

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 Geoffrey Waller (**Lighting**) on behalf of the
NZ Transport Agency

Dated: 1 February 2011

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REBUTTAL EVIDENCE OF GEOFFREY WALLER ON BEHALF OF THE NZ TRANSPORT AGENCY

INTRODUCTION

- 1 My full name is Geoffrey Ashton Waller. I refer the Board of Inquiry to the statement of my qualifications and experience set out in my evidence in chief (*EIC*), dated 4 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 Ms Bernadette McBride on behalf of Te Atatu Pony Club (Submitter No. 64-1);¹
 - 3.2 Mr Geoffrey Wood on behalf of West Auckland Pony Club (Submitter No. 105-1);
 - 3.3 Mr Alex Wardle (Submitter No. 61-1);
 - 3.4 Mr Brendon Vipond on behalf of the Vipond Family Trust (Submitter No. 100-1);
 - 3.5 Mr George Richardson on behalf of Townscape Securities (Submitter No. 101); and
 - 3.6 Mr Pita Turei on behalf of Te Kawerau A Maki Iwi Authority (Submitter No. 241).
- 4 In addition, I will comment on relevant aspects of the section 42A Report prepared by Environmental Management Services (*EMS*) dated 7 December 2010 (*Section 42A Report*) and the Addendum Section 42A Report dated 20 December 2010 (*Addendum Report*).

¹ References are to the Submitter Numbers on the EPA website.

POTENTIAL EFFECTS OF SPILL LIGHTING FROM CONSTRUCTION YARD 1 ON HORSES

- 5 Ms McBride and Mr Wood² raise concerns regarding potential effects of spill light from Construction Yard 1 on the welfare of horses at the Te Atatu Pony Club. Although the possibility of spill light affecting horses was not specifically mentioned in my EIC, I consider that the horses will not be affected by construction lighting as a result of:
- 5.1 The lighting design methods as explained in my assessment of Lighting Effects Report (*Report*)³ and paragraphs 24–27 of my EIC; and
- 5.2 Proposed Lighting conditions L.2 and L.3.
- 6 I understand that in discussions with the Te Atatu Pony Club, the NZTA has offered to construct a 2m high acoustic fence around all sides of Construction Yard 1.⁴ If constructed, a closed fence of this type would screen any low level spill light effects on the adjacent Te Atatu Pony Club.

EFFECTS OF LIGHTING ON PROPERTIES AT 9 AND 15 BERRIDGE AVENUE, POINT CHEVALIER

- 7 Mr Wardle of 15 Berridge Avenue, Point Chevalier is concerned that “during ongoing operation, traffic volumes will rise, especially at night, and this will increase headlight strike, noise and pollution”.⁵
- 8 Mr Vipond of 9 Berridge Avenue requests an extension to a proposed retaining wall and backfilling to raise the lower areas high enough in part, to reduce light and noise from the existing ramps.⁶
- 9 In both cases, the submitters’ requests relate to the expected increased traffic headlight sweep from the two existing ramps at the Great North Road Interchange, being the eastbound on ramp to the City and the east bound off ramp, which are close to both properties.

² Statement of evidence of Bernadette McBride, Matters of Submission, Item 5b) and statement of evidence of Geoffrey Wood, Item 4 Part 1, Hazard abatement – ‘floodlights’.

³ Section 7.5 Recommended Mitigation Methods, “Construction Yard”, Assessment of Lighting Effects (AEE, Part G, Technical Report G.10).

⁴ I understand that the acoustic fence would have no gaps between panels and the ground and would be made from 17mm thick ply (or 9mm fibre cement).

⁵ Statement of evidence of Alex Wardle, Matters of Submission, Item 5c).

⁶ Statement of evidence of Brendon Vipond, Matters of Submission, Item 5a).

- 10 I understand that there is likely to be less traffic on these on/off ramps due to the Project's new configuration.⁷ For this reason, I consider that any effects of headlight strike would be similar or less than existing effects on these properties.

POTENTIAL EFFECTS OF SPILL LIGHTING FROM CONSTRUCTION YARD 7

- 11 With respect to the apartments at 1510 Great North Road, Mr Richardson states⁸ that:
- "The level of lighting on the construction site located on our land will need to be daylight standards if the Health and Safety requirements are to be met".
- 12 This needs interpretation. Mr Richardson appears to be suggesting that the night time construction lighting at Yard 7 would need to be as high as daylight levels. As a result, he considers that apartments at 1510 Great North Road will be overlooking a "brightly lit" construction yard.
- 13 Mr Richardson refers to construction lighting needing to meet health and safety requirements. I am not aware of any Australian or New Zealand standards or guidelines that relate to lighting for working environments outside.⁹
- 14 Daylight is often as high as an average of 50,000 lux. Construction Yard 7 will have no greater than an average of 100 lux and the spill lighting restraints and lighting conditions will mitigate such obtrusive lighting effects, as explained in my Report at Section 13.4 'Construction Yard' and in paragraphs 24–27 of my EIC.
- 15 Consequently, with correctly specified and aimed luminaires, spill lighting from Construction Yard 7 will not pass up into the apartment windows at 1510 Great North Road. There will therefore be no need for any special blinds.

⁷ I have been advised by Mr Andrew Murray that Annexure D to his EIC (top left corner) shows a pattern of reduction in traffic on these ramps as a result of the Project.

