BEFORE INDEPENDENT HEARING COMMISSIONERS
AT WHANGĀREI

I MUA NGĀ KAIKŌMIHANA WHAKAWĀ MOTUHAKE
KI WHANGĀREI

IN THE MATTER	**of the Resource Management Act 1991**
AND	
IN THE MATTER	**of the hearing of submissions on applications by the Northport Ltd – Port Expansion project at Marsden Point**

STATEMENT OF PRIMARY EVIDENCE OF DR TOM BROUGH ON BEHALF OF PATUHARAKEKE TE IWI TRUST

(MARINE MAMMALS)

18 SEPTEMBER 2023

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1. EXECUTIVE SUMMARY

1.1 The 'best available information' used by Northport's experts and the Council's expert, to appraise the potential impacts of the project on marine mammals is inadequate. The data/information sources used are not sufficiently robust to determine the importance of Whangārei Harbour or Bream Bay to marine mammals, including occupancy or habitat use patterns and seasonality. Therefore, I do not agree that it is possible to draw robust conclusions on the severity of impacts from the evidence of Northport (Clement 2022) or from the S42a report (McConnell 2022).

1.2 The impact assessment undertaken by Northport's expert is largely based on the construction phase and omits the potential long-term and cumulative effects of the resulting increase in activity at Northport, in particular, the multiple stressors related to increases in shipping traffic.

1.3 The MMMP needs to be underpinned by robust datasets on the occurrence/abundance, habitat use and seasonality of all marine mammal species of interest. This information is critical to the effectiveness of any mitigation of potential impacts. The applicant should support the collection of the adequate information upon which to base a robust impacts assessment and expand the impact assessment to include additional effects of the port operating at increased capacity.

2. INTRODUCTION

2.1 I hold a PhD and MSc (University of Otago) in marine science with a specialisation in marine mammal ecology, a post-

graduate diploma in wildlife management and a bachelor of science in ecology and marine science (University of Otago).

2.2 Since 2020 I have been employed by the National Institute of Water and Atmospheric Research as a marine ecologist with a background in spatial ecology, marine mammal ecology and quantitative modelling. I am also a trustee and principal scientist with the Far Out Ocean Research Collective Charitable Trust where I lead research on marine mammals in Northland.

2.3 I have 15 years' experience in marine mammal science and broader marine ecology having led projects throughout New Zealand on a wide range of species and ecosystems. Previous relevant experience includes assessment of environmental effects of port expansion on marine mammals at Lyttleton Port, the impacts of the tourism industry on marine mammals in Fiordland and Banks Peninsula, and assessing the potential effects of offshore energy installations. I also have broad experience in conducting analyses on the distribution and abundance and the effects of a range of anthropogenic stressors on coastal marine mammal species.

2.4 I grew up in the Far North and have over 12 years' experience in conducting research on marine mammals along the north-east coast of Northland including in offshore habitat and in the Bay of Islands, Hauraki Gulf and more recently, Whangārei Harbour and Bream Bay.

Description of role taken for client, and when instructed

2.5 I have been engaged by Patuharakeke te iwi Trust as an expert on marine mammal science to provide a critical review of the applicants evidence to support the application for resource consent. I was initially engaged in September

2021 to support Patuharakeke's submission on the consent application. In June 2023, I was instructed to critically review the material presented by the applicant and council experts regarding the impact assessment of the proposed activity on marine mammals.

Code of Conduct

2.6 Although this is a Council hearing, I have read the Environment Court's Code of Conduct in the Practice Note 2023 and agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this statement of evidence are within my area of expertise.

Material reviewed

2.7 In preparing this evidence, I have reviewed the following material:

(a) Evidence of applicants – Appendix 14: Clements (2022) Potential effects of the proposed Northport Reclamation on marine mammals in the Whangārei Harbour region by Dr Diana Clement.

(b) Evidence of applications - Appendix 11 Assessment of Marine Ecological Effects (AMEE) by Shane Kelly and Carina Sim-Smith (2022).

(c) Evidence of applications - Appendix 25 Assessment of Underwater Noise Effects by Matt Pine (2022).

(d) The Northland Regional Council & Whangārei District Council Officer Report (s42A Planning Report).

(e) S42a planning report - Appendix 5. Technical memo – marine mammals by Helen McConnell (2023).

3. SCOPE OF EVIDENCE

3.1 In my evidence I will comment on:

(a) That the information used by Northport's expert to underpin the marine mammal impact assessment is inadequate and not fit for purpose.

