

File Ref: AC21193 – 03 – R1

13 October 2021

Parvati Rotherham
Hutt City Council
Private Bag 31-912
Lower Hutt 5040

Dear Parvati,

**Re: Wainuiomata Cleanfill 130 Coast Road, Wainuiomata
Noise monitoring September 2021**

As requested, Acoustic Engineering Services (AES) have undertaken Resource Consent compliance monitoring relating to the noise emissions from the Wainuiomata Cleanfill at 130 Coast Road, in Wainuiomata.

1.0 BACKGROUND

Condition 12 of the approved consent for the Cleanfill outlines the noise standards that are applicable for operation and is reproduced below.

12. Noise from cleanfill deposition activities (excluding emergency and construction works) shall not exceed the following levels when measured at or within the notional boundary of any dwelling existing at the time consent is granted:

- a. Monday to Friday (excluding public holidays) 7.30 am to 5.00 pm – 50 dB L_{Aeq}
- b. Saturday (excluding public holidays) 7.30 am to 12.00 pm – 50 dB L_{Aeq}
- c. All other times – 40 dB L_{Aeq}
- d. 10.00 pm to 7.00 am (all days) – 75 dB L_{Amax}

Notes:

For the purpose of monitoring all sound levels shall be measured in accordance with NZS 6801:2008 “Acoustics – Measurement of environmental sound” (NZS 6801) and be assessed in accordance with NZS 6802:2008 “Acoustics – Environmental Noise”.

The notional boundary is defined as a line 20 metres from the façade of a dwelling or the legal boundary of the site where this is closer to the dwelling.

Condition 16 requires noise monitoring to be undertaken within 30 days of work commencing within Stage 3 of the Cleanfill, and at three-month intervals thereafter. We previously undertook noise monitoring for the June period between the 29th of June and the 6th of July 2021 (AES report reference AC21193 – 02 – R1 and dated the 20th of July 2021).

2.0 SITE AND MONITORING LOCATION

The site is located at 130 Coast Road in Wainuiomata. Figure 2.1 below shows the site location, the surrounding property locations, and the measurement locations.

