

**CON520: SUBMISSION ON
RESOURCE CONSENT APPLICATION**
(SECTION 96 RESOURCE MANAGEMENT ACT 1991)

TO: Consents Hearings
Environment Canterbury
P O Box 345
CHRISTCHURCH 8140

Email: hearings@ecan.govt.nz
Ph: (03) 353 9007 Fax: (03) 365 3194

OR: submit by completing an on-line form at:

<https://www.ecan.govt.nz/do-it-online/resource-consents/notifications-and-submissions/notified-consents/>.

FOR OFFICE USE ONLY

FILE: CRC192408, CRC192409, CRC192410,
CRC192411, CRC192412, CRC192413,
CRC192414, RC185627

Closing Date: **5.00pm Thursday 6 June 2019**

Person(s) /Group /Organisation Making the Submission

Full Name of Submitter(s): Pamela Anne Kenyon

Postal Address

Contact Phone N

Fax/Email:

☐ Please tick this box if you do not want to receive any communication via email

Contact

Person:

Name of applicant: Fulton Hogan Limited

Applications to Environment Canterbury



All of the applications as listed below OR only those as ticked.



CRC192408

Land use to excavate material



CRC182409

Land use to deposit cleanfill



CRC192410

Discharge contaminants into air



CRC192411

Discharge contaminants into water from industrial processes



CRC192412

Discharge stormwater into land



CRC192413

Discharge contaminants into land associated with deposition of cleanfill



CRC192414

Water permit



I / We support the application



I / We oppose the application



I / We are neutral to the application
(neither support or oppose)



I / We do wish to be heard in support of my/our submission*

(Note: this means you wish to speak in support of your submission at the hearing)

*If others make a similar submission, I will consider presenting a joint case with them at the hearing ☐ Yes ☐ No

OR



I / We do not wish to be heard in support of my/our submission

(Note: this means that you cannot speak at the hearing, however you will retain your right to appeal any decision to the Environment Court on any decision made by the Council.)

Application to Selwyn District Council

☐ RC185627 Land use for gravel extraction and processes

☐ I / We support the application ☒ I / We oppose the application ☐ I / We are neutral to the application
(neither support or oppose)

☒ I / We do wish to be heard in support of my/our submission*

(Note: this means you wish to speak in support of your submission at the hearing)

*If others make a similar submission, I will consider presenting a joint case with them at the hearing ☒ Yes ☐ No

OR

☐ I / We do not wish to be heard in support of my/our submission

(Note: this means that you cannot speak at the hearing, however you will retain your right to appeal any decision to the Environment Court on any decision made by the Council.)

The reasons for making my submission are: *(state in summary the nature of your submission, giving reasons)*

I oppose the above application for the following reasons

- The additional noise pollution generated by the operation of the quarry and increased road traffic movement would have a number of adverse health effects.
- The air quality in and around the proposed quarry site would suffer considerably which also has a detrimental effect to public health.
- The loss of green space would discourage healthy outdoor activity preventing the local population reaching healthy outcomes.

Please attach additional pages if required

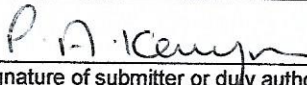
3. I wish the consent authority to make the following decision: *(give details, including the general nature of any conditions sought)*

I oppose all of the applications and want the consent authority to decline all applications. If the consent authority does see fit to grant permission I would like to see strong, sufficient, restrictive conditions applied to the consent such as, no night time operation, restricted day time operating hours, no weekend operation, substantial set backs, insertion of stop banks, noise monitoring by an independent third party, sufficient planting to mitigate dust movement, dust control measures such as automated damping, particulate monitoring by an independent third party, restrictions to traffic movement around the proposed quarry site, speed reductions and traffic calming measures such as speed humps, road bollards to reduce width of the roads, weight restrictions on local roads. I would also like to see details restricting the applicant from appealing any restrictive measures if consent is granted. Please see attached supporting document.

Please attach additional pages if required

5. ☐ I/We am / am not a trade competitor for the purposes of section 308B of the Resource Management Act 1991.

