



**HEGLEY ACOUSTIC
CONSULTANTS**

**HOLCIM (NEW ZEALAND) LIMITED
PROPOSED CEMENT SUPPLY PROJECT
REVIEW OF NOISE EFFECTS**

Introduction

Hegley Acoustic Consultants have been appointed by the Waitaki District Council to peer review the noise report prepared by Marshall Day Acoustics (MDA) in support of an application by Holcim (New Zealand) Ltd (Holcim) for resource consents to establish a cement manufacturing plant and limestone/tuff quarries near Weston plus an associated coal pit near Ngapara and a sand pit near Windsor. We have visited the site and are familiar with the area.

This report considers the noise aspects of the application and recommends conditions that are appropriate to control the noise for neighbours should the Council approve the application. It is noted that the recommendations are based on information currently available and comments made in submissions to the application. Additional information may be provided at the hearing that warrants a review of this report at that time.

Design Requirements

To determine a reasonable noise level for an application such as this project, guidance can be taken from the District Plan. The MDA report correctly identifies the noise requirements (Rule 4.5.1) in the Waitaki District Plan for an activity carried out in a rural zone:

On any site activities shall be conducted such that the following noise limits are not exceeded at the notional boundary of any residential unit other than residential units on the same site as the activity within the Rural Zone or at the boundary of the Residential, Rural Residential or Township Zones:

55dBA L₁₀ 7:00am – 10:00pm Monday to Friday
55dBA L₁₀ 7:00am - 7:00pm Saturday
40dBA L₁₀ At all other times and any public holiday
75dBA L_{max} 10:00pm – 7:00am

Exemption:

Noise limits shall not apply to:

- a) residential activities
- b) harvesting, forestry harvesting, bird scarers and any one-off activity not normally anticipated as being required for normal farming activities.
- c) Fire Service and Police

providing that the activity shall comply with the requirements of Section 16 of the Resource Management Act 1991.

Sound levels shall be measured and assessed in accordance with the provisions NZS 6801:1991 *Measurement of Sound* and NZS 6802:1991 *Assessment of Environmental Sound*.

The above controls form the baseline levels for the area so it is reasonable to use these levels as the design limits for the project. It is noted that the night time noise level of 40dBA L₁₀ is a relatively stringent requirement as many District Plans adopt 45dBA L₁₀.

During the construction phase of the development, Part III Zone Rules, 1.1 Definition, defines noise as:

Noise means the noise level from an activity is measured and assessed in accordance with NZS 6801:1991 *Measurement of Sound* and NZS 6802:1991 *Assessment of Environmental Sound*. In circumstances where the noise from any activity has special audible characteristics, the L₁₀ limits shall be reduced by 5dBA for comparison with the measured L₁₀ noise level.

Vehicles being driven on a road (within the meaning of s2(1) of the Transport Act 1962), residential vehicular movements on any site, construction and demolition noise, high energy impulsive sounds such as gunfire and blasting, the operation of trains and aircraft including helicopters are excluded as they are not appropriately controlled by using assessment under NZS 6802:1991 or rules in this Plan.

The impact of those excluded noise sources would be assessed by reference to Section 16(1) of the Resource Management Act 1991 or where applicable by assessment under one of the following acoustic standards: -

- NZS 6803P:1984 *The Measurement and Assessment of Noise from Construction Maintenance and Demolition Work*.
- NZS 6807:1994 *Noise Management and Land Use Planning for Helicopter Landing Areas*.
- NZS 6805:1992 *Airport Noise Management and Land Use Planning*.

From the above it is apparent that there are no specific controls with respect to noise from vehicles on the road or train noise off the site. This is no different to any other District Plan. In fact, there is no known District Plan that sets noise rules on either traffic or trains.

