

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 **Dr Sharon De Luca (Marine Ecology)** on behalf of the **NZ Transport Agency**

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REBUTTAL EVIDENCE OF DR SHARON DE LUCA ON BEHALF OF THE NZ TRANSPORT AGENCY

INTRODUCTION

- 1 My full name is Dr Sharon Betty De Luca. I refer the Board of Inquiry to the statement of my qualifications set out in my evidence in chief (*EIC*) (dated November 2010).¹
- 2 I repeat the confirmation 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. My rebuttal evidence addresses issues in the submitters' evidence only to the extent that those issues have not already been addressed in the original application and technical reports or in the NZTA's evidence in chief. Specifically, my evidence will respond to the evidence of:
 - 3.1 Various submitters² who seek the extension of the Motu Manawa Marine Reserve as mitigation for loss of reserve area.
 - 3.2 Dominic McCarthy – Auckland Council (Evidence No. 111-5).
 - 3.3 Wendy John – Friends of Oakley Creek – Te Auaunga (Evidence No. 179-1).
 - 3.4 Shona Myers – Living Communities and Friends of Oakley Creek (Evidence No. 167 and 179-2).
 - 3.5 Bill McKay – North Western Community Association (Evidence No. 185-1).
 - 3.6 Michael Coote – Forest and Bird Motu Manawa Restoration Group (Evidence No. 217-1).
 - 3.7 Dr Mark Bellingham – Royal Forest and Bird Protection Society of NZ Inc (Evidence No. 217-2).
 - 3.8 Hiltrud Gruger – Springleigh Residents Association (Evidence No. 43-1).

¹ NZTA EIC No. 19 on EPA website.

² Robert Black (Evidence No. 186-1), Shona Myers (Evidence No. 167 and 179-2), Michael Coote (Evidence No. 217-1), Dr Mark Bellingham (Evidence No. 217-2), Shirley Upton (Evidence No. 103-1), Shirley Upton and Karen Brown (Evidence No. 85-1).

- 3.9 Shirley Westwood Upton (Evidence No. 103-1) and Shirley Upton and Karen Brown – Waterview Environmental Society (Evidence No. 85-1).
- 4 I also respond to relevant key matters raised in the Section 42A Report prepared by Environmental Management Services Ltd (*EMS*) to assist the Board of Inquiry, in particular:
- 4.1 EMS’s initial s42A Report (dated 7 December 2010);³ and
- 4.2 Appendix A to the EMS Report (prepared by Dr Stewart of Ryder Consulting Limited dated November 2010).
- 5 I attended caucusing on marine ecology on 28 January 2011, and my evidence will refer to caucusing outcomes where relevant.

EXTENSION OF MARINE RESERVE

- 6 Many submitters⁴ seek mitigation for loss of marine reserve area as a result of the Project through the extension of the Motu Manawa Marine Reserve (*MMMR*). Dr Stewart, in his Section 42A Report, also appears to support extension, suggesting that “expansion of the Motu Manawa Marine Reserve may be an additional mitigation measure that would find favour with many submitters”.⁵
- 7 While extension of the MMMR may have some merit, in general I consider it is not necessary or appropriate to extend the MMMR as mitigation for the Project, because:
- 7.1 I consider there is greater benefit to the ecological values of the MMMR by improving the quality of the marine habitat;
- 7.2 I consider the package of offset mitigation measures proposed for loss of marine habitat will address the Project’s adverse effects on the marine environment; and
- 7.3 I am advised extension of the MMMR raises jurisdictional issues outside the scope of the RMA.
- 8 I will further discuss each of these points in the following paragraphs.

³ I have also reviewed the Addendum to EMS’s s42A Report (dated 20 December 2010), but considered there was nothing additional in the Addendum that I needed to address in this evidence.

⁴ Robert Black (Evidence No. 186-1), Shona Myers (Evidence No. 167 and 179-2), Michael Cote (Evidence No. 217-1), Dr Mark Bellingham (Evidence No. 217-2), Shirley Upton (Evidence No. 103-1), Shirley Upton and Karen Brown (Evidence No. 85-1).

⁵ See Dr Stewart’s Section 42A Report, Executive Summary, paragraph vi.