☒ I / We am / am not directly affected by an effect of the subject matter of the submission that (a) adversely affects the environment; and (b) does not relate to trade competition or the effects of trade competition.


Signature of submitter or duly authorised agent on behalf of submitter

Date 5 16 19

Notes to the submitter:

1. The person making this submission must send a copy to the applicant as soon as reasonably practicable after serving Environment Canterbury

2. A list of all submissions received will be provided to the applicant.

3. Please be aware that third parties may request a copy of submissions received and that request is subject to the Local Government Official Information

and Meetings Act 1987.

The address for service of the applicant is:

Fulton Hogan Limited

c/- Golder Associates

PO Box 2281

Christchurch 8041

Attn: Kevin Bligh / Geoff England

Email: submissions@golder.co.nz

Submission to Selwyn District Council and Environment Canterbury

Re RMA Application Numbers:

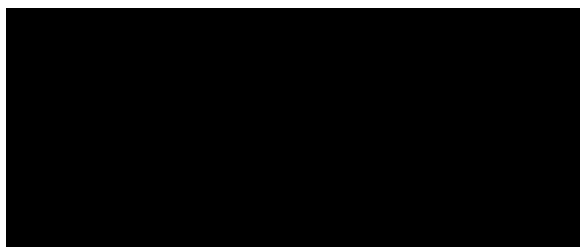
CRC192408/CRC182409/CRC192410/CRC192411/CRC192412/CRC192413/CRC192414

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My details

Pamela Anne Kenyon



My position regarding the application

I oppose the above application for the following reasons

- The additional noise pollution generated by the operation of the quarry and increased road traffic movement would have a number of adverse health effects.
- The air quality in and around the proposed quarry site would suffer considerably which also has a detrimental effect to public health.
- The loss of green space would discourage healthy outdoor activity preventing the local population reaching healthy outcomes.

I hereby submit a detailed, evidence-based objection opposing the above application. My submission highlights local government's responsibility to protecting public health followed by detailed evidence to support the reasons for my objections.

Local Government's responsibilities to protect public health and wellbeing

According to the Ministry of Health published document Public Health in New Zealand: Local Governments Contribution to Wellbeing¹, under the Local Government Act 2002 local authorities must consider the impact of activities on their population's cultural, economic, environmental and social wellbeing and take a sustainable development approach.

Good transport is critical for the economy, the environment and people's quality of life. These factors are key determinants of public health and wellbeing. Transport includes buses, trains, private vehicles, cycles and pedestrian traffic. However, transport can also have negative influences on public health as a result of high traffic volumes and traffic congestion that contribute to air pollution and stress and reduce the time available for work and leisure.

Public health nuisances include a variety of situations that can be offensive or injurious to health. Situations can include, but are not exclusive to, smoke and fumes, conditions where potentially disease-carrying insects such as flies and mosquitoes might breed, physical working conditions, leaks, smells, noise and accumulation likely to cause offence or harm.

Under the Resource Management Act 1991, local authorities are responsible for ensuring sustainable management. This is directly relevant to health and wellbeing, since the Act defines sustainable management as managing uses of resources 'in a way or at a rate which enables people and communities to provide for their social, economic and cultural wellbeing, and for their health and safety'.

I therefore rely upon the people assessing the above application to consider the following information when assessing the above application for resource consent, and to take earnestly its responsibility to protect the health and wellbeing of myself and all the local residents whose health would be effected if resource consent is granted.

Noise Pollution

The additional noise pollution generated by the operation of the quarry and increased heavy vehicle road traffic movement would have a number of adverse health effects. Based upon the following information I would like resource consent to be declined or sufficient restrictive conditions made to the consent so as to protect myself and the local population from the adverse effects of noise pollution, particularly with regard to night time operation and hours of work.

I draw particular attention to the section that addresses the effects of noise on vulnerable groups and note that we have several vulnerable groups in our community not only living in the community but also at Brackenridge on Madisons Road.