For the construction phase of the work the requirements of NZS6803P:1984 are adopted in the District Plan. Since the District Plan was prepared, NZS 6803:1999 Acoustics – Construction Noise has been published. The main difference between the 1984 and 1999 versions of the Standard is that the use of L_{10} has been changed to L_{eq} , the L_{95} limit has been dropped (as it provided no practical noise control) and the ambiguities of the 1984 version of the Standard have been removed. It is therefore agreed with MDA that NZS 6803:1999 Acoustics – Construction Noise be adopted for this project. Essentially, this Standard requires the following noise levels to be complied with for the duration of the construction works (based on the work taking longer than 20 weeks).

Recommended Upper Limits for Construction Noise Received in Residential Zones and Dwellings in Rural Areas

Time of week	Time period	L_{eq}	L_{max}
Weekdays	0630-0730	55	75
	0730-1800	70	85
	1800-2000	65	80
	2000-0630	45	75
Saturdays	0630-0730	45	75
	0730-1800	70	85
	1800-2000	45	75
	2000-0630	45	75
Sundays and public holidays	0630-0730	45	75
	0730-1800	55	85
	1800-2000	45	75
	2000-0630	45	75

Recommended upper limits for construction noise received in industrial or commercial areas for all days of the year

Time period	L_{eq} (dBA)
0730-1800	70
1800-0730	75

These levels are measured at 1m from the most exposed façade of an occupied building, not at the boundary or notional boundary, as adopted for the ongoing operation noise.

Transportation Noise

As set out above, the District Plan does not control traffic noise (other than when on site when it is considered part of the overall site noise) or noise from trains transiting between points. However, MDA has considered the Transit New Zealand Guidelines for The Management of Road Traffic Noise (Transit Guidelines). These are the only guidelines available in New Zealand to date. These guidelines were developed for new or altered state highways but they also give some guidance as to the effects of traffic noise. From these guidelines and other technical reports available, MDA have concluded that the single event sound (L_{max}) of 50dBA inside bedrooms at night time would be an appropriate design goal. In addition MDA have considered the increase in the level of traffic noise with respect to the 24 hour L_{eq} , which is the measurement often adopted for traffic noise assessment.

The lowest general design goal in the Transit Guidelines is 55dBA when measured as a 24 hour L_{eq} . It is noted that the Environment Court¹ has recently adopted a level of 50dBA L_{eq} (1 hr) as a reasonable noise level for trucks from a quarry at the end of a rural road. It would therefore be reasonable to assume a level of between 50 – 55dBA 1 hr L_{eq} is in the order of what would be reasonable for this proposal where the noise levels are at the lower end of the Transit Guidelines.

MDA have considered the control of train noise as is adopted in parts of Australia and the United Kingdom. From this analysis MDA have concluded that a daytime level of around 60dBA L_{eq} is a typical form of control as measured 1m from an occupied dwelling. It is agreed this is within a reasonable limit for train noise.

Existing Noise Environment

MDA have undertaken background noise recordings over a number of days. Measurements were carried out in Weston adjacent to Essex Street. This site is adjacent to the road where traffic dominated the noise environment. The measurements showed the existing daytime level is typically 55dBA L_{eq} with the night time level at 30 – 45dBA L_{eq} . The greater variation at night time reflects the variability of the lower traffic flows during the night time period. The background sound (L_{95}) varied between 35 – 36dBA during the daytime to around 25dBA at night time.

¹ Decision A31/2007

The existing noise environment at the proposed cement plant site back from the road (the exact distance is not given) was typically around 55dBA L_{eq} during the daytime and between 20 – 45dBA L_{eq} at night time. These levels have been attributed to the effect of traffic noise which is agreed with. A level of 20 – 25dBA L_{eq} (10 minute measurement period) indicates no traffic passed the site over the measurement period. No background measurements (L_{95}) were given for this site although during the daytime it would be reasonable to assume the level would be typically 20dBA below the L_{eq} level as shown for the Weston site and the lower night time background sound would only be 1 – 2dBA lower than the L_{eq} at approximately 22dBA.

