

NORTHLAND REGIONAL COUNCIL

<p>Report and Decision of the Hearings Commissioners Meeting held at Toll Stadium, Whangārei and Takahiwai Marae on 26 February – 2 March and 13–14 March 2018 commencing at 9.00 a.m.</p>

Independent Hearings Commissioners Ms Sharon McGarry (Chair), Ms Sheena Tepania and Dr Rob Lieffering were appointed by the Northland Regional Council to hear and determine an application by the New Zealand Refining Company Limited for resource consents to deepen and realign the Whangārei Harbour and approaches. The application, made in accordance with the Resource Management Act 1991, was lodged with the Northland Regional Council on 31 August 2017 and referenced as NRC Application No. APP.037197.01.01.

Representations and Appearances

Applicant:

Mr C Simmons, Counsel, ChanceryGreen

Ms K Price, Counsel, ChanceryGreen

Mr S Post, Chief Executive Officer, RNZ

Mr D Martin, Business Opportunities Manager, RNZ

Mr G McNeill, Communications and External Affairs Manager, RNZ

Mr J Cross, Consulting Engineer, Royal HaskoningDHV

Dr B Beamsley, Senior Oceanographer and Project Director with MetOcean Solutions (NZ) Limited

Mr R Reinen-Hamill, Senior Coastal Engineer, Tonkin & Taylor Limited

Mr K Oldham, Risk Management Consultant, Navigatus Consulting Limited

Mr G Bermingham, Risk Management Consultant, Navigatus Consulting Limited

Dr D Clement, Marine Mammal Ecologist, Cawthron Institute

Mr G Don, Manager, Bioresearches Group Limited

Dr B Coffey, Chief Scientist, Brain T Coffey & Associates Limited

Dr B Stewart, Senior Environmental Scientist, Ryder Environmental Limited

Mr P Clough, Senior Economist, New Zealand Institute of Economic Research

Mr R Boyd, Principal Consultant, Boyd Fisheries Consultants Limited

Mr R Greenaway, Consultant Recreation and Tourism Researcher and Planner, Greenaway & Associates Limited

Mr A Coffin, Consultant, Te Onewa Consultants Limited

Mr G Kemble, Environmental Planner, Enspire Consulting Limited

Written Statements of Evidence received:

Mr S Brown, Landscape Architect, Brown New Zealand Limited

Mr J Styles, Acoustic Consultant, Styles Group

Dr M Pine, Acoustic Consultant, Styles Group

Dr R Clough, Heritage Consultant, Clough & Associates Limited

Submitters:

Patuharakeke Te Iwi Trust

- **Ms K Dixon**, Counsel, Dixon & Co Lawyers
- **Ms A Castle**, Counsel, Dixon & Co Lawyers
- **Dr S Mead**, Environmental Scientist, eCoast Limited
- **Mr G Paki**, Trustee
- **Mr R Shepherd**, Kaumatua
- **Ms J Chetham**, Trustee and author of the Cultural Values Assessment (CVA) and Cultural Effects Assessment (CEA)
- **Mr A Riwaka**, Te Ohu Kaimoana Trustee
- **Mr D Badham**, Senior Planner, Barker & Associates Limited

Ms R A Kawiti

Mr M Ruka

Bream Bay Coastal Care Trust - Ms R Hembry

Whānau of Henare Maki and Tuihau Elizabeth Pirihi – Mr D Milner

Bream Head Conservation Trust – Mr R Gates

Northland Chamber of Commerce – Mr T Collins

Air Zone Limited – Mr K Martin

McKay Limited & Maintenir Limited – Mr L Faithful

Dr B Pyle

Worley Parsons NZ Limited – Mr K Nutting and Mr T Kermahon

Rewarewa D Māori Incorporated and Pehiaweri Resource Management Group

- **Ms N Wakefield**

Northland Scallop Enhancement Company Limited – Mr O Wilson

Fisheries Inshore New Zealand – Mr O Wilson, Programmes Manager

Mr D R Lawson

Dr M Kepa

Mr A Tonks

Ruakaka Parish Residents & Ratepayers Association – Mr W Daniels

Ms W Kingi and Mr W Kanara

Ms M Hicks

Te Pouwhenua

- **Mr P Kitchen (Ringa Atawhai Trust)**
- **Mr D Dargaville**
- **Ms L Collier**
- **Mr K Tito**
- **Ms M Norris (Ringa Atawhai Trust and Whangārei Māori Executive Committee of Tai Tokerau Māori)**

Te Parawhau Hapū – Mr P Walker

Section 42A Reporting Officer:

Mr G Mortimer, Planning Consultant, Mortimer Consulting

Written Statements of Evidence received:

- **Mr R Griffiths**, Marine Research Specialist – Regulatory Services for the NRC

BACKGROUND AND PROCEDURAL MATTERS

1. This is the report and decision of independent Hearings Commissioners Ms Sharon McGarry (Chair), Dr Rob Lieffering and Ms Sheena Tepania. We were appointed by the Northland Regional Council (NRC or 'the Council') to hear and decide the application lodged by the New Zealand Refinery Company Limited (RNZ or 'the Applicant' or 'Refining NZ'), pursuant to the Resource Management Act 1991 (RMA or 'the Act'), for resource consents to deepen and realign the Whangārei Te Rerenga Parāoa/Whangārei Harbour entrance and approaches.
2. The hearing of these applications commenced at 9.00 a.m. on Monday 26 February 2018. Evidence was heard over the course of the week and the hearing was adjourned at 4.30 p.m. on Friday 2 March 2018. The hearing was held at Toll Stadium in Whangārei for four days and one hearing day was held at Takahiwai Marae (Wednesday 28 February 2018).
3. The hearing was reconvened for a further two hearing days on Tuesday 13 March 2018. The hearing was adjourned at 3.00 p.m. Wednesday 14 March 2018 to enable the provision of further information and the Applicant's written right of reply, including the revision of proposed consent conditions.
4. Prior to the hearing, a report was produced pursuant to section 42A of the RMA ('the Staff Report') by NRC's Reporting Officer, Mr Glenn Mortimer, a Consultant Planner. The Staff Report stated 'pre-lodgement versions' of the application reports were peer reviewed on behalf of the NRC by Dr Rob Bell (numerical modelling of wind, wave, current and sediment dynamics; physical effects; coastal processes; and dredging and disposal options), Dr Loher (marine ecology) and Dr Thompson (birds), all of whom are employed by the National Institute of Water and Atmospheric Research (**NIWA**). We requested copies of these independent peer reviews prior to the hearing. We also requested copies of the Cultural Values Assessment (**CVA**) and Cultural Effects Assessment (**CEA**) referred to in the Staff Report.
5. The Staff Report provided an analysis of the matters requiring consideration under the RMA and recommended the application should be granted, subject to addressing issues around the long-term stability of Mair Bank and the biota it supports (shellfish and birds). A suite of recommended consent conditions was appended to the Staff Report for our consideration.
6. Prior to the hearing, we issued a number of minutes addressing procedural matters and making directions to ensure a smooth hearing process.
7. The Staff Report, Applicant's evidence and submitter expert evidence was pre-circulated prior to the hearing in accordance with section 103B of the RMA. The application documentation, submissions, Staff Report and pre-circulated evidence was pre-read by us and we directed that it be 'taken as read' during the hearing¹.

¹ As provided for by section 41C(1)(b) of the RMA.

8. On 30 January 2018, we issued Minute #2 informing the parties that it had come to our attention that Mrs Robin Loeffering, Dr Loeffering's stepmother, was a trustee of the Bream Head Conservation Trust, a submitter. The Minute outlined the extent of Mrs Loeffering's involvement in the application process and sought comment from the parties. We also specifically sought the views of the Applicant and the NRC. Both the Applicant and Mr Stuart Savill, Consents Manager for the NRC, informed us that they had no objection to Dr Loeffering's continued appointment in light of the disclosed relationship. We received an email from one submitter, Dr Mere Kepa (dated 31 January 2018), stating she considered Dr Loeffering had a conflict of interest.
9. Having considered the views of Dr Loeffering, the Applicant, the NRC and Dr Kepa, we determined that the declaration of a family relationship with one of the nine trustees of the Bream Head Conservation Trust did not constitute a conflict of interest and that Dr Loeffering would remain on the Hearing Panel. We informed the parties of our decision in Minute #3 issued on 13 February 2018.
10. We received a Memorandum of Counsel on behalf of RNZ on 8 February 2018 seeking further directions and requesting that a number of witnesses be excused from attending the hearing. We responded to these matters in our Minute #4 (dated 16 February 2018) where we requested copies of the Applicant's peer reviews and indicated the need to schedule additional hearing days in the week beginning 12 March 2018. We also responded to a request from a submitter (dated 15 February 2018), Patuharakeke Te Iwi Trust Board (**PTB** or 'Patuharakeke'), to waive compliance with the time limit for the provision of expert evidence under section 37 of the RMA. We agreed to waive compliance, allowing two additional days.
11. We received a further request from Ms Dixon, on behalf of Patuharakeke, by email on 22 February 2018, requesting a further waiver of compliance and an additional one day extension for the provision of Mr Badham's statement of evidence due to a family emergency.
12. In both cases, having taken into account the matters set out in section 37A(1) of the Act, we determined to waive compliance with the set time limit for the provision of the submitter expert evidence. We note that during the hearing, Mr Simmons, Counsel for the Applicant, expressed concern that we had agreed to these waivers without seeking the Applicant's agreement. However, we note this is not a requirement under section 37A in order to waive compliance with a time limit, if special circumstances apply. We considered in both cases there were special circumstances. Overall, we are satisfied that no party has been prejudiced by us granting the waivers sought.
13. We received a joint statement of evidence from Messrs Mortimer and Kemble (the latter being the Applicant's planning expert) on 20 February 2018, addressing consent requirements, applicable planning instruments, and other planning matters.
14. At the commencement of the hearing, Ms Dixon tabled a Memorandum of Counsel on behalf of Patuharakeke in respect of expert conferencing. The Memorandum sought the removal of the joint witness statement from the record, recommencement of the expert conferencing with the inclusion of Mr Badham, and provision of an alternative joint witness statement of all three planning experts.

15. Having taken a brief adjournment to consider the Memorandum, we determined not to put aside the joint statement of evidence from Messrs Mortimer and Kemble. We noted that we had not directed expert conferencing and that nothing prevented ongoing discussion between the experts both before and during the hearing process. In our view, no party had been prejudiced by the provision of the joint statement. We considered Mr Badham would have the opportunity to address any matters raised in evidence during the hearing.
16. On Tuesday 27 February 2018, we received a letter from the Ngātiwai Trust Board (dated 23 February 2018) formally withdrawing its submission to the application and providing affected party written notice in relation to the project.
17. On 1 March 2018, we received a letter from Mr Hayden Edmonds, Chairman of the Ngātiwai Trust Board advising that the decision to withdraw its submission had been legally challenged and that the withdrawal was no longer applicable. We addressed this matter in Minute #6 (also dated 1 March 2018), where we advised the parties that the Ngātiwai Trust Board submission had been formally withdrawn.
18. We undertook a site visit on Saturday 3 March 2018. We viewed the lower Whangārei Harbour by boat, accompanied by Mr Laurence Walkinshaw (Regional Deputy Harbourmaster) and Mr Ross Watters (Maritime Officer), and from the surrounding land. We viewed the RNZ jetty and part of the Marsden Point Refinery ('the Refinery') facilities, accompanied by RNZ staff, Mr Peter Gubb, Mr Mike Swords and Mr Damian Southorn.
19. We issued Minute #7 on 29 March 2018 confirming the further information requested during the hearing, setting out timeframes for the provision of the further information and circulation of that material to the parties for written comment.
20. We received the further information and a set of revised volunteered consent conditions from the Applicant on 13 April 2018. We received further written comments from submitters on 30 April 2018 and an addendum to the Staff Report on 9 May 2018.
21. Counsel for RNZ provided a final written right of reply and a final revised set of proposed conditions on behalf of the Applicant on 31 May 2018. Attached to the right of reply was a statement of agreed points and unresolved issues in relation to turbidity monitoring from Mr Mortimer, Mr Griffiths and Dr Stewart dated 16 May 2018.
22. We formally closed the hearing on 13 June 2018.
23. On 2 July 2018, we extended the timeframe to issue this decision from 4 July to 18 July 2018 under section 37A of the RMA. We considered special circumstances applied given the scale and complexity of the technical issues involved in assessing the application.
24. We acknowledge all the parties' willingness to respond to our requests for further information, further revision of conditions, and responses to new information throughout the process. We consider the approach taken has greatly assisted us in fully understanding the technical evidence presented and determining appropriate consent conditions. We thank all the parties for their contributions in this regard. We also thank Ms Ali Sluys, the NRC's Hearings Administrator, for the assistance that she provided throughout the hearing process. We wish to thank those parties who attended the hearing and presented evidence.

25. Throughout this decision we have endeavoured to use both the Māori and English words the first time we use a word. For example – Whangārei Te Rerenga Parāoa/Whangārei Harbour. After the first use of a word we use either the Māori or English words interchangeably.

THE APPLICATION

26. The background to the Whangārei Harbour deepening and realignment project ('the project') is outlined in the application documentation² and the Staff Report, and is not repeated here. In summary, the Staff Report stated that the purpose of the application is to allow modification of the Whangārei Harbour entrance channel, via dredging, in order to increase the amount of crude oil that can be brought to the Refinery in Suezmax tankers. It outlined the project includes the following four main components:
- (a) Capital dredging of selected sites within the entrance channel and adjacent to the Refinery jetty, an area referred to as 'the jetty berth pocket' ('berth pocket');
 - (b) Periodic maintenance dredging of the channel and berth pocket to maintain water depth;
 - (c) Disposal of capital and maintenance dredging spoil at two locations, referred to as Disposal Area 1.2 and Disposal Area 3.2, both within Bream Bay; and
 - (d) Relocation of some existing navigation aids ('navaids') and installation of new navaids to facilitate safe passage of vessels.
27. The proposed activities and resource consents sought were summarised on page 1 of the Staff Report as follows:
- | | |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| APP.037197.01.01 | Capital dredging of the Whangārei Harbour entrance and approaches between the refinery jetty. |
| APP.037197.02.01 | Discharge decant water from a dredge hopper or barge into coastal waters as a result of capital dredging operations. |
| APP.037197.03.01 | Deposition of capital dredging spoil at two defined marine disposal sites within Bream Bay. |
| APP.037197.04.01 | Discharge of sediment and water associated with capital dredging spoil disposal at two defined marine disposal sites within Bream Bay. |
| APP.037197.05.01 | Removal of sand, shell and other capital dredging material from the coastal marine area for land-based disposal. |
| APP.037197.06.01 | Erection, placement, alteration, and maintenance and repair of navigation aids. |
| APP.037197.07.01 | Maintenance dredging of the Whangārei Harbour entrance and approaches between the refinery jetty. |
| APP.037197.08.01 | Discharge decant water from a dredge hopper or barge into coastal waters as a result of maintenance dredging operation. |
| APP.037197.09.01 | Deposition of maintenance dredging spoil at two defined marine disposal sites within Bream Bay. |
| APP.037197.10.01 | Discharge of sediment and water associated with maintenance dredging spoil disposal at two defined marine disposal sites within Bream Bay. |
| APP.037197.11.01 | Removal of sand, shell and other maintenance dredging material from the coastal marine area for land-based disposal. |

² Crude Shipping Project – Proposed Deepening and Realignment of the Whangārei Harbour Entrance and Approaches by Ryder (August 2017) Volumes 1-5 and section 92 response from Chancery Green dated 13 November 2017.

28. In the joint statement of evidence from Messers Mortimer and Kemble (dated 20 February 2018) it was agreed that separate consents are also required for:
- (a) the taking of coastal water associated with dredging activity; and
 - (b) discharges of contaminants into water associated with new navigation aid installation and the relocation of existing navigation aids.
29. Consent durations of 35 years are sought for all resource consents except those relating to the nav aids for which a duration of 25 years are sought.

REGIONAL PLAN RULES AFFECTED

30. The proposed activities are classified as follows under the operative Regional Coastal Plan for Northland (**RCP**):

Consent Type	For	Detail	Classification
Coastal Permit	<ul style="list-style-type: none"> Capital Dredging 	<ul style="list-style-type: none"> Capital dredging of an estimated 3,467,200 cubic metres of seabed within a M2MA (harbour channel) and 153,000 cubic metres within a M5MA (refinery berth pocket). 	<ul style="list-style-type: none"> Classified by Rule 31.4.8(g) of the RCP as a Discretionary Activity within a M2MA. Classified by Rule 31.7.8(b) of the RCP as a Discretionary Activity within a M5MA.
Coastal Permit	<ul style="list-style-type: none"> Discharge of sediments containing contaminants and water to water. 	<ul style="list-style-type: none"> Discharge of excess water to CMA from dredge hopper overflow during capital dredging operations. 	<ul style="list-style-type: none"> No applicable rule in the RCP for M2MA so a Discretionary Activity under RMA section 87B. Classified by Rule 31.7.12 of the RCP as a Permitted Activity within a M5MA.
Coastal Permit	<ul style="list-style-type: none"> Deposition of dredged spoil onto the seabed. 	<ul style="list-style-type: none"> Deposition of up to 3,620,200 cubic metres of capital dredging spoil disposal on the seabed at two selected sites. 	<ul style="list-style-type: none"> Classified by Rule 31.4.8(f) of the RCP as a Discretionary Activity.
Coastal Permit	<ul style="list-style-type: none"> Discharge of sediments containing contaminants and water to water. 	<ul style="list-style-type: none"> Discharge of dredge water to CMA associated with capital dredging spoil deposition. 	<ul style="list-style-type: none"> Classified by Rule 31.4.8(f) of the RCP as a Discretionary Activity.
Coastal Permit	<ul style="list-style-type: none"> Removal of sand, shell and other natural material from the CMA 	<ul style="list-style-type: none"> Disposal of capital dredging spoil to land-based site(s) 	<ul style="list-style-type: none"> Classified by Rule 31.4.11(b) of the RCP as a Discretionary Activity.
Coastal Permit	<ul style="list-style-type: none"> Erection, placement, alteration, and maintenance and repair of navigation aids. 	<ul style="list-style-type: none"> Relocation of nine existing navigation aids (channel marker buoys and fairway buoy). Erection or placement of five new navigation aids (two channel marker buoys, one cardinal beacon, and two lead lights). Modification of two existing lead lights. 	<ul style="list-style-type: none"> Classified by Rule 31.4.4(o) of the RCP as a Controlled Activity.