Noise pollution can cause health problems such as noise-induced hearing impairment, cardiovascular and physiological impacts, disturbed rest and sleep (increased fatigue, a depressed mood or wellbeing, and decreased performance), mental health and performance effects, effects on residential behaviour and annoyance, and interference with intended activities. In addition to physical health effects, noise can produce social and behavioural effects in residents, besides annoyance, such as adverse changes in social behaviour (for example, aggression, unfriendliness,

¹ <https://www.health.govt.nz/publication/public-health-wellbeing-new-zealand-interface-local-government>

disengagement and non-participation) and adverse changes in social indicators (such as residential mobility, hospital admissions, drug consumption and accident rates).

Sleep deprivation due to noise

According to the World Health Organisation (WHO) Guidelines for community noise, section 3² uninterrupted sleep is known to be a prerequisite for good physiological and mental functioning of healthy persons (Hobson 1989); sleep disturbance, on the other hand, is considered to be a major environmental noise effect.

The WHO's understanding of the impact of noise exposure on sleep stems mainly from experimental research in controlled environments. Field studies conducted with people in their normal living situations are scarce. Most of the more recent field research on sleep disturbance has been conducted for aircraft noise (Fidell et al. 1994 1995a,b 1998; Horne et al. 1994 1995; Maschke et al. 1995 1996; Ollerhead et al. 1992; Passchier-Vermeer 1999). Other field studies have examined the effects of road traffic and railway noise (Griefahn et al. 1996 1998).

The primary sleep disturbance effects are: difficulty in falling asleep (increased sleep latency time); awakenings; and alterations of sleep stages or depth, especially a reduction in the proportion of REM-sleep (REM = rapid eye movement) (Hobson 1989). Other primary physiological effects can also be induced by noise during sleep, including increased blood pressure; increased heart rate; increased finger pulse amplitude; vasoconstriction; changes in respiration; cardiac arrhythmia; and an increase in body movements (cf. Berglund & Lindvall 1995). For each of these physiological effects, both the noise threshold and the noise-response relationships may be different. Different noises may also have different information content and this also could affect physiological threshold and noise-response relationships (Edworthy 1998).

Exposure to night-time noise also induces secondary effects, or so-called after effects. These are effects that can be measured the day following the night-time exposure, while the individual is awake. The secondary effects include reduced perceived sleep quality; increased fatigue; depressed mood or well-being; and decreased performance (Öhrstöm 1993a; Passchier-Vermeer 1993; Carter 1996; Pearsons et al. 1995; Pearsons 1998).

Long-term effects on psychosocial well-being have also been related to noise exposure during the night (Öhrstöm 1991). Noise annoyance during the night-time increased the total noise annoyance expressed by people in the following 24 h. Various studies have also shown that people living in areas exposed to night-time noise have an increased use of sedatives or sleeping pills. Other frequently reported behavioural effects of night-time noise include closed bedroom windows and use of personal hearing protection. Sensitive groups include the elderly, shift workers, persons especially vulnerable to physical or mental disorders and other individuals with sleeping difficulties.

Questionnaire data indicate the importance of night-time noise on the perception of sleep quality. A recent Japanese investigation was conducted for 3 600 women (20-80 years old) living in eight roadside zones with different road traffic noise. The results showed that four measures of perceived sleep quality (difficulty in falling asleep; waking up during sleep; waking up too early; feelings of sleeplessness one or more days a week) correlated significantly with the average traffic volumes during night-time. An in-depth investigation of 19 insomnia cases and their matched controls (age,work) measured outdoor and indoor sound pressure levels during sleep (Kageyama et al. 1997).

² <http://apps.who.int/iris/handle/10665/66217>

The study showed that road traffic noise in excess of 30 dB LAeq for night time induced sleep disturbance, consistent with the results of Öhrström (1993b).

Special attention should also be given to the following considerations:

- a. Noise sources in an environment with a low background noise level. For example, night-traffic in suburban residential areas.
- b. Environments where a combination of noise and vibrations are produced. For example, railway noise, heavy duty vehicles.
- c. Sources with low-frequency components. Disturbances may occur even though the sound pressure level during exposure is below 30 dBA.

