Before the Independent Hearing Panel
Appointed by the Southland Regional Council

Under	the Resource Management Act 1991 (**RMA**)
In the matter of	an application by **South Port NZ Limited** to dredge parts of the Bluff Harbour

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Supplementary statement of evidence of Simon Childerhouse

29 June 2022

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Qualifications and experience

1 My full name is Dr Simon John Childerhouse.

2 I have prepared a statement of evidence dated 29 March 2022. My qualifications and experience are set out in that statement. I confirm that this supplementary evidence is also prepared in accordance with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014.

3 This statement addresses questions raised by Commissioners during my oral presentation.

Coverage of mitigation zones

4 Commissioner Lieffering asked about the relative coverage of the mitigation zones by Marine Fauna Observers (MFO). If I understood his question correctly, he requested clarification of the issue where the Marine Fauna Observation Zone (MFOZ) based on Permanent Threshold Shift (PTS) modelling would have full visual coverage by MFOs and that the larger MFOZ based on Temporary Threshold Shift (TTS) modelling would also be covered by the same MFOs, but given the nominal effective visual search distance of a MFO of approximately 500 m, that coverage would not be 100% but would be maximised as much as a possible.

5 Commissioner Lieffering suggested that a condition could be offered to specifically address this issue. While a specific condition could be developed to clarify, I believe that a new condition is not required but rather that it is, in essence, a statement of fact. In Attachment 8 of my Evidence (the Marine Fauna Operational Plan), Section 3.0, numbered bullet 3, says, "*Sufficient dedicated MFOs will be placed around the activity site to ensure full coverage of the PTS zone and to maximise the coverage of the TTS zone*." I believe that this statement is clear and addresses the question of Commissioner Lieffering.

Certification of the Marine Mammal Management Plan

6 Commissioner McGarry asked about the process for certifying the Marine Mammal Management Plan (MMMP) and, presumably, I assume that this would also refer to the certification of the Marine Fauna Operational Plan.

7 Section 1.3 of the MMMP provides details of the process for the review and updating of the MMMP. Given that MMMP has been attached as part of the application, it is already a matter of record and therefore I do not believe

that it needs any separate approval as it is specifically referred to in draft conditions 20 and 34.

8 However, the following could be added to draft condition 20: “Any changes or revisions to the Marine Mammal Management Plan or Marine Fauna Operational Plan shall be approved in writing by the Consents Manager, Environment Southland acting in a technical certification capacity”. This is essentially a revision of existing draft condition 41.5 applied to the MMMP.

Content of Marine Fauna Observer Training course

9 Commissioner McGarry asked about the content of the MFO training course. A full description of the content of the Marine Mammal Observer (MMO) course is provided on page 15 of the MMMP. Obviously, this course content was written prior to the change of MMOs into MFOs and therefore it only reflects marine mammal observer training. However, it would be easy to expand the present description and just add some additional biological information about the other marine fauna species MFOs also need to be aware of (e.g., seabirds, penguins, sharks). The rest of the original course content would remain the same as originally stated.

Draft Condition 31 - Use of acoustic harassment device

10 Commissioner McGarry asked about condition 31 and whether it could be expanded to include a specific start time for when the acoustic harassment device is used prior to activities commencing. I suggested that it should be started one hour before the start of rock breaking or blasting (which is consistent with when the MFOs need to start observations anyway). This amendment could be added into condition 31.

Draft Condition 32 – Monitoring of mitigation for entanglement

11 Commissioner McGarry asked about condition 32 and suggested some potential monitoring around this condition. I have suggested the following addition to draft condition 32: “*At the start of each day, all marine vessels will be checked to ensure that all ropes and/or lines used during the works are taut as far as is safely practicable to avoid the potential for marine mammals to become entangled in the lines. There shall be no loose lines over the sides of vessels throughout the hours of operation.*

Relative effectiveness of visual and acoustic observations

12 Commissioner McGarry asked about relative effectiveness of visual observations carried out by MFOs versus acoustic detections. I have provided some general statements to address this:

(a) Visual observations and acoustic detections can both be effective forms of confirming the presence of marine mammals (and other species) within an area. Both have relative strengths and weaknesses and are generally complementary with higher detection rates achieved when both methods are used together.

(b) As a general rule, the effectiveness of visual detections declines with increasing wind, increasing swell height, as light levels decline and also as the distance of the marine mammal increases from the observer. By contrast, acoustic methods are not affected by light levels but can also be affected by increasing wind and swell (although generally to a lesser degree than visual observations). Distance to the marine mammal also affects acoustic detections with small effective detection distances for some species (e.g., Hector's dolphins 300-400m) and larger distances for other species (e.g., blue whales >10 kms).

(c) The relative effectiveness of the two approaches varies considerably depending on a range of factors as noted above. However, some general conclusions can be made:

    (i) acoustic methods provide higher detection rates when weather or visibility is poor; and

    (ii) in reasonable or better weather, visual observations generally provide higher detection rates.

(d) While not directly comparable to the SouthPort situation, an analysis of visual detections vs acoustic detections from New Zealand seismic surveys found that when both systems were operating concurrently, there were a total of 626 detections. Of these, 493 (79%) were detected only by MMOs, 43 (7%) only by passive acoustic monitoring system and 90 (14%) were detected by both. This confirms that 93% of all marine mammals were detected visually and only 21% acoustically[1]. Additional data directly comparing visual and acoustic detection rates of Hector's dolphins during pile driving operations should be available from a monitoring project in Lyttelton shortly.

[1] Childerhouse S, Douglas L, Kennedy J, Burns D (2016) Report: Analysis of Marine Observer data from New Zealand seismic surveys. Unpublished Report to Department of Conservation. Document number: BPM-15-DOC-Analysis of Marine Observer data from NZ seismic surveys-v1.4. 18 January 2016. 50 p.

(e) Visual observations are the preferred option for the detection of seabirds, penguins and sharks as these cannot be detected using the presently available acoustic methods.

(f) Overall, in my opinion, visual observations with multiple MFOs are the most effective way of reliably and robustly monitoring the Marine Fauna Observation Zones. Acoustic detection methods could be used to complement visual observations and are likely to improve the detection rates of marine mammals (but not for other species). However, the significant cost involved in the set up and implementation of an effective acoustic monitoring programme is not warranted for this project given: (i) the low likelihood of marine mammals being in the area during operations, (ii) the already high probability of detecting marine mammals from visual observations, and (iii) the expected small marginal increase in detection rates that also using acoustic methods would bring.

Dr Simon John Childerhouse

29 June 2022