

Before the Board of Inquiry
Waterview Connection Project

in the matter of: the Resource Management Act 1991

and

in the matter of: a Board of Inquiry appointed under s 149J of the Resource Management Act 1991 to decide notices of requirement and resource consent applications by the NZ Transport Agency for the Waterview Connection Project

Rebuttal evidence of **David Black (Public Health)** on behalf of the
NZ Transport Agency

Dated: 1 February 2011

Hearing start date: 7 February 2011

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REBUTTAL EVIDENCE OF DAVID BLACK ON BEHALF OF THE NZ TRANSPORT AGENCY

INTRODUCTION

- 1 My full name is David Russell Black. I refer the Board of Inquiry to the statement of my qualifications and experience set out in my evidence in chief (*EIC*) (dated 11 November 2010).
- 2 I repeat the confirmation given in that statement that I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court.

PURPOSE OF EVIDENCE

- 3 The purpose of this rebuttal evidence is to respond to certain aspects of the evidence lodged by submitters. Specifically, my evidence will respond to the evidence of:
 - 3.1 Dr Alison Towns (Submitter No. 121-1);¹
 - 3.2 Robert Black (Submitter No. 186-1);
 - 3.3 Waterview Primary School Board of Trustees and the Ministry of Education (Submitter Nos. 175, 176-2 and 176-3);
 - 3.4 Auckland Council (Submitter No. 111-7);
 - 3.5 Springhleigh Residents' Association (Submitter No. 43-1);
 - 3.6 Andrew Tauber for Apartments Limited (Submitter No. 75-1);
 - 3.7 Paul Conder for Unitec (Submitter No. 160-1);
 - 3.8 Wilson Irons for Metro Mt Albert Sports Club, Football Division (Submitter No. 249-1); and
 - 3.9 Margaret Watson for Albert Eden Local Board (Submitter No. 252-1) and William McKay for North Western Community Association (Submitter No. 185-1).
- 4 In addition, I will comment on relevant aspects of the Section 42A Reports prepared by Environmental Management Services (*EMS*) (dated 7 and 20 December 2010), Emission Impossible (air quality) and Malcolm Hunt Associates (noise and vibration).
- 5 I also wish to take this opportunity to correct a minor error in my *EIC*.

¹ References are to the submitters' evidence as listed on the EPA website.

DR ALISON TOWNS

- 6 The evidence of Dr Alison Towns² discusses the known and established effects of air pollution and vehicle emissions on health. I note that Dr Towns is a psychologist who has been involved in public health research, but she acknowledges that she is not an expert in the field of environmental health. She quotes various published reports and gives some statistics for vehicle emission health effects in New Zealand. She goes on to strongly criticise the NZTA for wishing to proceed with the Project, in particular the ventilation vents, despite the known health effects of vehicle emissions. Regarding the proposed ventilation vents, Dr Towns likens the NZTA to the "*nicotine smoking industry which continued to sell cigarettes knowing that they contained lethal toxins*".³
- 7 Whilst I agree with Dr Towns that the health effects of vehicle emissions are a serious matter of public health concern and are scientifically established, I strongly disagree with her likening the NZTA to the tobacco industry. I also disagree that the health effects of vehicle emissions are a reason to disallow the Project. My reasons for this are covered in my EIC in paragraphs 32-37. I am satisfied that the modelling done by Mr Gavin Fisher indicates that the overall effect of the Project would, if anything, be to decrease vehicle emissions through more efficient driving practices. Mr Fisher also shows that the levels of emissions entering breathing spaces arising from the ventilation vents are well within safe levels and, in fact, much lower than can be found near many Auckland roads. In proceeding with this Project, the NZTA is simply pursuing the direction already established in the Auckland Regional Transport Strategy. Realistic public health management in a democratic society such as Auckland has to balance the immediate and short-term needs of transport users with more idealistic options. In my opinion, that is being done with this Project, and as the air quality evidence clearly shows, the efficiency of the existing roading network is being greatly improved with no net deterioration in air quality, more likely an overall improvement.