If negative effects on sleep are to be avoided the equivalent sound pressure level should not exceed 30 dBA indoors for continuous noise. If the noise is not continuous, sleep disturbance correlates best with L_{Amax} and effects have been observed at 45 dB or less. This is particularly true if the background level is low. Noise events exceeding 45 dBA should therefore be limited if possible. For sensitive people an even lower limit would be preferred. It should be noted that it should be possible to sleep with a bedroom window slightly open (a reduction from outside to inside of 15 dB). To prevent sleep disturbances, one should thus consider the equivalent sound pressure level and the number and level of sound events. Mitigation targeted to the first part of the night is believed to be effective for the ability to fall asleep.

Cardiovascular and physiological effects of noise

The WHO also report the cardiovascular and physiological effects of noise. Epidemiological and laboratory studies involving workers exposed to occupational noise, and general populations (including children) living in noisy areas around airports, industries and noisy streets, indicate that noise may have both temporary and permanent impacts on physiological functions in humans. It has been postulated that noise acts as an environmental stressor (for a review see Passchier-Vermeer 1993; Berglund & Lindvall 1995). Acute noise exposures activate the autonomic and hormonal systems, leading to temporary changes such as increased blood pressure, increased heart rate and vasoconstriction. After prolonged exposure, susceptible individuals in the general population may develop permanent effects, such as hypertension and ischaemic heart disease associated with exposures to high sound pressure levels (for a review see Passchier-Vermeer 1993; Berglund & Lindvall 1995). The magnitude and duration of the effects are determined in part by individual characteristics, lifestyle behaviours and environmental conditions. Sounds also evoke reflex responses, particularly when they are unfamiliar and have a sudden onset.

Laboratory experiments and field quasi-experiments show that if noise exposure is temporary, the physiological system usually returns - after the exposure terminates - to a normal (pre-exposure) state within a time in the range of the exposure duration. If the exposure is of sufficient intensity and unpredictability, cardiovascular and hormonal responses may appear, including increases in heart rate and peripheral vascular resistance; changes in blood pressure, blood viscosity and blood lipids; and shifts in electrolyte balance (Mg/Ca) and hormonal levels (epinephrine, norepinephrine, cortisol). The first four effects are of interest because of noise-related coronary heart disease (Ising & Gjøntner 1997). Laboratory and clinical data suggest that noise may significantly elevate gastrointestinal motility in humans.

The overall conclusion is that cardiovascular effects are associated with long-term exposure to LAeq, 24hour values in the range of 65-70 dB or more, for both air- and road-traffic noise. However, the associations are weak and the effect is somewhat stronger for ischaemic heart disease than for

hypertension. Nevertheless, such small risks are potentially important because a large number of persons are currently exposed to these noise levels, or are likely to be exposed in the future. Furthermore, only the average risk is considered and sensitive subgroups of the populations have not been sufficiently characterized. For example, a 10% increase in risk factors (a relative risk of 1.1) may imply an increase of up to 200 cases per 100 000 people at risk per year. Other observed psychophysiological effects, such as changes in stress hormones, magnesium levels, immunological indicators, and gastrointestinal disturbances are too inconsistent for conclusions to be drawn about the influence of noise pollution.

Effects of noise on mental health

In addition the WHO describe the effects on mental health from noise exposure. Mental health is defined as the absence of identifiable psychiatric disorders according to current norms (Freeman 1984). Environmental noise is not believed to be a direct cause of mental illness, but it is assumed that it accelerates and intensifies the development of latent mental disorder. Studies on the adverse effects of environmental noise on mental health cover a variety of symptoms, including anxiety; emotional stress; nervous complaints; nausea; headaches; instability; argumentativeness; sexual impotency; changes in mood; increase in social conflicts, as well as general psychiatric disorders such as neurosis, psychosis and hysteria. Large-scale population studies have suggested associations between noise exposure and a variety of mental health indicators, such as single rating of well-being; standard psychological symptom profiles; the intake of psychotropic drugs; and consumption of tranquilizers and sleeping pills. Early studies showed a weak association between exposure to aircraft noise and psychiatric hospital admissions in the general population surrounding an airport (see also Berglund & Lindvall 1995).