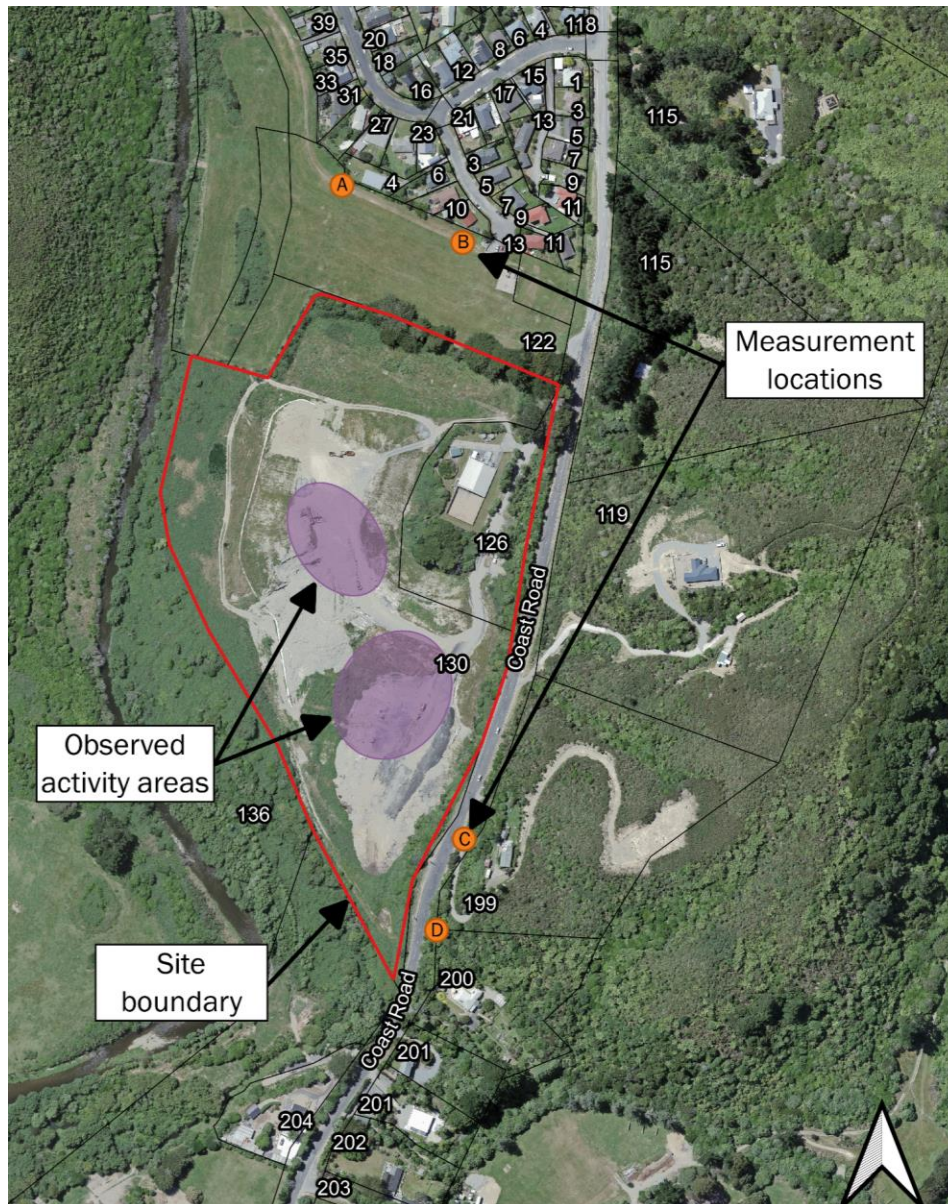


Figure 2.1 – Site and monitoring location

Measurement location A is approximately five metres to the south of the boundary of 4 Ngaturi Grove on top of an earthen bund in Ngaturi Park. This location was selected as on the 24th of September it allowed for line of sight to the raised arm of an excavator operating on the Cleanfill site. The noise limits in this area apply at the site boundary of 4 Ngaturi Grove. We note that the measurement was undertaken out from the boundary so that reflections from the boundary fence will not influence results, and any mitigation/ground effect provided by the earthen bund in the park will be minimised as much as was practical.

Measurement location B is approximately nine metres to the south of 10 Ngaturi Grove and was also on top of an earthen bund in Ngaturi Park. This location was selected as on the 30th of September it allowed for line of sight to the raised arm of an excavator on the site and subjectively the noise from the Cleanfill was the

loudest in this general area. The noise limits in this area also apply at the site boundary of 10 Ngaturi Grove, with the same reasoning as above as to why the measurement was undertaken out from the site boundary.

Measurement location C is approximately six metres to the west of the notional and site boundary for 199 Coast Road on the driveway to the property. This location was selected as on both days when the measurements were taken, the closest Cleanfill activity was approximately 100 to 130 metres away, and because the raised location allowed for direct line of sight to the Cleanfill and the closest activity. The noise limits are applicable at the notional boundary for 199 Coast Road. The noise measurement was taken approximately 8 metres to the west of the notional boundary on the driveway for the property. We note it was not practical to complete the noise measurement at the notional boundary as this is located up a steep cliff.

Measurement location D is approximately at the site boundary for 200 Coast Road and was selected as it has been used for the previous unattended noise monitoring. This location is approximately six to eight metres above the road, and at the monitoring position allowed for line of sight to most of the western half of the site. This location is approximately 20 metres to the north west of the notional boundary of the site. The noise limits are applicable at the notional boundary for 200 Coast Road.

3.0 ACTIVITY OBSERVED

We understand that the site is used by commercial operators to deposit cleanfill material including natural materials (clay, soil, rock, concrete, or brick), and other inert materials. The material is delivered by tipper trucks of various sizes and is unloaded on to the site by tipping the truck deck so that the material slides to the ground. The truck is then driven forward, and the deck lowered. This material is then flattened and positioned on the site by an excavator or bulldozer.

We have been advised that the southern portion of the site has been filled to its finished height. It has been landscaped and planted, and we understand that no heavy vehicles or machinery will now operate in this area. The south eastern portion of the site (directly adjacent to Coast Road) has been filled to its finished height but is yet to be landscaped and planted.

The noise sources we observed during our visits include reversing beepers, trucks manoeuvring into position to unload and when exiting the site, tailgate slams, cleanfill material sliding down the truck deck and onto the ground, excavator movements, and bulldozer movements. This activity was primarily occurring in the areas shown in figure 2.1

4.0 SEPTEMBER 2021 NOISE MONITORING

Attended noise monitoring was undertaken by Josh Luscombe of AES from 10:00 am on Friday the 24th of September 2021, and from 10:30 am on Thursday the 30th of September 2021.