Consent Type	For	Detail	Classification
Coastal Permit	<ul style="list-style-type: none"> Maintenance Dredging 	<ul style="list-style-type: none"> Maintenance dredging within a M2MA (harbour channel) and a M5MA (refinery berth pocket). 	<ul style="list-style-type: none"> Classified by Rule 31.4.8(c) of the RCP as a Discretionary Activity within a M2MA. Classified by Rule 31.7.8(a) of the RCP as a Controlled Activity within a M5MA.
Coastal Permit	<ul style="list-style-type: none"> Discharge of sediments containing contaminants and water to water. 	<ul style="list-style-type: none"> Discharge of excess water to CMA from dredge hopper overflow during maintenance dredging operations. 	<ul style="list-style-type: none"> No applicable rule in the RCP for M2MA so a Discretionary Activity under RMA section 87B. Classified by Rule 31.7.12 of the RCP as a Permitted Activity within a M5MA.
Coastal Permit	<ul style="list-style-type: none"> Deposition of dredged spoil onto the seabed. 	<ul style="list-style-type: none"> Deposition of up to maintenance dredging spoil disposal on the seabed at two selected sites. 	<ul style="list-style-type: none"> Classified by Rule 31.4.8(f) of the RCP as a Discretionary Activity.
Coastal Permit	<ul style="list-style-type: none"> Discharge of sediments containing contaminants and water to water. 	<ul style="list-style-type: none"> Discharge of dredge water to CMA associated with maintenance dredging spoil deposition. 	<ul style="list-style-type: none"> Classified by Rule 31.4.8(f) of the RCP as a Discretionary Activity.
Coastal Permit	<ul style="list-style-type: none"> Removal of sand, shell and other natural material from the CMA 	<ul style="list-style-type: none"> Disposal of maintenance dredging spoil to land-based site(s). 	<ul style="list-style-type: none"> Classified by Rule 31.4.11(b) of the RCP as a Discretionary Activity.
Coastal Permit	<ul style="list-style-type: none"> Discharge of water and contaminants into water. 	<ul style="list-style-type: none"> Discharge of water and contaminants (comprising predominantly seabed material and construction materials) into water when installing new navigation aids and relocating existing navigation aids. 	<ul style="list-style-type: none"> No applicable rule in the RCP for M2MA so a Discretionary Activity under RMA section 87B.
Coastal Permit	<ul style="list-style-type: none"> Taking of coastal water 	<ul style="list-style-type: none"> Taking of sea water associated with maintenance dredging. 	<ul style="list-style-type: none"> Classified by Rule 31.4.7(d) of the RCP as a Discretionary Activity within a M2MA. Classified by Rule 31.7.7(b) of the RCP as a Discretionary Activity within a M5MA.

SITE DESCRIPTION

31. The general application site of the Whangārei Harbour is described in detail in the application documents. The Staff Report briefly described the following three main areas of interest:
- (a) The inner (harbour) channel area;
 - (b) The outer (Bream Bay) channel area; and
 - (c) Proposed dredge material Disposal Areas 1.2 and 3.2.

32. The Staff Report described the existing Refinery facilities, the Northport facilities (including the consents for future development held), nearby coastal settlements, Marsden and Mair Banks, Calliope Bank, Motukaroro (Passage) Island and the associated 26.2 hectare (**ha**) Whangārei Harbour Marine Reserve – Motukaroro ('Motukaroro Marine Reserve'), Home Point, Busby Head, the Bream Head Scenic Reserve, the Smugglers Bay loop track, and popular fishing areas along the existing channel.
33. The Staff Report noted the majority of the main channel area is zoned as 'Marine 2 (Conservation) Management Area' and that the area of the Refinery jetty (including the berth area) is zoned as 'Marine 5 (Port Facilities) Management Area' under the RCP. It noted that the Motukaroro Marine Reserve, Calliope Bank, Mair Bank and part of Marsden Bank, and the area north of the channel between Home Point and Busby Head are zoned as 'Marine 1 (Protection) Management Areas' (**M1MAs**) under the RCP. All of northern Bream Bay area is zoned as 'Marine 2 (Conservation) Management Area' under the RCP.
34. The Staff Report referred to the CVA³ and outlined the significance of Whangārei Te Rerenga Parāoa and the surrounding landscape to tangata whenua.

NOTIFICATION AND SUBMISSIONS

35. The application was publicly notified on 13 September 2017.
36. Fifty submissions were received. As noted above, the submission lodged by the Ngātiwai Trust Board was subsequently withdrawn. Of the remaining 49 submissions, 18 were in support of the applications, 29 were in opposition and two were neutral.
37. The Staff Report noted that reasons for the submissions in support included:
- (a) The project will have a range of positive effects for Whangārei and Northland.
 - (b) RNZ has consulted widely with regards to the application.
 - (c) RNZ has comprehensively assessed the effects associated with the project such that interested parties have sufficient information to understand potential effects on the environment and on themselves.
 - (d) Improved environmental performance through fewer ships (tankers) visiting the harbour and increases in navigational safety.
 - (e) Any adverse environmental effects of the project will be minor and acceptable.
 - (f) There are significant positive economic benefits including:
 - (i) Economic sustainability/retention of RNZ as a major employer and local business contractor within the region.
 - (ii) Potential benefit in cost savings from the use of bigger vessels which will assist the Refinery to remain competitive internationally and continue to contribute to the local economy.
 - (iii) Downstream spending as a result of the continued operation of the Refinery, and the jobs it creates.

³ Chetham, J. Patuharakeke Te Iwi Trust Board Incorporated. *Cultural Values Assessment Report: Refining NZ Ltd, Crude Freight Proposal*. Dated January 2015.

- (iv) Better opportunities for growth for RNZ and its suppliers.
 - (v) Enhancement of navigation safety for all commercial vessels accessing Whangārei Harbour.
 - (vi) There are a range of environmental initiatives which will result in overall positive outcomes for certain sensitive species and habitats.
38. The Staff Report noted that the principal cultural concerns raised by Māori submitters included (though not limited to):
- (a) Failure to include the CEA by PTB as part of the application and improper use of, and/or undue reliance upon, the peer review of the CEA.
 - (b) Conflict between the Māori worldview and the western worldview including lack of proper consideration of cultural effects such as the ability of tangata whenua to exercise kaitiakitanga and manaakitanga.
 - (c) Potential effects on existing Treaty of Waitangi Claims and applications for recognition of customary interests under the Marine and Coastal Area (Takutai Moana) Act 2011.
 - (d) Continued loss of mauri of Whangārei Te Rerenga Parāoa and Bream Bay.
 - (e) Effects on taonga within the harbour entrance area including shellfish beds, tohorā, marine mammals, seabirds and migrating eels.
 - (f) Potential for additional stress on traditional kaimoana (pipi) beds at Mair Bank – which are already known to be in decline – and the associated undermining of kaitiaki efforts to restore those beds.
 - (g) Disruptive effects on customary fishing activity undertaking using the guidance of maramataka (traditional Māori fishing calendar).
39. The Staff Report noted other concerns raised in submissions in opposition included:
- (a) Failure to take into account the long-term effects of climate change adaption on the future of the oil industry.
 - (b) Product consumers will not benefit from the cost-savings expected from the project.
 - (c) Potential for a general increase in shipping traffic using the harbour as a result of the channel deepening and realignment.
 - (d) Increased risks of oil spills or accidents as a result of using larger Suezmax tankers.
 - (e) Not convinced that effects will be minor, especially if actual effects should differ from those predicted by modelling.
 - (f) The lack of provision for adaptive management within the proposed monitoring should model predictions be found to be inaccurate.
 - (g) The proximity of the proposed dredging and dredging spoil disposal sites to Mair Bank, the Motukaroro Marine Reserve or other sensitive ecosystems.
 - (h) Inadequate consideration of alternative spoil disposal sites including land based options.
 - (i) Effects of the project on known local commercial and recreational fisheries including scallop beds and Three Mile Reef.
 - (j) Inadequate consultation with recreational fishers over the location and extent of local fishing activity and the potential effects, including economic effects, of the project on this.
 - (k) Effects of the 24/7 dredging activity on marine life and residents in nearby coastal settlements.

- (l) Impacts of sedimentation rates and associated effects appear understated as plumes will not be confined to main channel and the overall scale of the dredging operation is not taken into account.
 - (m) The application is contrary to Part 2 of the RMA, the New Zealand Coastal Policy Statement (**NZCPS**), and/or the RCP.
40. We were provided with, and have read copies of, all of the submissions received and consider these were accurately summarised in the Staff Report. We adopt that summary for the purposes of our decision as provided for by section 113(3)(b) of the RMA.

ASSESSMENT

41. In assessing the application, we have considered the application documentation, the Staff Report and technical reviews, the CVA and CEA, all submissions received and the evidence provided during the hearing process.
42. In addition to the statements of evidence and supplementary statements of evidence presented at the hearing, we requested copies of the following documents:
- (a) *'DNV GL Peer Review of 'Navigational Risk Assessment of Channel Design' (dated 13 February 2017) by Neil Pollock.*
 - (b) *'Review of Refining NZ Dredging Project Reports on Ecological Effects' (3 March 2017) by Brian Stewart, Ryder Consultants.*
 - (c) *'Peer Review Coastal Processes Assessments and Effects of the Crude Shipping Project Whangarei Harbour' (19 December 2016) by Professor Paul Kench, University of Auckland.*
 - (d) *'Investigation into the decline of pipi at Mair Bank, Whangarei Harbour' (June 2014) by James Williams and Terry Hume, NIWA.*
 - (e) *'Geomorphic change of an ebb-tidal delta: Mair Bank, Whangarei Harbour, New Zealand' (March 2011) by KM Morgan, PS Kench and RB Ford.*
 - (f) *'Whangarei District Council – Bream Bay Water Quality 2008-2009' (December 2009) by MWH.*
 - (g) *'State of the Environment Water Quality in the Whangarei Harbour 2000-2010' (October 2011) by Sophie Tweedle, Ricky Eyre, Richard Griffiths and Ana McRae.*
 - (h) *'Evaluating TSS/NTU Relationship for CAP, Refining NZ' (undated) by Dr Brian Stewart, Ryder Consulting.*
 - (i) *'Short-term Passive Underwater Acoustic Survey of Whangarei Harbour Entrance and Marsden Point: Preliminary Investigation' (dated 13 November 2015) by Matt Pine and Jon Styles.*
 - (j) Letter from Marsden Maritime Holdings Ltd, as owner of Motukaroro Island (dated 1 March 2018) agreeing in principle to RNZ installing and maintaining up to 24 nesting boxes and predator controls.
 - (k) Cawthron Report No. 2648 *'Review of the Northland Regional Council's Consent Conditions for Dredging'* by Donald Morrissey and Paul Barter dated February 2015.
 - (l) *'Assessment of Marine Ecological Effects Excluding Seabirds and Marine Mammals' (dated 15 August 2017) by Brian T Coffey and Associates Limited.*

- (m) *'Characterizing wave- and current- induced bottom shear stress: U.S. middle Atlantic continental shelf'* (14 December 2011) by P Soupy Dalyander, Bradford Butman, Christopher R Sherwood, Richard P Signell and John L Wilkin;
 - (n) *'Long-term morphological modelling of the Mouth of the Columbia River'* (19 January 2011) MSC Thesis by Emiel Moerman.
 - (o) *'Verification and Validation of the Coastal Modelling System'* Report 4, CMS-Flow: Sediment Transport and Morphology Change (December 2011) US Army Corps of Engineers.
 - (p) Northport Resource Consents.
 - (q) Memorandum of Understanding between the New Zealand Refining Company Limited and Patuharakeke.
 - (r) Environment Court substantive decision for resource consents for the Port of Tauranga dredging (*Te Runanga O Ngai Te Rangi Iwi Trust v Bay of Plenty Regional Council* [2011] NZEnvC 402).
 - (s) Environment Court further decision regarding conditions and jurisdictional issues for Port of Tauranga dredging (*Te Runanga O Ngai Te Rangi Iwi Trust v Bay of Plenty Regional Council* [2012] NZEnvC 197).
 - (t) High Court decision dismissing the appeal of the Environment Court decision for the Port of Tauranga dredging (*Nga Ruahine v Bay of Plenty Regional Council* [2012] NZHC 2407 (HC)).
43. We record that the findings we have made and the decision we have arrived at are based on all the evidence before us and our consideration of that material within the context of the statutory framework.

Status of the Resource Consents

44. The starting point for our assessment of the application is to determine the status of the proposed activities under the RCP and the proposed Regional Plan (**pRP**). There was agreement between Mr Mortimer, Mr Kemble and Mr Badham that the activities should be assessed under both the RCP and the pRP.
45. Mr Badham stated that the RCP pre-dates the superior planning instruments, the RPS and NZCPS, and that the pRP had been notified after the NZCPS and RPS came into force. He stated that the provisions of the pRP remain untested and subject to wide ranging submissions which have yet to be heard and, as such, substantial changes to them may result. For this reason, Mr Badham considered the provisions of the pRP should be afforded minimal weight in the assessment of the proposal.
46. Mr Kemble confirmed that his analysis of the pRP did not change the activity classification that applies to the bundled resource consent applications. Mr Mortimer concurred.
47. We agree that the proposed activities should be bundled and considered as **discretionary activities** under sections 104 and 104B of the RMA.

Statutory Considerations

48. Section 104(1) of the RMA states that, when considering an application for resource consent and any submissions received, we must, subject to Part 2 of the Act (which contains the Act's purpose and principles), have regard to-

- (a) *Any actual and potential effects on the environment of allowing the activity;*
 - (ab) *Any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment offset or compensate for any adverse effects on the environment that will or may result from allowing the activity;*
 - (b) *Any relevant provisions of a national environmental standard, other regulations, a national policy statement, a New Zealand coastal policy statement, a regional policy statement or a proposed regional policy statement, a plan or proposed plan; and*
 - (c) *Any other matters the consent authority considers relevant and reasonably necessary to determine the application.*
49. Section 104(2) of the RMA states that, when forming an opinion for the purposes of section 104(1)(a), we may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect. This is referred to as the application of the 'permitted baseline'. We agree with Mr Kemble and Mr Badham's recommendation to not apply any permitted baseline in this case.
50. Section 104(3)(a)(ii) states that we must not have regard to the effect on any person who has given written approval to the application. We record we have not, in making our decision, had regard to the effects of the project on Ngātiwai Trust Board as it provided its written approval during the course of the hearing as discussed earlier in our decision.
51. Section 104B of the RMA states that we may grant or refuse the application sought; and if granted we may impose conditions under section 108 of the Act.
52. Section 105 of the RMA states that, when considering section 15 RMA matters (discharges), we must, in addition to section 104(1), have regard to-
- (a) *The nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
 - (b) *The applicant's reason for the proposed choice; and*
 - (c) *Any possible alternative methods of discharge, including discharge to any other receiving environment.*
53. Section 107(1) of the RMA states that we are prevented from granting consent allowing any discharge into a receiving environment which would, after reasonable mixing, give rise to all or any of the following effects, unless the exceptions specified in section 107(2) apply⁴ -
- (c) *The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended material:*
 - (d) *Any conspicuous change in the colour or visual clarity:*
 - (e) *Any emission of objectionable odour:*
 - (f) *The rendering of fresh water unsuitable for consumption by farm animals:*

⁴ The exceptions being:

- (a) that exceptional circumstances justify the granting of the permit; or
- (b) that the discharge is of a temporary nature; or
- (c) that the discharge is associated with necessary maintenance work — and that it is consistent with the purpose of this Act to do so.

(g) *Any significant adverse effects on aquatic life.*

54. Our assessment of the application considers each of these sections of the RMA below.

SECTION 104(1)(a) – ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT

55. The project will result in various actual and potential effects on the environment. The more significant of these formed the basis of most of the submissions that were received by the NRC and the evidence presented to us. There were, however, some effects in respect of which we received evidence which was not contested. We briefly cover those in the following paragraphs before addressing the matters that were the focus of the hearing (i.e. the matters in contention) under separate effects headings.
56. We accept that any adverse effects on archaeological or heritage values will be minor, on the basis of the archaeological assessment undertaken by Dr Rod Clough and Mr Simon Bickler, included with the application (Application Volume 2, Annexure 2: Technical Report (n)) and the statement of evidence of Dr Clough. We note that Mr Mortimer agreed with these assessments and conclusions. Accordingly, we adopt the assessment in the Staff Report for the purposes of our decision as provided for by section 113(3)(b) of the RMA.
57. We considered the Applicant's landscape assessment (Application Volume 2, Annexure 2: Technical Report (m)), the statement of evidence and the rebuttal statement of evidence of Mr Brown, which concludes there will be a 'low level' of effect on the landscape, natural character and amenity values of Whangārei Harbour (including Mair Bank), Whangārei Heads and Bream Bay. We note Mr Mortimer agreed with this assessment and conclusion. Accordingly, we adopt the assessment and conclusion of the Staff Report for the purposes of our decision as provided for by section 113(3)(b) of the RMA.
58. We have considered the Applicant's assessment of environmental (airborne) noise effects (Application Volume 2, Annexure 2: Technical Report (h)) and the statement of evidence of Mr Styles in relation to terrestrial noise, including the draft Noise Management Plan. We note his recommendations are reflected in the proposed conditions. We also note the supplementary evidence of Mr Styles which addressed noise effects of two dredges operating simultaneously as opposed to a single dredge on which his initial assessments were based. Mr Mortimer agreed with this assessment and concluded that with the imposition of conditions and the implementation of a Noise Management Plan, the noise effects will be reasonable in terms of section 16 of the RMA and less than minor. Accordingly, we adopt the assessment and conclusion of the Staff Report for the purposes of our decision as provided for by section 113(3)(b) of the RMA.
59. We accept the Applicant's evidence presented that any adverse environmental effects associated with the removal and installation of nav aids will be very localised and of a very short duration. We note that these have been located to avoid impacts on rocky substrate and limit the footprint, by pre-constructing beacons and positioning them on the seafloor using a weighted tripod base. We agree that any adverse effects of the proposed nav aids in terms of removal and construction, and the occupation of space in the coastal marine area (**CMA**), will be minor. We accept the nav aids will reduce the likelihood of a shipping accident, thus having a positive effect by reducing the risk of oil spill.