Exposure to high levels of occupational noise has been associated with development of neurosis and irritability; and exposure to high levels of environmental noise with deteriorated mental health (Stansfeld 1992). These and other results show the importance of taking vulnerable groups into account, because they may not be able to cope sufficiently with unwanted environmental noise (e.g. Stansfeld 1992). This is particularly true of children, the elderly and people with preexisting illnesses, especially depression (IEH 1997). Despite the weaknesses of the various studies, the possibility that community noise has adverse effects on mental health is suggested by studies on the use of medical drugs, such as tranquilizers and sleeping pills, on psychiatric symptoms and on mental hospital admission rates.

Effects of noise on vulnerable groups

We have living in our community a vulnerable group of people with reduces personal abilities and therefore include the WHO published research in to the effects of noise on this discreet group.

Protective standards are essentially derived from observations on the health effects of noise on "normal" or "average" populations. The participants of these investigations are selected from the general population and are usually adults. Sometimes, samples of participants are selected because of their easy availability. However, vulnerable groups of people are typically underrepresented. This group includes people with decreased personal abilities (old, ill, or depressed people); people with particular diseases or medical problems; people dealing with complex cognitive tasks, such as reading acquisition; people who are blind or who have hearing impairment; fetuses, babies and young children; and the elderly in general (Jansen 1987; AAP 1997). These people may be less able to cope with the impacts of noise exposure and be at greater risk for harmful effects.

Persons with impaired hearing are the most adversely affected with respect to speech intelligibility. Even slight hearing impairments in the high-frequency range may cause problems with speech

perception in a noisy environment. From about 40 years of age, people typically demonstrate an impaired ability to understand difficult, spoken messages with low linguistic redundancy. Therefore, based on interference with speech perception, a majority of the population belongs to the vulnerable group.

Children have also been identified as vulnerable to noise exposure (see Agenda 21: UNCED 1992). The evidence on noise pollution and children's health is strong enough to warrant monitoring programmes at schools and preschools to protect children from the effects of noise. Follow up programmes to study the main health effects of noise on children, including effects on speech perception and reading acquisition, are also warranted in heavily noise polluted areas (Cohen et al. 1986; Evans et al. 1998).

The issue of vulnerable subgroups in the general population should thus be considered when developing regulations or recommendations for the management of community noise. This consideration should take into account the types of effects (communication, recreation, annoyance, etc.), specific environments (in utero, incubator, home, school, workplace, public institutions, etc.) and specific lifestyles (listening to loud music through headphones, or at discotheques and festivals; motor cycling, etc.).

Air Quality

The air quality in and around the proposed quarry site would suffer considerably which also has a detrimental effect on public health. Based upon the following information I would like resource consent to be declined or sufficient restrictive conditions made to the consent so as to protect myself and the local population from the adverse effects poor air quality with particular attention paid to minimum set-backs, dust mitigation measures and particulate monitoring.

The Ministry of Health published Environmental Health Indicators on 2008³. It reports that environmental health covers those general aspects of health that are related to the environment. The WHO developed the following draft definition of environmental health at a meeting in Sofia, Bulgaria, in 1993:

'Environmental health comprises those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social and psychosocial factors in the environment.

It also refers to the theory and practice of assessing, correcting, controlling and preventing those factors in the environment that can potentially affect adversely the health of present and future generations' (WHO, 1993).

Environmental health covers a broad range of topics, including air pollution, water quality, noise, sanitation, housing, radiation, waste management, food safety, traffic accidents, vector-borne disease, occupational health and chemical emergencies (Briggs 1999).

Air quality is an important aspect of environmental health in New Zealand. Air pollutants include fine particulate matter, and toxic gases such as nitrogen dioxide, sulphur dioxide, ozone, carbon monoxide and hydrocarbons. The sources of outdoor air pollution include home heating, vehicle emissions, industrial processes, power stations, and natural sources such as pollen, sea salt, soil, volcanoes and forest fires (Kjellström 2004). Indoor air quality is affected by tobacco smoke, fuels used for cooking and heating, and wall materials (Kjellström 2004). Human health effects from poor air quality include respiratory problems, particularly in the young and old and in people with pre-

³ <https://www.health.govt.nz/publication/environmental-health-indicators-new-zealand-2008>

existing medical problems. A study recently found that air pollution accounted for 1079 cases of premature mortality in New Zealand in 2001 (Fisher et al 2007).

