

Before the Independent Commissioner Hearing Panel

Under the Resource Management Act 1991 (**RMA**)

In the matter of an application by **Dunedin City Council** to develop a landfill at Smooth Hill, Dunedin.

Statement of evidence of Christian Claude Vossart

29 April 2022

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Qualifications and experience

- 1 My name is **Christian Claude Vossart**.
- 2 I am GHD's Technical Director of Acoustics for New Zealand
- 3 I have 20 years of experience as a noise specialist for international, multi-disciplinary engineering companies such as GHD and URS and for specialist acoustics consultancy firms such as Sound Research Laboratories and Styles Group Acoustics and Vibration Consultants.
- 4 I specialise in environmental and building acoustics and have worked as a consultant in the United Kingdom, the Republic of Ireland, and New Zealand. I have been a practising acoustician for 20 years, the last 12 years of which have been in New Zealand.
- 5 I have a Bachelor of Science with Honours in Environmental Technology Management and a Diploma in Acoustics and Noise Control from the Institute of Acoustics of the United Kingdom.
- 6 I am a Member of the Acoustical Society of New Zealand (MASNZ).
- 7 My relevant experience for landfills includes appearing as an expert witness for a submitter regarding the application for a Cleanfill at 61 Pioneer Lane, Taupaki, Auckland; acting on behalf of Auckland Council for the review of the application for a landfill at 261 Twilight Road, Clevedon, Auckland; provision of an acoustic assessment in support of applications for managed fill and waste recycling facilities in the Bombay Hills on the Auckland-Waikato border.
- 8 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014. This evidence has been prepared in accordance with it and I agree to comply with it. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

Scope of evidence

- 9 I have been asked to prepare evidence in relation to the effects of the proposed Smooth Hill landfill on noise. This includes:
 - (a) The existing environment;
 - (b) An overview of the construction and operational noise and vibration effects of the Project:
 - (i) Public roads – construction noise;

- (ii) Public roads – operational noise;
- (iii) Landfill activity;
- (c) Comments on Otago Regional Council (ORC) hours
- (d) peer review;
- (e) Comments on the section 42A report; and
- (f) Response to matters raised in submissions.

Executive summary

- 10 The nearest noise sensitive receivers to the road works are anticipated to be R8 (108 McLaren Gully Road) and R9 (109 McLaren Gully Road). It is practicable for noise emissions from construction works to comply with the appropriate noise limits as long as noisy roadworks are limited to between 0730 to 1800 hours Monday to Saturday, and a minimum 40 metre separation distance is maintained between construction equipment and residential dwellings.
- 11 Should practical considerations in the future, which are unable to be envisaged at this time, require either of these limitations to be exceeded this would need a suitably qualified and experienced acoustician to advise on how this can be achieved whilst still maintaining compliance with Rule 4.5.4.1 of the Dunedin City Council (DCC)'s proposed Second Generation Dunedin City District Plan¹ (2GP). This approach would necessitate the production of a Construction Noise Management Plan (CNMP) to ensure that the Best Practicable Option (BPO) measures are employed to enable compliance with the noise limits under Rule 4.5.4.1.
- 12 I consider that the noise conditions of the draft DCC Conditions of Consent adequately address construction noise associated with upgrades to the roads. I am happy to accept the conditions as proposed by DCC, noting that if the road construction works are to be undertaken in accordance with DCC's certification that this process in terms of both timeframe and reasonableness of that certification needs qualification. I have recommended appropriate wording for consideration.
- 13 ORC's reviewer Mr Humpheson (from Tonkin & Taylor) requested an assessment of operational noise effects from waste vehicles travelling from SH1 to the site entrance on existing noise sensitive locations along the

¹ Dunedin City Council, proposed Second Generation Dunedin City District Plan, Appeals version

access route to address 2GP-AP-1 Policy 6.2.1.3(b)(i). This was on the basis that the design of the road should minimise, as far as practicable, adverse effects on surrounding residential or other sensitive activities from the noise of vehicle movements.

- 14 However, Rule 9.3.6.7(h) is clear that vehicles operating on public roads are exempt from the noise standards in Rule 9.3.6 and Policy 6.2.1.3 cannot override the specific exemption provided for in rule 9.3.6.7(h).
- 15 Notwithstanding, the upgrade to the road will include a chip-sealed surface from the existing 'gravel' wearing course that will be a noise benefit in line with Policy 6.2.1.3.
- 16 The proposed landfilling activity is required to comply with Condition 3 of Designation 659 (D659). The condition does not distinguish between noise associated with establishment of the infrastructure to enable operation of the landfill, and the noise from the day-to-day operation of the landfill.
- 17 It is practicable for noise arising from activities associated with both the construction of the infrastructure, and the day-to-day operation of the site, to comply with Condition 3 of designation D659 at the closest dwellings to the landfill (R10 and R11).
- 18 The management of noise from any activity on the site is to form part of the Landfill Management Plan (LMP) to ensure the BPO mitigation measures are incorporated into the works in order to minimise noise emissions and ensure ongoing compliance is achieved at noise sensitive receivers.
- 19 This requirement is addressed by the noise section of the draft ORC Conditions of Consent which requires the LMP to include procedures, including monitoring and contingency actions to ensure that "noise from the landfill site complies with the designation conditions and is minimised where practicable".
- 20 The draft LMP framework includes provisional noise management procedures.