(b) There is an omission of an appraisal of potential effects associated with increased shipping traffic in Bream Bay and Whangārei Harbour, with increased anthropogenic noise pollution from shipping being a key concern. A more thorough characterisation of potential cumulative effects is also warranted.

4. INADEQUACY OF INFORMATION

4.1 I do not agree that the available information on marine mammals for Whangārei Harbour/Bream Bay is adequate or in any way fit-for-purpose for informing the assessment of potential effects of the activity.

4.2 While the data sources may constitute the best available information at the time the application was lodged, the data sources nevertheless lack the necessary scope to make an informed assessment. While both Northport's evidence[1] and the s42a report concede there are issues with the main information/data sources for the area, Northport's evidence goes on to use these data to make claims concerning the importance of Whangārei Harbour and Bream Bay to various marine mammal species, and determine seasonality and habitat use patterns.

4.3 The s42A Report and associated appendix (Appendix 5) state that the sources are appropriate for providing a baseline on marine mammals within Whangārei Harbour

[1] Clement 2022 page 7

Bream Bay. McConnell (2023) states 'the use of multiple data sources that collate information on marine mammals throughout time is well recognised best practice'[2]. I agree with this statement, but it is only relevant when at least one of the data sources in question holds some robust information. The caveats associated with the data source that seems to be the most regularly used (DOC's National Marine Mammal Database) are identified within Clement (2022). Despite these caveats, it seems this database forms the basis for the majority of claims concerning the importance of Whangārei Harbour/Bream Bay, seasonality and habitat use[3].

4.4 McConnell (2023) does note the need for systematic surveys, yet in response to several submissions that raise concerns on the adequacy of available information on marine mammals, McConnell (2023) states that the approach is 'sufficient as multiple data sources spanning decades or more were used to successively establish a baseline of relative marine mammal occurrence'.

4.5 That statement suggests that multiple sources of actual 'data' confirm the lack of importance of the area for marine mammals when in reality the only data available are the opportunistic/anecdotal sightings and strandings information from the DOC databases. Other sources include research on marine mammals in other areas of the north-east of the North Island that contain no information on the relative importance of Whangārei Harbour/Bream Bay, as they did not undertake sampling in the area.

4.6 I do not agree that, because this information span multiple decades, that somehow validates the use of these

[2] McConnell (2023) page 4
[3] Clements (2022) Table 1

opportunistic datasets for evidence-based decision making. For example, the DOC sightings database has only two records of Orca in Whangārei Harbour made over several decades. In contrast, the opportunistic sightings log by Northport staff included nine sightings of Orca between 2019 and 2021. This discrepancy shows that there is not necessarily any additional value in the long-term nature of opportunistic sightings databases when attempting to establish a baseline for marine mammals. Specific comments on the biases associated with using the DOC sightings database for this purpose are given in section 5 below.

4.7 I note that the majority of assessments of environmental effects for other taxa utilised datasets collected directly for that purpose (e.g., marine ecology components; shellfish, fish etc[4]). I question why this was deemed unnecessary for marine mammals, with the impact assessment relying solely on inadequate, opportunistic information or information from outside of Whangārei Harbour/Bream Bay. It seems that in-situ acoustic monitoring data were collected for the Whangārei Harbour, and this is listed as a data sources in Clements (2022)[5]. These data would make a significant contribution to understanding the importance of the Whangārei Harbour for marine mammals, yet the results of the data collection are not presented or discussed. I note that McConnell (2023) raises the same question and states such data would be of 'additional value'[6]. In my view, in the absence of adequate information for the proposal area, the acoustic monitoring data should be fundamental to the marine mammal impact assessment and should be made

[4] Kelly and Sim-Smith (2022)
[5] Clements (2022) page 27
[6] McConnell (2023) page 4

available for a more robust characterisation of the severity of effects.

4.8 In recognition of the inadequacy of available data for providing a baseline on marine mammals for the area, a long-term, systematic survey programme has been commissioned on behalf of manawhenua. While the survey programme is still in the early stages, preliminary results indicate year-round presence of bottlenose dolphins, Bryde's whales and common dolphins – with evidence that the area is important for feeding. Sighting and acoustic detection rates for most species are comparatively high, especially in the wider Bream Bay area. This suggests that, contrary to the inadequate information presented in Clements (2022), the area is in fact important for several marine mammal species.

4.9 The underwater noise impacts associated with pile driving are well characterised. I do, however, question the interpretation of the modelling results to rank the severity of pile driving impacts. In my opinion, the available information on the frequency of occurrence of marine mammals precludes the ability to gauge severity.