Air quality is a critically important environmental health issue because clean air is essential to life and development. Air pollution has been linked to a wide range of health effects. These include exacerbation of respiratory and cardiovascular conditions (American Thoracic Society 1996, 2000) as well as causing restricted activity days (eg, air pollution causing breathing problems that prevent work attendance) (Fisher et al 2007).

Ambient air pollution encompasses a number of pollutants, including:

- coarse particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}), which can penetrate deep into the lungs
- carbon monoxide (CO), which is highly correlated with particulates and can affect the blood's ability to carry oxygen
- nitrogen dioxide (NO₂), which can exacerbate asthma
- sulphur dioxide (SO₂), which can cause sore eyes and throat
- ozone (O₃), which can cause breathing difficulties
- benzene, which is a carcinogen (Fisher et al 2007; Ministry for the Environment 2007).

In New Zealand, the Health and Air Pollution in New Zealand (HAPiNZ) study showed a correlation between increased levels of air pollution and adverse health effects (Fisher et al 2007). The study estimated that in New Zealand in 2001 among the total population aged over 30 years air pollution from domestic, vehicular and industrial sources accounted for 1079 cases of premature mortality due to PM₁₀ and CO, 1544 cases of bronchitis and related illnesses, as well as 703 extra hospitalisations for respiratory and cardiac problems. This study estimated that there was an increase of 4.8% in the national average mortality rate associated with air pollution. The annual cost of air pollution in New Zealand due to health effects and mortality was estimated to be \$1.14 billion (Fisher et al 2007).

The Ministry of Health commissioned Emission Impossible Ltd in 2013 to review the WHO document Review of evidence on health aspects of air pollution this summary⁴ reports a sizable amount of scientific literature exists on the short-term and long-term health effects of PM₁₀ at concentrations below the current European limit values. The following arguments make it clear that PM₁₀ is not just a proxy measure of PM_{2.5}.

1. There is increasing evidence for the adverse effects on health of coarse particles (PM_{10-2.5}). Short-term effects on health of coarse particles have been observed independently of those related to fine particles (PM_{2.5}).
2. New European studies further strengthen the evidence for an association between long-term exposure to PM₁₀ and health – especially for respiratory outcomes – and for health benefits from the reduction in long-term mean concentrations of PM₁₀ to levels far below the current EU limit value for PM₁₀.
3. Coarse and fine particles deposit at different locations in the respiratory tract, have different sources and composition, act through partly different biological mechanisms, and result in different health outcomes.

⁴ <https://emissionimpossible.co.nz/who-review-of-evidence-on-health-aspects-of-air-pollution/>

Therefore, maintaining independent short-term and long-term limit values for ambient PM₁₀ in addition to PM_{2.5}, to protect against the health effects of both fine and coarse particles, is well supported.

New evidence on health effects has emerged since the review work done for the WHO air quality guidelines published in 2006, particularly with regard to the strength of the evidence on the health impacts associated with exposure to PM_{2.5}. Based on this new information, the scientific conclusions given in 2005 require revision.

- Many more studies since 2005 Global Update.
- Additional support for mortality and morbidity effects of short-term exposure to particulate matter less than 2.5 micrometres in diameter (PM_{2.5}) based on several multicity epidemiological studies.
- Additional support for mortality and morbidity effects of long-term exposure to PM_{2.5} based on studies of long-term exposure on large cohorts in Europe and North America.
- Authoritative review concluding long-term PM_{2.5} is causative for cardiovascular mortality and morbidity
- New insights into physiological effects and plausible biological mechanisms linking short and long-term PM_{2.5} exposure with mortality and morbidity (observed in epidemiological, clinical and toxicological studies)
- New health outcomes linked to long-term exposure to PM_{2.5} (e.g. arteriosclerosis, adverse birth outcomes and childhood respiratory disease)
- Emerging evidence suggesting links between long-term PM_{2.5} and neurodevelopment and cognitive function as well as other chronic diseases such as diabetes.