4.1 Weather information

The weather conditions as measured during our visits was as shown in table 4.1 below.

Table 4.1 – Weather conditions during measurements

| Date | Weather conditions during measurements | | |
|-----------------------|---|--------|-------------|
| | Wind | Rain | Temperature |
| Friday 24 September | 0.5 to 3.0 m/s Northerly (gusts up to 4.0 m/s) | 0.0 mm | 18° C |
| Thursday 30 September | 1.3 to 1.6 m/s Southerly (gusts up to 2.0 m/s) | 0.0 mm | 15° C |

As shown in table 4.1, during our visit on the 24th of September the wind conditions were at the upper end of the allowable meteorological conditions according to the requirements of NZS 6801. Subjectively this had

the result of making the Cleanfill noise to the north largely indiscernible above the ambient noise. In order to capture the noise from the Cleanfill under downwind conditions we undertook additional noise measurements on Thursday the 30th of September, as well as a close proximity measurement of the Bulldozer operating.

4.2 Equipment

The attended noise measurements were undertaken using a Bruel and Kjaer 2250 Class 1 sound level meter (serial number 2630291). The sound level meter holds a current calibration certification and was field checked before and after each series of measurements. No significant drift in calibration was observed.

4.3 Results

The results of the attended noise monitoring are as follows.

4.3.1 Measurement 1

Measurement location: A

Orientation to Cleanfill: North

Measurement date: 24 September 2021

Measurement duration: Multiple 15 minute measurements, during 1 hour at this location

Measurement results: 44 dB L_{Aeq} / 40 dB L_{A90} / 60 dB L_{AFmax}

Observations: Wind was from the north with the Cleanfill activity occurring approximately 180 metres to the south. The measurement location was exposed to the prevailing wind at the time and it was concluded that the noise emissions at measurement location were being influenced by being upwind of the site. There was a high amount of background noise that was subjectively to the north of the measurement location and not related to the Cleanfill. There sounded like there were construction activities to the north – excavators and hammering. The noise from the Cleanfill was largely indiscernible from the other noise sources. For the majority of the measurement period, an excavator could be seen operating on the Cleanfill site, although this was not audible, except when the noise source was elevated. The main noise source from the site that was audible at the measuring location was from trucks on the access to the Cleanfill and on Coast Road as they would accelerate or brake, and when they would go over a pothole or bump in the road the tipper tray would rattle.

4.3.2 Measurement 2

Measurement location: D

Orientation to Cleanfill: South

Measurement date: 24 September 2021

Measurement duration: 15 minutes

Measurement results: 47 dB L_{Aeq} / 42 dB L_{A90} / 67 dB L_{AFmax}

Observations: Same measurement location as the unattended monitoring undertaken during the previous noise monitoring period. Location was sheltered from the wind and was downwind from the Cleanfill site with minimal foliage noise present. Measurement was paused when the noise from vehicles on Coast Road was audible, when an overhead plane was audible, or when the noise from the Cleanfill site was not audible so that the Cleanfill activity was the dominant source during the measurement period. The majority of the noise

from the Cleanfill site was from trucks manoeuvring on site, reversing beepers, excavators, cleanfill sliding off the truck, and the occasional noise from people on the site.

4.3.3 Measurement 3

Measurement location: C

Orientation to Cleanfill: South East

Measurement date: 24 September 2021

Measurement duration: 5 minutes

Measurement results: 50 dB L_{Aeq} / 45 dB L_{A90} / 73 dB L_{AFmax}

Observations: Location was the closest point to the activity with direct line of site. During measurement period an excavator was operating approximately 100 metres away, with three trucks arriving to the tipping position, raising their tipping trays, unloading, and driving away. No bulldozer activity was observed during this measurement, nor was any observed while in the vicinity of the site. The Cleanfill activity was the dominant source during the measurement period.

4.3.4 Measurement 4

Measurement location: B

Orientation to Cleanfill: North

Measurement date: 30 September 2021

Measurement duration: 15 minutes

Measurement results: 46 dB L_{Aeq} / 40 dB L_{A90} / 59 dB L_{AFmax}

Observations: To the north of the Cleanfill. Location selected as subjectively the noise from the Cleanfill was clearly audible and louder than other locations further along the bund towards measurement location A. During the majority of the measurement period noise from the bulldozer operating was clearly audible and dominated the measurement. The Cleanfill activity was the dominant source during the measurement period, and was paused such that traffic on the surrounding roading network and aircraft overhead would not influence the measurement.