4.10 In both the Clements (2022) and McConnell (2023) reports, there is a substantial omission of the potential effects of increased shipping on marine mammals in terms of increased noise pollution. There is also a significant lack of detail on the forecast increase in shipping traffic due to the increase in Northport's capacity. Other than the impacts of vessel strike, there are no considerations of the potential effects of the port operating at increased capacity. In addition to the increased anthropogenic noise pollution from increased vessel traffic, there may be ecological effects of noise pollution on potential prey (e.g., fish), and

destruction of benthic habitats (that may support prey) if there is likely to be increased use of the existing ship anchorages in Bream Bay (see below for more details). While the forecast increases in commercial shipping traffic do not seem to be provided, the s 42A Report notes that cruise ship traffic will increase to up to 30 ships per year[7]. Recent research in New Zealand has shown declines in the use of harbour environments by coastal dolphins is related to increasing cruise ship traffic[8]. Thus, at the very least, these potential effects warrant recognition and consideration.

4.11 While I agree that the mitigation options provided by the MMMP will likely reduce the impact associated with any adverse effects, there is still a lack of information with which to appropriately implement several mechanisms. For example, having seasonal[9] or diurnal restrictions on construction (i.e., piling activity) would rely on some robust information as to seasonal or diurnal patterns of occurrences for marine mammal species – information that is currently not available. Similarly, while the uptake of the Hauraki Guld Transit Protocol is commendable, good quality information on the spatial and temporal distribution of marine mammals and their overlap with shipping lanes would ensure the protocol is more effective and allow a more meaningful appraisal of the severity of the threat of vessel strike. Thus, the significant gaps in the baseline information of marine mammals for the area should be addressed to ensure mitigation is effective.

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[7] S 42a Report page 22
[8] Carome et al. (2022). A long-term shift in the summer distribution of Hector's dolphins is correlated with an increase in cruise ship tourism. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *32*(10), 1660-1674.
[9] Clements (2022) page 48

5. BIAS IN INFORMATION RELIED ON IN RESPECT OF SEASONALITY, OCCUPANCY AND FREQUENCY OF OCCURRENCE

5.1 I agree with the listing of particular species of interest for the Whangārei Harbour and wider Bream Bay area which rightly includes bottlenose dolphins, common dolphins, Orca and Bryde's whales. These are the most common species in coastal waters in north-east New Zealand.

5.2 I do not agree with the interpretation of information on 'patterns of seasonality' or occupancy/frequency of occurrence within Whāngarei Harbour/Bream Bay[10]. The data/information assessed provides no basis to arrive at these conclusions. For bottlenose dolphins, the author suggests 'occasional visits to Whāngarei /Bream Bay, with perhaps more over summer months'. For Bryde's whales, the author states the whales 'regularly move through Bream Bay between the Bay of Islands and the Hauraki Gulf hotspots'. The basis for these conclusions is not clear as references are not provided, however, I assume that the information underpinning these statements comes from comparing maps of opportunistic sightings from the Department of Conservations National Marine Mammal Database (Hendriks 2020) and/or from published studies on bottlenose dolphins elsewhere in north-eastern NZ.

5.3 The DOC database contains all reported sightings to the department from a range of sources including from the general public, research and industry (e.g., tourism, energy) groups. Locations with more people on the water to report sightings will have more sightings. The Bay of Islands and the Hauraki Gulf have established marine mammal tourism industries and a long history of marine mammal research, while Whāngarei Harbour/Bream Bay does not. Thus,

[10] Clements (2022) Table 1

sightings of marine mammals reported in the DOC database are unsurprisingly more frequent in these two locations compared to Whāngarei Harbour/Bream Bay.

5.4 Similarly, any statement as to the seasonality or spatial distribution within Whangarei Harbour/Bream Bay is subject to the same biases in the distribution of opportunistic sighting effort. For example, suggested higher occurrence of bottlenose dolphins during summer may be due to greater numbers of recreational vessels during this time. The bias in the available data precludes any meaningful inference on the importance of the Whangārei Harbour/Bream Bay compared to other areas along the north-east coast of Northland.