Introduction

- 21 I was first engaged by the applicant in August 2020 to prepare an assessment of acoustic effects in relation to the proposed Smooth Hill landfill (the Site). I have also been involved in preparing responses to the additional information requests by ORC.

- 22 Specifically, my involvement in this project has included:
- (a) Preparation of an Assessment of Acoustics Effects in August 2020 – Reviewer. (Noise Assessment 2020);
 - (b) Review and response to the ORC s92 Request in October 2020;
 - (c) Updating my Assessment of Acoustics Effects in May 2021 in response to changes in the application and the s92 request. (Noise Assessment 2021); and
 - (d) Review and response to the ORC's second s92 Request in June 2021.

The existing environment

- 23 The site and all land in the proximate vicinity of the site are rural in nature. The land is zoned as “coastal rural” under DCC’s 2GP. Noise sources in such an environment typically include those associated with a rural environment such as wind blowing through flora; fauna such as birds and insects; and intermittent anthropogenic sources such as forestry, road traffic and air traffic. Noise levels are typically low compared to an urban area.
- 24 It is important to note that noise emissions arising from landfill activity within Designation D659 are already subject to compliance with the limits under Condition 3 of the designation (Condition 3). This can be considered to form the environmental baseline from which acoustic effects should be considered.
- 25 The noise sensitive receptors identified in the area are presented in Appendix A.

Public roads – construction noise

- 26 The nearest noise sensitive receivers to the road works are anticipated to be R8 (108 McLaren Gully Road) and R9 (109 McLaren Gully Road).
- 27 The noisiest combination of equipment that could potentially operate simultaneously is an excavator (L_{Aeq} 80 dB at 10 metres) and a dozer (L_{Aeq} 81 dB at 10 metres). As long as a minimum separation distance of 40 metres is maintained between the construction equipment and the houses then compliance with the daytime construction noise limit of $L_{Aeq(15min)}$ 75 dB and L_{Amax} 90 dB under Rule 4.5.4.1 of DCC’s 2GP-AP-1 can be achieved.

Public roads – operational noise

- 28 Rule 9.3.6.7.(h) of DCC's 2GP-AP-1 states that vehicles operating on public roads are exempt from the noise limits specified under the rule. As such, a full quantitative assessment of road traffic noise from vehicles associated with the landfill site has not been conducted on SH1, McLaren Gully Road and Big Stone Road.

Landfill activity

- 29 The proposed landfilling activity is required to comply with Condition 3. Condition 3 is as follows:

Noise generated by any activity on the site shall comply with the following standards within 50 metres of the nearest house existing at the date on which the designation becomes operative - 55Dt/40Nt dBA. (NB These levels are subject to an adjustment of minus 5dBA for noise emissions having special audible characteristics.)

- 30 The condition does not distinguish between noise associated with establishment of the infrastructure to enable operation of the landfill, and the noise from the day-to-day operation of the landfill.
- 31 The noise sensitive receivers that are closest to the landfill site are the houses at R10 (731 Big Stone Road) and R11 (689 Big Stone Road). The shortest distance between the location of potential operational activity on the landfill and the façade of the closest receiver (R10) is approximately 400 metres. Note the Odour Assessment and the Acoustic Assessment use different locations for compliance/assessment on properties. Therefore, the distances quoted in both reports for the same receivers are different. The house at R12 is significantly further away, with receivers R6 to R9 in excess of 2 km away from the nearest part of the landfill.

Construction noise

- 32 The construction noise levels were predicted using proprietary noise modelling software Datakustik Cadna A. My assessment assumes a worst-case scenario whereby the equipment required for the establishment of the infrastructure to enable operation of the landfill, is all located in close proximity to Big Stone Road. The noisiest construction noise level at 50 metres from dwellings at R10 and R11 are predicted to be up to L_{Aeq} 54 dB and L_{Aeq} 48 dB respectively, thereby complying with Condition 3.

Operational noise

- 33 Assuming an excavator, bulldozer and waste compactor are all operating in close proximity to each other, the cumulative noise level complies with the Condition 3 daytime noise limit of L_{Aeq} 55 dB at approximately 215 metres from the equipment. The shortest distance between the location of potential operational activity on the landfill and the assessment point (50 metres from the house) of the closest receiver (R10) is 350 metres. As such, operational noise is predicted to comply with Condition 3.