Improving the quality of the marine habitat

- 9 It is my opinion that there is greater benefit to the ecological values of the MMMR, given that it suffers from the historic and ongoing discharge of contaminants from a range of sources, to focus Project mitigation on improving the quality of the marine reserve habitat instead of increasing its size. For this reason, through the process of developing the mitigation package to offset the Project's adverse effects on the marine environment (including the permanent loss of marine habitat and marine reserve area), I have strongly supported improving the efficiency of the treatment of Project stormwater that is to be discharged to the marine environment.
- 10 The package of mitigation measures proposed by the NZTA includes enhanced stormwater treatment (80% removal of sediment and associated contaminants, rather than the 75% required by ARC TP10) prior to discharge into the marine environment, remediation of the mudflat at the base of the Causeway revetments, restoration of the coastal fringe vegetation along the Project alignment and removal of gross litter and debris from the adjacent marine environment.⁶
- 11 The improved level of stormwater treatment will result in a lower concentration of contaminants entering the marine environment, which will help to improve the quality of surrounding marine water and sediment. A lower concentration of contaminants in water and sediment has direct benefit to the organisms that inhabit this marine environment and the organisms that feed upon them, through reduced bioaccumulation of contaminants.
- 12 It is my opinion that, in the long-term, improvements in sediment quality and water quality (including those improvements proposed as part of the Project) will contribute to improved biodiversity in the marine environment surrounding the Project and therefore benefit the MMMR.

Offset mitigation adequately addresses adverse effects

- 13 I remain of the opinion that the package of offset mitigation measures proposed⁷ is sufficient to address the Project's adverse effects on the marine environment and the loss of marine habitat (both outside and within the MMMR)⁸ I disagree that extension of the MMMR is necessary in addition to the mitigation measures already proposed.

⁶ See my EIC, paragraph 59.

⁷ See my EIC, paragraph 59.

⁸ See my EIC, paragraph 17 and G.11 Assessment of Marine Ecological Effects, section 9, pages 93-94.

No jurisdiction to consider extension of the MMMR

- 14 During caucusing, extension of the MMMR was discussed as a potential way to offset marine habitat loss within the MMMR. Notwithstanding my opinion that further mitigation is not required, all parties agreed that extension of the MMMR was not something the NZTA could offer through the RMA process in any event.

Avoidance as well as mitigation

- 15 In addition to the mitigation proposed, I am advised the NZTA will continue to seek ways to avoid effects on the marine environment. During Project design, the Project team has sought to minimise the width of the Causeway, thus minimising effects on marine habitat. It is expected that minimisation of the Causeway width will continue to be a key objective of the design team through the detailed design process. However, to ensure this objective remains front and centre and to ensure that the least area of marine habitat is permanently lost, I propose the following new marine ecology condition:

M.12 The NZTA will minimise the extent of the Causeway footprint to the greatest extent possible.

- 16 I am advised the NZTA agrees to this new condition.

DOMINIC MCCARTHY – AUCKLAND COUNCIL

- 17 Mr McCarthy discusses⁹ a concern raised in the former Auckland Regional Council's submission regarding the potential discharge of contaminated water, collected from within coffer dams, to the marine environment. Mr McCarthy proposes a new condition¹⁰ that requires the monitoring of pH and suspended sediment (or turbidity) in sump water collected in the coffer dams in order to determine the suitability of the water quality prior to discharge to the CMA. I agree with Mr McCarthy's proposed condition, subject to the minor rewording suggested by Mr Ridley.¹¹

WENDY JOHN – FRIENDS OF OAKLEY CREEK – TE AUAUNGA

- 18 Ms John states¹² that the "Hauraki Gulf Marine Park Act (2000) [HGMPA] requires that the [MMMR] be maintained and enhanced and protected as a matter of national significance". It is my opinion that these principles of the HGMPA have been considered as important throughout the Project design process and through the determination of mitigation measures. I consider that enhancement

⁹ See McCarthy Statement, paragraphs 16 and 17.

¹⁰ See McCarthy Statement, proposed Condition C.17, paragraph 39.

¹¹ See Rebuttal Evidence of Mr Ridley, paragraph 14.

¹² See John Statement (No. 179-1), paragraph 5.2.

and protection of the MMR will be achieved, with the adverse effects of loss of marine reserve area being appropriately offset.¹³

SHONA MYERS – LIVING COMMUNITIES AND FRIENDS OF OAKLEY CREEK

- 19 Ms Myers considers¹⁴ that the Project “will result in significant loss of estuarine vegetation, including ecotone zones”. Mr Slaven covers loss of ecotone sequences in his rebuttal evidence.¹⁵ I will now comment on Ms Myers’ comment regarding loss of estuarine vegetation.
- 20 Estuarine vegetation that will be removed within the marine environment (including the MMR)¹⁶ as a result of the Project comprises only mangroves. The removal of approximately 2.79 ha¹⁷ of mangrove vegetation is anticipated. It is my opinion that given the ubiquitous nature of mangroves in the Project area, the upper Waitemata Harbour and other areas in northern New Zealand, and its propensity to rapidly colonise new intertidal areas, in the long-term, mangroves will re-establish in the disturbed areas of intertidal mudflat that are not removed through reclamation. Accordingly, I do not consider the loss of estuarine vegetation below MHWS to be “significant” as stated by Ms Myers.
- 21 Agreement was reached during caucusing that “the permanent loss of mangrove habitat is not significant”.¹⁸