6. WHANGĀREI HARBOUR IS A UNIQUE HABITAT

6.1 I do not agree with the conclusion that Whangārei Harbour is not unique habitat for some marine mammal species of interest[11]. The harbour contains one of the largest estuarine environments in north-eastern New Zealand with substantial sand/mudflats, tidal channels and extensive biogenic habitats (seagrass, mangroves). These habitat characteristics likely favour high use by Orca, with the key prey of the species (sting-rays and eagle rays) being very abundant within these habitat types. As the author notes, both the proposed Northland Regional Plan and various Visser publications note the importance of Whangārei Harbour to Orca. However, the report goes on to state that 'Orca do not spend much time in any one location, and likely move in and out of the harbour'. I agree with this statement, however, the fact that Orca are not in the harbour on a daily basis does not diminish the potential importance of the area

[11] Clements page 15

for the species. In the absence of appropriate information to the contrary, expert knowledge from the leading Orca scientist in New Zealand is likely the best available information on the importance of the harbour to this species.

6.2 Clements 2022 states that 'based on current knowledge, the proposal area is not considered ecologically more significant in terms of feeding, resting or breeding habitats for any marine mammal species relative to other regions along the north-eastern coastline'[12]. I consider this statement to be misleading due to the fact there has not, until very recently, been any research to document the importance of this area for any species and the 'current knowledge' is thus inadequate as a basis for this statement. The area may well be critically important for a range of key behaviours; in the absence of adequate information a precautionary approach should be taken particularly given the endangered status of several species of interest in this area. Further, preliminary results for research underway suggest very high rates of feeding for several species and nursing of young for bottlenose and Bryde's whales.

6.3 The statement that the harbour is not ecologically unique is contradicted by the applicants' own evidence on the assessment of the ecological impacts of the application[13] and by the council's expert review[14]. Both reports recognise the unique and diverse suites of habitats provided by the harbour and comment on the areas' high biodiversity, factors that, in my opinion, are highly likely to contribute to the importance of the area for marine mammals.

[12] Clements (2022) page 15
[13] Kelly & Sim-Smith (2022) page 94
[14] Lohrer (2022) page 9

7. CONSTRUCTION EFFECTS

7.1 I am generally in agreement with the assessment of the effects of general construction.

7.2 I am in agreement with the acoustic propagation modelling and determination of zones of PSS and TSS and behavioural modification from pile driving. I do, however, have some concerns on the interpretation of this modelling that forms the assessment of effects of pile driving on marine mammals.

7.3 While I agree that the recommended management actions[15] will likely reduce the severity of effects of pile driving, one of the mitigating factors for this reduction is 'the harbour is not considered ecological important habitat'. As above, there is no basis for this statement given the available information.

7.4 Another mitigating factor states 'previous and current underwater acoustic monitoring confirm that several species visit Whangārei Harbour'. Marine mammal acoustic monitoring would go a long way towards resolving issues around baseline data adequacy, however the data are not presented anywhere within this report for review. Without explicit data on the importance of the harbour, designating the severity of impacts of pile driving is based on the information that is not fit-for-purpose.

8. EFFECTS OF INCREASED VESSEL TRAFFIC

8.1 Clements (2022) and McConnell (2023) completely omit any mention of potential impacts of increased vessel traffic other than vessel strike. Large container ships generate a significant amount of noise pollution and a wide body of

[15] Clements (2022) Table 5

research has demonstrated a range of impacts on marine mammal populations[16]. Increases in the volume of shipping by the proposed activity may increase anthropogenic noise and thus this should be considered as a potential impact on local marine mammal populations.

8.2 Additionally, if increases in ships anchoring in Bream Bay (as is current practise) will occur due to the proposed activity there should be some consideration of the ecological impacts of this practise on marine mammals (via disturbance of benthic habitat). Anchoring has recently been shown to have a significant impact on benthic ecosystems[17]. Further, there is a general scarcity of information on the forecast increases in shipping volumes and vessel traffic as a product of this application. The report states there may be some increases in the proportion of south-bound vessels turning to enter Whangārei Harbour, and that there may be increases in north-bound traffic transiting through Bream Bay. Given the potential impacts of increased noise and vessel strike (see below), it is important that actual data detailing the forecast increases in shipping are provided. Without this information, it is not possible to adequately determine the severity of potential impacts on marine mammals due to increased shipping.

8.3 The report correctly notes vessel strike as a potential impact on marine mammals, particularly for endangered Bryde's whales that have experienced impacts from this stressor in the Hauraki Gulf. I agree with the representation of this potential impact and the discussion of the contributing factors to its severity.

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[16] Erbe et al. (2019). The effects of ship noise on marine mammals—A review. *Frontiers in Marine Science*, *6*, 606.
[17] Watson et al. (2022). The footprint of ship anchoring on the seafloor. Scientific Reports 12 (1), 1-11

8.4 However, I do not agree with the spatial and temporal factors listed to determine the severity of vessel strike for the proposed activity.

