

BEFORE THE AUCKLAND UNITARY PLAN INDEPENDENT HEARINGS PANEL

IN THE MATTER of the Resource Management Act
1991 and the Local Government
(Auckland Transitional Provisions)
Act 2010

AND

IN THE MATTER of Topic 081b Rezoning and Precincts
(Geographical Areas)

STATEMENT OF REBUTTAL EVIDENCE OF ANDRES ROA
(STORMWATER) ON BEHALF OF THE LONG BAY - OKURA GREAT PARK
SOCIETY INCORPORATED AND THE OKURA ENVIRONMENTAL GROUP

WEITI PRECINCT
STORMWATER

14 MARCH 2016

1 INTRODUCTION

- 1.1 My full name is Andrés Roa. I hold a Bachelor of Engineering degree from the Javeriana University in Bogotá, Colombia.
- 1.2 I am an Engineering Consultant. I hold membership of the Institute of Professional Engineers New Zealand (IPENZ) and Chartered Professional Engineer (CPEng) and International Professional Engineer (IntPE) status.
- 1.3 I have approximately twenty years' experience in the field of Civil Engineering. I am currently a director of AR & Associates Ltd, a civil engineering consulting firm based in Takapuna, Auckland.
- 1.4 I have acted as a civil engineering consultant to a wide range of clients in both the public and private sectors throughout New Zealand. I have considerable experience in the stormwater, wastewater and water supply fields, having been responsible for the design and supervision of many civil engineering projects.
- 1.5 For the last ten years I have acted as a stormwater management consultant for the Auckland Council (and the legacy councils), where I have been responsible for undertaking technical review of numerous stormwater-related consents throughout the Auckland Region, and more recently the technical review of Special Housing Area applications on behalf of the Stormwater Unit (for the Housing Project Office) and Development Engineering.
- 1.6 In addition, since 2008 I have been responsible for the feasibility planning and design of a considerable number of stormwater projects for Auckland Council, involving stormwater quality, quantity and addition to flood management works. My work has also included the design and delivery of stormwater modelling training courses to industry and tertiary institution entities on behalf of Council.
- 1.7 I have also been responsible for the engineering design and supervision of a number of land development and residential subdivision proposals such as the ones discussed in this statement of evidence, including stormwater, wastewater, water supply and roading elements.
- 1.8 In preparing this rebuttal statement I have read the evidence prepared in relation to Weiti by the following parties:

Weiti Development LP (WDLP)

- Sean Grace (Planning)
- Stephen Priestley (Engineering and Infrastructure)
- David Slaven (Terrestrial and Freshwater Ecology)

- Sharon De Luca (Marine Ecology)

1.9 I also reviewed the evidence report on submissions by Robert Bruce Scott on the Weiti Precinct dated 26th January 2016.

1.10 I also attended the Ecology and Stormwater Expert Conference held on 15th October 2015 in respect of Topic 016 RUB North / West, which relates to the adjoining Okura estuary.

1.11 I have read and understand the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and agree to comply with it. This evidence is within my area of expertise, except where I state otherwise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this statement of evidence.

2 BACKGROUND AND SCOPE

2.1 The focus of my rebuttal evidence is on the potential stormwater and sediment related effects from urban development and intensification in the Weiti Precinct, from 1,200 dwellings to a total of 1,750 dwellings as proposed by WDLP. The proposed intensification is located within three sub-precincts, with the increase in yield within each summarised as follows (the limit previously approved under the operative Auckland Council District Plan (Rodney Section) 2011 - “Operative Plan” - is also given for reference):

Sub-Precinct	Development Limit as per Rodney ODP	Development Limit as per PAUP Provisions	New Development Limit as Proposed by WDLP
A1	150	150	150
B	400	1,050	1,450
A2	0	0	150
TOTAL	550	1,200	1,750

2.2 I also provide general comment on the ability to develop sub-precinct B to the limits currently proposed under the PAUP provisions (which allows for 1,050

dwellings), with respect to the technical viability of implementing WSD philosophies.