4.3.5 Measurement 5

Measurement location: C

Orientation to Cleanfill: South East

Measurement date: 30 September 2021

Measurement duration: 5 minutes

Measurement results: 54 dB L_{Aeq} / 49 dB L_{A90} / 69 dB L_{AFmax}

Observations: Bulldozer was operating for the entire measurement period approximately 100 metres away, as well as truck movements and an excavator operating. The measurement was paused when traffic on Coast Road was audible and was resumed when the traffic noise was not audible. The Cleanfill activity was the dominant source during the measurement period.

4.3.6 Overall noise rating levels

Based on the above, the noise emissions from the Cleanfill when received at measurement location A, B, and D comply the 50 dB L_{Aeq} noise condition with no adjustments due to the duration, distance, or Special Audible Characteristics, and is expected to comply regardless of the operation of the bulldozer on the site (noting that this conclusion is based on the areas of operation of the bulldozer during our site visits, and that if it were to operate closer to any of the Cleanfill site boundaries this might not be the case).

The noise emissions from the Cleanfill site when received at measurement location C were 50 dB L_{Aeq} without the bulldozer operating, and 54 dB L_{Aeq} with the bulldozer operating.

With regard to any possible adjustments to the noise monitoring results:

- Noise levels at the notional boundary of 199 and 200 Coast Road and the property boundary of the sites to the north will be slightly lower than at the monitoring locations. Due to relatively small differences between the distances from the Cleanfill activity to the monitoring locations and from the Cleanfill activity to the notional/property boundaries we expect any distance adjustment will be 1 dB or less.
- Section 6.4 of NZS6802:2008 allows a duration adjustment to be applied to the 15-minute 'representative level' of sounds that are not continuously present within the daytime period. With the nature of our measurements being 'snapshots' of the noise emissions, and during our second visit and associated measurement the noise from the bulldozer was audible for the majority of the time, we do not consider it appropriate to apply a duration adjustment or energy average to the measured noise levels.
- Section 6.2 of NZS6802:2008 allows an adjustment to be applied to the 15-minute 'representative level' for sounds that contain Special Audible Characteristics. Our subjective judgement was that overall the Cleanfill sound did not contain Special Audible Characteristics.

Based on the above, it is concluded that during our site visits the rating level of the sound associated with the Cleanfill when received at the site boundary of 4 and 10 Ngaturi Grove to the north and at the notional boundary of 200 Coast Road to the south east was 47 dB L_{Aeq} or lower. At the notional boundary of 199 Coast Road to the east, the noise rating level, adjusted for distance only, was 53 dB L_{Aeq} with the bulldozer operating and 49 dB L_{Aeq} without the bulldozer.

We note that the noise rating level of 53 dB L_{Aeq} at the notional boundary of 199 Coast Road, is consistent with the predicted noise level of 56 dB L_{A10} in the original Assessment of Environmental Noise Effects document prepared by Tonkin + Taylor using a + 3 dB conservative conversion between L_{Aeq} and L_{A10} . However as outlined in section 1.0 above, a limit of 50 dB L_{Aeq} was put in place in this location regardless.

We have briefly considered how the activity would need to be modified to comply with the noise limit in this location, and have the following observations:

- Noise from the bulldozer radiator fan appeared to dominate. There may be a way this noise could be reduced or attenuated at the source.
- If the bulldozer only operated for a very limited portion of any daytime period, a sufficiently large energy-average adjustment may apply (e.g. less than 2 hours 45 min on weekdays, and 1 hour 15 minutes on Saturday).
- The minimum setback between the bulldozer and neighbouring dwellings could be increased to 140 metres. We do not know if this is practical.

5.0 CONCLUSIONS

AES has been engaged to undertake noise monitoring of the Wainuiomata Cleanfill at 130 Coast Road to determine if it is complying with Consent Condition 12. Attended noise monitoring was undertaken at a number of the surrounding locations on the 24th and 30th of September 2021.

Based on the attended noise monitoring, noise levels from the Cleanfill site complied with the 50 dB L_{Aeq} noise limit at the northern sites and at the notional boundary of 200 Coast Road. At 199 Coast Road the measured noise rating level complied with the noise limit when the bulldozer was not operating and exceeded the noise limit by 3 dB when the bulldozer was operating.

We trust this is of some assistance.

Kind regards



Josh Luscombe

BE Hons (Mech)

Acoustic Engineer

Acoustic Engineering Services Ltd