60. On the basis of the evidence before us, we have focused our assessment on the following potential and actual environmental effects which formed the basis of much of the evidence presented during the hearing:
- Coastal processes;
 - Water quality;
 - Sediment plume modelling
 - Receiving water quality limits
 - Ecological values;
 - Benthic ecology
 - Fish
 - Birds
 - Marine mammals
 - Commercial fisheries;
 - Recreation and tourism;
 - Cultural values and relationships;
 - Navigation safety;
 - Oil spill risk;
 - Economics; and
 - Cumulative effects.
61. We consider each of these separately below.

Coastal Processes

62. Many submissions raised concern that the project will adversely affect coastal processes. Coastal processes are driven by a combination of wind, waves, and tidal currents, which in turn drive coastal sediment transport. The proposed dredging will result in changes in coastal processes within Bream Bay and the Whangārei Harbour. These relate to changes in the:
- wave environment;
 - tidal currents;
 - water level;
 - tidal flux; and
 - ebb tide delta, including Mair Bank.
63. The Applicant engaged MetOcean Solutions Limited (MetOcean) to develop a numerical model which was used to predict changes in the wave climate, tidal currents, water level, and tidal flux as a result of the proposed dredging and disposal of material – this model being referred to as the hydrodynamic model (Application Volume 2, Annexure 2: Technical Report (a)).

64. The hydrodynamic model was then used to predict the likely physical responses (changes) in the sediment transport within Bream Bay and Whangārei Harbour (Application Volume 2, Annexure 2: Technical Report (b)). This work included assessing the behaviour of the dredge material after it is disposed of at both Disposal Areas 1.2 and 3.2 (Application Volume 2, Annexure 2: Technical Report (c)).
65. Dr Beamsley, for the Applicant, described the model and confirmed that the consented but yet to be constructed Northport reclamation extension was included in the model setup.
66. The existing physical setting and coastal processes were comprehensively described in the AEE (Application Volume 2, Annexure 2: Technical Report (d)) and by Mr Reinen-Hamill, for the Applicant, in his evidence. Mr Reinen-Hamill stated the coastal processes are influenced by the wave climate on the open coast and tidal inlet processes affecting the localised open coast in Bream Bay and the lower reaches of the Whangārei Harbour. He stated the entrance to the harbour is stable, being controlled by the Whangārei Heads to the north and a large ebb tide delta to the south. He noted that there is a net longshore sediment transport on the open coast of Bream Bay but this is small in comparison to the sediment flux that enters and exits the harbour through tidal exchange.
67. Mr Reinen-Hamill stated that erosion rates at the open coastal beaches extending south of the ebb tide delta have been low over the past few decades. He stated there has been no significant change to the ebb tide delta below the 2 metre (m) depth contour over the past 76 years.
68. Mr Reinen-Hamill stated that Mair Bank, which is part of the shallower part of the ebb tide delta, has been dynamically stable with natural fluctuations in the surface topography in the order of ± 1 m vertically and ± 2 m horizontally over the past 76 years. However, over the past 16 years there appears to have been a northerly migration of sand towards and extending into the main harbour channel.
69. Dr Beamsley stated that the predicted change in wave heights from the dredged channel in average and moderate wave climate conditions was less than 0.02 m. Mr Reinen-Hamill stated that this was an order of magnitude less than the annual variability in mean wave heights over the 35 year hindcast of 0.31 m and no significant change to the average wave heights resulting from the placement of dredged material at the two proposed disposal sites is predicted.
70. Mr Reinen-Hamill stated the modelling showed that during extreme storm events there would be some localised channel refraction effect, which may result in slightly higher waves (0.1 to 0.3 m increase) breaking on the edge of Mair Bank and towards Busby Head. He stated that this is an order of magnitude less than the annual variability of 1.36 m for the 99% wave height currently experienced at these sites.
71. Mr Reinen-Hamill stated that the predicted effects of the dredging on tidal currents will be restricted to the channel in the vicinity of the harbour entrance and the ebb tide delta. He stated no changes to the regional scale hydrodynamics and no changes to water levels within the harbour are predicted, however, there will be a small shift in the tidal phase. In relation to this, Dr Beamsley stated that the mean tidal shift would be around seven minutes, of which five minutes was attributed to the consented, but yet to be constructed, Northport reclamation extension and two minutes attributed to the proposed dredging.

72. Mr Reinen-Hamill concluded that the dredging will result in a very small reduction in tidal velocities (less than 0.02 m/s) except along the channel between Marsden Point and Mair Bank, between Mair Bank and Home Point, and between Home Point and Busby Head where changes in the order of 0.1 m/s are predicted.
73. The Applicant engaged Professor Paul Kench of Auckland University to peer review two of MetOcean's reports (one on the establishment of the numerical model and the other on the predicted physical effects of the channel deepening and offshore disposal) as well as Tonkin and Taylor's coastal processes assessment report. Professor Kench concluded that –

'Collectively the three reports provide an integrated and detailed analysis of the coastal processes and geomorphic conditions of the Whangarei entrance system. The studies adopt leading modelling approaches and sound judgement in the application and interpretation. I consider the conclusions related to the impacts of the proposed dredging and channel realignment works to be sound and based on rigorous analysis and interpretation'.

74. Mr Reinen-Hamill stated that the project will remove material from the active part of the ebb tide delta and that the overall sediment budget of the delta will need to be managed to ensure the morphology of Mair Bank is maintained within historic recorded levels. To achieve this, the Applicant proposes to deposit a proportion of the dredge material (during both the capital and maintenance dredging) at Disposal Area 1.2 as this is within the active ebb tide delta and the material will, over time, migrate shoreward and then north towards Mair Bank. Mr Reinen-Hamill advised us that whilst there were uncertainties associated with this approach, he was confident that an adaptive management approach could be used to ensure effects would be acceptable. During the hearing he prepared and submitted a draft Replenishment Management Plan (**RMP**) which includes objectives, outcomes, and performance indicators for the disposal of material. The objectives of the RMP are stated as being:
- (a) To maintain the sediment budget of the active part of the ebb tide delta affected by the dredging activities;
 - (b) To manage sand levels and morphology of Mair Bank within historic recorded levels; and
 - (c) To have provision to increase the sediment budget to the active part of the ebb tide delta if required to assist in managing natural erosion cycles and possible climate change effects.
75. According to the draft RMP, the deposition of dredge material at Disposal Area 1.2 will be based on how the system responds to such deposition. It is a cyclical process, starting from clear objectives and outcomes, modified by evaluation and assessments of the effect of the activity.
76. Mr Mortimer agreed with the conclusions reached by Dr Beamsley and Mr Reinen-Hamill, but noted that he would assess the changes in wave climate as 'less than minor' rather than 'negligible'. Dr Bell, the NRC's expert technical reviewer on coastal processes, stated that the adaptive management approach outlined in the draft RMP is the best way to manage the disposal at Disposal Area 1.2 and align it with the fluctuations in the morphology of Mair Bank. Dr Bell made a number of suggestions in respect of the draft RMP, which the Applicant has agreed with.

77. Dr Mead, for the PTB, stated that many of the Applicant's conclusions are based on relative change (i.e. percentage difference) and he considered that they should relate to the physical processes that these changes have the potential to impact on. He considered this to be a major flaw in the interpretation of the modelling results.
78. Dr Mead disagreed with Mr Reinen-Hamill as to location of the tidal 'throat' of the Whangārei Harbour. Dr Mead considered the throat to be a line extending from the intertidal Mair Bank on one side and a shallow subtidal bank on the other (being the northwest end of Calliope Bank). Whereas, Mr Reinen-Hamill considered it to be the narrowest and deepest part of the lower Whangārei Harbour, being a line extending from Marsden Point to the rocky headland near the former Reotahi freezing works.
79. Dr Mead stated that removing 593,900 m³ of material from the throat area would likely increase the deposition within the Whangārei Harbour due to changes in tidal amplitude and the tidal phase shift. In answers to questions, Dr Mead stated that these changes could be significant but at this stage the magnitude of such effects are unknown. Mr Reinen-Hamill stated that, unlike many other harbour dredging operations in New Zealand and overseas, no material will be dredged from the tidal throat. That is, the project does not significantly modify the harbour entrance but deepens the harbour approaches within Bream Bay. As such, Mr Reinen-Hamill was of the opinion that the potential issues identified by Dr Mead, regarding increasing tidal prisms, are not likely and that this has been confirmed by the numeric modelling undertaken by MetOcean.
80. Dr Mead stated that there are obvious couplings between physical processes and marine ecology that are not well understood and advised us to proceed with caution until these are better understood for the areas potentially affected by the project. He stated that even small changes in morphology can lead to large changes in the overall system, including the ebb tide delta and, in particular, Mair Bank.
81. One of Dr Mead's greatest concerns relate to the dredging of the berth pocket. He advised us that the inner ebb tide delta, comprised of Mair and Marsden Banks, is an important biogenic feature and its stability has been attributed to the presence of shell material (both from shell-lag and dense beds of live pipi) which provides an armouring layer that protects underlying soft sediments. He stated that the berth pocket area represents '*a major distribution site for maturing pipi*' and that dredging material from this area, which is the active head of the alongshore transport pathway, may alter pipi recruitment at Mair Bank if the pipi population within the dredged area does not recover to pre-dredging densities. In answers to questions, Dr Mead stated that the physical/ecological processes in and around Mair Bank are not well understood and questioned whether the pocket could be dredged at the northern end of the Refinery jetty instead.
82. Mr Reinen-Hamill did not consider the berth pocket area to be the active head of alongshore sediment pathway but noted it is a depositional feature of the ebb tide shoal.
83. Mr Mortimer agreed with Dr Mead that the physical/ecological processes that affect Mair Bank are not well understood. He therefore recommended that further investigations of those relationships should be undertaken and preventative or remedial measures implemented, if required.

84. In the right of reply, the Applicant suggested that Mr Mortimer expects these investigations will be undertaken as part of the Benthic Ecology Management Plan (**BEMP**). However, Mr Mortimer's Staff Report addendum recommended that these investigations be undertaken in lieu of the Applicant's proposed investigations of Rauiri/Blacksmiths Creek. Accordingly, Mr Mortimer recommended that proposed Conditions 56 and 57 be reoriented to focus on understanding the physical/ecological dynamics and interrelationships of Mair Bank, as a matter of first priority before any other enhancement initiative.
85. Dr Mead stated that the objectives of the draft RMP are important as the Mair Bank/ebb tidal delta is an important control feature for the Whangārei Harbour entrance. He stated that the adaptive management methodology makes sense but noted that it is 'somewhat experimental' – meaning the location and size of Disposal Area 1.2 may not be the best to achieve the objectives.
86. Mr Milner, for the whānau of Henare and Tuihau Pirihi, also supported the use and implementation of the draft RMP to ensure effects on Mair Bank are avoided.

Findings – Coastal Processes

87. We find that the Applicant has demonstrated, using a comprehensive numeric model, that the proposed activities will result in, at worst, minor effects/changes in coastal processes.
88. We note that the predictions are based on the results of a numeric model and there is always an element of uncertainty associated with predicted effects that are made from the outputs of such models. In answers to questions, Mr Reinen-Hamill advised us that, in his opinion, the uncertainty associated with the model used for wind, wave, current, and sediment was small as such models have been shown to be reasonably accurate, but that more uncertainty exists in predicting the morphological effects/changes of the proposed dredging and disposal. Despite these uncertainties, we are satisfied, on the basis of the Applicant's evidence and the comments of the two peer reviewers that the predicted effects are based on leading modelling approaches and that rigorous analysis and interpretation of the outputs has occurred.
89. We find that managing the sediment budget of the active ebb tide delta through placement of dredge material at Disposal Area 1.2, both during the capital and maintenance dredging, is the most critical matter to ensure the morphology of Mair Bank is not altered beyond historic recorded levels. While we acknowledge there is some uncertainty in this regard, the experts all agree that the proposed adaptive management approach, as outlined in the draft RMP, is the best way to achieve this. We agree.
90. In respect of the potential effects of dredging of the berth pocket and its effects on pipi recruitment for Mair Bank, we find that this is a risk that requires further investigation. We agree with Mr Mortimer that this relationship should form part of specific investigations on the physical/ecological dynamics and interrelationships of Mair Bank. We have redrafted Conditions 56 to 59 accordingly to require further investigations to be undertaken to understand these relationships. Should these investigations confirm that the berth pocket is an important pipi recruitment area for Mair Bank then we find that the Applicant should mitigate/remedy these effects by, *inter alia*, reseedling of pipi on Mair Bank.

Water Quality

91. Suspended sediment release and turbidity effects are an inevitable consequence of dredging operations. Potential adverse effects associated with sediment disturbance and discharge relate to deposition of sediment on benthic communities and degraded water quality.
92. The Applicant's assessment of water quality effects relies on the sediment plume modelling undertaken by Dr Beamsley and the imposition of receiving water quality limits to protect ecological values. We consider sediment plume modelling and the proposed receiving water quality limits below. Effects on ecological values, including benthic communities are considered later in this decision.

Sediment Plume Modelling

93. As discussed in the Coastal Processes section (above), Dr Beamsley's evidence summarised the numerical modelling of wind, waves, hydrodynamic, sediment transport, dredge/disposal plumes, and the disposal grounds undertaken by the Applicant (Annexure 2: Technical Reports (a) and (b)). He modelled the dredge plumes and the disposal plumes separately. He stated that the discharge of sediment from the disposal results in two plumes – a dynamic plume and a passive plume. He explained that in the dynamic plume phase (which constitutes approximately 75% of the discharged material) sediment falls as a jet straight to the seabed with sediment settling quickly within a radial area of the release point. He noted the plume modelling undertaken examined the behaviour of the passive plume through the process of advection of the discharged material.
94. Dr Beamsley predicted the passive sediment plume dispersion for the dredging using the numerical model for different dredge types because the plume location within the water column and the relative magnitude of entrained sediment is dependent on the size and type of dredge used (Trailing Suction Hopper Dredge (**TSHD**), Cutter Suction Dredger (**CSD**) or Back Hoe Dredger (**BHD**)), the dredging mode (dredging versus overflow) and the characteristics of the sediment being dredged (grain size distribution, settling velocities and cohesiveness). He outlined different dredges were likely to be used for deepening the channel (most likely TSHD(s)) and the deepening of the berth pocket (most likely a CSD or BHD) and noted that the plumes for each were considered, including two TSHDs operating simultaneously. He noted that the plumes associated with a CSD or BHD would be less than those associated with a TSHD due to the fact that TSHDs included an overflow discharge whereas a CSD and BHD did not. However, he stated that the assessment undertaken is conservative (i.e. worst-case plume outcome) because it was based on a TSHD which did not have a 'green valve' fitted as not all dredges have them fitted. We discuss green valves in greater detail later in this decision.
95. In addition to probabilistic outcomes of plume dispersal, Dr Beamsley determined suspended sediment concentration (**SSC**) exceedance times (percentage of time a certain SSC is exceeded) by considering realistic dredge cycles for both large and small TSHDs (104 and 185 minutes respectively) for SSC exceedance of 12 mg/L, 50 mg/L and 100 mg/L. He stated that the extent of the plume was delineated at the 12 mg/L SSC threshold, which he considered was conservative based on the difference between the proposed Level 2 Response Limit (20 nephelometric turbidity units (**NTU**) averaged over 6 hours) and the 3 NTU background level (relying on the 1:1 NTU:SSC relationship used by Dr Stewart). Dr Beamsley stated that he relied on Dr Stewart's evidence in respect of the justification for these limits.