- 2.3 There are a number of overlays applying to the Weiti Precinct and receiving environments, as stated in paragraph 7.13 of Mr. Scott's evidence. Among the overlays applicable to Weiti is SEA Marine 1 (64(a), lower reaches of the Karepiro Stream, and the Long Bay Okura Marine Reserve) and this clearly demonstrates the sensitivity of the receiving environment. This means that the protection of these environments in respect of stormwater, sediment and other effects that may result from urbanisation is a high priority.
- 2.4 In this rebuttal evidence I comment on the evidence as submitted by WDLP to the Independent Hearings Panel regarding a proposal for intensification of development within the Weiti Precinct, in regard to:
- Stormwater contaminant management and related effects
 - Stormwater management design and applicability of Water Sensitive Design (WSD)
- 2.5 I have mainly focussed my comments on the evidence presented by Mr Grace, Mr Priestley, Ms De Luca and Mr Slaven (on behalf of WDLP) and Mr Scott (on behalf on Auckland Council).

3 STORMWATER CONTAMINANT MANAGEMENT AND RELATED EFFECTS

- 3.1 The development yield proposed in the PAUP provisions considers 150 dwellings in sub-precinct A and 1,050 dwellings in sub-precinct B (the latter being an increase from the 400 dwellings originally approved for the Weiti Village Development Area in sub-precinct B under the Operative Plan).
- 3.2 WDLP now propose a new subdivision 'cell' west of sub-precinct B, where an additional 400 dwellings will be introduced (resulting in the yield for sub-precinct B increasing from 1,050 to 1,450 dwellings), and an additional 150 dwellings within a new low density development area referred to in Mr Grace's evidence as "sub-precinct A2".
- 3.3 Mr Scott in paragraph 9.17 quotes evidence by Shona Myers, council ecologist in relation to adverse effects on the receiving environments. She states that:

"The additional level of development proposed by Weiti Development LP and Green and McCahill Holdings Ltd is likely to have downstream effects on Karepiro Bay and the marine reserve. This will be over and above the effects generated by the increase in density from the ODP to the PAUP provisions, which is also likely to

have effects. The additional development proposed in the expanded sub precinct B area by Weiti Development LP and Green and McCahill Holdings Ltd is on steeper land and could require significant earthworks. This is likely to generate sediments and impact on the marine reserve”.

- 3.4 I have not seen specific development plans for the new “cell” west of sub-precinct B but have studied the ground topography based on Council’s Lidar contour data, which suggests that the topography is very steep in nature, being an average of around 15 to 20% in gradient with some areas steeper than about 60%.
- 3.5 In order to achieve suitable gradients to facilitate the level of intensification proposed, comprehensive earthworks would be required which would result in significant modification landforms within this area, including the potential loss of stream environments and changes to the hydrological regime. In my view these disturbances are significant and if not adequately controlled (or the proposed yields reduced), they are likely to result in increased runoff discharges both in the construction and operational phases, in addition to increased erosion and sediment generation during the construction phase. I therefore agree with Ms Myers and consider that the development of this area has the potential to adversely affect the receiving stream and coastal environments.
- 3.6 In addition, the very steep topography will severely restrict any opportunities to promote WSD in the development, particularly in regards to the core WSD principles of minimising earthworks and changes to the hydrological regime.
- 3.7 I have also briefly reviewed the topography in the proposed development areas within sub-precinct A2 and the Weiti Village areas in sub-precinct B (as approved under the Operative Plan and proposed by the PAUP) and found that although slightly easier in gradient than the aforementioned sub-precinct B ‘cell’, these areas are also relatively steep (with average gradients of around 15%). As such, I consider that these areas also have the potential to present significant challenges for the yields predicted, in terms of the avoidance of comprehensive earthworks and associated changes to hydrological regime, and ability to implement WSD principles.
- 3.8 Mr Grace’s evidence in the executive summary (item H) states that *“Amendments now sought for additional development with the Proposed Weiti Precinct..... will potentially deliver an overall better long term environmental outcome for the project.”* This statement appears to be largely justified by the *“increased level of planting”* across the site, and *“better utilisation of the infrastructure that is currently needed to support development within the Precinct”*. Additionally Ms De Luca asserts that there will be *“negligible adverse effects on marine ecological values”* due to *“the provision of stormwater treatment and controls around increased human presence within and adjacent to the Coastal Marine Area”*.