BILL MCKAY - NORTH WESTERN COMMUNITY ASSOCIATION

- 22 In his statement, Mr McKay suggests that “[t]here has been insufficient provision, especially in riparian and coastal areas, in design or mitigation for bio-diversity and the habitats of varied native fauna”.¹⁹
- 23 I do not agree with Mr McKay that insufficient consideration has been given to habitats of native flora and fauna during the Project design and mitigation processes. Whilst marine habitat will be permanently lost through construction of the Project, significant

¹³ See my EIC, paragraph 59.

¹⁴ See Myers Statement, paragraph 5.26.

¹⁵ See Mr Slaven’s rebuttal evidence where he discusses loss of ecotone sequences as raised by Ms Shona Myers.

¹⁶ I have considered the marine environment is considered to be that which is below Mean High Water Spring (MHWS).

¹⁷ See Mr Slaven’s Evidence in Chief, paragraph 40.

¹⁸ See paragraph 5 of the Expert Caucusing Joint Report to the Board of Inquiry - Marine Ecology (dated 28 January 2011), attached as **Annexure A**.

¹⁹ See McKay Statement, paragraph 6.10.2.

effort has been made by the Project team to minimise adverse effects on marine organisms and their habitats and to restore and offset the residual effects. For example, the mudflat remediation zone, which involves the restoration of a 3.0m width of intertidal mudflat to a depth of 0.5m along each side of the Causeway, provides habitat for the range of marine organisms that are currently present.²⁰

- 24 Further, I consider the avoidance and mitigation measures proposed to protect marine ecological values, such as the coffer dams, timing of works, stormwater treatment etc., provide direct benefit to marine species.
- 25 Mr McKay also raises concerns about monitoring of at risk species, pest control and weed control.²¹ I confirm that no threatened or at risk benthic marine organisms were detected in my assessment or known to be present based on my examination of the existing literature.²² Further, the marine monitoring conditions proposed were considered sufficient by the participants in the marine ecology caucusing.²³ Pest control and weed control are terrestrial issues and are considered by Mr Slaven.²⁴

MICHAEL COOTE – FOREST AND BIRD MOTU MANAWA RESTORATION GROUP

- 26 Mr Coote raises several concerns regarding the Project. I will respond to those concerns raised that are within my area of expertise.

Recognition is required that Motu Manawa (Pollen Island) Marine Reserve is indeed a marine reserve and that it is an offence under the Marine Reserves Act 1971 to wilfully damage or injure any marine life, the foreshore or seabed, or any of the natural features in a marine reserve (as per Section 18 subsection (1))

It is recognised in my assessment²⁵ and EIC²⁶ that part of the Project occurs within a marine reserve. In addition, I have been assisting the NZTA in the preparation of its application for

²⁰ See G.11, Assessment of Marine Ecological Effects, Section 5.4.2.2, page 50 and my EIC, paragraphs 28-31.

²¹ See McKay Statement, paragraphs 8.9 and 8.10.

²² See my EIC, paragraph 29.

²³ See Marine Ecology Caucusing Report, paragraph 6.

²⁴ See Mr Slaven's rebuttal evidence, where he discusses the evidence of Dr Andrea Julian.

²⁵ See G.11, Assessment of Marine Ecological Effects, paragraph 3.2.

²⁶ See my EIC, paragraph 24.

authorisation under the Marine Reserves Act 1971 for the Project works in the MMMR.

Mr Coote and Dr Bellingham stated during caucusing that in their opinion the assessments of effects carried out for the Project did not fully recognise or appreciate the special values of the MMMR. I continue to disagree with this view, as I firmly believe the marine ecological values of the MMMR were fully considered in my assessment. My understanding from the caucusing discussions was that Dr Stewart (of Ryder Consulting) was satisfied that my Technical Report (G.11) and my EIC appropriately considered the status and values of the MMMR.

