

15 December 2023

Cold Gold Clutha Limited
C/- Gallaway Cook Allan Lawyers
PO Box 143
Dunedin 9054

Attention: Bridget Irving

Dear Bridget

DETERMINATION OF OPERATIONAL SETBACKS AND COMPLIANCE

You have asked us to describe the way in which operational setbacks for Cold Gold's dredging operation proposed in the upper Clutha River can be determined. We understand that while measurements have previously been performed on the dredge in its current operational area there is a desire to be able to demonstrate that compliance can be achieved within the proposed new operational area.

To assist the Commissioners hearing this application, we have prepared some commentary below describing how both measurement and assessment under the relevant NZS 6801 and NZS 6802 Standards can be undertaken. We have also provided an example of a relevant consent condition should this be considered appropriate.

Measurement of noise under NZS 6801:2008

New Zealand Standard NZS 6801:2008 *Acoustics – Measurement of environmental sound* defines how measurement of noise sources should be carried out.

Without unnecessarily repeating the Standard, the key elements are:

- **Measurements are conducted in appropriate meteorological conditions.** Section 7.2 of the standard defines an appropriate meteorological window within which compliance measurements are to be undertaken. This permits both upwind and downwind locations with respect to the receiver and requires excluding conditions that are uncommon such as strong ground-based temperature inversions, high-winds (or locations with foliage generating significant wind noise, and rain.
- **Measurements are taken at a location that is appropriate.** This is discussed in detail in Section 6.1 of the Standard. The location selected for measurements should be representative of the path between the noise source and receivers. This includes the ground type (acoustically hard, mixed, or soft), terrain, and the ability to measure the noise source accurately over any ambient noise that cannot be excluded. Often this results in measurements being made closer to the noise source, rather than at the nearest receiver. When this occurs, any adjustments must be noted and accounted for as described below.
- **Measurements are taken using the correct type of equipment.** This is addressed in Section 5 of the standard. Any monitoring report must list the specific equipment used and a record of its calibration.
- **Results are expressed in terms of the correct parameters.** Different plan rules use different noise parameters. The correct parameters must be measured and used for all calculations and comparisons against the noise limit.
- **Any deviations from the normal process are noted and the effects accounted for.** Where measurements must be made at a location or under circumstances that deviate from the Standard, or not at a receivers (notional) boundary, the reason for this must be noted and the manner in which it has been accounted for described.

Assessment of noise under NZS 6802:2008

New Zealand Standard NZS 6802:2008 *Acoustics - Environmental Noise* describes the process by which the measured noise level determined under NZS 6801 is assessed. Key elements of this Standard include:

- **Special Audible Characteristics (SAC).** The measured noise must be assessed for penalizable SAC such as tonality or impulsiveness. In the context of the dredge examples that may be present might be impulsive character caused by large rocks falling onto metal gratings or a tonal engine exhaust or generator. In the event that SAC is identified, 5 dB is added to the measured noise level in accordance with Section 6.3 of the Standard.
- **Duration.** If a sound is not present for the full prescribed timeframe (District Plan daytime or consented daytime operation where these vary), it is permissible to average the measured noise to a limited extent. For example, if the dredge were to operate for less than 30% of the daytime, the noise level can be reduced by 5 dB. If the dredge operates for 60 – 80% of the daytime, then the adjustment is just 1 dB. Where operation time exceeds 80% of the day, no adjustment occurs. This process is described in Section 6.4 of the Standard. No duration adjustment is permitted at night.
- **Residual Sound.** Where the residual sound (sound in the environment unrelated to the activity) is within 10 dB of the measured sound, but within no more than 3 dB, the residual sound can be subtracted from the measured sound using the process described in Section B3.3.3 of the Standard. Where the residual and activity sound are less than 3 dB apart compliance cannot be determined unless special precautions are taken and report.
- **The Rating Level is compared against the relevant noise limit.** The rating level is determined by adding and subtracting the adjustment described above from the measured noise level.

Discussion

Cold gold has previously measured noise from the dredge and believe that compliance can be achieved at a distance of 175 m from the dredge. We understand modifications are proposed to the dredge prior to it commencing work at the upper Clutha site. It is prudent to verify that this setback is correct.

Based on our experience it would be appropriate to undertake measurements of the dredge under conservative conditions (i.e. likely to give the largest setback) soon after commencing work in the Upper Clutha.

If we were to undertake this assessment, we would:

- Liaise with the operator to select an area of flat terrain with good access and line of site to the dredge, but as distant as possible to the State Highway and other sources of residual sound.
- Measure noise at an appropriate location(s) under light downwind conditions where this can be arranged, but otherwise making an appropriate adjustment for the conditions prevailing at the time of measurement.
- Note the nature of the terrain and estimate the likely ground absorption factor.
- Calculate the distance at which compliance with relevant District Plan noise limits will be achieved under these conditions.

We note that changes to elevated or rolling terrain in the upper reaches of the work area will likely result in some degree of terrain screening that will reduce the noise level received. By measuring under downwind conditions, or adjusting for this, a degree of conservatism will be built into the prediction, meaning that under still or upwind conditions, the noise level received will again be reduced.

Proposed conditions of consent

Notwithstanding the discussion above, we note that there is no need to specify individual elements of the Standards, except where some element is to be specifically excluded (e.g. some Districts exclude application of SAC).

Condition X

At the notional boundary, being a line 20 metres from part of any dwelling or the legal boundary where this is closer to the dwelling, noise generated by the dredging operation must not exceed the following levels:

In QLDC

Daytime hours	Limits	Night-time hours	Limits
0800hr to 2000hr	50 dB $L_{Aeq(15\text{ min})}$	2000hr to 0800hr	40 dB $L_{Aeq(15\text{ min})}$ and 75 dB L_{AFmax}

In CODC

Daytime hours	Limits	Night-time hours	Limits
0700hr to 2200hr	55 dB $L_{Aeq(15\text{ min})}$	2200hr to 0700hr	40 dB $L_{Aeq(15\text{ min})}$ and 70 dB L_{AFmax}

Noise must be measured in accordance with NZS6801:2008 and assessed in accordance with NZS6802:2008.

Condition Y

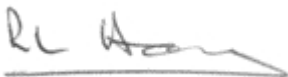
Within two months of commencing operations the consent holder shall have the noise level of the dredge measured by a suitably qualified and experienced acoustic consultant to confirm methods by which compliance with condition [X] will be achieved. In particular, any setback distance that needs to be maintained from any dwelling in order to comply. A copy of the noise assessment must be submitted to the Council for certification regarding the ability for the dredge to comply with the noise limits.

Condition Z

The dredge activity must be undertaken in compliance with any setbacks specified in the noise assessment.

Yours faithfully

MARSHALL DAY ACOUSTICS LTD



Rob Hay
Associate