The above levels are typical for a rural location such as those monitored when near a road.

Predicted Noise Levels

Cement Plant

In order to predict the noise levels from the proposed cement plant, MDA visited two existing plants in Australia and obtained technical information from a third plant in the United States of America. From this information, they have identified the noisier items of plant and developed noise contours around the proposed cement plant. Hegley Acoustic Consultants have been involved with the noise control of an existing cement plant and in order to ensure a full understanding of the type of cement plant at the subject site, a visit was made to the Portland Cement Plant just south of Whangarei.

Based on the above, the type of noise control proposed by MDA for this site is reasonable and the level of noise that will be generated from the site is considered a realistic to achieve.

Limestone Quarry

The limestone quarry will be located to the north east of the proposed cement plant and well clear of any existing dwellings. The quarry has been designed so that a 10 - 12 hour quarry operation can meet typical 24 hour cement plant requirements. However, some flexibility is required by Holcim to allow for the effects such as seasonality, breakdown, building stocks, working around holidays, maintenance and weather disruptions. Therefore, the design needs be able to cater for some night

time and Sunday activities when the quarry must comply with the lower noise limit of 40dBA (L_{10}) plus 75dBA L_{max} for work at night time.

MDA have listed the expected equipment to be used in the quarry and have predicted that the noise level at the closer houses will be well within the proposed 55dBA L_{10} daytime noise limit. For the periods when it is necessary to operate at night time, any activity will need to be restricted to the less noise sensitive areas of the quarry and by doing so it will be practical to comply with the lower 40dBA noise limit. Compliance with the 75dBA L_{max} at night time is not expected to be difficult to achieve. In order to provide certainty that any night time or Sunday work will achieve the lower noise limit, it is recommended that a Noise Management Plan be prepared to demonstrate the measures that will be implemented to ensure the design limits are achieved. With this in place it is agreed it will be practical to achieve the noise criteria.

Tuff Quarry

The tuff quarry will be located 200 – 300m to the north of the Limestone Quarry. MDA have listed examples of equipment that will operate in the quarry and typical noise levels have been given. From this information MDA have predicted the noise level at the closest notional boundary will be within the 55dBA L_{10} design limit for the smaller equipment operating. MDA have stated the 55dBA L_{10} daytime limit will be exceeded at one dwelling if the larger equipment is used without any screening of the equipment.

Some attention to noise control may be required when working in this area. However, if consent is granted, by implementing a Noise Management Plan will ensure the appropriate screening is undertaken so that the District Plan noise limits are complied with.

A workshop is proposed at the eastern side of the tuff quarry. The proposal is to orientate the workshop so the open doors face away from the closer dwelling. This approach will control any noise from the workshop and this is not considered likely to exceed the proposed noise limits.

Coal Pit

The proposed coal pit will be located to the north east of Ngapara and approximately 900m from the township. The closest house will be approximately 650m from the pit.

The noise predictions undertaken by MDA show that the activities in coal pit can achieve the 55dBA L₁₀ daytime level in the township. This is agreed with.

Two Engineered Land Forms are proposed to the east and south east of the coal pit which will come within 250m of one house. However, as pointed out in the MDA report, the landfill is on property owned by the owner of this house and Holcim has the consent of this resident. Thus, in terms of the requirements of the Resource Management Act, the noise effects for this resident cannot be considered in the analysis. The next nearest house to the landfill is approximately 850m away where it is agreed that compliance with the 55dBA daytime noise limit is practical.

Sand Pit

The proposed sand pit will be located approximately 1.5km west of Windsor. The plant to be used in the sand pit will be a loader and grader plus road trucks to transport the sand. Based on this equipment, MDA have reported that with one exception the noise level will comply with the 55dBA L₁₀ daytime requirement. It is understood that Holcim own the dwelling of potential concern so the noise for this resident cannot be considered in the analysis. The next two closest houses, where written consent has not been given, are approximately 500m from the sand pit. MDA state that the noise criteria will be achieved at these houses. This is agreed with.