*Assurance that no avoidable "harm, disturbance or destruction occurs to the life in or the habitat capacity of" the MMMR.*²⁷

- 27 I reiterate that the Project has been designed to avoid adverse effects on marine ecological values (including the marine ecological values of the MMMR) as far as is practicable. Where adverse effects cannot be avoided, these effects are to be mitigated or offset.²⁸

*Assurance that long-term ecological health of the MMMR will improve.*²⁹

- 28 Sediment and associated contaminants that are discharged to the MMMR are, in my opinion, one of the main threats to the ecological health of this marine environment. There are currently a range of discharges into the MMMR, not only runoff from the existing (and proposed) motorway. It is estimated that approximately 3% of the total sediment, 34% of the total zinc and 31% of the total copper that is delivered to the Waterview Estuary from the representative catchment will be attributable to the proposed and existing motorway once the Project is operational.³⁰ It is difficult to predict whether the decrease in contaminants to the Waterview Estuary as a result of the Project stormwater treatment will be discernable above the background in the short to medium term, given the difficulties in predicting contaminant loads from other sources, which may increase or decrease over time, and which currently comprise the majority of the total contaminant loads.
- 29 However, the Project is contributing significantly to the long-term reduction in contaminants entering the MMMR through the treatment of both the existing and the proposed motorway, and also through the higher level of stormwater treatment proposed. As

²⁷ See Coote Statement, section 5(a), bullet point 1.

²⁸ See my EIC, paragraphs 58-61.

²⁹ See Coote Statement, section 5(a), bullet point 2.

³⁰ See Mr Moore's Evidence in Chief, Annexure A.

such, it is my opinion that the Project will contribute to an improvement in the long-term ecological health of the MMR.

*Assurance that the life within the marine reserve, particularly avian and marine, suffers no avoidable injury, disturbance or displacement during construction and operations, or after the motorway works are completed.*³¹

- 30 The marine monitoring conditions³² proposed for the Project incorporate surveying intertidal benthic invertebrate community composition (infauna and epifauna), sediment quality and sediment grain size prior to commencement of construction, during construction and for a maximum of three years post construction. It was agreed by all participants of the marine ecology caucusing that the marine monitoring conditions proposed are sufficient.³³
- 31 The marine monitoring programme will identify any significant changes in surface sediment contaminant concentrations and benthic invertebrate community composition. In addition, monitoring of pH and total suspended sediment around the coffer dams forms part of the Construction Environmental Management Plan.³⁴
- 32 Accordingly, in my opinion monitoring will appropriately determine whether the construction or operation of the Project has adverse effects on marine ecological values, beyond the effects identified in Report G.11.³⁵

*Marine habitat loss as a result of the Project should be offset by adding significantly to the size of the MMR.*³⁶

- 33 As already discussed above, it is my opinion that sufficient mitigation is proposed to offset the adverse effects of permanent marine habitat loss arising from construction of the Project³⁷ and extension of the MMR is not required.

³¹ See Coote Statement, section 5(a), bullet point 3.

³² See my EIC, Annexure D.

³³ See Marine Ecology Caucusing Report, paragraph 6.

³⁴ See G.22 Construction Environmental Management Plan, Section 5.3.2 page 25.

³⁵ The proposed monitoring includes a process for what action is to be taken should a "trigger event" be detected for marine ecology habitats, which is defined in the ECOMP as a greater than 50% change in one of the metrics monitored (e.g. >50% change in benthic invertebrate community composition). See my EIC, Annexure D, proposed condition M.6, and G.21 Construction Environmental Management Plan, Appendix H.

³⁶ See Coote Statement, Section 5(b).

³⁷ See my EIC, paragraphs 58-61.

*Retention of the culvert at the Rosebank Peninsula end of the SH16 causeway in order to protect the adjacent ecological values on the southern side of the Causeway.*³⁸

- 34 Dr Bell has stated³⁹ that the culverts⁴⁰ provide negligible tidal flow to the intertidal area on the southern side of the Causeway. Dr Bell also states that the sediment that has deposited around the boardwalk in this area is most likely derived from the culvert operation itself.⁴¹ Based on Dr Bell's assessment, the proposed decommissioning of both culverts, in my opinion, would have no effect on the adjacent ecological values on the southern side of the Causeway.
- 35 Furthermore, it is my opinion, given the high concentration of contaminants in surface sediment adjacent to the southern side of the culverts, that if the culverts were retained and cleared out there would be a risk of transferring contaminants to the northern side of the Causeway where sediment contaminant concentrations are significantly lower.⁴² Accordingly, I consider there would be no ecological benefit, and potentially an adverse ecological impact, of retaining and clearing the Rosebank culvert.