ROBERT BLACK

- 8 The evidence of Robert Black⁴ raises concerns over the ventilation vents and Waterview Kindergarten and calls for the vents to be filtered.⁵ I have addressed these issues in paragraphs 63-65 and

² Submitter No. 121-1.

³ Page 4, paragraph 9.

⁴ Submitter No. 186-1.

⁵ Page 16, paragraph 11. This issue was also raised in the evidence of Margaret Watson, representing the Albert Eden Local Board (Submitter No. 252-1), Wendy John, representing Friends of Oakley Creek (FOOC) (Submitter No. 179-1), William McKay, representing the North Western Community Association (Submitter No. 185-1), David Shearer (Submitter No. 178-1), Winston Aldworth and Louise Taylor (Submitter No. 200-1), Shirley Upton (Submitter No. 103-1),

68-70 of my EIC. In brief, the tunnel vehicle emissions will not be harmful when dispersed in air at the levels of the vents.⁶ Filtering is not necessary and would be highly energy inefficient. Mr Black also discusses the low socio-economic status of Waterview and the potential for respiratory effects to be greater in such communities.⁷ I have discussed this in paragraphs 71-72 of my EIC. I do not consider either issue to be of concern regarding public health effects of this Project.

- 9 By way of relief, Mr Black seeks that *"if local children visit the doctor because of an air related complaint then Auckland Council are required to test the air under the 1956 Public Health Act"* and *"that the health of the community is monitored and intervention and healthcare provided free of charge to meet the needs of the community"*.⁸
- 10 It is generally true that respiratory complaints may be increased in intensely populated and trafficked areas such as dense city environments. Having said that, it is not a significant problem in the majority of suburban Auckland and, because of the nature of the terrain and prevailing meteorological conditions, will not be added to by either the Waterview Connection roads or the tunnels. Children under 6 are usually able to be seen in general practice at little or no cost through the Primary Health Organisation (PHO) system. Air quality in suburban Auckland is monitored and, on an international scale for a city of Auckland's size, rates well in the suburban areas. I therefore do not consider the relief sought by Mr Black in relation to health issues to be either necessary or appropriate.

WATERVIEW PRIMARY SCHOOL BOARD OF TRUSTEES AND THE MINISTRY OF EDUCATION

- 11 The evidence on behalf of the Waterview Primary School Board of Trustees⁹ list a range of issues which have been raised by parents as of concern. These mainly involve concern over noise, dust, air pollution and the ventilation vents, all of which have been covered in my EIC and in my opinion are not of concern from a public health perspective.

Shirley Upton and Karen Brown (on behalf of the Waterview Environmental Society Inc.) (Submitter 85-1).

⁶ This is the case regardless of whether the proposed height of 25m is maintained or whether a lower height of 15-17m could be achieved.

⁷ This issue was also raised by William McKay, representing the North Western Community Association (Submitter No. 185-1).

⁸ At page 16, points 13 and 14.

⁹ Represented by Robert Black (Submitter No. 175 and 176-2) and Brett Skeen (Submitter No. 175 and 176-3).

- 12 The School also raises concerns over “*the health effects of children being exposed to an electrical substation*”.¹⁰ The submission does not specify what substation the parents are concerned about, but I assume the concern is over the substations that will be located within the ventilation buildings to operate the tunnel ventilation system.
- 13 Magnetic field exposure levels to the community from electricity substations are miniscule. In fact, the levels are generally at least 10 times lower than the general public limits in the internationally recognised ICNIRP (International Commission for Non-ionising Radiation Protection) Guideline¹¹ suggests. The Guideline itself incorporates considerable margins for safety. Public concern often exists with regard to health effects caused by magnetic fields. However, despite more than three decades of research into this possibility, a causative link between extra low frequency electromagnetic fields and illness has never been proven. In any event, substations are not a significant source of magnetic fields in communities. Both electric and magnetic fields from substations are not usually detectable outside the property boundary.
- 14 Electromagnetic fields from a substation are not alone or cumulatively a significant determinant of public health.