Overall conclusion confirms and strengthens the findings of the 2005 Global Update that there is a causative link between PM_{2.5} and adverse health outcomes.

The evidence base for the association between particulate matter (PM) and short-term, and long-term, health impacts has become larger and broader. Recent long-term studies show associations between PM and mortality at levels well below current annual WHO guideline. Recommend the WHO guideline be revised.

Coarse (PM_{2.5-10}) particulate (including crustal material) is associated with adverse respiratory and cardiovascular effects on health (including premature mortality).

- Toxicological studies report coarse particles can be as toxic as PM_{2.5} on a mass basis
- Epidemiological studies show coarse PM has at least as strong short-term effects on respiratory health as PM_{2.5} and health effect estimates for cardiovascular outcomes (admissions and physiological effects) were comparable.
- Clinical studies suggest both size fractions are comparable in inducing cardiopulmonary changes in acute exposure settings.

EU legislation has a concentration limit value and an exposure reduction target for PM_{2.5}. In the absence of a threshold and in light of linear or supra-linear risk functions, public health benefits will result from any reduction in PM_{2.5} concentrations, whether or not the current levels are above or below the limit values.

Emmission Impossible Ltd found that, with relevance to public health in New Zealand, the Review of evidence on health aspects of air pollution is authoritative, comprehensive and recent (WHO, 2013). Importantly, it includes negative findings as well as positive associations. This increases its credibility.

Recent IARC Press Releases have provided a definitive backdrop to the WHO review:

- June 2012 – diesel engine exhaust is carcinogenic to humans (Group 1)³
- October 2013 - 'outdoor air pollution' is carcinogenic to humans (Group 1)⁴
- Both due to increased risk of lung cancer

They also found that key things to note with regard to particulate matter are:

- We should be assessing PM₁₀ and PM_{2.5}
- We should be assessing short-term (i.e. 24 hour) and long-term (i.e. annual) effects of PM
- None of the above is currently required in national regulations or guidance

Loss of Green Space

The loss of green space would discourage healthy outdoor activity preventing the local population reaching healthy outcomes. Based upon the following information I would like resource consent to be declined or sufficient restrictive conditions made to the consent so as to protect myself and the local population from the adverse effects of loss of green space, in particular with regard to operating hours, minimum set-backs and restrictions as to what roads vehicles associated with the quarry can use, with reduced speed limits.

According to the document Public Health in New Zealand: Local Governments Contribution to Wellbeing ¹ the physical and mental wellbeing of people living in urban areas is affected by their access to green space and recreation. Obesity, inactivity and poor nutrition all affect health, and several sectors, including health, physical activity, education, active transport, local government, and the food and beverage industry can influence these factors and mitigate their effects.

The physical environment, policy, programmes, community attitudes and many other factors influence the uptake of activity. 'Partnerships are vital for active living because they can bring together the many disciplines that have influence in a community, such as public health, urban planning, transportation, recreation, architecture.'

Obesity has become an epidemic in many Western countries. It causes many health problems. Physical activity and nutrition are the strongest determinants of obesity levels, so it is important to invest in parks, walkways, cycle ways and recreational activities and to encourage the use of those facilities (WHO 2004a). The location and pricing of these types of facility, and ensuring they are safe, can affect the ability of different population groups to access them.

The World Health Organization has proposed a range of activities to address non-communicable disease risk factors, including national, community and individual actions. Local government's role often includes activities such as providing sites for physical activity.

Local authorities in New Zealand have played varying (and primarily discretionary) roles in providing parks, meeting places and sports facilities, including swimming pools, stadiums and skateparks. The district plan and Resource Management Act 1991 provide for planning and zoning to reserve green spaces.

The loss of the green space in the proposed area of the quarry will impact on the local community who use this area, the roads around the area for a variety of outdoor activities, including but not limited to, walking, cycling, running, and horse riding. In addition the viability for continuing with these activities will be severely hampered with reduced air quality, increased heavy road traffic and increased noise levels making these activities no longer safe or have any health benefit.