*Adverse effects outside the footprint of the Project, within the MMR, need to be "catalogued".*⁴³

- 36 I confirm that the potential effects of the Project outside of the footprint, within the MMR, have been fully and appropriately considered in both the marine ecological assessment and the coastal processes assessment.⁴⁴ Further, the marine ecological monitoring that will be carried out prior to construction, during construction and post-construction will enable any effects on marine ecological values to be identified and recorded (or catalogued).⁴⁵

³⁸ See Coote Statement, section 5(e).

³⁹ See Dr Bell's Evidence in Chief, paragraphs 37-46.

⁴⁰ The culvert in question is actually twin culverts; see Dr Bell's Evidence in Chief, paragraphs 42 and 45.

⁴¹ See Dr Bell's rebuttal evidence where he responds to statements made by Mr Coote and Dr Bellingham.

⁴² See my EIC, paragraph 75.

⁴³ See Coote Statement, first paragraph in section 8.

⁴⁴ See my EIC, paragraph 24-28 and Dr Bell's Evidence in Chief, paragraphs 61-86.

⁴⁵ See my EIC, Annexure D.

*Contaminant monitoring in the MMR should be undertaken regularly.*⁴⁶

- 37 Monitoring of contaminants in surface sediment⁴⁷ and in marine water around the coffer dams⁴⁸ forms part of the Project's construction and post-construction monitoring.⁴⁹

DR BELLINGHAM – ROYAL FOREST & BIRD PROTECTION SOCIETY OF NZ INC

- 38 Dr Bellingham states⁵⁰ that he concurs with Dr Stewart (the author of Ryder Consulting's s42A Report on marine ecology) that "the loss of part of the marine reserve is not minor". To clarify, I determined the permanent loss of marine habitat as a result of the Project to be a significant adverse effect of moderate degree⁵¹ and therefore concur with Drs Stewart and Bellingham that the effects of permanent habitat loss within the MMR as a result of the Project are not minor.
- 39 Dr Bellingham states that Dr Stewart notes the chenier ridges and loss of mangrove habitat and that these features were part of the case for nominating this area of the Waitemata Harbour as a marine reserve.⁵² I reiterate that the chenier ridges will not be lost.⁵³ They are to be removed from the construction area prior to the commencement of any construction that may impact on them, stored and then replaced on the upper intertidal area.⁵⁴
- 40 Dr Bell contends that the chenier ridges will reform naturally once replaced at the base of the Causeway revetment.⁵⁵ It was agreed in the coastal processes caucusing that proposed Coastal Condition C.12 (detailing mitigation measures for the chenier ridges) satisfied the participants.⁵⁶

⁴⁶ See Coote Statement, last paragraph in section 8.

⁴⁷ See my EIC, Annexure D.

⁴⁸ See G.22 Construction Environmental Management Plan, Section 5.3.2, page 25.

⁴⁹ See G.21 Construction Environmental Management Plan, Appendix P.

⁵⁰ See Bellingham Statement, paragraph 22.

⁵¹ See my EIC, paragraph 40.

⁵² See Bellingham Statement, paragraph 22.

⁵³ See Dr Bell's Evidence in Chief, paragraphs 75, 98 and 99, and proposed Condition C.12 in Annexure C, G4, Assessment of Coastal Processes.

⁵⁴ See my EIC, paragraph 41.

⁵⁵ See Dr Bell's Evidence in Chief, paragraph 75.

⁵⁶ See paragraph 6 of the Expert Caucusing Joint Report to the Board of Inquiry – Coastal Processes (dated 28 January 2011), attached as Annexure A to Dr Bell's rebuttal evidence.

- 41 As discussed earlier in this evidence, approximately 2.79 ha of mangroves will be removed as a result of the Project.⁵⁷ Some of this area will be remediated and will be able to be recolonised by mangroves and other organisms in the longer term. Mangroves are ubiquitous within the Waterview Estuary and surrounding marine environment and I do not consider that the loss of 2.79 ha will have adverse effects on ecological values of the MMR. The loss of mangrove habitat was agreed during caucusing as not significant.⁵⁸

Comments during caucusing

- 42 The ongoing discharge of stormwater contaminants into the MMR and Waterview Estuary, in particular, was discussed during the marine ecology caucusing.⁵⁹ Dr Bellingham's contention was that the NZTA has caused degradation of the MMR through the ongoing discharge of contaminants from untreated motorway runoff. As noted above, there are currently a range of discharges into the MMR, not only runoff from the existing (and proposed) motorway.⁶⁰ While I recognise that the Project, in its operational phase, will continue to contribute to the long term accumulation of contaminants in marine sediment, this will be at a lower rate given the higher level of stormwater treatment to be provided.⁶¹ Moreover, I consider the stormwater treatment measures proposed for the Project will contribute to an improvement in the marine habitat of the MMR.
- 43 During caucusing, Dr Bellingham proposed that further mitigation was required to offset permanent marine habitat loss and degradation and, given that opportunities for mitigation within the Project area that have direct benefit to marine ecological values are limited,⁶² offsite mitigation would be appropriate in the form of financial compensation.⁶³ As discussed in detail above, I remain of the opinion that the package of offset mitigation measures already proposed is sufficient to address the Project's impacts on the marine environment.