96. Dr Beamsley outlined that he had modelled nine different release locations, at three different release depths, along the length of the channel over a 6 month period; and at five sites at Disposal Area 3.2 over a 6 month period, and two additional discrete periods during strong west directed currents and two single month periods during winter and summer. Dr Beamsley did not initially model the effect of sediment plume dispersion at Disposal Area 1.2 due to the relatively shallow water and relatively high naturally occurring SSC associated with incident wave conditions. However, in response to concerns raised by submitters regarding potential adverse effects on shellfish, particularly scallops, he carried out further modelling for disposal of sediment at Disposal Area 1.2.
97. Dr Beamsley stated the modelling undertaken showed the largest dredging plume excursions are predicted where tidal current velocities are strongest, being adjacent to Home Point and to the north and east of Mair Bank, while smaller plumes are expected at the offshore extent of the channel. When considering overflow from a TSHD, he noted the maximum extension of the 12 mg/L SSC plume (over a 24 hour period) does not exceed 1,200 m at any of the sites examined and that all are constrained within the channel. He stated there was no evidence of plumes dispersing to adjacent beaches, sand banks, or M1MAs, including the Motukaroro Marine Reserve. He noted the overflow duration has a significant impact on the magnitude and extent of the plume, with longer overflow periods resulting in higher SSCs and an increased plume footprint.
98. Dr Beamsley considered the dredge disposal plumes at Disposal Area 3.2 will be typically short lived and not highly dispersive; typically extending along a northeast – southwest axis. He noted the expression of the plume at the water surface was expected to be minor, while mid water plumes were typically confined to within 500 m of the discharge point. He stated the largest near bed plume concentrations were predicted to the southwest of the disposal area, with modelling suggesting it is extremely unlikely that plumes will reach Three Mile Reef.
99. In relation to Disposal Area 1.2, Dr Beamsley expected disposal plume expression in the surface water level which he described as ‘less than minor’, while mid water plumes are typically confined to within 100 and 200 m of the point of discharge for a small and large dredge respectively. At the near bed level, plumes are typically confined to within approximately 300 m of the discharge point for both small and large dredges. He noted that the disposal of between 2.5–5% of the capital dredge volume and up to 100% of the maintenance dredge volume had been considered at Disposal Area 1.2.
100. In response to concerns raised by submitters regarding uncertainty in the plume modelling and the effects of a localised counter-clockwise eddy observed by yachtsmen between Home Point and Busby Head, Dr Beamsley confirmed the modelling outputs replicated this eddy and as such it had accounted for in the predicted dispersion of the dredging plumes.

Findings – Sediment Plume Modelling

101. In the Coastal Processes section (above) we found that the dominant physical oceanic and marine processes, at both regional and local scales, have been simulated through the application of industry standard numerical models based on published scientific methodologies and the background knowledge acquired from numerous previous numerical modelling studies. This numerical modelling underpins the sediment plume modelling undertaken by Dr Beamsley to predict the magnitude and extent of sediment behaviour from dredging and disposal activities within the receiving environment. Overall, we find the sediment plume modelling predictions undertaken have followed

best scientific practice, including sensitivity analysis of the effective fall velocity of the finest fraction (1 mm/s and 0.4 mm/s) and percentage of fines (5% and 10%) showing no significant effect on the resulting plume. We consider this addresses the risk of encountering material with more than 6% fines (the maximum measured in the sediment sampling undertaken).

102. We find that the seabed material to be disturbed and disposed of has been sufficiently sampled and analysed to describe its characteristics. We accept the material is generally comprised of medium and fine sands, with low fines (silts and clays) content; and that there are no contaminants present in concentrations in excess of the ANZECC (2000)⁵ Interim Sediment Quality Guidelines – Low (ISQG-Low).
103. We find the range of the types of dredges and the range of release location and simulation periods (including seasonality factors and variables such as wind and current) used are sufficiently representative of the proposed dredging within the footprint area and from the disposal of sediment at both disposal sites.

Receiving Water Quality Limits

104. Water quality impacts were a key concern of many submitters in opposition to the application. Submitters were concerned that the harbour waters are already under stress from increasing sediment inputs from land use activities in the catchment, stormwater discharge and other dredging activities.
105. Ms Chetham, for PTB, noted Dr Lohrer's comments on the Applicant's lack of analysis of the sensitivities of northern New Zealand marine benthic taxa (including pipi, cockles and various other types of macrofauna) to suspended and deposited sediments. She considered the evidence of Dr Coffey and the Staff Report essentially ignored the peer review.
106. Mr Tonks highlighted existing sediment discharges to the harbour from the surrounding catchments and the effect of dredging sediment on the northern bays and lower harbour.
107. Mrs Hicks stated that since 2015 there had been mass mobilisation of the sediment in the Ruakākā River estuary, which had increased deposition in Bream Bay and resulted in discolouration of much of the bay after heavy rain.
108. The evidence of Drs Stewart and Coffey, for the Applicant, addressed proposed receiving water quality limits based on three thresholds for total suspended solids (TSS)⁶ concentrations and turbidity values.
109. Dr Stewart said the RNZ turbidity sonde data showed the ambient turbidity in the harbour is around 3-5 NTU, with regular fluctuations associated with tidal flow reaching up to 10 NTU. He outlined laboratory and field trials he had undertaken to establish a relationship between NTU values and TSS concentration, which he considered was close to a 1:1 relationship.

⁵ Australian and New Zealand Environment and Conservation Council 2000.

⁶ TSS and Suspended Sediment Concentration (SSC) are used interchangeably throughout this decision as a measure of total sediment that is suspended in the water column. We have generally used the term as stated by each witness.

110. Dr Stewart said Dr Coffey had proposed a series of recommended turbidity thresholds based on his trial results, the RNZ turbidity sonde results and results from other dredging situations (Port of Tauranga and Port of Otago). Dr Stewart set out these recommended turbidity thresholds in Table 1 of his statement of evidence (dated 12 February 2018), which is reproduced below:

TABLE 1: Recommended turbidity thresholds (NTU for the dredging programme. A and D relate to 6-hour average of one-minute interval records from fixed turbidity meters, B, C and E relate to hand-held turbidity meter readings as per Figure 17 of the AEE (Adapted from Coffey 2017))

Location	Concern	Level 1 Threshold	Level 2 Threshold	Level 3 Threshold
A – Motukaroro Island Whangarei Marine Reserve Marine Management Area	Rocky Reef Taxa	15*	20*	25
B – Calliope Bank Marine 1 Management Area	Shellfish benthic invertebrates	15	20	35
C – Mair Bank Marine 1 Management Area	Shellfish benthic invertebrates	15	20	35
D – Home Point Marine 1 Management Area	Rocky Reef Taxa	15*	20*	25
E- Bream Bay including Three Mile Reef	Shellfish benthic invertebrates	20	25	40 (100** for Disposal Area 1.2)

* Provisionally based on RNZ data for location A between May and July 2017.

** based on Table 3-4 of Tonkin and Taylor 2017b.

111. Dr Stewart considered the suggested thresholds are '*...entirely reasonable and will ensure that the adjacent ecological communities are protected from adverse effects*' (pg. 18). He stated that, outside of the mixing zone, water quality will be maintained within the natural range and will not contravene the water quality standards specified in Appendix 4 of the RCP.
112. Dr Stewart provided further comment (dated 13 April 2018) in response to our Minute #7 addressing the rationale for turbidity monitoring, current data/research on effects of sedimentation on benthic organisms, an analysis of the recommended thresholds, alternatives considered, an analysis of the existing water quality data, the applicability of Cawthron Report No.2648 ('the Cawthron Report')⁷, a response to comments from Mr Griffiths of NRC, and proposed conditions.
113. Dr Stewart noted thresholds used in monitoring schemes are generally derived from a combination of environmental limits and ambient turbidity levels in conjunction with experience gained from other similar dredging operations. He noted 'considerable' work had been done overseas and 'some' work in New Zealand on the effects of high sediment concentrations on suspension feeding processes and benthic fauna. He said most data available are for bivalves and that there is a paucity of information relating to temperate reef dwelling organisms. He referred to literature searches undertaken by James *et al.* (2009)⁸ and Warren *et al.* (2014)⁹ and summarised this in his Table 1 (pg. 3-4). He outlined limited results of varying SSCs on bivalve species over a range of exposure times. He said that most seagrasses can survive moderate levels of

⁷ Morrissey, D. and Barter, P. (2015). *Review of Northland Regional Council's Consent Conditions for Dredging – Cawthron Report 2648*. Prepared for the Northland Regional Council by Cawthron Institute, Nelson.

⁸ James, M., Probert, K., Boyd, R. and Sagar, P. (2009). *Biological resource of Otago Harbour and offshore: assessment of effects of proposed dredging and disposal by Port Otago Ltd*. Client report HAM2008-152 prepared for Port Otago Lt by NIWA.

⁹ Warren, P., Sharp, D. and Guccione, D. (2016). *Rapid ecological assessment of sponge and associated marine communities post dredging in Tauranga Harbour entrance*. Report #2016-02-TGAH prepared for Refining New Zealand by the Toi Ohamai Institute of Technology.

sedimentation. He noted the potentially deleterious direct impacts of sedimentation for macroalgae and rocky shore communities are associated with settlement, recruitment, growth and survival, and indirect effects of loss of photosynthetic capacity from sedimentation, light reductions and potentially anoxia. He said coralline crusts were found to be unaffected by burial sand for a few months but that there was significant mortality of the sea lettuce *Ulva*. He noted recruitment for macroalgae such as *Macrocystis* and *Eklonia* relies on adequate light reaching the seabed; and that spring and summer is likely to be a critical period in recruitment. He concluded that the overall impacts on macroalgae are likely to be localised and described them as 'low to moderate', with recovery being in the short-term (less than one year), depending on the time of year when dredging takes place.

114. Dr Stewart set out the thresholds, operation responses and absolute environmental limits set for the Otago Harbour and Tauranga Harbour dredging operations in Table 2 and Table 3 (pg. 6-7 of further comments dated 13 April 2018). He noted the Port of Tauranga consent stipulated that turbidity shall not be greater than 15 NTU above the natural background level 200 m downstream of the dredging operation. He said these thresholds had been successful in protecting adjacent benthic communities from adverse effects attributable to dredging operations in Otago and Tauranga Harbours. He considered there were many similarities with this project and the Port of Otago and Port of Tauranga operations, and that therefore the proposed monitoring regimes and recommended thresholds are based on these with allowances for local conditions. He was confident the recommended thresholds in Table 4 fall well within the range of tolerances shown by species likely to be found around the entrance to the harbour and the wider Bream Bay environs; and noted the thresholds were more conservative given the use of a 1:1 NTU:TSS relationship and the fact the fines content is much lower – that is, the material that will be dredged is expected to settle more quickly and sedimentation will not be as widespread.
115. Dr Stewart noted the proposed verification of the 1:1 NTU:TSS relationship based on ambient TSS concentrations prior to commencing dredging operations and the current monitoring being undertaken. He noted that monitoring undertaken near the Motukaroro Marine Reserve suggested a mean turbidity of 3.1 NTU (10 May 2017 to 19 October 2017), compared to a mean turbidity of 1.33 NTU for the NRC data collected at the RNZ jetty (September 2004 to July 2016). He considered the NRC State of the Environment (SOE) data for the RNZ jetty had too few data points (n=9) to be considered robust or to establish a robust NTU:TSS relationship.
116. Overall, Dr Stewart concluded that the recommended thresholds in Table 4 (pg. 7 of further comments dated 13 April 2018) are robust and will provide appropriate protection for local benthic communities; and that, provided the responses required in the BEMP are adhered to, no adverse effects on adjacent rocky substrate communities are expected. He acknowledged that setting limits for environmental effects needs to accommodate the length of time conditions remain sub-optimal. He noted that exposure to elevated levels of sedimentation from the dredging operation will be sporadic and relatively short duration (no more than 1-3 days and generally in the order of a few hours) due to the dredger moving location, tidal changes and stoppages when the hopper is emptied. He highlighted temporal caps on exposure had now been proposed to limit the amount of time a threshold can be breached. He confirmed that he and Dr Coffey considered TSS concentrations up to Level 1 are well tolerated by rocky reef benthic organisms and that exposure at the Level 1 concentrations for up to 14 days will result in no adverse effects. He noted they also both believed that, due to high tidal currents around Motukaroro Island and Home Point, sediments will not settle for any significant duration and will likely be moved within one to two tidal cycles.

117. Dr Stewart stated RNZ favours the proposed monitoring regime and thresholds (over the alternative approaches recommended by Mr Griffiths in his comments dated 23 March 2018) as they lend themselves readily to real time data gathering and allow for rapid operational changes to be implemented should thresholds be breached. He recommended real time monitoring equipment should be located a minimum of 2 m below the water surface and attached to permanently fixed structures, with the location decided in consultation with the NRC. He noted that, in recognition that high clarity and amenity value are of high importance to recreational uses, and the importance of clarity to the transmission of light to benthic algae, RNZ also now proposes monitoring clarity using a Secchi disc (the results of which are referred to as 'Secchi depth'). He outlined the approach to monitoring visual clarity, as recommended in the Cawthron Report and noted RNZ rejected that approach on the following grounds:
- (a) It does not lend itself to practical, continuous, real-time data gathering and is difficult in open water, therefore severely limiting its value to operational management response;
 - (b) For real-time data gathering, a site-specific robust relationship between NTU and Secchi depth would need to be determined, and this is likely to be difficult given the NRC SOE monitoring data show an extremely poor correlation between NTU and Secchi depth;
 - (c) Due to the structure of the plume there is a high likelihood of both spatial and temporal variability when sampling the plume, depending on where and when readings are taken, leading to uncertainty with respect to the results obtained;
 - (d) It is not clear what responses would be triggered should a threshold be breached; and
 - (e) The NRC reference sites suggested are not suitable because they are too far removed and will likely not be representative of water upstream of the dredging operations.
118. Dr Stewart stated that while the approach of using TSS concentration percentiles to determine thresholds lends itself to real-time monitoring of turbidity (as a proxy for TSS concentrations), RNZ has rejected using percentiles for the following reasons:
- (a) The dataset for determining percentiles (i.e. the NRC SOE) is not robust enough to provide meaningful percentiles and there is no robust relationship in the dataset between NTU values and TSS concentrations;
 - (b) The bimonthly data collection (six measurements per year) is likely to miss many days of significant rainfall; and
 - (c) For a percentile approach to be valid, site-specific collection of continuous real time TSS concentration and turbidity data over a period of at least one year would be required.
119. Dr Stewart's Table 5 (pg. 15 further comment dated 13 April 2018) reproduced below showed the difference between the percentiles for RNZ sonde data¹⁰ and the NRC SOE data:

¹⁰ RNZ data with the data from the mis-calibrated sonde deleted.

	Median	Mean	80 th percentile	90 th percentile	95 th percentile
RNZ @ Motukaroro Island	1.89	3.1	3.8	5.3	7.6
NRC @ RNZ Jetty	1.02	1.39	1.71	3.13	4.26

120. Dr Stewart noted the suggested approach of using 'above ambient' NTU values relies on setting thresholds based on ambient NTU values plus an allowance for contributions from dredging operations. He said this approach had been used by the Port of Tauranga based on thresholds for local species (pipi and seagrass) and the Port of Lyttelton using modelling combined with ambient measurements to determine a 'total turbidity' trigger level for each location. He noted these approaches were similar to that used by the Port of Otago and to that originally proposed in the AEE to keep TSS concentrations (measured as NTU) below pre-determined thresholds using real time data. However, he said RNZ rejected this approach and the associated thresholds because the NTU:TSS relationships for Tauranga and Whangārei are expected to be quite different (with Tauranga having significantly greater proportions of silt), and the perceived high clarity of the ambient water in Bream Bay.
121. In relation to the statistical analyses of the NRC SOE dataset, Dr Stewart highlighted the 'relative paucity of the data points' when compared to the RNZ dataset; and that variations in NTU between sites reinforces the need for site-specific monitoring of parameters, particularly NTU.
122. Dr Stewart outlined the recommendation of the Cawthron Report to measurement of light attenuation in preference to turbidity. He noted that, while the report does not recommend guidelines based on turbidity or TSS concentration, such guidelines can be developed as site specific surrogates with cross-calibration with visual effects methods. He considered these parameters addressed optical effects as well as physical effects from suspended sediments or the subsequent effects of deposition. He noted the Cawthron Report also recommended a closed season from October to January (inclusive) in the lower harbour to protect the shellfish beds. However, he said he and Dr Coffey did not support this because of the anticipated level of sedimentation due to dredging and their confidence that effects on soft-bottom benthic fauna will be minor and/or transitory and coupled with monitoring and operational response, will protect nearby shellfish beds.
123. Dr Stewart noted that Mr Griffiths had combined data from Mair Bank, Marsden Point and Snake Bank to arrive at the recommended exceedance values. He considered they should have been derived from measurements obtained from water representative of the areas being worked by the dredge. He acknowledged there may be some seasonal bias in the RNZ sonde data and therefore recommended deployment for a full year before dredging commences, at least in the most ecologically sensitive areas. He considered the water quality standards (a) to (h) suggested by Mr Griffiths are not applicable given the thresholds proposed by RNZ and the clean nature (i.e. low concentration of fines) of the sediment being dredged. He noted that the thresholds proposed fall within the maximum 40 mg/L above background TSS concentration suggested in the Cawthron Report, except at the disposal site.
124. Mr Griffiths provided commentary on the proposed turbidity monitoring (dated 23 March 2018) at our request, following the adjournment of the hearing. He outlined the NRC SOE water quality monitoring undertaken at 16 sites in the harbour every two months since 2008. He noted that three different measures of water clarity are determined (turbidity, TSS concentration¹¹ and Secchi depth). He said that the results from the closest sites (Mair Bank, Marsden Point and Snake Bank) indicate water

¹¹ TSS concentrations have been measured since November 2014.

clarity in the vicinity of the proposed dredging is 'very good'. He noted that the local flora and fauna will have adapted to good water clarity (low concentrations of suspended solids) and may therefore be vulnerable to poor water clarity. He stated further analysis of the NRC SOE data from other sites in Whangārei Harbour, Bay of Islands, Kaipara Harbour and Mangawhai (including the more turbid tidal creek environments), indicated that turbidity values of more than 15 NTU are extremely rare occurrences.

125. Mr Griffiths considered the NRC's SOE dataset to be scientifically robust long-term data in and around the vicinity of the proposed dredging that could be used to develop trigger values. He noted the ANZECC (2000) guidelines outline the following preferred approach to deriving trigger values, in descending order:

- (1) Use of biological effects data;
- (2) Location reference data (mainly physical and chemical stressors); and
- (3) The tables of default values provided in the guideline document (least preferred).