Road Traffic

As set out above, there are no specific controls for traffic noise in New Zealand. However, MDA have considered the potential noise effects in some detail.

As a general comment, MDA have stated *“from all of the routes it is predicted that there will be a negligible increase in adverse reaction to traffic noise as a result of this proposal.”* The analysis shows the maximum noise increase is 4dBA with a 2dBA being typical (both 24 hour L_{eq}), which is a small increase to the existing traffic noise. Their conclusion there will be a negligible increase in adverse reaction to the traffic noise has been based on international research and for the lower traffic flows involved this project sits at the base of the assessment curve. It is considered that there may some slightly greater adverse reaction to traffic noise than the above research suggests due to the noise being placed at the beginning of this assessment curve. It is perhaps more realistic to say that the change to the traffic noise environment will be within a reasonable level even though the individual vehicle movements will be heard.

In Table 10 of the MDA report the existing and predicted traffic noise levels and the distances from the road to the residential unit have been given. The predicted noise level is between 47 – 57dBA (24 hour L_{eq}). When taking into account the existing noise levels (which are also given in Table 10), the design recommendations of the Transit Guidelines and the actual increase in the noise level, the traffic noise is considered to be within what is generally to be a reasonable limit.

Train Noise

MDA have considered train noise in more detail. Based on the proposed four trains per day (two return trips) it is agreed that the noise from these trains will be within a reasonable limit.

Construction Noise

Construction noise is limited to development of the cement plant plus commissioning of the plant. At the various pits the construction noise is limited to any initial topsoil removal and the construction of any noise bunds that may be built. The removal of overburden and winning of the product is not included in the construction works.

During this period the requirements of NZS 6803:1999 Acoustics – Construction Noise are applicable as set out above and can be achieved at all times.

Submissions

There are a number of submissions on noise and in some cases further information is required to warrant further consideration of the comment. The following address the main points raised in the submissions.

The noise from trucks and trailers has been raised in a number of submissions. This includes comments such as *they will be heard, including on the farm and will be unacceptable at night time*. The applicant has stated that the only trucks that will operate on a regular basis at night time are those to the cement plant so minimising any noise effects at night time.

It is appreciated that individual truck movements will be heard. However, the design criterion is not based on audibility but rather on what is considered to be a reasonable level of noise when taking all of the facts into account. Based on the

MDA report and after checking their analysis, truck noise will be within generally accepted limits at any noise sensitive building.

The submission stating that the noise may be heard on farms is correct. The noise from traffic or any other type of noise source has to date been assessed at either the residential boundary or the notional boundary of rural dwellings. (The notional boundary is a point 20m from any rural dwelling). To protect farm land to the same level of acoustic protection as dwellings has not to date been a aim at this site or any other site in the Waitaki District. This is, in part, due to a farm being considered an 'industrial' activity in its own right so it is difficult to justify placing the same strict noise controls on farmland as reasonably expected around a dwelling.

With respect to train noise, MDA point out there are currently 8 – 10 trains through Oamaru each week day and four during the weekends. The proposal is to add four train movements and this will not cause any significant change to the existing noise environment. Obviously, individual movements will be heard in the same way as they currently are heard, although it is agreed with MDA that the effects of train noise will be well within what is considered a reasonable noise level.

Concern has been expressed about noise from 24 hour conveyor plant and construction noise. It is understood that generally only the cement plant will operate 24 hours each day although the quarry may need to operate during the night time on some occasions. However, regardless of the activity, the noise must not exceed a level of 40dBA if the event occurs at night time or on Sundays. This level is a strict requirement and within the limits as permitted by the Proposed District Plan for any activity in the area. This is a Council requirement and not a level advanced, or developed, by Holcim. Should a lower limit be considered appropriate by the community, this is an issue best dealt with at the next District Plan review when the levels are established. At this point it is considered that a level of 40dBA (L_{10}) is both within the baseline level for the area and a level that will provide a good level of acoustic protection for the community.