AUCKLAND COUNCIL

- 15 The evidence of Janet Petersen on behalf of Auckland Council¹² discusses the Council’s concern regarding health issues as a result of dust from rock crushing and concrete batching.¹³ Ms Petersen calls for specific conditions to ensure these facilities are enclosed, rather than having enclosure as part of the Concrete Batching and Crushing Plant Management Plan (*CBCPMP*).¹⁴
- 16 I agree that appropriate measures must be in place to limit public exposure to dust arising from rock crushing and concrete batching during the construction phase. I note that these outcomes may be met in a variety of ways, including, but not confined to enclosure. I note that the rebuttal evidence of Siiri Wilkening (in response to Janet Petersen) recommends a condition requiring full enclosure of concrete batching plants in order to minimise noise. I support this as it will have the additional effect of providing public health protection regarding concrete dust as well as noise protection.

¹⁰ Mr Robert Black evidence (Submitter No. 175 and 176-2), at paragraph 36(h).

¹¹ ICNIRP (1998). "Guideline for limiting exposure to time-varying electric, magnetic and electromagnetic field (up to 300 GHz)." *Health Physics* 74 (April 1998): 4.

¹² Submitter No. 111-7.

¹³ Paragraph 6.1, page 7.

¹⁴ Paragraph 6.2, pages 7-8 and paragraph 8.2, page 9.

SPRINGHLEIGH RESIDENTS' ASSOCIATION

- 17 The evidence of Hiltrud Gröger¹⁵ on behalf of the Springhleigh Residents' Association raises concern over effects on the health and safety of residents in the suburb of Owairaka as a result of introducing tunnels, motorways and over-bridges to the area, which she says attracts graffiti, vandalism and violence.¹⁶
- 18 These suggested effects, which I don't accept are inevitable, were in the first instance, a matter taken into account in the evolution of the Auckland Regional Transport Strategy, which determined the need for this motorway connection. With regard to the criminal activities mentioned, these are not within my area of expertise and are not an issue of public health.
- 19 Ms Gröger's evidence also claims that the levels of noise from the proposed SH20 extension through Owairaka will be "*above the levels that are recommended in the 'Guidelines for Community Noise' by the World Health Organisation 1999*" and have the potential to affect public health. Ms Gröger quotes the Guideline's recommendations for noise limits in schools and pre-schools for learning and sleeping.¹⁷
- 20 I have discussed both constructional and operational noise and the Guidelines for Community Noise in my EIC (at paragraphs 41-52) and refer again to the evidence of Siiri Wilkening. Ms Wilkening's rebuttal evidence shows that the World Health Organisation's recommendations will not be exceeded by the operation of the Project, including in classrooms and preschools. During construction, Ms Wilkening's evidence proposes the use of a noise criteria based on AS/NZS2107. Ms Wilkening's rebuttal evidence discusses the NZTA's proposal for noise criteria as set out in proposed condition CNV.2(iv). As Ms Wilkening's evidence shows, in the long-term, the WHO's recommendations will be met. However it is not possible to always meet these criteria during construction, nor is it intended in the design of the WHO criteria. Therefore specific mitigation will be required. With regard to the school, the likely effect of construction noise is impaired communication, so techniques which mitigate this effect as well as possible methods to attenuate the noise are appropriate. This is particularly important having regard to the duration of the construction phase.
- 21 In my opinion, the mitigation and criteria proposed by the NZTA and outlined in Ms Wilkening's evidence will be adequate to protect school and pre-school children from health and learning effects of noise.

¹⁵ Spokesperson for the Springhleigh Residents' Association (Submitter No. 43-1).

¹⁶ Paragraph 11.4, page 22.

¹⁷ Paragraphs 16.5 and 16.6.