126. Mr Griffiths noted that the ANZECC guidelines recommend trigger values for physical and chemical stressors for 'Condition 2' type ecosystems be defined in terms of the 80th percentile. He set out the percentiles for Mair Bank (separately), and Mair Bank, Marsden Point and Snake Bank (combined), for turbidity (NTU) and TSS concentrations in Table 1 and Table 2 of his commentary, as reproduced below:

TABLE 1: The 80th, 90th, 95th percentiles derived from reference data for turbidity

Site	Samples	80 th	90 th	95 th
Mair Bank	30	1.2	1.3	2.1
Mair Bank, Marsden Point and Snake Bank	90	1.6	2.5	2.7

TABLE 2: The 80th, 90th, 95th percentiles derived from reference data for suspended solids (mg/L)

Site	Samples	80 th	90 th	95 th
Mair Bank	18	8.76	13.2	15.6
Mair Bank, Marsden Point and Snake Bank	54	8.64	13	14.7

127. Mr Griffiths noted the results show that there is very little difference in turbidity or TSS concentrations between the three locations. He therefore recommended, for simplicity, one set of values for the six locations proposed in conditions and provided trigger values for three levels (if required) in his Table 3, based on the 80th, 90th and 95th percentiles for the combined sites in Table 1 and Table 2, as reproduced below:

TABLE 3: Recommended exceedance values based on reference data

Parameter	Level 1	Level 2	Level 3
Turbidity (NTU)	1.6	2.5	2.7
Total Suspended Solids mg/L	8.64	13	14.7

128. Given the turbidity values are very similar for each level, Mr Griffiths suggested this could be simplified to one exceedance level for each parameter (2.7 NTU for turbidity and 14.7 mg/L for TSS). In the event that either was exceeded, he considered dredging should cease in the current area and continue in a different area with the permission of the NRC's Compliance Manager.

129. Mr Griffiths suggested another approach would be to install an additional turbidity sensor at a control/reference site and specify a maximum allowable percentage change relative to the reference site. He noted this was the approach recommended in the Cawthron Report and the approach used in all other dredging consents issued by the NRC. He outlined sections of the Cawthron Report recommending no more than a 33% relative change to background water clarity at the time of monitoring for the middle and lower harbour to protect aesthetic water quality for contact recreation, and sensitive habitats and organisms (seagrass and shellfish beds, encrusted biota of rocky reef); and no more than a 20% relative change for Motukaroro Marine Reserve to protect a diverse and abundant fish fauna, macro algal beds and assemblages of filter feeding organisms. He set this out in Table 4 and suggested a suitable reference site could be located in the southern portion of Bream Bay towards Waipu Cove or within the harbour at Snake Bank.
130. Mr Griffiths recommended water quality limits for turbidity, TSS concentrations or Secchi depth should apply at the end of the mixing zone in order to protect ecological values and that these are set out in consent conditions. He highlighted the proposed conditions do not include water quality limits for the disposal of dredge material and that this activity is much higher risk than the dredging of the material. He recommended the suggested water quality limits should be applied to the disposal of dredge spoil and could repeat the standards for dredging.
131. Mr Griffiths highlighted that a 'closed season', being a period where no dredging was allowed, was a key recommendation of the Cawthron Report and that such a condition had been included on all other dredging consents issued since the Cawthron Report was published. He stated that a closed season from October to January (inclusive) was recommended for areas in the vicinity of Snake Bank, Rauiri/Blacksmiths Creek, the RNZ wharf (Marsden Point) and Mair Bank to protect shellfish beds. He therefore strongly recommended a condition be imposed to protect the values identified and to be consistent with other consents issued for dredging activities. He noted that the closed season coincided with the period of high recreational use where expectations for aesthetic values are at their highest. He outlined five other existing consents had closed season conditions imposed on them.
132. Mr Griffiths reviewed the RNZ sonde data. He noted that none of the three deployments had included summer months and therefore some seasonal bias is likely in the data. On the basis of the results, he questioned whether the instrument had been calibrated correctly in the second deployment and therefore ignored this data period. He presented the results of his analysis of the two deployments in Table 5 and Table 6, as reproduced below:

TABLE 5: The 80th, 90th, 95th percentiles derived from SONDE data between 10/05/2017 and 11/07/2017 for turbidity (NTU)

Site	Measurements	80 th	90 th	95 th
New Zealand Refinery Limited SONDE	5926	4.5	6.0	9.1

TABLE 6: The 80th, 90th, 95th percentiles derived from SONDE data between 15/09/2017 and 19/10/2017 for turbidity (NTU)

Site	Measurements	80 th	90 th	95 th
New Zealand Refinery Limited SONDE	2669	1.2	1.8	2.8

133. Mr Griffiths noted that this data also indicates that water clarity in the vicinity of the proposed activity is 'very good' and that turbidity values >15 NTU are very rare. He also noted that the results in Table 6 are very similar to the NRC's SOE long-term data set. He highlighted that the percentiles in Table 5, for the spring deployment are noticeably higher than the results in Table 6 and the NRC's dataset.
134. In his further comments included with the addendum to the Staff Report (dated 8 May 2018), Mr Griffiths noted the significant scale of the proposed dredging activity and the high value and sensitivity of the receiving environment. He considered the conditions associated with water clarity are of primary importance and that it is imperative these are robust and enforceable. He noted the Applicant's proposed conditions are more lenient than other dredging consents issued by the NRC. While he acknowledged the value of continuous real time turbidity monitoring, he outlined a number of shortcomings and pitfalls of the methods. He stated the NRC had considerable experience in deploying such monitoring equipment and noted it is a difficult and complex task. He highlighted the obvious errors in the RNZ turbidity data, suggesting an error when calibrating the sensors and the risk of sensor failure or equipment loss. He noted that dredge operators in Northland currently collect Secchi depth data on a daily basis and provide this to the NRC. He considered measuring Secchi depth had the advantage of being easy to undertake and instantly understood and interpreted by the dredge operator.
135. Mr Griffiths noted a number of problems with the proposed conditions relating to the NRC's ability to monitor and enforce the conditions, particularly in relation to response actions to trigger levels and timeframes for reporting breaches. He highlighted key differences in the proposed conditions and those documented for the Port of Otago and the Port of Tauranga.
136. Mr Griffiths strongly disagreed with Dr Stewart that the proposed thresholds for turbidity are robust and will provide adequate protection. He also disputed that the levels proposed fall within the range experienced by local benthic communities under ambient conditions. He considered both the NRC and RNZ data show ambient turbidity levels are significantly lower. He noted that using the RNZ sonde data, the 6 hour average only exceeded the proposed Level 1 threshold for Mair Bank (15 NTU) on 4 days (out of a total of 88 days) and that the rolling 6 hour average only breached the proposed Level 3 threshold (35 NTU) on 1 day out of 88 days. He noted during the final deployment (15 September to 19 October) the highest 6 hour rolling average was 8 NTU. He stated that this indicates the proposed thresholds occur very rarely.
137. Mr Griffiths noted RNZ's principal argument for the thresholds appears to be that they have been used successfully in consents issued for Port of Otago and Tauranga. However, he stated that, without knowing how frequently these thresholds were breached and what management responses were adopted, it is not possible to attribute the success of the activities to the threshold values imposed on those consents. He noted that the limited data provided by Dr Stewart suggested the thresholds were rarely breached and that this could have been because the thresholds were set too high. He considered the success of these cited dredging operations could have been as the result of local hydrodynamics, sediment characteristics and good operator practices, or a combination of these factors.

138. Mr Griffiths recommended that the proposed threshold levels be deleted and that the thresholds are set using the 80th, 90th and 95th percentiles determined for each location. However, he stated he still preferred the approach recommended in the Cawthron Report to use a control/reference site and base the exceedance value on a percentage change, as this had worked well for other dredging consents in Northland and it would be simpler to implement, monitor and enforce. He set out his recommended exceedance levels in Table 1 and potential locations of a reference site if this approach was adopted.
139. Mr Griffiths noted it was imperative for the NRC to have a mechanism to independently monitor the activity, as it does with all other dredging consents in Northland. He considered this ability to independently monitor the activity should include standards for water clarity, turbidity and TSS concentrations as conditions of consent and not as a schedule. He recommended wording for a water quality standard and noted this was the same as other recent consents for dredging issued by the NRC. He also re-iterated the recommendation in the Cawthron Report for a closed season and noted the significant planning and lead time required for the activity and the ability to work outside of the closed season. He considered Dr Stewart had provided limited evidence to reject the inclusion of a closed season on the consent.
140. Mr Mortimer outlined the further comment of Mr Griffiths and noted a number of recommended changes to the proposed conditions. While he had no fixed view on the inclusion of a closed season condition, he acknowledged this would ensure consistency with other dredging consents issued by the NRC and provide an additional safeguard, while still allowing eight months for the proposed dredging activity.
141. The statement of agreed points and unresolved issues in relation to turbidity signed by Dr Stewart and Messrs Mortimer and Griffiths (dated 16 May 2018) addressed the rationale for the proposed methodology for establishing turbidity thresholds, technical challenges in NTU:TSS relationship and interpretation of the NRC and RNZ data, the relevance of percentile thresholds and sensitivity of different receiving environments, appropriate management response for turbidity thresholds exceedance, and the basis for the suggested closed season. Overall, the experts remained unchanged in their views, as articulated separately. However, they noted all agreed that baseline data should be collected for 12 months prior to commencement regardless of the thresholds imposed. Mr Griffiths questioned the need for calculating a NTU:TSS relationship with a more simplified monitoring approach. While Dr Stewart was of the view that ratios may vary with location and that some areas are more sensitive than others. It was agreed that it would be beneficial to complete the dredging in the shortest possible timeframe without breaks.
142. In further comments, PTB supported the position of Mr Griffiths in relation to the need for more stringent water quality limits and the need for a closed season.
143. In the Applicant's right of reply, Mr Simmons submitted the TSS concentration limits proposed in Condition 104 (of the Applicant's final proposed conditions) are, almost in every case, much more conservative than the approach suggested by Mr Griffiths and Mr Mortimer, and more conservative than other New Zealand dredging projects such as Port of Otago and Port of Tauranga. He explained that if, after 12 months of monitoring TSS concentrations prior to commencement of the dredging, the proposed thresholds were found to be too conservative when considering natural variations, the TSS concentration thresholds would be adjusted upwards. He clarified RNZ is not proposing to revise the default TSS concentration thresholds down because RNZ's experts were of the view that the default TSS concentration thresholds are not expected to have any adverse effects on the receiving environment. He noted RNZ

had adopted an 'effects based' approach to determining default turbidity threshold levels based on expert advice and incorporating a level of conservatism, particularly with regard to the more sensitive receiving environments. He submitted the adoption of ambient percentiles as recommended by Mr Griffiths is not effects based and is not appropriate. He considered there was no sound resource management reason why turbidity should be restricted to a percentile of what is naturally occurring, when communities can tolerate higher levels without suffering adverse effects. He also submitted the percentile approach was not practicable if ambient turbidity levels are very low and a small change could trigger an exceedance.

144. In relation to the recommended imposition of a closed season by Mr Griffiths on the basis that such an approach has been imposed on other dredging consents issued by the NRC, Mr Simmons refuted there is any true precedent effect and did not agree that this constitutes an issue for plan integrity. He submitted a closed season would have significant implications for a dredge operator, not least the demobilisation and remobilisation of dredge plant at a cost of several million dollars. However, he noted that if we were to impose a closed season condition it should only apply over the traditional summer period and only to the inner harbour area because this area is subject to more recreational/social use during this part of the year. He highlighted the Applicant's final proposed conditions and submitted these are robust, stringent and comprehensive.

Findings – Receiving Water Quality Limits

145. The evidence presented to us shows there is considerable spatial and temporal variability in background water clarity, turbidity and TSS concentrations in different parts of the harbour, as highlighted by the Cawthron Report and the NRC's SOE dataset. However, we find that, based on the available data (including RNZ's sonde data), water quality in the lower harbour and the wider Bream Bay area is generally very good. We agree with Mr Griffiths that there are sufficient data in the NRC SOE dataset to be considered scientifically robust and to give a long-term picture of water quality. We also agree with Mr Griffiths that there is a good correlation between the SOE long-term data and the RNZ sonde data for the September-October deployment.
146. We also find that the available RNZ sonde data is not robust enough to establish any site-specific NTU:TSS relationship to allow for TSS concentration limits to be monitored using turbidity measurements. We agree that the collection of site-specific data over at least 12 months prior to the commencement of dredging is necessary to ensure a sufficiently robust dataset is available to establish whether a NTU:TSS relationship exists to enable the use of the two real time continuous turbidity recorders and hand held turbidity recorders as a surrogate for TSS concentration. We do not consider the preliminary work undertaken by Dr Stewart in establishing a 1:1 NTU:TSS relationship is robust given the limited nature of the testing undertaken and the relatively poor correlation shown. We have accordingly, not relied on the 1:1 NTU:TSS relationship in considering the RNZ NTU data and how this could reflect a TSS concentration limit. We have focused on ambient TSS concentrations in assessing the adequacy of the proposed TSS concentration limits.

147. We are satisfied that the Applicant has identified areas of the harbour that are particularly sensitive to any reduction in water quality based on ecological, cultural and recreational values. These are rocky reef areas around the Motukaroro Marine Reserve, the coastline from the Motukaroro Marine Reserve to Busby Head (including Home Point), and, in the wider Bream Bay, at Three Mile Reef. We find that the ecological, recreational and cultural significance of Marsden and Mair Banks, in conjunction with the importance of maintaining a viable shellfish population to the stability of Mair Bank, warrant affording these areas the same level of protection of water quality as the other M1MAs on the north side of the lower Whangārei Harbour.
148. We accept that fine sediments pose a much greater risk to benthic species and that the sediments to be disturbed have been shown to predominantly contain sand and a very small amount of fine sediment. The evidence of Dr Beamsley is that most of the sediment disturbed by the dredging operations will initially settle in the channel area given the low proportion of fine sediment. We find that areas removed from the dredge footprint and the disposal sites are unlikely to be affected by the dredging or disposal plumes and if they are, will be subject to relatively low and sporadic rates of sedimentation or suspended sediment concentrations.
149. As noted by Dr Stewart, there is, however, little available information on the effects of high TSS concentrations on temperate reef dwelling organisms and limited information on such effects on bivalves within the New Zealand species. There is very little guidance as to the rates of sedimentation or TSS concentrations that reef dwelling benthic flora and fauna can tolerate, or for how long they can tolerate exposure to increased TSS concentrations. Therefore, we find we have no evidence on the level of protection provided by the Applicant's proposed TSS concentration thresholds/triggers. The Applicant's evidence states adverse effects on the identified ecologically sensitive areas will be avoided (as required by the planning provisions), not minimised. We agree that this is the appropriate level of protection for M1MAs adjacent to the inner channel.
150. We note the closing submissions of Mr Simmons that '*...for many of the adjacent areas, a 'no effect' approach is not required*'. We agree. We find that the requirement to avoid effects (as opposed to minimise adverse effects) should apply to all dredging operations in close proximity to M1MAs, whereas effects are to be minimised at the outer channel areas (beyond Busby Point) and the dredge disposal sites.
151. We find that the default TSS concentrations in the Applicant's proposed Condition 104 are too high (as expressed as TSS concentration) based on the ambient NRC SOE dataset. These data indicate that TSS concentrations above 15 mg/L (the Applicant's proposed Level 1 threshold) occur infrequently and exist for only a short duration (i.e. occurring for less than 5% of the time); and that TSS concentrations of 25 mg/L (the Applicant's proposed Level 3 threshold) occur extremely rarely, if at all, and are likely to be above the 99th percentile statistic. We find that setting the TSS concentration limits at the Applicant's proposed default values, with the ability to adjust them upwards only, is untenable.
152. We have given little weight to justification of the NTU values proposed based on the fact they have been used elsewhere in New Zealand for three main reasons. Firstly, no evidence was provided to us to confirm what TSS concentrations were created by those dredging operations or what TSS concentrations the sensitive receptors there were subjected to during the operations. Secondly, we are required to consider the potential effects of this project on the existing environment of Whangārei Harbour, in the context of existing ambient water quality and protection of cultural, aesthetic, recreational and ecological values. Thirdly, we do not know the details of other

dredging operations in terms of ambient water quality, sediment nature and characteristics, operational controls implemented, or the level of protection of cultural and ecological values directed by the relevant planning documents in those parts of New Zealand. Furthermore, we understand turbidity as measured by NTU is complex and can be affected by environmental factors such as air bubbles, algae or plankton.