There are two submissions from the Weston Primary School and a number of important issues have been raised. There is concern that noise may lead to the loss of concentration in the classroom. There will be an increase in the traffic flow but the actual noise from individual trucks passing will be the same as from any existing trucks that pass so the children's concentration should not be affected any more than

it is at the moment. The school has not indicated what level they consider reasonable making it impossible to judge if there is in fact any discrepancy between the school and what Holcim are proposing. There is no justifiable reason at this point to change what is proposed by Holcim.

It has also been suggested that noise may be a problem when giving safety instructions to children on crossing the road. I am not aware of this type of problem at other schools adjacent to much busier roads and the noise from individual trucks is unlikely to cause a speech intelligibility problem for the given activity. No further noise control is considered to be warranted with respect to this comment.

The concern of long term health effects due to noise has been raised. This issue has not been addressed by MDA but based on the proposed traffic generation and the control of plant noise, it is not considered that this proposal will cause any adverse health problems for the community.

Noise in the classrooms has been raised and a request has been made for soundproofing. The buildings are not available at this point so no specific recommendations can be given. However, based on the predicted traffic noise it is not considered there is the justification to require Holcim to implement the work sought by the school.

The Waiareke – Weston Presbyterian Parish has two churches, one at Weston and one at Enfield. The Parish has submitted that traffic noise may disrupt Sunday programmes at the church in Weston. Similar concerns have been expressed for the Enfield church for weekday events. While traffic noise will intrude in the same way it already will be, the noise will be within what is generally considered to be a reasonable limit so no specific noise control is considered to be appropriate.

Conclusions

The analysis has shown the proposed development will comply with the noise conditions for a rural zone. It is considered that the proposal is reasonable with respect to noise and with the following noise controls implemented the baseline noise as set by the District Plan will be complied with. The resulting noise will be within what is considered a reasonable noise limit at all times. Therefore, based on noise there is no reason why the application should not be approved.

Recommendations

If the Council should decide to approve the proposed cement supply project the following noise conditions are recommended to ensure the plant and associated pits operate within a reasonable noise limit.

1 Construction Management Plan

To achieve the objective the Construction Management Plan shall provide detailed descriptions of the following:

The potential sources of noise and the methods used to avoid or minimise the emissions of noise and associated effects on the environment during construction;

2 Management Plans – General

A Noise Management Plan for each site by a suitably qualified acoustic expert.

3 Noise Management Plan

The objective for the Noise Management Plan shall be to minimise the effects of noise:

To achieve the objective, the Noise Management Plan shall include:

- a) A description of the activities authorised by the consents which generate noise;
- b) A description of any noise monitoring and reporting requirements set out in the resource consent conditions;
- c) Description of noise management measures and the methods used to minimise noise at and from a site;
- d) A description of detailed vehicle or plant specifications and vehicle maintenance requirements to avoid excessive noise production (e.g. silencers, mufflers) and details of speed restrictions placed on parts of the site to minimise noise;
- e) A description of any shield, enclosures or barriers to minimise noise.

3 Cement Manufacturing Plant

Construction Noise Limits

During periods of construction the noise levels shall not exceed the recommended upper limits for levels of construction work noise as required by NZS 6803:1999 Acoustics – Construction Noise. The term construction noise includes all works up to and including the commissioning of the cement plant.

Operational Noise Limits

Noise from activities shall not exceed the limits set out below within the notional boundary of any occupied rural dwelling (other than those owned by the Consent Holder)

55dBA L₁₀ 7am - 10pm Monday to Friday
 55dBA L₁₀ 7am - 7pm Saturday
 40dBA L₁₀ At all other times
 65dBA L_{max} 10:00pm – 7:00am

Noise levels shall be measured in accordance with the requirements of New Zealand Standard NZS 6801:1991 Measurement of Sound and assessed in accordance with the requirements of NZS 6802:1991 Assessment of Environmental Sound.