- 3.9 In my view neither of the above statements or the evidence available provides sufficient information to justify the conclusion that the effects on the receiving environment will be negligible. In my view, development in the manner and intensity proposed could result in significant generation of sediment and heavy metals and other contaminants associated with stormwater discharges, unless adequately controlled (or proposed development yields reduced). Development to this level would require a very high degree of mitigation to ensure that effects are indeed negligible. Details of such controls (or the viability of implementing them) have not been provided with the information available.
- 3.10 Mr Grace in paragraph 5.11 states that *“The landscape and ecological assessments have identified the northern portion of Sub-precinct C as an area capable of accommodating additional development. This part of Sub-precinct C is not subject to any of the requirements for enhancement planting. It is proposed that this area be identified as Sub-precinct A2 – Weiti River. Similar provisions to this currently applied to Sub-precinct A – Karepiro (Weiti Bay) would apply in the Sub-precinct. By identifying this as a development area within the Weiti Precinct provisions provides the Council and the community with a great degree of certainty about the resulting environmental outcome, in terms of the location, form and scale of development that would occur...”*
- 3.11 I do not believe that sufficient information has been made available from a stormwater or sediment management perspective to support Mr Grace’s statement that a “great degree of certainty” will be provided in respect of any environmental outcomes.
- 3.12 Mr Grace in paragraph 6.23 makes reference to Ms De Luca’s evidence where she outlines that sediment can be *“robustly managed during earthworks and appropriate treatment of stormwater in the operational phase can be provided, concluding that the effects on marine ecology are negligible”*. Ms De Luca’s evidence in the executive summary (item C) states that *“it is important to treat stormwater to a high standard to avoid cumulative effects”*. Additionally, in her executive summary (item D) Ms DeLuca states that, on the basis of Mr. Priestley’s evidence, *“residual sediment and contaminants in treated discharge will not have more than negligible effects on marine ecology...”* However, no reference is given in the evidence to what an ‘acceptable’ level or standard of treatment might be, in the context of the sensitive receiving environments at Weiti. I therefore do not agree with Ms De Luca’s assertion that the effects are negligible, as they cannot be measured or verified with the information currently available.
- 3.13 Ms De Luca in paragraph 5.3 states that significant adverse effects on marine ecological values can be avoided through *“use and regular monitoring of appropriate erosion and sediment control devices and robust site management”*. She also makes reference to Mr Priestley’s evidence (para 6.5) which describes the type of sediment control measures proposed. Ms De Luca then goes on to

suggest in paragraph 5.5 that a similar level of treatment as the Long Bay development, which attained removal of 95% of sediment from stormwater during earthworks (para 6.3), is expected to be achieved at Weiti.