ANDREW TAUBER

- 22 The evidence of Andrew Tauber¹⁸ raises concern over construction activity planned on land proximal to student accommodation at 1510 Great North Road, mentioning the potential for dust to affect allergies.¹⁹ Mr Tauber is also concerned over the potential for noise from construction activities to impact on students' sleep.²⁰
- 23 In general, dust from construction is of a mineral nature and is not a cause of allergy as such. Having said that, people with atopic (allergic) based diseases such as asthma may be made worse by exposure to such dusts and therefore do form a vulnerable section of an exposed population. I therefore agree that dust management of construction activities is important. However, in my opinion, the mitigation measures which are already proposed by the NZTA, such as enclosure of concrete batching facilities and other standard construction management techniques (which will be outlined in the Construction Management Plan), are sufficient.
- 24 Regarding noise from construction affecting sleep, I refer to the rebuttal evidence of Siiri Wilkening which states that the Project will generally comply with the New Zealand Construction Noise Standard NZS6803:1999 at 1510 Great North Road. If during the course of the Project it becomes apparent that the noise criteria at some of the student apartments at 1510 Great North Road are not complied with, mitigation measures such as building modification could be considered. Ms Wilkening's EIC also discusses the possibility of temporary relocation where, despite mitigation, the Construction Noise Standard cannot be complied with.²¹ Compliance with the New Zealand standard is designed to protect against health effects from noise, including sleep disturbance.

PAUL CONDER

- 25 Paul Conder²² calls for the implementation of a higher construction noise standard regarding the Mt Albert Unitec campus to "*reflect the needs, health and safety of students*" who have to study and sit exams at the site.²³
- 26 Implementing a higher noise standard in a particular zone of construction is neither practical nor warranted. For some sensitive health care facilities such as hospitals, restriction of hours of construction might be justified, however, that approach would not

¹⁸ For Apartments Limited (Submitter No. 75-1).

¹⁹ Section 5 (c), page 8.

²⁰ Section 5 (b), page 7.

²¹ Wilkening EIC, paragraph 59, page 12.

²² On behalf of the Unitec Institute of Technology (Submitter No. 160-1).

²³ Paragraph 3.3, page 3.

be helpful or warranted with regards to Unitec. The students studying at Unitec do not, on average, fall within a particularly sensitive group regarding health effects of noise. The New Zealand Construction Noise Standard NZS6803:1999 is designed to protect all members of the "normal"²⁴ population, which includes students at Unitec. The issue of a different noise standard for Unitec is discussed in greater detail in the rebuttal evidence of Siiri Wilkening.

WILSON IRONS

- 27 The evidence of Wilson Irons²⁵ raises concern over having sports fields near a construction zone (the Waterview fields and 3 proposed temporary junior fields), making them "*not a healthy environment in which to play sport*".²⁶ I have already discussed this issue in paragraphs 79-82 of my EIC and do not consider that there is any risk to the exercising public from the Project.

MARGARET WATSON AND WILLIAM MCKAY

- 28 The evidence of Margaret Watson²⁷ as well as others²⁸ raised the issue of the perception of negative health effects and the impact this will have on Waterview Primary School. Similarly, the evidence of William McKay²⁹ raises concern over the potential for "*construction, disruption, noise and fumes*" to have a "*deleterious effect*" on residents, causing increased stress and anxiety and corresponding mental and physical health problems³⁰. I have already discussed the issue of mental health and perception in paragraphs 56-61 of my EIC. I believe once the Project is underway and the effects are realised to be minimal and the benefits become tangible, public concern will decrease and it will become unlikely that this will be a significant health issue. I also reiterate that the perception of health effects is not the same as actual health effects and not an issue for confirming designations or granting resource consents. In my opinion, education of the public as to the reality of the Project effects is the best answer to this issue.

²⁴ This does not include hypersensitive individuals who lie outside the normal bell curve of responses and as a result cannot be included in standards setting.

²⁵ On behalf of the Metro Mt Albert Sports Club, Football Division (Submitter No. 249-1).

²⁶ Paragraph 6(a), page 4.

²⁷ On behalf of Albert Eden Local Board (Submitter No. 252-1), at paragraph 11, page 5).

²⁸ Peter Pablecheque (on behalf of the Auckland Kindergarten Association) (Submitter No. 153-1) and Duncan McKenzie (Submitter No. 167-3).