Noise Monitoring

Noise monitoring shall be conducted to verify that the activities within the cement plant site comply with the noise limits described in Condition x above. The noise monitoring shall be conducted in accordance with the requirements of NZS 6801:1991 Measurement of Sound and include:

- a) Within one month of commissioning of the plant noise measurements shall be undertaken by a person experienced in measuring noise within the notional boundary of any occupied rural dwelling (other than those owned by the Consent Holder). The results are to be provided to the Consent Authority within one week of undertaking the measurements.
- b) 12 months of the plant commencing operation and at any other time requested by the Consent Authority, noise verification measurements shall be conducted by a person experienced in measuring noise at the same positions as set out in (a). The results are to be provided to the Consent Authority within one week of undertaking the measurements. In the event of any non-compliance the Consent Holder shall advise the Consent Authority immediately of the steps they will implement to achieve compliance and the time they expect to take to resolve the matter. Additional measurements shall be undertaken once the activity has been modified and the noise measured and reported as set out above.

4 Limestone/Siltstone Extraction

Construction Noise Limits

During periods of construction the noise levels shall not exceed the recommended upper limits for levels of construction work noise as required by NZS 6803:1999 Acoustics – Construction Noise. The term construction noise shall include all works associated with the construction of any site access and noise bunds but excludes noise from mining operations, elevated landform and stockpile construction and dumping and all rehabilitation including the decommissioning and removal of any buildings.

Operational Noise Limits

Noise from activities shall not exceed the limits set out below within the notional boundary of any occupied rural dwelling (other than those owned by the Consent Holder)

55dBA L₁₀ 7am - 10pm Monday to Friday
 55dBA L₁₀ 7am - 7pm Saturday
 40dBA L₁₀ At all other times
 65dBA L_{max} 10:00pm – 7:00am

Noise levels shall be measured in accordance with the requirements of New Zealand Standard NZS 6801:1991 Measurement of Sound and assessed in accordance with the requirements of NZS 6802:1991 Assessment of Environmental Sound.

Noise Monitoring

Noise monitoring shall be conducted to verify that the activities within the quarry site comply with the noise limits described in Condition x above. The noise monitoring shall be conducted in accordance with the requirements of NZS 6801:1991 Measurement of Sound and include:

- a) Within one month of quarry extraction commencing noise measurements shall be undertaken by a person experienced in measuring noise within the notional boundary of any occupied rural dwelling (other than those owned by the Consent Holder). The results are to be provided to the Consent Authority within one week of undertaking the measurements.
- b) 12 months of the plant commencing operation and at any other time requested by the Consent Authority, noise verification measurements shall be conducted by a person experienced in measuring noise at the same positions as set out in (a). The results are to be provided to the Consent Authority within one week of undertaking the measurements. In the event of any non-compliance the Consent Holder shall advise the Consent Authority immediately of the steps they will implement to achieve compliance and the time they expect to take to resolve the matter. Additional measurements shall be undertaken once the activity has been modified and the noise measured and reported as set out above.

5 Extract Sand and undertake all Associated Operations

Construction Noise Limits

During periods of construction the noise levels shall not exceed the recommended upper limits for levels of construction work noise as required by NZS 6803:1999 Acoustics – Construction Noise. The term construction noise shall include all works associated with the construction of any site access and noise bunds but excludes noise from mining operations, elevated landform and stockpile construction and dumping and all rehabilitation including the decommissioning and removal of any buildings.