153. We find the Applicant's proposed TSS concentration limits are not, as asserted by Mr Simmons, more conservative than the approach suggested by Mr Griffiths for the NRC. This is shown in the table below using Mair Bank as an example:

Location	Level 1 Threshold	Level 2 Threshold	Level 3 Threshold
Condition 104 – Mair Bank Marine 1 Management Area	15	20	35
NRC SOE data Mair Bank	8.6 (80 th)	13 (90 th)	14.7 (95 th)

154. The above table clearly shows the Applicant's proposed default values are significantly higher (more than double in some cases) than the 80th, 90th and 95th percentiles for TSS concentration based on existing ambient water quality data at Mair Bank.
155. We also agree with Messrs Mortimer and Griffiths that the proposed three levels of thresholds are unnecessarily complex and that the proposed responses are unclear and inadequate for Levels 1 and 2. In our view, the Level 3 response will not avoid adverse effects given it only requires the dredging to cease, after an investigation is carried out, and it allows for the dredging to continue when levels fall below the Level 3 threshold '*at any monitoring station within 300 m of the activity*'. We find this is unacceptable given it does not require an immediate cease response and it would allow the dredging to continue potentially causing TSS concentrations of up to 24 or 34 mg/L (i.e. just below the thresholds) up to 300 m from the activity. In our view, this is not consistent with the requirement to avoid adverse effects on M1MAs outside the 100 m mixing zone.
156. We accept the Applicant's claims that these proposed default values are 'effects based' in terms that they are based on predicted sediment effects from the plume modelling. However, we do not accept the thresholds are 'effects based' in terms of avoiding and/or minimising adverse effects on ecologically important reef species, such as kelps, anemones and sponges that are sensitive to increased TSS concentrations. We are concerned that they do not take into consideration frequency or duration of exposure. Overall, we find the Applicant has not made its case for the proposed three level thresholds of TSS concentrations. For this reason, we agree with Mr Griffiths that thresholds should be based on either the 80th, 90th and 95th percentiles of the 12 month baseline data that will be collected, as a three tiered limit; or alternatively a more simplified approach of setting a single upper threshold limit, being the 95th percentile TSS concentrations naturally experienced.
157. We prefer the simplified approach of setting a single upper TSS concentration limit at the edge of the zone of reasonable mixing based on the 95th percentile. This approach would apply to all dredging in close proximity to any M1MAs, with a requirement to cease dredging operations if that TSS concentration limit is breached. This approach provides for an immediate operational response to avoid unacceptable adverse effects outside the 100 m zone of mixing. We consider the Applicant should take immediate steps to assess the likely cause of the breach and to determine operational actions required to rectify the breach. The Applicant should notify the NRC and the KG within 24 hours of any breach and inform them of any operational responses taken to rectify the breach. We consider that in these circumstances, dredging operations should be able to continue at another location (away from where the breach occurred) or at the

site of the breach during periods when tidal flow directs sediment away from the sensitive receptor area(s).

158. In order to avoid adverse effects on ecologically sensitive M1MAs bordering both sides of the inner dredge channel and berth pocket, we consider the 'default' TSS concentration limit should be 15 mg/L, this being based on the combined 95th percentile for Marsden Point, Mair Bank and Snake Bank from the NRC SOE data, outside the proposed 100 m mixing zone. For simplicity of monitoring and operational practicality, we consider this limit should apply to all dredging activity occurring in the inner channel (including the berth pocket), as defined as the channel areas north of the line between No. 6 and No. 3 channel buoys. We consider daily measurements using a hand held turbidity recorder when the dredge is operating at the closest point (for that day) to any M1MA (i.e. when risk to any M1MAs is highest), is warranted and appropriate. We note Dr Stewart considered there was a degree of uncertainty with hand held meters, but agreed readings are useful to give immediate monitoring feedback to operators and to validate the sediment plume modelling.
159. In addition, we agree that continuous turbidity recorders should be positioned in close proximity to the inner M1MA boundary at Motukaroro Island and outer M1MA boundary at Busby Head. We consider Busby Head is preferable to Home Point given its proximity to the identified sections of the channel where dredging is proposed. We note there is very little dredging proposed which could potentially affect water quality around Home Point.
160. We consider the 'default' TSS concentration limits for dredging the outer channel (south of the line between the No. 6 and No. 3 channel buoys) and at both Disposal Areas 1.2 and 3.2 should be 20 mg/L, outside the proposed 300 m zone of reasonable mixing. We agree this can be monitored by hand held turbidity recorders using the daily mean of three measurements taken 300 m downstream (current) of the dredge spoil discharge point, within no less than 15 minutes and no more than 30 minutes after completing the disposal.
161. Given the separation distance between Disposal Area 3.2 and Three Mile Reef, the TSS concentration limit imposed at the disposal sites, the evidence of Dr Beamsley, and the fact that no continuous monitoring is proposed at Three Mile Reef, we do not consider it is necessary to monitor turbidity using a hand held meter at Three Mile Reef during disposal operations. We do not consider this would provide any meaningful information in terms of monitoring sediment effects.
162. We find the 'default' TSS concentration limits imposed should be able to be increased if the 95th percentile derived from the proposed 12 months of baseline water quality monitoring is in fact greater than the imposed default concentrations. We consider such an increase should only be made if the NRC agrees the 12 month baseline data is robust and of sufficient quality on the basis of a report from a suitably qualified independent person.
163. We find that use of the 95th percentile statistic for the TSS concentration limit for dredging in the inner harbour, rather than the 80th percentile recommended in the Cawthron Report, allows for the dredging related increase in TSS concentrations, while recognising that the dredge related sediment plumes will occur in intermittent pulses and will not occur continuously in one location.

164. The Cawthron Report notes that the preference of MfE (1994) is for measurement of optical quality over measurement of turbidity or TSS concentration based on greater precision, ease of use and cost effectiveness. The report also notes that the ANZECC (2000) guidelines are consistent with this approach and that a move towards measurement of light attenuation in preference to turbidity is recommended. The Cawthron Report suggests that water clarity should be the primary guideline variable. We agree.
165. Dr Stewart outlined the reasons why RNZ prefers continuous real time turbidity monitoring over the Cawthron Report recommendation of visual clarity monitoring, which is the approach favoured by Messrs Griffiths and Mortimer. We have considered these reasons and agree that visual clarity monitoring does not lend itself to continuous, real time data gathering and that it can be difficult in open water locations. However, the sites where the protection of visual clarity is most critical are located close to the shore and inside the harbour entrance. We do not agree that it is not practical to undertake regular visual clarity monitoring when the dredge is operating at the closest point to the identified sensitive receptor sites (i.e. within 100 m of the shoreline). We agree there will be spatial and temporal variability in the sediment plume, which is why visual clarity monitoring should be undertaken daily when the dredge is operating in close proximity to sensitive sites and when the tide is directing the sediment plume towards the M1MAs. We consider it is during these 'worst case operating conditions' when the risk to ecological values is greatest and the effect on water clarity should be monitored by way of measurements of Secchi depth.
166. We consider daily monitoring of water clarity by measuring the Secchi depth is appropriate if the dredge is operating within the inner channel (which we define in paragraph 158 above) and weekly monitoring is appropriate during outer channel dredging and at both the disposal sites. This recognises the greater risk posed to M1MAs during dredging operations in the inner harbour. We agree with Mr Griffiths that the appropriate level of acceptable change for water clarity is 20% for the inner channel dredging, outside the 100 m mixing zone; and 33% for the outer channel dredging and disposal sites, outside of the 300 m mixing zone. We find the water quality standards set out in Schedule 3 and 4 should be included as conditions. Mr Griffiths recommended a 33% change for Mair Bank and Calliope Banks' M1MAs, however, as discussed above, we consider the cultural and ecological significance of Mair and Marsden Banks justify the need for the same level of protection for all M1MAs.
167. We find that determining whether a robust, site specific, NTU:TSS relationship exists is very important if measuring turbidity (as NTU) is able to be used as a proxy for TSS concentrations, thereby enabling real time continuous turbidity monitoring and use of hand held turbidity meters for compliance purposes. We accept this has been done elsewhere nationally and internationally. We agree that a site-specific validation process can be used to set an appropriate NTU value based on the default TSS concentration limits of 15 mg/L for the inner channel dredging; and 20 mg/L for the outer channel dredging and both the disposal sites. We consider this will require at least 12 months of baseline water sampling measuring TSS concentrations and turbidity at the two locations of the real time continuous turbidity recorders, both disposal sites, and at Mair Bank.
168. We are satisfied that the NRC have the ability to independently monitor compliance with the conditions of consent, including undertaking independent water quality monitoring, without the need for a specific condition.

169. Overall, we find that the imposition of water quality standards (TSS concentration limits and allowable water clarity changes) in the receiving waters, as outlined above, can avoid adverse effects on ecologically significant M1MAs and will mitigate significant adverse effects on the coastal marine area.
170. We consider the need for a closed season for dredging in relation to sections on the effects on benthic ecology and recreation below.

Ecological Effects

171. Effects on ecological values were a key concern identified in the CEA and raised by many submitters in opposition to the application, including the Department of Conservation (**DoC**), Dr Kepa, Ruakaka Parish Residents and Ratepayers Association, Ms Bruce-Kingi, Te Parawhau, Rewarewa D Māori Incorporated and Pehiaweri Resource Management Group, the Northland Conservation Board, the Bream Head Conservation Trust, the Bream Bay Coastal Care Trust, the Whangārei Harbour Marine Reserve Advisory Committee, the Northland Scallop Enhancement Company Limited, Dr Pyle, PTB, Mr Lawson, Fisheries Inshore New Zealand Limited (**FINZ**), Mr Tana, the whānau of Henare and Tuihau Pirihi, Mr Modrich, Mrs Hicks and Mr Tonks.
172. A number of submitters gave evidence on the deterioration in water quality and the decline of kaimoana species in the harbour over the last 20 years.
173. The application included a number of assessments of the actual and potential effects on ecology, including benthic communities, marine mammals, coastal birds, and commercial fishing. For clarity, we have considered these separately below. We record that our findings on ecological effects are directly linked to our findings on the water quality addressed above, which, in turn, are linked to our findings on coastal processes also addressed above.
174. We note the evidence of Dr Coffey that any adverse effects on plankton are expected to be negligible. There was no evidence presented by any parties challenging this conclusion. We accept any impact on plankton is likely to be localised and transient, with the imposition of water quality limits after reasonable mixing.
175. We also note the evidence of Dr Coffey in relation to any effect on the risk of algal blooms in Whangārei Harbour. Dr Coffey was of the view that historical restrictions on dredging in summer to reduce the risk of algal bloom were unwarranted. Again, we have no evidence to contradict this and so accept his conclusions in this regard.
176. We address ecological effects in relation to benthic ecology, fish and marine mammals separately below.

Benthic Ecology

177. Adverse effects on benthic communities are a key concern of many submitters. Concerns were raised regarding the loss of the benthic communities in the dredge footprint and disposal areas; and the adverse effects of the sediment plume on benthic communities adjacent to the dredges footprint and disposal areas.
178. Mr Ruka emphasised the importance of the harbour and the wider Bream Bay area as a food basket for tangata whenua and the local community.

179. Mr Lawson expressed concern for ecological communities from dredge spoil disposal. He highlighted the devastation he had observed to benthic communities in the Rakino Channel (Auckland) after the disposal of material from dredging Halfmoon Bay.
180. Mr Milner raised concerns about impacts of fine sediment on the recruitment of kaimoana species (scallops and pipi) and impacts on Calliope Bank, Three Mile Reef and Urquharts Bay. He also highlighted the importance and significance of the scallop fishery in Bream Bay (commercial fishery) and Urquharts Bay (customary and recreational scallop beds).
181. Ms Rawiti-Tana noted it had been over 30 years since she had eaten any pipi from Whangārei Harbour and that the shells had gone blue.
182. Mr Kitchen, for Ringa Atawhai, noted that pipi were all but gone and scallops are decreasing. He emphasised the importance of manawa/mangroves for fish breeding and the need to understand the linkages and to work with the land.
183. Mr Dargaville and Ms Tito, for Te Parawhau, noted the decline of pipi and scallops since the Refinery had been established. They noted Mair Bank had changed and the pipi population had been decimated.
184. Ms Hembry highlighted the ongoing decimation of the pipi beds in Whangārei Harbour and the greater Bream Bay area, and the loss of access from the Northport development and the Marsden Cove marina.
185. Ms Wakefield, for Rewarewa D Māori Incorporated and Pehiaweri Resource Management Group, emphasised the ongoing loss of access to kaimoana in the harbour and significant reduction and degradation of shellfish beds. She said the project is a continuation of putting the harbour at risk and that the effects are unknown and irreversible.
186. Dr Pyle noted the extremely long-term effects of the project and cumulative effects on the availability of seafood.
187. Dr Kepa, the Bream Head Conservation Trust, Mr Tana and the whānau of Henare and Tuihau Pirihi, raised concern that invasive species would colonise disturbed areas displacing endemic species and changing benthic community structure.
188. Ms Kawiti-Tana emphasised the decline of kaimoana species (particularly pipi and cockles) and the impact this is having on the health and well-being of her whānau. She spoke of the healing powers of kaimoana and the importance of having access to healthy seafood.
189. Ms Chetham highlighted the total loss of benthic communities within the dredge footprint and the disposal areas and that this represents a loss of mauri that cannot be mitigated. She noted the importance of these communities as food for taonga species and that while these may eventually recover, if not affected by ongoing maintenance dredging, the effect is unacceptable.

190. Ms Chetham showed a video at the hearing of the movement of juvenile pipi in the swash channel between Marsden and Mair Banks, and of green-lipped mussel beds. She explained that the placement of a rāhui over Mair Bank had taken a long time with the Ministry for Primary Industries (MPI) processes. She doubted overharvesting was the key issue in the decline in pipi. She emphasised that Marsden and Mair Banks are key priorities for iwi because they are seen as the last bastion of shellfish beds in the harbour. She emphasised how little is known about the biology of pipi.
191. Dr Mead emphasised the massive decline in live pipi in 2014 and the importance of both live pipi and shell lag in the stability of Mair Bank. He said –
- ‘In recent years there has also been a diminishing intertidal habitat area on the Marsden bank that could well be a factor in the decline of pipi on the bank and the inner harbour pipi beds are no longer viable due to the port construction in the past – it has been suggested that encroachment into the channel by the port reclamation has influenced erosion and accretion around the Marsden spit (e.g. Barnett, 1993), since it interrupts the eastward-directed sediment transport pathway (Figures 9 and 6). In my view, these components are all interrelated, and the relationships between the physical processes and biological factors of the banks need to be better understood in order to properly consider the potential impacts.’ (EIC, pg. 23)*
192. The application included an assessment of marine ecological effects, excluding seabirds and marine mammals by Dr Coffey (Application, Volume 2, Annexure 2, Technical Report (k)).
193. Dr Coffey highlighted that the project design and refinement of the proposed channel alignment had been determined with the input of ecological values and potential effects. He noted that proposed option (Option 4.2) avoids rocky reef outcrops on the western side of Home Point and restricts dredging to soft-bottom communities.
194. Dr Coffey noted that the proposed dredge footprint and both Disposal Area 1.2 and 3.2 are occupied by soft-bottom benthic communities that colonise materials (silt, sands, shell and gravel) that are sorted/moved by tidal and wave induced disturbance, and therefore relatively resilient to sedimentation effects. He described the affected communities as dominated by sand dollars, starfish, polychaete worms, hermit crabs, flatfish, shellfish and crabs. He said these communities were typical of the North-east coastline and are not considered endangered or at risk, or of national or regional significance.
195. Dr Coffey stated that the capital dredging will remove the existing benthic communities from the dredge footprint and the disposal of the dredge material will bury and effectively eliminate existing benthic communities within the disposal sites. He estimated this was a loss of 437 ha of soft-bottom benthic communities over a period of 6-24 months. He noted a reduced area would be impacted by maintenance dredging, which would affect colonisation and result in smaller size class of perennial taxa such as shellfish, bryozoans, urchins and hydroids. However, he considered an ecologically constructive community would re-establish within six months of each disturbance event. In his supplementary statement of evidence (dated 8 March 2018), Dr Coffey stated that the matter of whether satisfactory benthic recovery has occurred within disturbed areas is more appropriately provided for using the methodology recommended in the updated draft BEMP (which was appended to his statement), rather than specifying or prescribing such a definition in conditions. However, he stated that if we considered it appropriate to impose a condition which defined what constituted ‘benthic recovery’, that in his opinion this would be where disturbed areas

- supported more than 50% of the species richness and abundance (for macrofauna benthic taxa) of comparable reference sites.
196. Dr Coffey concluded that the impacts on soft-bottom benthic communities would be short-term, and that the minor to moderate impacts could be compensated for by the proposed ecological initiatives to improve the overall health of the lower Whangārei Harbour.
197. Dr Coffey noted that the dredging footprint is adjacent to areas of high, or outstanding natural character, including conservation areas. He highlighted the ecologically significant hard-bottom reef communities, such as kelp forests and sponge gardens in the Motukaroro Marine Reserve and Home Point areas. He concluded that, given the low content of fines (silts and muds) in the dredge material and the results of the sediment plume modelling, water quality and sedimentation effects were not expected to occur in adjacent hard-bottom communities. He considered the proposed monitoring of TSS concentrations (using the proxy of real time turbidity monitoring) will manage, and if necessary stop, the dredging to ensure the volunteered threshold TSS concentration limits are not exceeded. He also noted there was a comprehensive monitoring programme proposed to ensure disturbed areas and adjacent benthic communities are adequately described before and after the capital dredging activities so the actual effects can be established and compared with predicted effects. He considered this would also ensure adequate protection is afforded to identified sensitive areas.
198. Dr Coffey noted beds of pipi and cockle are present on intertidal and adjacent subtidal sandy substrates within the lower harbour, and scallops are locally common in subtidal channels and in Bream Bay. He referred to the Williams and Hume (2014)¹² study into the changes at Mair Bank and the most recent study by Pawley (2016)¹³ commissioned by RNZ. He noted that, since the 2010 and 2014 surveys, Mair Bank is no longer separate from the adjacent Marsden Bank; and the total biomass and abundance of pipi have declined significantly between 2010 and 2016 (from around 460 million individuals and a biomass of 4,450 tonnes in 2010 – to around 4.95 million individuals and a biomass of 44.7 tonnes in 2016). He stated the average commercial landings of pipi from Whangārei Harbour was 176.6 tonnes per annum between 1986 and 2010, but it is now non-existent. He noted that in recent years an expanding band of green-lipped mussels had established on Mair Bank, but had been removed by shellfish gatherers.
199. Dr Coffey stated he relied on the evidence of Mr Reinen-Hamill that any changes in coastal processes and sedimentation from dredge spoil disposal will not impact Mair Bank and concluded there would be no impact on the benthos (including shellfish communities) there.
200. Dr Coffey considered the risk of recolonisation of disturbed areas by adventive pest and weed species. He concluded there is a low risk based on observations after other dredging operations and noted conditions have been proposed to address this. Mr Mortimer agreed with this conclusion and the need to address this risk by the imposition of conditions.