- 3.14 In my view there is no indication given in Mr Priestley's evidence that the 95% level of sediment removal is achievable, given the steep topography in parts of the Weiti precinct. Additionally, there appears to be no justification in Ms De Luca's statement that this or any level of treatment will be sufficient to ensure that significant effects can be avoided, in the context of the Weiti receiving environments.
- 3.15 In paragraph 6.3 Ms De Luca suggests that the modelling undertaken by NIWA on behalf of Okura Holdings Ltd (OHL) for the Okura estuary and associated results can be applied to Weiti. While I am not a coastal processes expert, I would question this point as the Okura and Weiti estuaries would appear to be (despite their physical proximity) two separate systems with their own characteristics and processes. Additionally, as explained in my rebuttal evidence on Topic 016, the NIWA analysis and conclusions were based on the OHL development in isolation, without consideration to contaminant discharges from existing sources or potential development of other land within the Okura catchments. Therefore in my view the NIWA conclusions presented only a partial picture without due consideration to cumulative effects, and cannot be used to assess the potential effects of development within the Okura catchment as a whole.
- 3.16 Mr Slaven in paragraph 4.9 asserts that the increment in earth being moved is not likely to be large, when compared to the presently anticipated earthworks. I disagree with this view, given that the very steep topography in parts of the development areas will require comprehensive earthworks to achieve suitable landform gradients in order to enable the development densities proposed. Mr Slaven goes on to say that erosion and sediment control techniques are well understood and that this will ensure that potential adverse effects are appropriately mitigated. I do not share this view because while it may be true that these techniques have advanced in recent years and are well understood in a general sense, there is insufficient information to show that the efficacy of these controls has been assessed in the context of the Weiti Precinct and associated receiving environments, in terms of the levels of mitigation that would be required to achieve acceptable outcomes.
- 3.17 A similar assertion is made by Mr Slaven in paragraph 4.10 with respect to operational stormwater treatment methods, which consist of conventional devices such as swales and wetlands, as being well understood. There is no specific information on the nature and extent stormwater treatment devices proposed, or evidence that these measures will indeed be appropriate or sufficient to mitigate effects on the receiving environments at Weiti to a satisfactory level.

- 3.18 Mr Priestley in his evidence states that within the greenfields area of the site, stormwater infrastructure can be provided to meet the requirements of the Proposed Auckland Unitary Plan. However, I do not consider that the information provided to date is sufficient to support this statement. Additionally, regardless of whether the Unitary Plan requirements can be met or not, no indication is given to demonstrate that these requirements are in fact adequate or sufficient to address potential effects in this particular context and given the sensitive nature of the receiving environments.
- 3.19 With regard to land use, paragraph 6.4 of Mr Priestley's evidence states; "... A change in land use (from rural/forestry activities) to urban, re-generated native bush, and recreational and conservation areas will reduce the long-term, overall sediment yield, probably by a factor of 2 to 3". Mr Priestley has however provided no basis to support this statement, or comment on how the short term effects during construction may impact on any perceived longer-term positive effects of land use. It is also unclear what timeframe the phrase 'long term' in Mr Priestley's statement makes reference to.
- 3.20 Mr Scott in his evidence report (para 8.2) highlights the objectives and policies of the NZCPS that are relevant to Weiti, including:

"Objective 1

To safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems, including marine and intertidal areas, estuaries, dunes and land, by: (.....)

- *Maintaining coastal water quality, and enhancing it where it has deteriorated from what would otherwise be its natural condition, with significant adverse effects on ecology and habitat, because of discharges associated with human activity."*

And;

"Policy 22 sedimentation

- *Assess and monitor sedimentation levels and impacts on the coastal environment.*
- *Require that subdivision, use, or development will not result in a significant increase in sedimentation in the coastal marine area, or other coastal water.*
- *Control the impacts of vegetation removal on sedimentation including the impacts of harvesting plantation forestry.*

- *Reduce sediment loadings in runoff and in stormwater systems through controls on land use activities.”*

3.21 Based on my review of the evidence and submissions presented, in my opinion there is insufficient supporting information or evidence that the proposed development will provide measures to protect the quality of the coastal environment in a way that is consistent with the above objectives and policies, or to mitigate stormwater or sediment-related effects to levels that are “negligible” or “no more than minor”, as claimed in the evidence by Mr Grace, Ms De Luca and Mr Slaven.