⁵⁷ See Mr Slaven's Evidence in Chief, paragraph 40.

⁵⁸ See Marine Ecology Caucusing Report, paragraph 5.

⁵⁹ See Marine Ecology Caucusing Report, paragraph 10.

⁶⁰ It is estimated that approximately 3% of the total sediment, 34% of the total zinc and 31% of the total copper that is delivered to the Waterview Estuary from the representative catchment will be attributable to the proposed and existing motorway once the Project is operational. See Mr Moore's Evidence in Chief, Annexure A.

⁶¹ See my EIC, paragraph 61.

⁶² See Marine Ecology Caucusing Report, paragraph 7.

⁶³ See Marine Ecology Caucusing Report, paragraph 11.

HILTRUD GRUGER – SPRINGLEIGH RESIDENTS ASSOCIATION

- 44 Ms Gruger raises⁶⁴ concerns that insufficient information has been presented on sediment discharges and deposition. I consider sufficient information in relation to sediment was provided in the application and the NZTA's evidence in chief.
- 45 Sediment discharges (total suspended sediment and sediment deposition) have been modelled and assessed in terms of coastal processes for the construction phase.⁶⁵ Similarly, these results have informed the assessment of potential effects on marine ecological values.⁶⁶ I consider the assessment on marine ecological values to be robust and appropriate.
- 46 Relief sought by Ms Gruger includes amending the designation to avoid adverse effects on the MMMR in order to maintain the chenier ridges and ensure the ecological integrity of the MMMR is maintained.⁶⁷ It is my opinion that the Project as proposed achieves these points raised.

SHIRLEY WESTWOOD UPTON AND KAREN BROWN – WATERVIEW ENVIRONMENTAL SOCIETY

- 47 In response to concerns raised⁶⁸ by these submitters regarding the names used for various marine areas, I would like to clarify that in my assessment and EIC the term Waterview Estuary is not used as a synonym for the MMMR. Annexure 1 in my EIC contains a map which aimed to show the location of each marine area referred to in my assessment. What I refer to as the Waterview Estuary is the marine environment to the south of the Causeway, also called the Waterview Basin and Waterview Inlet by other submitters.
- 48 The submitters also request an extension of the MMMR area, which has been addressed earlier in this evidence.

COMMENT ON ENVIRONMENTAL MANAGEMENT SERVICES SECTION 42A REPORT

- 49 The EMS Section 42A Report states that "Ryder Consulting considers the [marine ecological] assessments to be appropriate and that the

⁶⁴ See Gruger Statement, paragraphs 14.5 and 14.6.

⁶⁵ See Dr Bell's Evidence in Chief paragraphs 37-41, 58.2 and 83.

⁶⁶ See my EIC, paragraphs 46-50.

⁶⁷ See Gruger's Statement, paragraph b)(iv) on the last page.

⁶⁸ See Upton/Brown Statement, paragraph 5.5.

proposed mitigation goes a considerable way to offsetting the loss of marine reserve".⁶⁹

- 50 After noting Ryder Consulting's proposal of extending the MMR and that expansion of the marine reserve by way of a designation condition is beyond the Board's jurisdiction,⁷⁰ the Report suggests that the NZTA should inform the Board whether there are other measures to provide offset mitigation.⁷¹ As noted above, I do not consider further mitigation is required to offset the Project's adverse effects on the marine environment.
- 51 EMS notes⁷² that Ryder Consulting is cautious in advising whether the "effects of existing sediment-bound contaminants from marine disturbance are likely to be negligible". It is my understanding that this degree of caution is in relation to the potential contamination of marine sediment adjacent to the historic tannery in the upper reaches of Oakley Inlet. (This is addressed further in paragraph 58 below.)
- 52 EMS summarises the additional mitigation measures proposed by submitters to compensate for loss of part of the MMR.⁷³ I respond to the three additional measures that are within my area of expertise in the following paragraphs.

