

Before Hearing Commissioners
at Christchurch

under: the Resource Management Act 1991

in the matter of: applications CRC172455, CRC172522, CRC172456, and
CRC172523 to undertake channel deepening dredging
and maintenance dredging in Lyttelton Harbour

and

in the matter of: **Lyttelton Port Company Limited**
Applicant

Summary evidence of Derek Goring (waves and currents)

Dated: 27 April 2017

REFERENCE: JM Appleyard (jo.appleyard@chapmantripp.com)
ML Nicol (michelle.nicol@chapmantripp.com)

Chapman Tripp
T: +64 3 353 4130
F: +64 3 365 4587

60 Cashel Street
PO Box 2510, Christchurch 8140
New Zealand

www.chapmantripp.com
Auckland, Wellington,
Christchurch

SUMMARY EVIDENCE OF DEREK GARARD GORING

INTRODUCTION

- 1 My name is Derek Garard Goring.
- 2 I prepared evidence dated 28 March 2017 for Lyttelton Port Company Limited (*LPC*) in relation to its applications for resource consent to undertake works known as the Channel Deepening Project (*CDP*).
- 3 My qualifications and experience are as outlined in that evidence.

SCOPE OF EVIDENCE

- 4 This evidence consists of a summary of my evidence as filed.
- 5 No expert evidence relevant to my expertise was filed and as such I have no response evidence.

SUMMARY OF EVIDENCE

- 6 My evidence is concerned with the effects of the CDP on waves and tidal currents within the Harbour. I have made my assessment by means of hydrodynamic models, comparing the regimes before and after development. The models I used are state-of-the-art and they were validated against measurements in the Harbour.
- 7 Waves and tidal currents are important for sediment transport: waves initiate motion by stirring up the sediment on the bed and tidal currents transport it. Large changes in either waves or tides could result in more sediment being moved (leading to erosion) or less being moved (leading to accretion). Thus, it was important to determine the extent of change to waves and tidal currents as a result of the CDP.
- 8 For waves, my work has shown that the deepened channel will cause incoming swell waves to bend onto the northern and southern shorelines adjacent to the channel, increasing the average wave heights by a few centimetres. As a result, the swell waves in the central region of the Harbour will be reduced by a few centimetres. In the upper region of the Harbour, under present conditions swell waves do not penetrate to any large extent and this will not change with the CDP. There will be no change to the wave regime in Port Levy.
- 9 For tidal currents, my work has shown that reclamation will increase the tidal currents in the central and upper region of the Harbour, but channel deepening will offset this effect, resulting in almost no

change to the tidal currents, except in the immediate vicinity of the reclamation. In this region, the changes in tidal currents depend on the details of the reclamation and deepening. Overall, I found that the effect of the change in tidal current regime on sediment transport was imperceptible.

- 10 In summary, the CDP will have a minor effect on the wave climate of the shorelines adjacent to the shipping channel and in the vicinity of the reclamation, but less than minor elsewhere. The effect on tidal currents will be minor in the central region, but less than minor elsewhere. The effect on sediment transport will be less than minor.

Dated: 27 April 2017

Derek Garard Goring