4 STORMWATER MANAGEMENT DESIGN AND APPLICABILITY OF WATER SENSITIVE DESIGN

4.1 Referring to the provisions of the Unitary Plan, Mr Priestley in paragraph 5.2 outlines the standard requirements which include flow attenuation, management of overland flows, retention and detention and stormwater quality treatment “*using a range of water sensitive design features*”. This appears to be a somewhat arbitrary and generic statement that applies to what would be ‘normally’ required under the Unitary Plan, but does not give consideration to the manner in which the proposed housing yields in Weiti would be achieved, in light of the proposed development yields and the site-specific issues and constraints. The site-specific issues and constraints that need to be considered in the design include:

- Steep topography, which severely limits the implementation of WSD philosophies, due to the following reasons:
 - a) Restricts opportunities to replicate the existing hydrological regime so as to maintain the nature, magnitude and extent of existing discharges and avoid the concentration of flows;
 - b) Restricts opportunities to minimise earthworks in order to reduce associated sediment-related effects and retain stream environments.
- The sensitive nature of the receiving marine environment.

4.2 Mr Priestley in paragraph 5.6 discusses that stormwater effects will be addressed through conventional Auckland Council benchmarks, including technical publication TP10 (2003), and the implementation of WSD. Mr Priestley goes on to say in paragraph 5.9 that “*stormwater requirements can be accommodated within the site and should be very straightforward for the proposed 1750 dwelling development*” (emphasis added).

- 4.3 I disagree with Mr. Priestley statements. Given the steep topography that characterises parts of the proposed development area, it is my view that the ability to comprehensively implement WSD philosophies as claimed will be severely constrained.
- 4.4 Additionally, while TP10 has been recognised over the years as an acceptable guide to inform stormwater management design in the region, its key focus was on the design of individual stormwater practices and to a lesser extent, the way in which stormwater design may be integrated as part of a wider design process. In my view Mr Priestley does not show how consideration to WSD philosophies will be duly given in the design. These philosophies call for the management of stormwater in an integrated way, including consideration to initiatives such as the minimisation of earthworks, preservation of natural site features, the retention of hydrological regime and runoff patterns, and at-source control, and by their very nature, may not be technically viable in parts of the proposed development area if the proposed yields were to be maintained.
- 4.5 Mr Priestley in paragraph 6.2 acknowledges that steep topography is a potential constraint to development. In paragraph 6.6 he acknowledges that the protection of streams will be compromised as a result of the steep topography and the earthworks that would be needed to achieve suitable landform gradients. He goes on to state in paragraph 8.3 that the potential yield from sub-precinct B will require in-depth geotechnical investigations and earthworks design to meet the requirements of NZS4404 and Council's Code of Practice, and that at present, the ability for the development to yield 1,750 lots cannot be established (executive summary, item D). This would suggest to me that Mr Priestley himself has reservations about the ability to achieve the proposed yields in an economical or sustainable way.
- 4.6 In summary, I consider that proposed development areas within the new subdivision 'cell' in sub-precinct B, sub-precinct A2 and the Weiti Village areas in sub-precinct B (as approved under the Operative Plan and intensified in the PAUP) have the potential to present significant challenges for the yields proposed by WDLP. These challenges relate to the ability to adequately implement WSD principles, including the need to avoid or minimise comprehensive earthworks and associated changes to hydrological regime. Therefore it is my view that development to the yields proposed could potentially result in unacceptable effects on the receiving stream and marine environments.

5 CONCLUSION

- 5.1 Based on my review of the evidence and submissions presented, in my opinion there is insufficient supporting information or evidence that the proposed

development will provide measures to protect the quality of the coastal environment in a way that is consistent with the objectives and policies of the NZCP, or to mitigate stormwater or sediment-related effects to levels that are “negligible” or “no more than minor”, as claimed in the evidence by Mr Grace, Ms De Luca and Mr Slaven.

- 5.2 I consider that proposed development areas within the new subdivision ‘cell’ in sub-precinct B, sub-precinct A2 and the Weiti Village areas in sub-precinct B (as approved under the Operative Plan) have the potential to present significant challenges for the yields proposed by WDLP. These challenges relate to the ability to adequately implement WSD principles, including the need to avoid or minimise comprehensive earthworks and associated changes to hydrological regime. Therefore it is my view that development to the yields proposed could potentially result in unacceptable effects on the receiving stream and marine environments.

Andrés Roa

Civil Engineer

14 March 2016