

**IN THE MATTER** of the Resource Management Act 1991

**AND**

**IN THE MATTER** of a Board of Inquiry appointed under s149J of the Resource Management Act 1991 to consider Notice of Requirements and applications for Resource Consent made by the New Zealand Transport Agency in relation to the East West Link roading proposal in Auckland.

**SUMMARY OF EVIDENCE OF NATASHA ELIZABETH CARPENTER  
ON BEHALF OF AUCKLAND COUNCIL  
COASTAL PROCESSES AND ENGINEERING**

## **1. Corrections to Evidence**

Since preparing my evidence in chief I have one clarification to make:

(a) In paragraph 7.10 I said 'the pronounced headlands will further increase sedimentation rates by reducing tidal currents and increasing deposition. In my opinion, these effects could be reduced by limiting the extent of the headlands to enable circulation of tidal currents'. To be clear, I meant that reducing the seaward extent of the reclamation will reduce the spatial extent of the area where an increased sedimentation rate occurs. The maximum increase in rates of sedimentation (5mm/yr) would still be likely to be experienced at some locations, but those areas will be smaller.

## **2. Overview of Key Conclusions of Evidence**

The key conclusions of my evidence are as follows:

- (a) The proposed reclamation will increase the total extent of reclamation in the Mangere Inlet from 24% to 27.5%. Of the proposed total 24.2ha reclamation area, 5.6ha is required to construct the road. I understand that the reclamation is intended to fulfil a range of purposes. However, from a coastal processes point of view, I consider that there is scope to reduce the scale of the reclamation to minimise adverse effects as far as practicable.
- (b) The Mangere Inlet is a sediment and contaminant sink, with average rates of sedimentation increasing historically from 5mm/yr (pre 1950's) to 10mm/yr (post 1950's). On the northern shore, the current rate of sediment deposition has been estimated from LiDAR at approximately 25mm/yr.
- (c) The artificial headlands are larger than required for the coastal engineering purpose of retaining sediment. As the seaward extension of these features increases, so does the area of the highest rates of sediment deposition owing to the slowing of tidal currents in the lee of these structures. With the reclamation, sedimentation rates at this location increase by 3 to 5mm/yr, representing a long term increase of up to 20%.
- (d) The Mangere Inlet receives approximately 43,000 tonnes of sediment per year. The proposed stormwater treatment wetlands will have limited effect on this by reducing catchment loads from 870 to 200 tonnes per year. This is a -1.5% reduction in total sediment loads in the Mangere Inlet but will be offset by the increased deposition of sediment sourced

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from the wider Manukau Harbour that will be promoted by the reclamation.

- (e) Mangrove development in the Mangere Inlet has increased over time. While a natural habitat as highlighted by Sharon De Luca, the rate of colonisation has been influenced by anthropogenic factors. Owing to the effects of the reclamation on sedimentation, which will exceed that of predicted sea-level rise, the rate of mangrove colonisation is likely to further increase over time.
- (f) The proposed subtidal dredging includes a 15ha subtidal area of the Mangere Inlet, to provide material for the creation of 'mudcrete'. The practice will result in a range of adverse effects that could otherwise be avoided, including:
  - Creation of a dredge basin that will modify coastal processes with an uncertain timeframe for recovery. Sub-tidal dredging is typically avoided as a result of associated current speeds;
  - Increased sedimentation on the flanks of the dredge basin encroaching on an area of SEA; and
  - Disturbance and dispersal of contaminated sediment through the creation of sediment plumes during dredging activity.
- (g) The Manukau Harbour is already identified as an area of degraded water quality. Over the sustained dredging period of approximately one year, an additional 6,300 tonnes of additional sediment load is expected. While temporary, this is just under a 15% increase in the total sediment deposition of the inlet in one year.
- (h) In addition to subtidal dredging, intertidal dredging is required to create the foundations of the reclamation. Sediment plume modelling has shown the highest rates of sediment dispersal at the north eastern side of the inlet, with sediment encroaching into Anns Creek.

### **3. Summary of Issues Resolved and Unresolved**

The following matters have been resolved through evidence and expert conferencing:

- (a) It has been agreed that from a coastal processes perspective the size of the headlands could be reduced and this would reduce the total area of the highest sedimentation.
- (b) The stormwater channels should be relocated to discharge into the tidal channel.
- (c) Not undertaking sub-tidal dredging would reduce the adverse effects of the project on coastal processes.

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- (d) Partially or entirely coffering the reclamation site would reduce or avoid the adverse effects of sediment plumes generated from intertidal dredging.
  - (e) It has been confirmed that the proposed mudcrete material is to be covered in the long term and that the estimated weathering rates in the Coastal Processes Technical Report will not likely be experienced.

The following issues remain unresolved:

- (a) The level of adverse effects from the proposed reclamation and dredging activities on tidal currents, coastal morphology and sedimentation.