Operational Noise Limits

Noise from activities shall not exceed the limits set out below within the notional boundary of any occupied rural dwelling (other than those owned by the Consent Holder)

55dBA L₁₀ 7am - 10pm Monday to Friday
 55dBA L₁₀ 7am - 7pm Saturday
 40dBA L₁₀ At all other times
 65dBA L_{max} 10:00pm – 7:00am

Noise levels shall be measured in accordance with the requirements of New Zealand Standard NZS 6801:1991 Measurement of Sound and assessed in accordance with the requirements of NZS 6802:1991 Assessment of Environmental Sound.

Noise Monitoring

Noise monitoring shall be conducted to verify that the activities within the quarry site comply with the noise limits described in Condition x above. The noise monitoring shall be conducted in accordance with the requirements of NZS 6801:1991 Measurement of Sound and include:

- a) Within one month of quarry extraction commencing noise measurements shall be undertaken by a person experienced in measuring noise within the notional boundary of any occupied rural dwelling (other than those owned by the Consent Holder). The results are to be provided to the Consent Authority within one week of undertaking the measurements.
- b) 12 months of the plant commencing operation and at any other time requested by the Consent Authority, noise verification measurements shall be conducted by a person experienced in measuring noise at the same positions as set out in (a). The results are to be provided to the Consent Authority within one week of undertaking the measurements. In the event of any non-compliance the Consent Holder shall advise the Consent Authority immediately of the steps they will implement to achieve compliance and the time they expect to take to resolve the matter. Additional measurements shall be undertaken once the activity has been modified and the noise measured and reported as set out above.

6 Coal Extraction Operational Noise Limits

Noise from activities shall not exceed the limits set out below:

- i) Within the notional boundary of any occupied rural dwelling (other than those owned by the Consent Holder)
 - 55dBA L₁₀ 7am - 10pm Monday to Friday
 - 55dBA L₁₀ 7am - 7pm Saturday
 - 40dBA L₁₀ At all other times
 - 65dBA L_{max} 10:00pm – 7:00am
- ii) Within any Township Zoned site the following noise limits shall not be exceeded:
 - 55dBA L₁₀ 7am - 10pm Monday to Friday
 - 55dBA L₁₀ 8am - 7pm Saturday
 - 40dBA L₁₀ At all other times and any public holiday
 - 75dBA L_{max} At all other times
- iii) Within the boundary of the Business 3 Zoned site
 - 60dBA L₁₀ at all times

Noise levels shall be measured in accordance with the requirements of New Zealand Standard NZS 6801:1991 Measurement of Sound and assessed in accordance with the requirements of NZS 6802:1991 Assessment of Environmental Sound.

Construction Noise Limits

During periods of construction the noise levels shall not exceed the recommended upper limits for levels of construction work noise as required by NZS 6803:1999 Acoustics – Construction Noise. The term construction noise shall include all works associated with the construction of any site access and noise bunds but excludes noise from mining operations, elevated landform and stockpile construction and dumping and all rehabilitation including the decommissioning and removal of any buildings.

Noise Monitoring

Noise monitoring shall be conducted to verify that the activities within the quarry site comply with the noise limits described in Condition x above. The noise monitoring shall be conducted in accordance with the requirements of NZS 6801:1991 Measurement of Sound and include:

- a) Within one month of quarry extraction commencing noise measurements shall be undertaken by a person experienced in measuring noise within the notional boundary of any occupied rural dwelling (other than those owned by the Consent Holder). The results are to be provided to the Consent Authority within one week of undertaking the measurements.
- b) 12 months of the plant commencing operation and at any other time requested by the Consent Authority, noise verification measurements shall be conducted by a person experienced in measuring noise at the same positions as set out in (a). The results are to be provided to the Consent Authority within one week of undertaking the measurements. In the event of any non-compliance the Consent Holder shall advise the Consent Authority immediately of the steps they will implement to achieve compliance and the time they expect to take to resolve the matter. Additional measurements shall be undertaken once the activity has been modified and the noise measured and reported as set out above.



Nevil Hegley
July 2007