8.5 The Clement (2022) report states 'migrating whales within Whangārei Harbour and the wider Bream Bay region as currently only 1–3 individual whales are sighted within these waters each year'[18]. However, stating the rate at which whales are encountered in Bream Bay based on opportunistic and anecdotal information as evidence for the lack of importance of the area is highly misleading. As I have discussed earlier, variation in the amount of opportunistic effort (i.e., boats on the water with inclinations to report sightings) is unknown both over time and spatially which prevents any meaningful inference from the sightings dataset used by Clements (2022).

8.6 The same issue is true for statements that 'migrating whales currently pass by the Hen and Chicken Islands'. The contention that the area is only used by 'migrating' Bryde's whales is unsubstantiated by any of the sources used in this report. The statement that whales 'only occur in the area for a limited time of the year' and 'remain for a day up to a week' also cannot be supported by the information used in this report. For the latter, it is not clear where the authors have obtained this information, as the sightings database (or any associated references) hold no information on the residency of individual Bryde's whales in Bream Bay. Preliminary data from recent systematic surveys of Bream Bay show, as expected, that Bryde's whales occur daily within the area, over all seasons, and are almost always engaged in foraging behaviour – often with juveniles/calves present. This new

[18] Clements (2022) page 40

information directly counters the spatial and temporal factors used to rank the severity of vessel strike.

9. OPERATIONAL LOSS AND POSSIBLE ENTANGLEMENTS

9.1 I am generally in agreement with the Clement (2022) report's conclusions on operational loss and possible entanglements.

10. EFFECTS ON MARINE MAMMALS IN THE HARBOUR

10.1 While I agree that the ecological effects on marine mammals from the proposed activities in the harbour are likely negligible, I feel that there should be some consideration of potential ecological effects of increased shipping traffic due to the expansion of the port. These may include increases in anchoring in Bream Bay (and associated impacts on seafloor habitat/prey), and increased anthropogenic noise from increased vessel traffic which can have consequences for fish (i.e., prey) populations.

10.2 Clements (2022) details cumulative impacts associated with noise pollution[19] only. I consider section to be too narrow in scope, an opinion also expressed by McConnell (2023)[20]. However, in addition to McConnell (2023) who rightly discusses stressors not associated with the proposal, I am also concerned about the potential for cumulative impacts from stressors that originate from the port expansion. Cumulative impacts from all potential stressors should be considered; vessel strike, noise pollution from increased vessel activity and pile driving, and any ecological effects. While I agree with the statement that underwater noise is not generally additive, this is only relevant for acoustic

[19] Clements (2022) page 42
[20] McConnell (2023) page 21

pollution omitted from sources within a similar vicinity to each other. Increases in vessel traffic due to the proposed activity will likely increase the spatial footprint of potentially disruptive noise pollution (i.e., if multiple vessels transit Bream Bay, or are at anchor at the same time). Thus, underwater noise can result in cumulative effects in the spatial extent of potential stressors.

11. SUMMARY OF REMAINING KEY CONCERNS WITH PROJECT

11.1 That the information used to build a baseline of marine mammal occurrence, habitat use and seasonality and to infer the importance of Whangārei Harbour/Bream Bay is not fit-for-purpose. Thus, several of the factors used to rank the severity of the potential effects are invalid. The lack of adequate information could be addressed by utilising the acoustic monitoring data that was reported to have been collected for Whangārei Harbour (but is not showcased anywhere in the Clements (2022) report). As mentioned above, recently collected systematic data that can be used to provide a robust baseline on marine mammals for Whangārei Harbour/Bream Bay is currently being collected. The applicant should continue to support this research as a monitoring programme to discern any potential impacts on species and to apply adaptive management where impacts are noted.

11.2 There needs to be an incorporation of assessment of potential effects on marine mammals from the increased operational capacity of the port. Such assessment will include increased anthropogenic noise due to increases in shipping and any additional use of ship-anchorages that may have negatively affect benthic habitats.

11.3 The MMMP needs to be underpinned by robust datasets on the occurrence/abundance, habitat use and seasonality of all marine mammal species of interest. This information is critical to the effectiveness of any mitigation of potential impacts.

11.4 Due to the inadequacy of information on marine mammal occurrence etc, the MMMP should include the additional interventions to ensure a precautionary approach to mitigation. The applicant should engage widely with the marine mammal research community and manawhenua on potential additional interventions.

Tom E. Brough

14 September 2023