¹² Williams, J. and Hume, 2014: 'Investigation into the decline of pipi at Mair Bank, Whangārei Harbour' (June 2014) by NIWA.

¹³ Pawley, M. D., 2016: 'Population and biomass survey of pipi (*paphies australis*) on Mair Bank, Whangārei Harbour', 2016. Report prepared for Refining NZ.

201. Attached to Dr Coffey's initial statement of evidence was a copy of the draft BEMP, which was updated during the hearing in response to our questions, with the updated draft BEMP being attached to his supplementary statement of evidence (8 March 2018). He considered the volunteered monitoring and reporting obligations on the Applicant are comprehensive and will provide for the identification and analysis of the adverse effects of the dredging programme separately from other temporal ecological changes that may be occurring within the area. He noted that post-dredging reporting obligations for capital dredging include a comprehensive post-dredging ecological report; and annual post-dredging monitoring reports for up to three years (or until affected habitats have substantially recovered).
202. Dr Coffey, in his supplementary statement of evidence, addressed the evidence of Dr Mead of the potential effects of dredging the berth pocket on pipi recruitment and on re-seeding pipi. He said that pipi in Tauranga Harbour were found to feed efficiently at SSCs up to 39 g/m³. He noted that the proposed threshold of 35 NTU was lower than the tolerance of 39 g/m³ for pipi (assuming a 1:1 NTU:TSS relationship). He stated the decline in pipi at Mair Bank occurred before the dredge pocket was first dredged and therefore there is no established causal association. He stated that pipi are broadcast spawners and recruitment at Mair Bank is not from adjacent habitat. He noted that re-seeding efforts elsewhere in New Zealand had been hampered by difficulties in securing a pipi source area and concerns that pipi could be 'wasted' if efforts are unsuccessful.
203. On the basis of his modelling work, Dr Beamsley considered Disposal Area 1.2 does not pose a risk of sediment inundation at Mair Bank beyond naturally occurring levels. He considered the further modelling undertaken indicated sediment effects would be localised and would not adversely affect scallop beds south of Ruakākā.
204. Dr Beamsley concluded that due to limited sediment transport from Disposal Area 3.2 there is expected to be a less than minor impact at Three Mile Reef.
205. In the Staff Report, Mr Mortimer agreed with the Applicant's findings and conclusions on benthic effects within the dredge footprint and disposal sites from the capital dredging operation. He noted that the maintenance dredging would essentially 'reset' the recovery clock and prevent full recovery.
206. In his addendum to the Staff Report, Mr Mortimer agreed with Dr Mead that the physical and ecological processes on Mair Bank are not well understood. He was of the view that any adverse ecological effects on Mair Bank as a result of the project were of low probability, but high potential impact. He considered the risk should be addressed through further investigation of the relationship between physical and ecological processes at Mair Bank and the implementation of any preventative or remedial measures arising out of those investigations, including pipi reseedling. In response to comments made by PTB, he considered the baseline monitoring site 300 m from the RNZ jetty is within sufficient proximity to provide both an accurate assessment of turbidity and TSS concentrations within Mair and Marsden Banks.
207. Dr Loher peer reviewed the Applicant's assessment of ecological effects for the NRC and found that the Applicant's conclusions were '*reasonable but simplistic*'. He was of the opinion recovery would take longer than 6-12 months and would be unlikely to resemble the existing community structure. He considered that full functional recovery of the benthos is unlikely if maintenance dredging occurs every 2-5 years.

208. Mr Griffiths stated that sediment releases can clog the feeding and respiratory systems of marine organisms, impact the survival or development of eggs or larvae, smother and bury benthic communities, and reduce light availability. He noted that increased suspended sediment concentrations can restrict light transmission in the water column and adversely affect the amount of photosynthesis (primary production) of aquatic plants. He referenced research that showed seaweeds and seagrass, typically require more light for photosynthesis than phytoplankton and are particularly sensitive to increased concentrations of suspended sediments by nature of being attached to the seabed. He stated that increased concentrations of suspended sediments can also have negative impacts on suspension feeding animals, by clogging feeding structure, interfering with particle selection and requiring energy to clear unwanted particles away.
209. Mr Griffiths noted that the Applicant's effects assessment relied on a high level of recovery and therefore agreed that a condition requiring 50% recovery within two years following any dredge disturbance was appropriate to ensure expected recovery rates are achieved.
210. In his further comments, Dr Mead remained of the view that the berth pocket is a major distribution site for maturing pipi. He stated that this area is very important for pipi larval recruitment for Mair Bank. He asked what modifications might be made to the dredging if the berth pocket is found to have an impact on the ecology of Mair Bank, in particular on the pipi beds. He suggested the relocation of the berth pocket to the northern part of the Refinery jetty if ecological impacts on Mair Bank cannot otherwise be addressed through modifications to the dredging methodology.
211. On the basis of the evidence of Dr Mead, PTB sought the specific inclusion of the Mair Bank and Marsden Bank mahinga mātaītai among the sites to be used for baseline monitoring under Applicant's proposed Condition 103.
212. In their further comments, PTB supported the position of Mr Griffiths that a closed dredging season should be imposed to protect shellfish spawning.

Findings – Benthic Ecology

213. We find the existing environment has been sufficiently described by the Applicant to enable an understanding of the benthic communities present in the affected areas and to understand the potential adverse impacts on them.
214. It was agreed by all parties that there has been a significant decline in the abundance of kaimoana species in recent years, particularly pipi around Marsden Point and Mair Bank. We were told that seagrass beds around the harbour have also suffered from significant die back in past years. It was agreed that the cause of these declines is unclear, but all parties agreed degraded water quality from sediment inputs from land source with the harbour's water catchments is likely to be a key factor and that over-harvesting may also be a factor in the decline in some kaimoana species. It was agreed that these ecological values should be the focus of any proposed remediation or enhancement initiatives.

215. We find that thresholds for maintaining existing water quality such as TSS concentrations, turbidity and water clarity are critical in avoiding and mitigating adverse effects on benthic communities. We note that sessile species living on hard substrate are particularly sensitive to sediment deposition and reduced water clarity because they cannot move. Fragile, highly sensitive communities such as kelp beds and sponge gardens are particularly vulnerable to any decrease in water clarity and increases in TSS concentrations.
216. We have particularly considered potential adverse effects on soft-bottom sand benthic habitats (the dredge footprint and disposal sites), rocky reef benthic habitats (from Motukaroro Marine Reserve to Busby Head and Three Mile Reef), and shellfish beds on Mair and Marsden Banks.
217. We accept the evidence of Drs Stewart and Coffey that the areas to be dredged and the disposal sites are not ecologically significant. We find that the adverse effects on soft-bottom sand habitat within the dredge footprint will be confined to a relatively small area and that affected benthic communities will likely recover within 6-24 months of disturbance, albeit of a smaller class size than perennial taxa that were displaced and potentially a different community structure. We note Drs Coffey and Stewart have assumed complete mortality of the benthic community within the dredge and disposal areas, which we accept makes their assessment conservative.
218. Dr Coffey did not consider it necessary that the conditions include a definition of what constituted 'benthic recovery' but recommended to us some suggested words should we be of the view that such a condition is appropriate. We agree with Mr Griffiths that such a condition is warranted. We have amended the conditions accordingly to require an assessment to be made as to whether disturbed areas have 'recovered' or are on track to recovery in line with predictions made in the AEE. Further, we have included a condition that enables the council to review any (or all) conditions, pursuant to section 128 of the RMA, associated with the maintenance dredging in the event that benthic recovery of disturbed areas (which includes the dredge footprint and disposal areas) has not occurred within the predicted two year period. We have used Dr Coffey's recommended definition of what constitutes 'benthic recovery' – being where disturbed areas support more than 50% of the species richness and abundance (for macrofauna benthic taxa) of comparable reference sites.
219. We have considered the implications of maintenance dredging and the ongoing disturbance of habitats within the dredge footprint. We find the dredge footprint and the disposal areas are a small part of a wider relatively common soft-bottom sand habitat that does not contain any rare or ecologically significant habitats. While we do not know the extent or frequency of maintenance dredging that will be necessary, we accept this is unlikely to be required yearly and it will be limited to those areas where sediments have accumulated – we note that Mr Mortimer advised us that any maintenance dredging would by definition be restricted to the areas where capital dredging has previously occurred and the Applicant confirmed that separate consents would be needed if other areas within the channel and approaches needed to be dredged. We note the evidence of Dr Beamsley stated that two zones within the deepened areas that are expected to get accretion (sediment accumulation/build-up) are the areas immediately adjacent the RNZ jetty and the offshore section of the deepened channel.

220. Overall, we find that the direct effects (total removal) will have a moderate impact on benthic communities within the dredge footprint and disposal areas from the capital dredging operation. We accept that these benthic communities will recover over time, but that some areas will be effectively 'reset' in terms of recovery by any subsequent maintenance dredging disturbance and deposition. We consider it is appropriate to monitor the benthic recovery two years after disturbance to ensure it is occurring at the rates predicted by Dr Coffey and that the recolonised species are of similar community structure and function. We agree with the Applicant that the loss of benthic productivity from capital dredging and the ongoing adverse effects from maintenance dredging should be compensated. We address this later in our decision.
221. In terms of adverse effects on hard substrate habitat, we find that the Applicant has looked at alternative channel design and alignments, and that the option proposed avoids direct disturbance impacts on sensitive rocky reef habitats. We note that dredging will not generally come any closer than 100 m from any M1MAs, except when dredging the berth pocket area. We accept the expert evidence that water quality effects can be managed and monitored to ensure adverse impacts on ecologically sensitive areas are avoided by the imposition of appropriate water quality limits that must be met after reasonable mixing; and that water quality effects on other less ecologically sensitive areas will be acceptable provided by the imposed water quality limits are not exceeded. We find that a higher level of protection is required for protecting the culturally and ecologically significant M1MAs.
222. We find that any direct loss of pipi associated with dredging the berth pocket will be small in scale. While we agree there is some uncertainty regarding the biology of the pipi, we accept the evidence there is not likely to be any long-term discernible effect on the pipi population of Marsden and Mair Banks as a result of dredging the berth pocket.
223. All parties agreed that the pipi population on Mair Bank has suffered from a severe decline in abundance and biomass since 2006, and that the cause of this is unclear. We agree that maintenance, and ideally enhancement, of the existing pipi population on Mair and Marsden Banks is directly linked to the stability of these geomorphic features. We accept that there is likely to be a small direct impact on pipi from the dredging required to create the berth pocket. We agree with Dr Coffey that this is minor in the scale of the wider Marsden and Mair Banks pipi population. There is no evidence to suggest this area is critical to pipi spawning. However, we consider this should be studied and monitored as part of the consent. We also agree with Dr Mead and Mr Mortimer that the link between physical and ecological processes needs to be better understood and consider this should be investigated by way of consent conditions.
224. Given the cultural, social (recreational), and ecological significance of the existing shellfish beds in the lower Whangārei Harbour, and the evidence of declining shellfish abundance, we find that a 'closed season' from October to January (inclusive) to protect shellfish spawning is both warranted and appropriate. We consider this will also benefit macroalgae given the evidence of Dr Stewart that spring and summer are the critical period for recruitment. We do not see a closed season as a major imposition on the ability of the Applicant to undertake its capital or maintenance dredging as this still leaves eight months of the year in which the works can be programmed and undertaken – we were told that the capital dredging is expected to take in the order of six months.

225. On the basis of the evidence of Dr Beamsley, we find that sediment disposal at Disposal Area 1.2 is unlikely to result in sedimentation effects at Mair Bank beyond those that have historically occurred; and will result in relatively localised and temporary adverse effects on benthic species within 300 m of Disposal Area 1.2. We find that the disposal of dredge spoil at Disposal Area 1.2 is unlikely to adversely affect benthic communities on the ebb tide delta.
226. On the basis of the evidence of Dr Beamsley, we find that sediment from the disposal of dredge spoil at Disposal Area 3.2 will have a less than minor impact on benthic communities at Three Mile Reef.
227. We also accept the evidence of Dr Beamsley, in response to Mr Lawson, and find that the disposal of sediment at Disposal Area 3.2 will not increase any natural sedimentation rates to deep sea trenches located further offshore.
228. We find that any risk of recolonisation by unwanted exotic adventive species is low and accept that this has not proven to be a problem after other dredging operations in New Zealand. We accept this risk can be mitigated by post-dredging monitoring of disturbed areas and requiring an appropriate response in the event adventive pests or weed species dominate any recolonisation of disturbed areas (in collaboration with MPI).

Fish

229. Many submissions raised concern that the disposal of dredge spoil would adversely affect fish species. Mr Milner expressed particular concern that sharks and migrating eels could be adversely affected.
230. Dr Coffey described the diverse range of fish found around Motukaroro Marine Reserve and other rocky reef habitats. He also described the range of fish found within the harbour and along the coast, including a number of sub-tropical fish present around the Hen and Chickens Islands and Bream Head.
231. Dr Coffey said eels and whitebait migrate through the harbour to freshwater streams. He noted these species have a strong sense of purpose in terms of migration and have the ability to avoid obstacles and disturbance; or can wait until conditions are suitable to continue their migration.
232. Dr Coffey stated that pelagic fish and sharks have the ability to avoid disturbance activities associated with the dredging and disposal. He considered impacts on fish feeding and fish migration are expected to be minor, with the most important effect being a temporary reduction in food availability for taxa that feed on benthos in the entrance to the channel and at the disposal sites. He expected fish would return when the disturbed feeding grounds had substantially recovered (within 6-24 months). He acknowledged that some pelagic fish and epibenthic taxa such as flounder and goatfish could be smothered by dredge spoil at the disposal sites.
233. In response to questions regarding the hearing sensitivity of fish, Dr Coffey said although little is known, it is assumed that fish would avoid loud noise.
234. Mr Mortimer, in his Staff Report, agreed with findings and conclusions of the Applicant in relation to potential adverse effects on fish.

Findings – Fish

235. On the basis of the evidence of Dr Coffey, we find that any adverse effects on fish are likely to be localised and temporary. We accept there is likely to be a short-term displacement of fish from within the dredge footprint and disposal sites until the benthic community has recovered from the disturbance. We agree that these effects are likely to be minor in the context of the wider marine environment; and that it is appropriate to provide compensation for any temporary displacement or direct loss and we discuss this later in our decision. We also recognise that fish form an important recreational resource and we discuss these effects later in the 'Recreation and tourism' section.

Birds

236. A number of submissions in opposition to the application were concerned about adverse effects of the project on local bird populations and on significant bird feeding areas within Whangārei Harbour. Concerns were also raised in relation to vessel lighting and the potential for vessel strike by birds.
237. Mrs Hicks highlighted the importance of the area to shore and seabirds and the ongoing adverse impacts of human activity on their distribution and numbers, particularly the South Island oystercatcher and the New Zealand dotterel. She noted the ecological importance of Mair Bank and the proximity of the proposed activities to it. She emphasised the many moves these birds have had to make to avoid human disturbance over the years and that Mair Bank provides one of the only remaining safe havens for these birds. She noted that the rāhui over Mair Bank had decreased human disturbance in this area and that birds also sought refuge within the Refinery area and in the area between the Refinery and Northport. She requested specific mitigation measures for adverse effects on the South Island oystercatcher.
238. Ms Chetham emphasised the importance of maintaining the structural integrity of Mair and Marsden Banks as these are extremely important habitat areas for wading and pelagic birds, and other taonga species.
239. Ms Hembry, for the Bream Bay Coastal Care Trust, highlighted concern regarding the disruption to bird life, the importance of Marsden and Mair Banks to bird life and the observed marked decline in the local population of the dotterel and oystercatcher. She noted that one of its members' bird monitoring over the last 16 years had recorded a marked decline in local populations of dotterel and oystercatcher.
240. Mr Gates, for the Bream Head Conservation Trust, noted that grey-faced petrel are located some distance from the dredge area and he therefore considered the risk to them was low. However, he was fully supportive of the Applicant's proposed compensation measures aimed at enhancing their habitat.
241. The DoC submission sought conditions requiring the avoidance of dredging within the harbour mouth during the penguin breeding season.
242. The application included a technical report on the effects of the project on coastal birds (Application, Volume 2, Annexure 2: Technical Report (j)).
243. Mr Don, for the Applicant, described the notable features for some 34 species of birds known to utilise or breed in the area. He outlined literature reviews that had recorded four nationally threatened and eighteen nationally at risk coastal and pelagic species in the area. He had undertaken 124 hours of field observations at nine locations, including habitat use and breeding season records; and that 28.5 hours of specific survey of kororā/little penguins had been carried out.