⁸ Statement of evidence of George Richardson, Item 4, Lighting, page 11.

⁹ The CIBSE (UK Charter Institute of Building Services) "Industrial Environment" Technical Report LG1 is a generally accepted international guideline. It states that general exterior working areas should have a standard service illuminance of 50 to 100 lux. The CIBSE "Outdoor Environment" Technical Report LG6 is also relevant and gives light levels for Safety/Amenity as 10 lux, and Walkways and Platforms as 20 lux.

- 16 Finally I note that lighting condition L.2 will require preparation of a Temporary Construction Lighting Management Plan for all construction yards (including Construction Yard 7), to be independently verified by a lighting specialist and provided to Auckland Council.

REQUEST FROM TE KAWERAU A MAKI IWI AUTHORITY

- 17 Mr Pita Turei on behalf of Te Kawerau a Maki,¹⁰ has requested:

“an opportunity to work with the NZTA to find ways to limit the amount of light spill and reduce its negative impact on the night environment within the Marine Reserve, the inner harbour and the view lines associated with Te Rangi Matariki, an ancient site of celestial observation”.

- 18 I do not consider the effects of the proposed road lighting will be very different from the existing motorway lighting on SH16 even though two additional vehicle lanes are being added. To reach across the new extended width of the motorway, the lighting poles (which will be placed along the median), will be higher, with the lighting directed down onto the lanes. The spill lighting requirements will however, stay the same as the existing motorway lighting.
- 19 As I have explained in paragraph 46 of my EIC, spill lighting will be minimised using energy efficient luminaires, and the roadlighting will be designed in accordance with “Roadlighting Standards AS/NZS 1158” (*Roadlighting Standards*).
- 20 I attended a meeting with Mr Turei (along with Mr Deepak Rama of the NZTA) on Wednesday 26 January 2011 to discuss the lighting issue raised in his evidence. From that meeting, I understand that Mr Turei is concerned about spill light from the SH16 motorway near Rosebank Park Domain, impacting on the Marine Reserve and the view from the Te Rangi Matariki (a site of celestial observation),¹¹ which is located near the Rosebank Park Domain (between the Whau River and Patiki Interchange).

¹⁰ Statement of evidence of Pita Turei, ‘Relief Sought’ Item 8(h).

¹¹ Mr Turei advised that Te Rangi Matariki means the “Site of Observation Day of Matariki”, when the Maori calendar is set by the Pleidies star constellation and the morning rising of the Sirius star.

- 21 Mr Turei asked whether the motorway lighting poles could be lowered within the view shaft from Te Rangi Matariki towards the north. I explained that the motorway lighting will need to comply with the Roadlighting Standards, which are applied to ensure traffic safety. I also explained that reducing the height of the lighting poles would present problems projecting light across the lanes. This would significantly increase glare, as luminaires would need to be set at a higher angle and more luminaires would be required.
- 22 The NZTA proposes to liaise further with Te Kawerau a Maki at the detailed design stage. Provided that any refinements to the lighting layout proposed by Mr Turei for this part of the motorway do not compromise safety or otherwise result in a breach of the Roadlighting Standards or relevant Bylaw / District Plan rules, the NZTA will then consider if amendments to the lighting layout can be made to address Mr Turei's concern.

COMMENTS ON SECTION 42A REPORTS

- 23 Paragraph 10.8.66 of the Section 42A Report notes that the Temporary Lighting Management Plan for Construction Yards 6 and 7 is not listed on the table of Management Plans in the Construction Environmental Management Plan (CEMP). That is correct. As explained in the rebuttal evidence of Mr Hugh Leersnyder, the NZTA proposes that any such Plans shall now be included in the list of management plans in proposed condition CEMP.4.
- 24 Paragraph 10.8.66 of the Section 42A Report also notes that the Temporary Lighting Management Plan "will be required to demonstrate measures to achieve compliance with relevant District Plan rules and the Auckland City Bylaws". As set out in my Report, and paragraph 35 of my EIC, the construction yard lighting will comply with Part 13 of the Auckland City Bylaw and Rule 14 of the Waitakere City District Plan.
- 25 In order to be clear that the temporary construction lighting will be required to comply with the relevant Bylaw and District Plan Rules, I propose a minor amendment to Lighting condition L.2(a) as follows (additional text shown in bold underline):

L.2 Construction Zones and Construction Yards

Temporary Construction Lighting Management Plan(s) shall be prepared for all construction zones and construction yards prior to commencement of any night time works within the construction zones and construction yards. The Temporary Construction Lighting Management Plan shall be independently verified by a lighting specialist and provided to the [Auckland Council] for review and comment 15 days prior to any night time work commencing.

The Plan shall include, but not be limited to:

- a) The layout and arrangement of all temporary lighting required for night time works, and shall show how this avoids the "Light Spill Restriction Zone" identified on the Construction Yard Plans (Drawing Set F.6, Drawing Numbers 20.1.11-3-D-C-161-100 to 112) submitted with the application **and that the temporary lighting complies with relevant rules provided in Rule 14 of the Waitakere City District Plan or Part 13 of the Auckland City Bylaw (April 2008);**
- b) Provision for a 10m buffer between the night time work and any residential boundary at all times to minimise potential for light spill; and
- c) General operating procedures outlined in the CEMP.

A handwritten signature in blue ink, appearing to read 'G. Waller', with a horizontal line underneath.

Geoffrey Waller
February 2011