45	-	-
10:00 p.m. – 11:00 p.m.	46	-	-
11:00 p.m. – 12:00 a.m.	46	-	-
12:00 a.m. – 1:00 a.m.	45	-	-
1:00 a.m. – 2:00 a.m.	45	-	-
2:00 a.m. – 3:00 a.m.	45	-	-
3:00 a.m. – 4:00 a.m.	45	-	-
4:00 a.m. – 5:00 a.m.	45	-	-
5:00 a.m. – 6:00 a.m.	44	-	-
6:00 a.m. – 7:00 a.m.	45	-	-

*Ambient data does not include any compactor operations.

** No waste compactor operations were observed.

TABLE 2
SUMMARY OF LONG-TERM SOUND LEVELS (L₉₀, dBA)
13 DETTLING ROAD
December 14, 2021- December 15, 2021

Hour	Ambient Sound Levels without Compactor at Market Basket* L ₉₀ (dBA)	Uncontaminated Compactor Sound Levels at Market Basket L ₉₀ (dBA)	Sound Level Increase (dBA)
7:00 a.m. – 8:00 a.m.	48	48	0
8:00 a.m. – 9:00 a.m.	48	48	0
9:00 a.m. – 10:00 a.m.	47	46	0
10:00 a.m. – 11:00 a.m.	46	46	0
11:00 a.m. – 12:00 p.m.	50	46	0
12:00 p.m. – 1:00 p.m.	49	48	0
1:00 p.m. – 2:00 p.m.	49	49	0
2:00 p.m. – 3:00 p.m.	61	47	0
3:00 p.m. – 4:00 p.m.	46	45	0
4:00 p.m. – 5:00 p.m.	45	45	0
5:00 p.m. – 6:00 p.m.	44	44	0
6:00 p.m. – 7:00 p.m.	45	46	1
7:00 p.m. – 8:00 p.m.	44	44	0
8:00 p.m. – 9:00 p.m.**	44	-	-
9:00 p.m. – 10:00 p.m.	43	-	-
10:00 p.m. – 11:00 p.m.	42	-	-
11:00 p.m. – 12:00 a.m.	42	-	-
12:00 a.m. – 1:00 a.m.	41	-	-
1:00 a.m. – 2:00 a.m.	42	-	-
2:00 a.m. – 3:00 a.m.	41	-	-
3:00 a.m. – 4:00 a.m.	41	-	-
4:00 a.m. – 5:00 a.m.	42	-	-
5:00 a.m. – 6:00 a.m.	42	-	-
6:00 a.m. – 7:00 a.m.	44	-	-

*Ambient data does not include any compactor operations.