Landfill management plan

- 34 The management of noise from activity on the site is to form part of the LMP to ensure the BPO mitigation measures are incorporated into the works in order to minimise noise emissions and ensure ongoing compliance is achieved at noise sensitive receivers. This requirement is addressed by the noise section of the draft ORC Conditions of Consent which requires the LMP to include procedures, including monitoring and contingency actions to ensure that “noise from the landfill site complies with the designation conditions and is minimised where practicable”.
- 35 The draft LMP framework included with the updated application included provisional noise management procedures at section 3.8.7. However, I consider these should be refined to read as follows, or otherwise captured elsewhere within the LMP:
- (a) Compliance with $L_{Aeq(15min)}$ 55 dB between 7am – 7pm at 50 metres from noise sensitive receptors identified under Appendix A;
 - (b) Equipment is to be selected, maintained and operated to minimise noise emissions and prevent noise sources that could potentially lead to annoyance e.g. squealing dozer tracks;
 - (c) Movable equipment involved with the operation and/or construction of the landfill that typically stays on site for longer periods of time are to be fitted with broad-band reversing alarms. Note: this provision does not strictly apply to equipment that arrives and departs site on a daily basis (e.g. delivery vehicles), although installation of broad-band reversing sirens on such visiting equipment is to be encouraged whenever practical as good acoustics practice;
 - (d) Noise training is to form part of the site-induction program and include procedures for managing noise e.g. prevention of tailgates banging;

- (e) Methods of bird management that avoid noise-based bird dispersal methods are preferred whenever practicable e.g. anti-roosting strips to prevent birds landing and roosting on structures at the landfill;
- (f) A noise monitoring program is to include specification of noise measuring equipment, measurement duration, recommended weather conditions, required schedule of measurements (e.g. periodic and at the commencement of an activity), location(s) requiring measurement and reporting requirements;
- (g) An incident management procedure to include site contact details and the name of any persons responsible for responding to and resolving complaints;
- (h) A record of all noise monitoring results and complaints received (including actions taken to resolve any matters) are to be submitted to DCC annually with a copy available on-site;
- (i) A program of community liaison to provide information on noise (and wider environmental) aspects of the operational activities, monitoring and future plans with an avenue for community feedback; and
- (j) Procedure for amendments to the noise section of the management plan, including updating DCC.

Summary of key issues

Landfill activity

- 36 It is practicable for noise arising from activities associated with both the construction of the infrastructure, and the day-to-day operation of the site, to comply with Condition 3.
- 37 The management of noise from any activity on the site is to form part of the LMP to ensure the BPO mitigation measures are incorporated into the works in order to minimise noise emissions and ensure ongoing compliance is achieved at noise sensitive receivers.

Public roads – operational noise

- 38 Rule 9.3.6.7.a of DCC's 2GP states that vehicles operating on public roads are exempt from the noise limits specified under the rule.

Public roads – construction noise

- 39 My assessment concluded that it is practicable for noise emissions from construction works to comply with the appropriate noise limits under DCC's 2GP as long as:
- (a) noisy roadworks are limited to between 0730 to 1800 Monday to Saturday with no works on Sundays or public holidays; and
 - (b) a minimum separation distance of 40 metres is maintained between construction equipment and residential dwellings.
- 40 Should practical considerations in the future, which are unable to be envisaged at this time, require either of these limitations to be exceeded this would require a suitably qualified and experienced acoustician to advise on how this can be achieved whilst still maintaining compliance with Rule 4.5.4.1 of the 2GP. This approach would necessitate the production of a CNMP to ensure that the BPO measures are employed to enable compliance with the noise limits under Rule 4.5.4.1.

Response to any issues in ORC peer review

- 41 I have read ORC's s92 request dated October 2020 containing Tonkin & Taylor's peer reviewer, Mr Darran Humpheson's, requests for further information of a former version of my assessment of acoustic effects (Noise Assessment 2020). The observations made by the reviewer have been addressed in the updated version of my assessment of acoustic effects (Noise Assessment 2021). ORC's s92 request dated June 2021 confirmed that almost all of the matters raised have been addressed. The remaining matters of note are summarised below.