²⁹ Representing the North Western Community Association (Submitter No. 185-1).

³⁰ Paragraph 6.12.3, page 9.

COMMENT ON SECTION 42A REPORTS

EMS Planning Reports

- 29 I have read the Section 42A reports authored by Environmental Management Systems (*EMS*).
- 30 In its 7 December 2010 report, I note that EMS has supported the idea of air quality monitoring in Sector 7 and the provision of this information for the public to view³¹. The report suggests that this could address the problem of perceived health effects regarding air quality and notes that an ambient air quality monitoring station is already proposed "at or near Waterview Primary School". It is my opinion that this is an intervention which is worthwhile and is likely to provide reassuring data.
- 31 I note also that while seeming to be satisfied with the assessments of air quality regarding the ventilation vents, the report calls for further assessment on "*alternative design treatments to address/improve air quality emissions from the ventilation stacks and meet community concerns*"³². I believe that the initial predictions made by Mr Fisher and the additional work in his rebuttal evidence and in the Air Quality Caucusing Report are sufficient to meet any concerns regarding public health.
- 32 Overall, there is nothing in the initial s42A report that alters my assessment of the Project from a public health point of view.
- 33 I have also read the s42A Addendum report (dated 20 December 2010) and note that it proposes that a condition be made around arrangements for me to liaise with submitters who have health concerns which are not amenable to generic management, as well as suggesting I have a "*professional role and contribution for the practitioner in the Working Liaison Group (SO.12)*".³³
- 34 After assessing all the submissions and evidence, there is only one case which required my personal contact and the establishment of a professional relationship and this is in place and will be ongoing as long as it is necessary. Therefore in my opinion, it is unnecessary to include such a condition. Also, while I would be willing to participate in any Working Liaison Group (or for that matter any Community or Education Liaison groups), I believe I am probably of more use to the public assisting in a case-by-case basis where additional advice assessments are needed. Such medical assessments would need to be private and would not be appropriate for a public forum.
- 35 There is nothing else in the s42A Addendum report which alters my assessment.

³¹ Paragraph 10.8.55, page 71.

³² Table in paragraph 6.2, point 7.8.5., page 116.

³³ Paragraph 3.4.26, pages 11-12.

Air Quality s42A Report

- 36 I have read the Section 42A air quality report authored by Emission Impossible (Jayne Metcalfe and Rachael Nicoll) dated 14 January 2010.
- 37 I note that the report agrees with Mr Fisher's assessment of the ground level air quality around the tunnel ventilation vents³⁴ and his and my own assessment that treatment of tunnel ventilation is both unnecessary and cost prohibitive.
- 38 However the report later claims that the assessments on cumulative effects made by Mr Fisher are not conservative enough³⁵ and that further work is needed to be confident that the air quality effects have been adequately assessed. I note that Mr Fisher's rebuttal evidence addresses these concerns and I remain confident that Mr Fisher's assessment shows that, overall, from an air quality point of view, the Project will not negatively affect public health.
- 39 The report also raises concern over Mr Fisher's predictions for fine particulates suggesting that, once the motorway is operational, in some areas the Regional Air Quality Target for PM_{2.5} and the National Environmental Standard for PM₁₀ may be exceeded.³⁶
- 40 While I agree with the report that fine particulates are of particular concern to public health,³⁷ I am confident that the thorough predictions made by Mr Fisher are reliable and am reassured that the Project will not, overall, adversely impact on public health, even having regard to fine particulates.
- 41 Section 4.8 of the report discusses the health effects of air quality.³⁸ I agree with the report that both air pollution and traffic emissions are associated with significant adverse health effects, such as respiratory problems and cardiovascular problems and are linked to increased respiratory mortality. It is true that the exhausted products produced by combustion of hydrocarbon fuels as well as unburned volatile fuels from cars are a known and legitimate health concern. However, as the predictions by Mr Fisher show, the Project will lead to an overall improvement in the air quality by moving cars from suburban streets and onto motorways and therefore allowing more efficient engine combustion. The levels of exhaust gases in the surrounding community are predicted to be similar to and often less than what are found around many current Auckland city roads.