** No waste compactor operations were observed.

Figure 1:
Waste Compactor Only Octave Band Sound Data
Market Basket

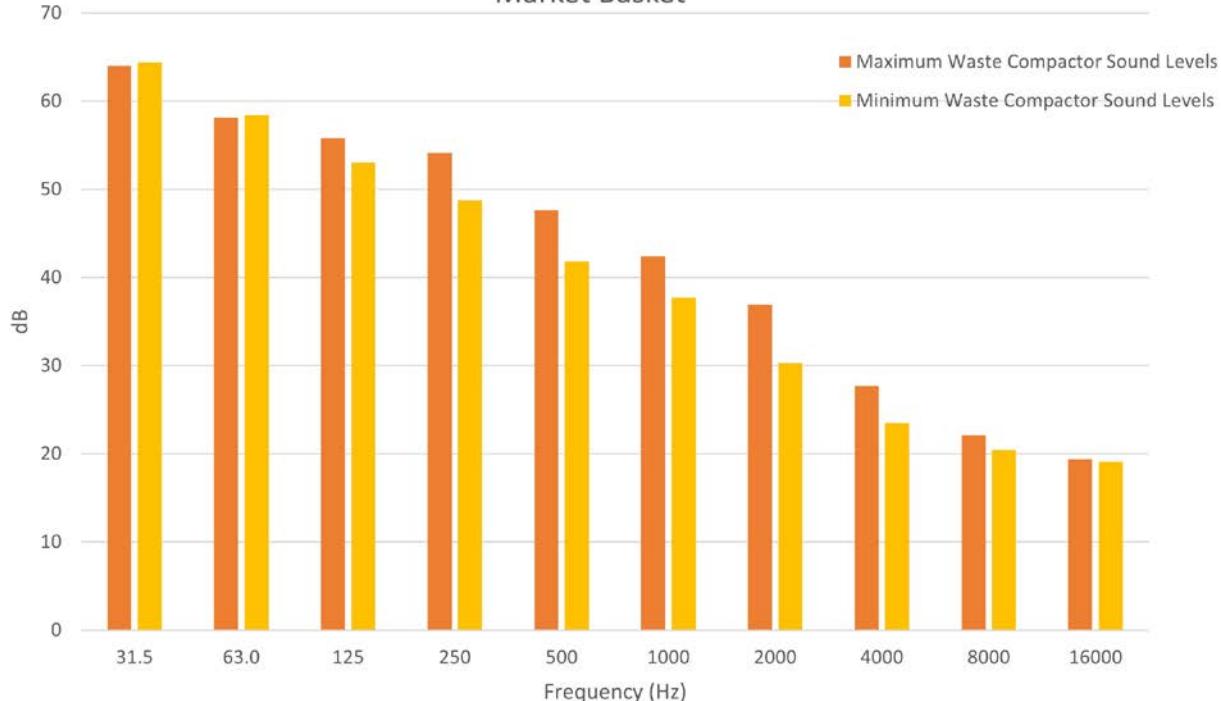
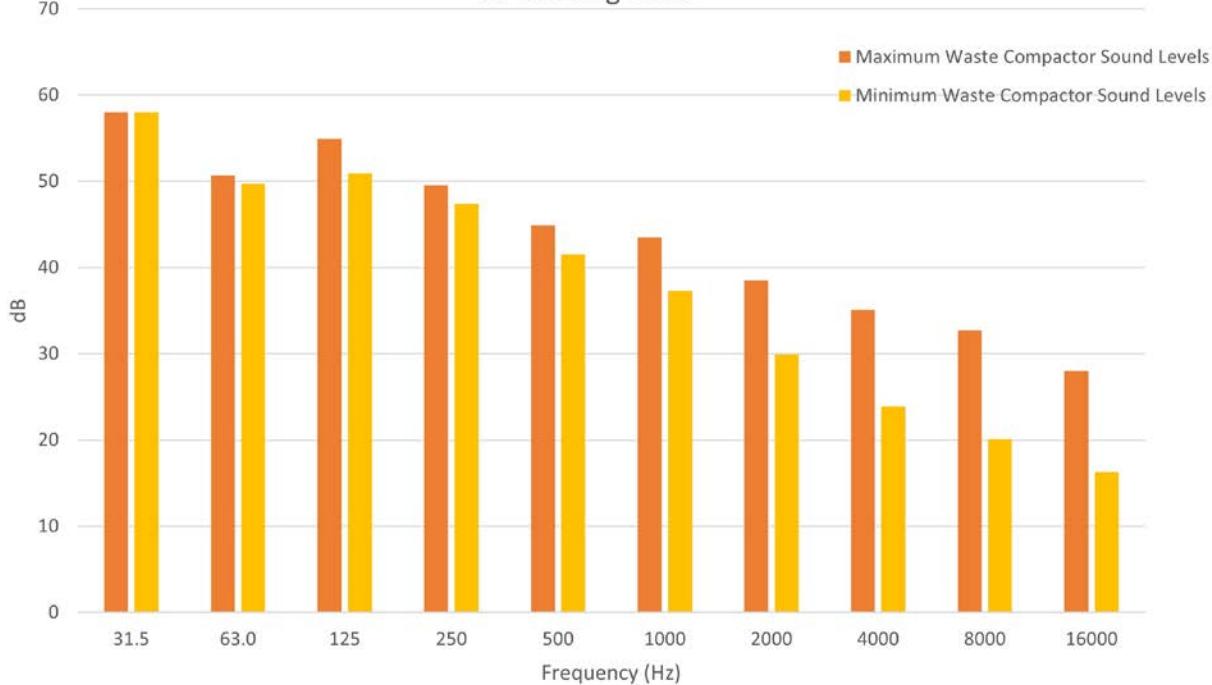


Figure 2:
Waste Compactor Only Octave Band Sound Data
13 Dettling Road



*Pre-existing tonal sound in 125 Hz octave band unrelated to the waste compactor.