Public roads – construction noise

- 42 The original proposed condition for the preparation of a CNMP was to trigger only if construction equipment is required to encroach the 40 metre setback distance and/or works are required outside of 0730 – 1800 hours Monday to Saturday. However, Mr Humpheson was concerned that a CNMP should be prepared regardless of triggers to ensure BPO mitigation measures are employed.
- 43 My view is that this is unnecessary, as compliance with the appropriate noise limits already constitutes a reasonable level of noise (and as such employment of BPO measures under a CNMP to reduce emissions yet further has the potential to place undue financial burden upon the applicant). I consider that the draft DCC Conditions of Consent adequately

address construction noise associated with upgrades to the roads. I am happy to accept the conditions as proposed by DCC, noting that if the road construction works are to be undertaken in accordance with DCC's certification that qualification of this process in terms of both timeframe and reasonableness of that certification needs qualification. I therefore suggest the following wording be added to the conditions that refer to situations when the construction equipment is required to encroach upon the 40 meter setback, or extend beyond the hours of work, set out in the draft Conditions of Consent:

- (a) A Construction Noise Management Plan (CNMP) must be prepared by an acoustic specialist which addresses the requirement of Appendix E of NZS6803: 1999 Acoustics – Construction Noise, and which includes measures to mitigate noise transmission from construction activity to the existing residential dwellings;
- (b) The CNMP must be submitted to the Resource Consent Manager, DCC, rcmonitoring@dcc.govt.nz for certification that it addresses the requirement of this condition at least 10 working days prior to commencement of the road upgrade works;
- (c) DCC are to provide any comments no later than 5 working days prior to commencement of the road upgrade and certification must not unreasonably be withheld; and
- (d) The road upgrade works must be undertaken in accordance with the certified CNMP.

Public roads – operational noise

- 44 Mr Humpheson requested an assessment of noise effects from waste vehicles travelling from SH1 to the site entrance on existing noise sensitive locations along the access route to address 2GP Policy 6.2.1.3 on the basis that the design of the road should minimise, as far as practicable, adverse effects on surrounding residential or other sensitive activities from the noise of vehicle movements.
- 45 However, Rule 9.3.6.7(h) of the 2GP is clear that vehicles operating on public roads are exempt from the noise standards in Rule 9.3.6 and Policy 6.2.1.3 cannot override the specific exemption provided for in rule 9.3.6.7(h).
- 46 However in order to provide a level of surety for adjacent landowners, noise levels at R8 and R9 have been predicted in Noise Assessment 2021 as ranging between $L_{Aeq(15min)}$ 43/44 dB to 47/48 dB. These levels are likely to

reduce yet further with an upgrade to a chip sealed surface from the existing 'gravel' (AP40/AP20) wearing course. I consider that these levels represent a low level of road traffic noise and demonstrate that adverse effects on surrounding residential activities from vehicle movements will be minimised in line with Policy 6.2.1.3. Tonkin & Taylor's review also considers upgrading the road surface will be a noise benefit – in line with Policy 6.2.1.3.

Section 42A reports

- 47 The reports from DCC and ORC both conclude that it has been demonstrated that the noise levels from activities within the designation, and noise arising from the road alignment, will be compliant with the relevant rules and conditions and that potential adverse effects from noise can be managed appropriately.

Response to matters raised in submissions

- 48 Big Stone Forest Limited (BSFRL) located at 689 Big Stone Road (R11), and separate submitter Ingrid Leary, both raise concerns of significant adverse effects arising from the application - including noise. However, as Noise Assessment 2021 demonstrates, significant adverse effects are not anticipated for noise from either the construction works resulting from upgrading the road, or construction and operation of the landfill based on compliance with Condition 3. This position is supported by Tonkin & Taylor.
- 49 Tonkin & Taylor queried in their review of Noise Assessment 2020 whether the proposed bird scaring activities had been included in the noise assessment and whether it would make any difference to the conclusions of assessment.
- 50 As detailed in Noise Assessment 2021, potential bird dispersal methods proposed under the draft Bird Management Plan included using stockwhips, pyrotechnics, starter pistols and portable distress callers. These forms of bird dispersal rely upon short, intermittent bursts of noise to deter birds. The levels of acoustic energy that these practices typically give rise to will not be significant in terms of overall compliance of landfill activity with Condition 3 and therefore would not make any difference to the noise assessment findings.
- 51 In terms of construction and other operational activities at the landfill site, the predicted noise levels are considered conservative as they do not allow for any barrier attenuation from the intervening topography (which will significantly reduce noise levels for the vast majority of the landfill's lifetime), ground absorption including foliage between source and receiver,

or atmospheric attenuation. The noise predictions are based on a worst-case scenario. In practice, the equipment will more typically either be set back further from the road edge and/or more evenly spread across the site for the vast majority of the landfill's lifetime.

Conclusion

- 52 Noise emissions from activities on the landfill site are predicted to comply with Condition 3 of the Designation. Noise emissions can be appropriately managed with inclusion of the amendments proposed to the noise section and/or elsewhere within the final LMP.
- 53 Road construction noise is predicted to comply with the appropriate limits at the nearest noise sensitive properties. The proposed Conditions of Consent will enable the BPO to be employed to minimise emissions from the construction works and maintain compliance with the limits under Rule 4.5.4.1 of the 2GP.



Christian Vossart

29 April 2022

Appendix A: Identified noise sensitive receptors