³⁴ Paragraph 144, page 24.

³⁵ Paragraph 165, pages 26-27.

³⁶ Discussed in section 4.7.7, paragraphs 165-172, pages 26-27.

³⁷ Paragraphs 123-124, page 22.

³⁸ 'Assessment of air quality health effects', paragraphs 173-178, pages 27-28.

- 42 The report goes on to state that there is "*limited value in debating the quantum of the [health] effects*"³⁹ and calls for mitigation instead. Mitigation is discussed further in section 4.10 and includes emission controls on vehicles using the route or offsets in other areas. This is a matter of transport planning and not an issue of public health effects of the Project and is therefore outside the field of my expertise.
- 43 I note that section 4.11.1 of the report discusses the issue of the tunnel ventilation vent height and the possibility that it could be lowered to 15m (from 25m) without adverse health impacts.⁴⁰ I believe that this is consistent with the predictions of Mr Fisher and that at heights of both 25m and 15m the appropriate air quality standards will be met and there will be no adverse risk to public health as a result of the ventilation vents. Therefore, the decision of whether to make the vents 25m or lower is not a public health one.
- 44 Overall, there is nothing in the report by Emission Impossible which changes my assessment of the Project regarding public health from an air quality point of view.

Noise and Vibration s42A Report

- 45 I have read the Section 42A noise report authored by Malcolm Hunt Associates dated December 2010.
- 46 I note that section 3.1 of this report⁴¹ recommends that a night time noise limit of 45 dB $L_{Aeq(10 \text{ min to } 60 \text{ min})}$ is generally complied with, but allows for occasional exceedances to a limit of 60 dB L_{Aeq} , when necessary, providing residents are warned in advance. While this approach may be regarded as more stringent than those recommended by Ms Wilkening on behalf of the NZTA, I do not consider the difference in these two approaches to be a significant determinant of public health.
- 47 I support the suggestion for an indoor night-time noise criteria of 30 dB $L_{Aeq(10 \text{ min to } 60 \text{ min})}$ to protect residents against structure-borne noise⁴² and note that this is supported by condition CNV.2 iii in the rebuttal evidence of Siiri Wilkening.⁴³
- 48 I also note that the report recommends amending the time periods used for noise limit setting in conditions CNV.2 to 10-60 minutes (instead of 8 or 16 hours)⁴⁴ and that this suggestion is adopted in

³⁹ Paragraph 178, page 28.

⁴⁰ Paragraph 214, page 33.

⁴¹ Page 8.

⁴² Final paragraph in section 3.3, page 10.

⁴³ Annexure A.

⁴⁴ Section 3.4, pages 10-11.

Ms Wilkening's rebuttal evidence.⁴⁵ I support this amendment and am confident that the conditions set out in the EIC and rebuttal evidence of Ms Wilkening will be adequate to protect against adverse health effects of noise.

- 49 Overall the report from Malcolm Hunt Associates supports the Project and there is nothing in the report which changes my assessment.

MINOR CORRECTION OF MY EVIDENCE IN CHIEF

- 50 Since preparing my EIC in November 2010, it has come to my attention that there is a minor typographical error in paragraph 46 of that evidence. Paragraph 46 refers to the "night-time internal noise limit of 45 dB L_{Aeq} in residential dwellings with low ambient noise". The word "internal" was included in error and should be deleted, as the relevant criteria are external noise criteria. Paragraph 46 of my EIC should therefore read:

Ms Wilkening's calculations show that noise from construction will be within the levels allowed by NZS 6803:1999; that is, a night-time noise limit of 45 dB L_{Aeq} for residential dwellings in areas with low ambient noise (Sectors 8 and 9) and a "background noise level (L₉₅ or L₉₀) plus 10 decibels" limit (which in this case gives a proposed limit of 60 dB L_{Aeq} in areas with high ambient noise (Sectors 1 to 7).



Dr David Black
February 2011

⁴⁵ Annexure A.