An extension of the reserve to include foreshore and seabed of the Te Atatu peninsula

- 53 Extension of the MMR is discussed earlier in my evidence. I reiterate that my focus during the development of the offset mitigation for permanent marine habitat loss (including that within the MMR) was to ensure that mitigation had direct benefit on the marine ecological values. Further, I understand that extension of the MMR is not something that can be pursued through this RMA process.

Stronger protection of the mangrove habitat

- 54 The loss of mangrove habitat within the MMR has been estimated by Dr Stewart as comprising approximately 3-4% of the total mangrove habitat (i.e. 2.79 ha). It is my opinion that abundant mangrove habitat in the MMR will remain for utilisation by the organisms that use this habitat type, and further that mangroves will readily recolonise areas of mudflat disturbed during construction of the Project. I do not consider that further protection of the mangroves is required.

⁶⁹ See EMS Section 42A Report, paragraph 7.6.4.

⁷⁰ See EMS Section 42A Report, paragraph 7.6.5.

⁷¹ See EMS Section 42A Report, paragraph 7.6.6.

⁷² See EMS Section 42A Report, paragraph 10.5.16.

⁷³ See EMA Section 42A Report, paragraphs 10.5.17-10.5.20

- The maintenance and if possible improvement of tidal flows*
- 55 From the perspective of protecting marine ecological values, increased flow under the Causeway Bridges or at the Rosebank culverts could assist the transport of sediment that is more highly contaminated from the southern side of the Causeway to the less contaminated northern side of the Causeway. This transportation of sediment may result in adverse effects on marine organisms on the northern side of the Causeway.

RYDER CONSULTING SECTION 42A REPORT ON MARINE ECOLOGY

- 56 Dr Stewart states that the "Assessment of Marine Ecological Effects is a generally robust and thorough document".⁷⁴ However, he raises a few points that I will now address.
- 57 Dr Stewart correctly points out that different sediment sampling methodologies referred to in my assessment have involved collection of sediment at different depths and are therefore not directly comparable.⁷⁵ However, Dr Stewart considers that the results provide a reasonable picture of the current contamination in surficial sediment.⁷⁶ I acknowledge that my assessment should have clearly stated that a sediment quality data set compiled from various sources (as used in my assessment) provides an indication of the sediment quality but cannot be statistically compared due to the differing sampling methodologies.
- 58 Dr Stewart raises the issue of contaminants leaching from buried sediment at the old Garnett Brother Tannery site adjacent to Oakley Creek during the construction phase of the Project.⁷⁷ He also suggests⁷⁸ further investigation of heavy metal contaminants in sediments. The Tannery site has been identified in the assessment of contaminated land and will be investigated fully once the Project is in construction phase.⁷⁹ Any contaminated land identified will be managed appropriately in accordance with the Contaminated Sites Management Plan.⁸⁰
- 59 Dr Stewart correctly identified some inconsistencies with areas of marine environment appearing to be considered under the incorrect Project Sector.⁸¹ To clarify, marine environment to the west of

⁷⁴ See Dr Stewart's Section 42A Report, paragraph 4.1.

⁷⁵ See Dr Stewart's Section 42A Report, paragraph 5.1.

⁷⁶ See Dr Stewart's Section 42A Report, paragraph 5.1.

⁷⁷ See Dr Stewart's Section 42A Report, paragraphs 3.13 and 5.1.

⁷⁸ See Dr Stewart's Section 42A Report, paragraph 8.5

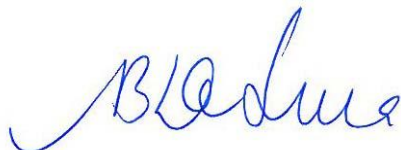
⁷⁹ See Appendix Q of G.9 Assessment of Land and Groundwater Contamination.

⁸⁰ See Appendix O of G.9 Assessment of Land and Groundwater Contamination.

⁸¹ See Dr Stewart's Section 42A Report, paragraph 5.2.

chainage 4400 should have been considered within Sector 2, whereas marine environment to the east of chainage 4400 around Rosebank Domain and on the northern side of the Causeway should have been assessed as within Sector 4. However, I confirm that all areas of marine environment that may be affected by the Project have been assessed, albeit with some areas considered under the incorrect Project Sector.

- 60 Dr Stewart concludes that the marine environment that has been assessed is "by no means pristine".⁸² For the most part Dr Stewart agrees with my assessment of effects and mitigation proposed. However, Dr Stewart considers that the magnitude of adverse effects arising from permanent marine habitat loss may be "slightly underestimated"⁸³ and suggests that further mitigation by way of extension of the MMR or reduction in the amount of habitat loss in the MMR should be investigated.⁸⁴
- 61 Through his Report, Dr Stewart indicates a number of times that, further measures to mitigate permanent habitat loss should be investigated "given the level of concern expressed by submitters".⁸⁵ As discussed earlier in my evidence, it is my opinion that the adverse effects arising from permanent habitat loss have been appropriately mitigated through the measures identified in my EIC⁸⁶ and detailed assessment. In my opinion, any extension of the MMR must be justified on an established environmental effects basis, rather than being suggested as a means of making "the Project more acceptable to ... submitters".⁸⁷



Dr Sharon De Luca
1 February 2011

⁸² See Dr Stewart's Section 42A Report, paragraph 9.1.

⁸³ See Dr Stewart's Section 42A Report, paragraph 7.1, and EMS Section 42A Report, paragraph 10.5.13.

⁸⁴ See Dr Stewart's Section 42A Report, paragraph 8.1.

⁸⁵ See Dr Stewart's Section 42A Report, paragraph 8.1. See also paragraphs vi and 9.4.

⁸⁶ See my EIC, paragraph 59.

⁸⁷ See Dr Stewart's Section 42A Report, paragraph 9.4.

**ANNEXURE A – EXPERT CAUCUSING JOINT REPORT TO THE
BOARD OF INQUIRY – MARINE ECOLOGY
(DATED 28 JANUARY 2011)**

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

Expert Caucusing Joint Report to the Board of Inquiry – Marine Ecology

Dated: 28th January 2011

Due: 7 February 2011

MC
[Handwritten signatures]

EXPERT CAUCUSING JOINT REPORT TO THE BOARD OF INQUIRY

INTRODUCTION

- 1 This joint signed report is written in response to the Board of Inquiry's Minute and Directions dated 23 December 2010. The Directions require the experts, following caucusing, to provide a report by 10am on 7 February 2011 "that includes:
 - Areas that have been resolved and how (e.g. by agreement about conditions)
 - Areas that are not resolved, and succinctly why."
- 2 This report relates to the caucusing topic of Marine Ecology.
- 3 Caucusing meeting(s) were held on 28th January 2011.
- 4 Attendees at the meetings were:
 - Dr Sharon De Luca, Marine Ecologist, Representing NZTA.
 - Dr Rob Bell, Coastal Scientist, Representing NZTA.
 - Dr Tim Fisher, Stormwater Engineer, Representing NZTA.
 - Mr David Slaven, Botanical Ecologist, Representing NZTA.
 - Dr Brian Stewart, Marine Scientist, Representing the Board of Inquiry.
 - Dr Greg Ryder, Freshwater Scientist, Representing the Board of Inquiry.
 - Dr Mark Bellingham, NZ Forest and Bird Motu Manawa Restoration.
 - Mr Michael Coote, NZ Forest and Bird Motu Manawa Restoration.
 - Dr Andrea Julian, Ecologist, Auckland Council.
 - Mr David Havill, Conservancy Botanist, Department of Conservation.
 - Ms Shona Myers, Ecologist, Living Communities & Friends of Oakley Creek.



SHL

MC

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AREAS THAT HAVE BEEN RESOLVED**Loss of Mangrove Habitat**

- 5 We agree that the permanent loss of 2.79 ha of mangrove habitat is not significant in isolation of other ecological effects.

Marine Monitoring Conditions

- 6 We agree that the marine monitoring conditions proposed are sufficient.

Mitigation to offset permanent marine habitat loss

- 7 We agree that there is limited capacity for further onsite mitigation within the adjacent Coastal Marine Area affected by the Project.

AREAS THAT HAVE NOT BEEN RESOLVED**Marine Reserve status consideration**

- 8 We have not reached agreement that there has been sufficient recognition of the status of the Marine Reserve under the RMA process.

Mitigation to offset permanent marine habitat loss

- 9 We are unable to agree that the mitigation proposed to offset permanent habitat loss from the widened Causeway is sufficient.
- 10 We are unable to agree whether or not ongoing contamination attributable to stormwater discharge from the Project contributes to a significant permanent degradation of habitat in the Marine Reserve.
- 11 We were unable to agree whether additional mitigation (including offsite) for permanent habitat loss and ongoing degradation from contaminants is required.

Date: 28 January 2011



Dr Sharon De Luca



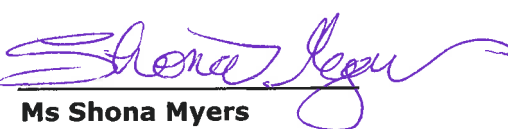
Dr Brian Stewart



Dr Mark Bellingham



Mr Michael Coote



Ms Shona Myers