244. Mr Don considered Mair Bank and Bream Bay are of national significance to birds; that the Marsden Bay-One Tree Point-Snake Bank complex is of high value in the context of the inner Harbour; and that Urquharts Bay is of high value in the context of the outer harbour. He noted breeding was recorded or strongly inferred by the variable oystercatcher (at risk), reef heron (threatened), black-back gull, little penguin (at risk), little shag and pied shag (at risk); the Marsden Point Refinery jetty area is used for dotterel rearing; and ōi/grey-faced petrels also breed within the Bream Head Scenic Reserve.
245. Mr Don assessed the potential effects of increased turbidity, deposition of resuspended sediment on intertidal feeding habitats, increased vessel movements, vessel lighting, underwater noise, and cumulative effects on birds. He considered the key issues were:
- increased turbidity effects and underwater noise affecting the passage of little penguin to and from the harbour; and
 - collision of fledged grey-face petrel with dredge vessels when operating beyond Busby Head caused by light attraction.
246. Mr Don considered the potential risk of project generated effects on shorebird habitat is relatively high at Mair Bank and low-moderate at Reotahi Bay, as a result of the proximity of both areas to the works and use of Mair Bank for feeding by the variable oystercatcher; and that the risk to other habitats is low because of their distances from the works, sediment type and quality, and the sediment plume behaviour.
247. Mr Don noted that information on little penguin use of the harbour is sparse. He stated that past observations note little penguin nesting areas at Little Munro Bay and McGregors Bay, but it is thought their current scarcity probably reflects their vulnerability to land-based predators over a long period and reduced availability of nesting sites as a result of increasing residential development. In recognition of any potential effect posed by a 'turbidity barrier' Mr Don recommended habitat enhancement through a predator eradication and control programme, and provision of nesting boxes on Motukaroro Island¹⁴. He noted the little penguin breeding season extends from June to March, and therefore restricting dredging to outside of this period would result in only two months available for dredging, which is unworkable.
248. Mr Don stated that the likelihood of collision between seabirds and the dredge vessels was 'likely' between Busby Head and Disposal Area 3.2. He considered that juvenile grey-faced petrels on their first flight were vulnerable to such collisions, particularly during a week either side of a new moon and in fog conditions, and were therefore at risk of injury or death from collision with a dredge vessel operating at night. However, he considered that any increased risk can be reduced by ensuring appropriate deck lighting is used (as confirmed by a lighting audit). He also noted there was little change to the existing risk posed given the number of other vessels with lighting operating in the area. Overall, he concluded that the local grey-faced petrel population would be maintained by the habitat enhancement proposed and that there would be no adverse effects on the grey-faced petrel at a population level.
249. In response to questions, Mr Don said there was a reasonably high level of information given the surveys cover the period 2005-2015.

¹⁴ RNZ provided a copy of a letter dated 1 March 2018 from Mr Graham Wallace, Chief Executive for Marsden Maritime Holdings Limited, as owner of Motukaroro Island, agreeing in principle to installing and maintaining up to 24 nesting boxes and predator traps and tracking tunnels on the island.

250. In summary, Mr Don recommended several mitigation and enhancement measures, including:
- (1) The provision of predator control and nesting boxes for little penguin inside the harbour to offset any adverse effect on breeding success;
 - (2) A lighting audit of the dredger(s) to minimise the attraction of seabirds, especially juvenile grey-faced petrel, to the vessel's lights;
 - (3) Provision of funds for additional predator control and endoscopes for burrow inspection at the Bream Head Scenic Reserve grey-faced petrel colony; and
 - (4) Post-dredging SOE data collection on coastal birds and little penguin.
251. The Applicant's assessments were peer reviewed by Dr David Thompson, on behalf of NRC. Overall, Dr Thompson agreed with the assessment approaches and the conclusions reached.
252. In his Staff Report, Mr Mortimer highlighted the importance of Mair Bank as a feeding habitat for birds and its recognition as a nationally significant bird habitat. He also noted that Bream Bay is considered nationally significant habitat for pelagic birds. Overall, he agreed with the Applicant's assessment of potential effects on birds and supported the proposed mitigation and enhancement measures.

Findings – Birds

253. We find that any direct impacts on local bird populations will be nil, except for the risk to juvenile grey-faced petrel at night from collision with the dredge vessels due to lighting. We agree with Mr Don that there will be little change to the existing level of risk to fledging grey-faced petrels given the number of vessels with lighting currently operating in the area. We agree with Mr Don that it is appropriate to reduce this risk by requiring a lighting audit before commencing operations to ensure light spill is minimised. We accept the evidence of Mr Don that the proposed habitat enhancements will help maintain the local population of grey-faced petrel; and that there will be no adverse effects at a population level.
254. We accept the evidence of Mr Don that any adverse effects on any threatened and endangered species at a population level will be avoided by ensuring there is no physical encroachment of activities into M1MAs and that any adverse effects on benthic communities in these areas are avoided.
255. We accept that little penguin are now relatively scarce within the harbour, but agree that sediment turbidity may pose a barrier to their movement in and out of the harbour. We acknowledge the sediment plume will be intermittent and will move as the dredge moves. We find the water quality limits imposed will ensure any turbidity impacts are minimised. We agree with Mr Don that this is a minor potential adverse effect that can be offset by providing breeding boxes suitable for little penguin on Motukaroro Island. We find it is not practical or warranted given the intermittent nature of the dredge plume to limit the dredging operation to April and May – that is, outside the little penguin breeding season. However, we acknowledge the imposition of a closed season for dredging will mitigate adverse effects for some of the breeding season.

256. We acknowledge the evidence of Mrs Hicks that local bird populations are suffering from human induced disturbance. This was evident during our site visit when we saw oystercatchers and dotterel seeking refuge from human disturbance inside the fences of the Refinery site between the RNZ jetty and Northport. While we agree with Mrs Hicks that there needs to be consideration of 'no go' areas for people and vehicles for the protection of birds, we do not consider the dredging operations will disturb birds feeding on intertidal areas during low tide. We consider Mrs Hicks's concerns and suggestions are relevant matters for the pRP process rather than this consent process. However, we have included provision for potential project funding to maintain or enhance the habitat of oystercatcher and other shorebirds.
257. We find there is a low risk of indirect adverse effects impacts on local bird population through impacts on shellfish and important feeding areas such as Marsden and Mair Banks. We find that any adverse effects on the benthic ecology in the intertidal areas of the harbour (including Mair Bank) will be minor with the imposition of appropriate water quality limits. Accordingly, we therefore also find that any indirect impacts on birds feeding on/in these intertidal areas will be minor and temporary.
258. Overall, we find the adverse effects of the dredging operations on local bird populations will be minor and temporary with the imposition of conditions.

Marine Mammals

259. Potential adverse effects on marine mammals was a concern of many submitters in opposition. These concerns relate to the risk of ship strike, oil spill, underwater noise effects and reductions in food availability. We were told by tangata whenua and some submitters that Whangārei Harbour is known as 'Whangārei Te Rerenga Parāoa', which means Whangārei, the gathering place of whales. The CVA stated that tohorā/whales are a taonga of great importance to tangata whenua.
260. Ms Chetham, highlighted the significance of marine mammals to tangata whenua and noted that they are central to their cultural identity. She said that injury to or mortality of any whale would be unacceptable.
261. Mr Milner, noted there have been 54 whale strandings in Bream Bay since 2006, including two mass strandings. He noted his whānau considered the death of a young sperm whale washed up on Mair Bank in June 2017 was a tohu (sign).
262. Ms Hembry noted concern that the project would see the introduction of Suezmax tankers and that these ships posed an increased risk to marine mammals.
263. Mrs Hicks questioned why a marine mammal expert from the South Island had been used when there were local experts with site specific knowledge and concluded this suggested the Applicant did not want accurate sighting information. She highlighted the number of orca sightings around the entrance to the harbour and suggested their regular presence puts them at risk from the dredging activities. She noted the whale observations and strandings, and the importance of the area to both whales and dolphins. Mrs Hicks requested dredging be limited to daylight hours because of the importance of having a marine mammal observer to mitigate adverse effects on marine mammals.
264. The DoC submission sought the avoidance of dredging operations within the harbour mouth during the orca stingray hunting season (late winter and spring).

265. The application included a technical report on the assessment of effects of the project on marine mammals (Application, Volume 2, Annexure 2, Technical Report (i)).
266. Dr Clement, for the Applicant, addressed potential adverse effects on marine mammals. She stated that of the 29 marine mammal species that have been sighted or stranded in the Bream Bay area, only four regularly or seasonally frequent the area, namely bottlenose dolphin (*Tursiops truncatus*), orca (*Orcinus orca*), Bryde's whale (*Balaenotera edeni*) and common dolphin (*Delphinus delphis*). She noted other species visit the area less frequently and the area is not known to be ecologically significant in terms of feeding, resting or breeding habitats.
267. Dr Clement considered the area affected by the project represented a small fraction of similar habitat available across a larger coastal region. She stated that the likelihood of direct impacts such as vessel strike, entanglement and injury from underwater noise was low; and she concluded the effects would be '*de minimis* (trivial)' with the proposed mitigation measures in place. She stated that indirect impacts from physical changes in the habitat or impacts on food availability and turbidity effects will be temporary and are not expected to be detrimental to local or visiting marine mammals. She highlighted that the underwater noise modelling undertaken by Pine and Styles (2016) showed adverse effects from underwater noise generated during dredging operation will be transitory and non-injurious, and comparable to existing vessel noise experienced in the area.
268. Dr Clement outlined a number of recommendations for avoiding and mitigating adverse effects on marine mammals; including implementation of a Marine Mammal Management Plan (**MMMP**) (proposed Condition 21) and use of a marine mammal observer on-board the dredge vessel during daylight hours (proposed Condition 24) to enable the activity to cease if a marine mammal is within 50 m of an active dredge, within 100 m of a pile driver vessel using vibro-hammer equipment, or within 300 m of a pile driver vessel using traditional impact equipment (proposed Condition 25). She stated that these 'safety shutdown zones' were based on the underwater modelling undertaken for such activities and the avoidance of physical injury to marine mammals. She also outlined passive acoustic monitoring to be undertaken to provide further information on the use of the area by marine mammals.
269. Dr Clement outlined a number of best practices to mitigate adverse effects on marine mammals to be included in the MMMP, which would be finalised in consultation with DoC, including vessel speeds, liaison with DoC regarding sightings, use of the best practicable option for minimising underwater noise, regular maintenance and upkeep of dredge equipment, use of an observer and the safety shutdown zones, avoiding loose ropes and other lines, on-board waste management, and testing dredge spoil between maintenance dredging operations.
270. In response to submissions, Dr Clement stated that the highest frequencies of sightings of orca in Northland occur between August and October. She noted orca are generalist feeders that range over a large area, spending only short periods in any one location. She concluded that given the small proportion of habitat affected, and the intermittent and transitory nature of the dredging operations, any short-term interaction will have no effect on an animal's decision to return to the area in future years.
271. In response to questions, Dr Clement said that there were no nearby breeding areas for pinnipeds (seals) and the closest would be at the Hen and Chickens Islands. However, she noted pinnipeds were included in the safety shut down zone.

272. In response to further questions, we were provided with additional underwater noise modelling undertaken by Dr Pine with two dredges operating simultaneously, as his original modelling was based on only one dredge operating. Dr Clement confirmed her assessment and conclusions remained unchanged on the basis of the results of this further modelling.
273. Further written comment from Dr Clement (12 April 2018) on the applicability of the ANZECC Interim Sediment Quality Guidelines – Low (ISQG-Low) as proposed triggers for the protection of marine mammals from contaminants was provided. Dr Clement noted there are no national or international guidelines for monitoring contaminant exposure in marine mammals and that predicting possible impacts was complex. She highlighted that sediment sampling had not identified any contaminants that represent a risk to ecology and that there were no year-round residents of marine mammals. She considered the most effective and standardised manner for monitoring possible uptake of contaminants by marine mammals was to ensure contaminants concentrations in the dredge sediments were below the best available guideline (i.e. ANZECC 2000) before the commencement of any maintenance dredging operations. She therefore supported imposition of Condition 26 and 27, as proposed by RNZ.
274. We requested a copy of the report by Pine and Styles (2015)¹⁵ referred to by Dr Clement which involved undertaking a passive acoustic survey of the ambient underwater soundscape of Whangārei Harbour and Bream Bay using acoustic loggers. The report showed that the broadband sound levels were comparable to other nearshore environments in New Zealand and that the soundscape within 'Calliope Bay' was spectrally similar to other busy harbours where vessels are common. It found there was no relationship between vessel tonnage and received sound levels, which it noted is also a phenomenon found elsewhere. It found evidence that dolphins (species unidentified) frequent the area.
275. Mr Mortimer agreed with the Applicant's assessment of effects on marine mammals. He concluded direct impacts such as vessel strike, increased underwater noise, and the possible risk of entanglement were of low risk and can be mitigated by the conditions proposed. He concluded that indirect effects from any potential bioaccumulation of contaminants will be nil given the quality of the sediments to be dredged; and that the loss and disturbance of marine mammal prey species would be minor based on the temporary and localised nature of the disturbance.
276. Mr Mortimer did not see a need for the Applicant's proposed Condition 26, requiring the testing of marine sediments, to minimise the risk to marine mammals given the results of the analysis undertaken. However, he said he had no issue with the inclusion of the condition as a safeguard for marine biota in the vicinity of the dredging operations.

Findings – Marine Mammals

277. We have carefully considered the potential impacts on marine mammals given their significance to tangata whenua and the local community, the frequent presence of some marine mammal species in the area, and the intermittent presence of species that are threatened or endangered.

¹⁵ Pine, M and Styles, J (2015) 'Short-term Passive Underwater Acoustic Survey of Whangārei Harbour Entrance and Marsden Point: Preliminary Investigation'.

278. Overall, we find that any adverse effects of underwater noise will be localised, transitory and non-injurious, except in very close proximity to the dredge(s) and pile driving vessels. We find that risks of physical harm can be mitigated by use of a marine mammal observer and implementation of safety shutdown zones. We note that the noise of the dredge(s) will be audible over large distances, particularly for baleen whales. We find it is likely that marine mammals will avoid the dredging area while operations are occurring. We accept the pile driving activity will be very short-term.
279. We accept the evidence of Dr Clement that the project area is not known to be ecologically significant in terms of feeding, resting or breeding habitats of any threatened or endangered species of marine mammal.
280. We have considered whether there is a need to limit dredging operations to periods of daylight because of the inability of the marine mammal observers to see animals within the safety shutdown zone at night. However, we consider the low risk posed to marine mammals does not warrant such a restriction. We agree that marine mammals are likely to avoid any noise source. We are also conscious that such a restriction would significantly extend the duration of the capital dredging programme and we consider this is not desirable from an ecological or an operational perspective – the quicker the dredging operation is completed the less effects will arise. We do, however, note that the October to January closed season which we discussed earlier in this decision will also be of benefit to some marine mammal species.
281. We note that the requirement to test sediment before dredging (proposed Condition 26) relates to maintenance dredging operations. We consider this is appropriate given there may be long periods between maintenance dredging and that the testing already undertaken applies to the material to be removed during the capital dredging operation.
282. We note that Suezmax tankers are already visiting the Harbour, albeit not fully laden. Therefore, we find there is no increase in risk to marine mammals from vessel strike.
283. Overall, we find the conditions proposed are appropriate to avoid and minimise adverse effects from the project on marine mammals.

Commercial Fisheries

284. The Northland Scallop Enhancement Company Limited, FINZ, PTB, Mr Riwaka, and Mr Milner raised concerns that sediment disposal will adversely affect scallop beds, and marine life and fisheries. They considered that the impact of the disposal of dredge material at the two disposal sites, but in particular Disposal Area 1.2, on scallops, including spat, larval production and distribution, needs further research.
285. Mr Wilson, for the Northland Scallop Enhancement Company Limited, stated there was too little information on the distribution of the scallops and that there is concern regarding both disposal sites. The submission stated that the maps provided for the overlap with local fisheries are not of sufficient detail to accurately demonstrate the extent of the overlay.
286. FINZ raised concern that the project would adversely affect the inshore fisheries and marine life at Three Mile Reef. FINZ stated that Disposal Area 1.2 is located adjacent to important scallop beds within Bream Bay. Mr Wilson, for FINZ requested finer scale mapping to understand the overlay with commercial fisheries.

287. Mr Riwaka noted the efforts being made to build the scallop fishery in Bream Bay and the slow improvement that is occurring. He said that scallops currently grow to a certain size and then die, but it is not known why. He said there were scallops present in both disposal areas and that they had also been present in the harbour prior to the port development.
288. Mr Milner emphasised the importance of the scallop fishery to tangata whenua and the need for more information on their distribution and biology.
289. The application included a technical report on the effects on commercial fishing in Whangārei Harbour and Bream Bay (Application, Volume 2, Annexure 2: Technical Report (p)).
290. Mr Boyd, for the Applicant, addressed the effects on commercial fisheries and responded to submissions. He stated that available information from MPI indicated commercial fishing is widespread in Bream Bay. He noted there were almost no parts of Bream Bay that are not commercially fished, except the channel area. He acknowledged that fish may be temporarily displaced to other nearby areas by the project but considered this would not impact the ability of commercial fishers to successfully operate in Bream Bay. He noted that the combined area affected by the project is only 1.62 square nautical miles.
291. Mr Boyd said that the catch effort data by species from MPI was at the finest scale available and to get more detailed information would require the approval of all the quota holders. In his opinion the available information provided a sufficiently clear picture that commercial fishing occurs everywhere and indicates they will not need to move far from areas that will be affected by the project to catch fish.
292. Mr Boyd considered there were no known commercial shellfish beds (that presently operate) within or immediately adjacent to the dredging or disposal site footprints. He noted there is little fine material in the sediment to be dredged and that the areas where scallops are commercial dredged are a considerable distance from the dredging and disposal sites. Overall, he concluded that the fishery habitats would recover from any short duration, localised impacts that may occur and that there would be no long-term effects on commercial fishing.
293. Drs Stewart and Coffey noted they agreed with Mr Boyd's conclusions.
294. Dr Beamsley noted that additional sediment plume modelling had been undertaken at Disposal Area 1.2 in response to the concerns raised by FINZ. He provided figures showing the predicted SSCs of disposing the material using a small TSHD and a large TSHD. He stated the plume extents are very limited in the mid and surface water and are confined to within approximately 300 m of the point of discharge near the seabed.
295. Dr Beamsley considered it was extremely unlikely (less than minor) that sediment plumes would reach the Three Mile Reef area.

296. Dr Coffey considered that 'the worst case scenario' is that the scallop habitat within the footprint of the disposal sites will be compromised, but that this is a small proportion of available scallop habitat in the context of Bream Bay and the wider Northland coastline. He highlighted the 6% fine sediment content of the dredge material and considered this is '*...relatively minor and benign in terms of potential effect on marine life within the context of the proposal*' (pg. 56). Overall, he considered the '*...rigorous monitoring, coupled with stringent turbidity thresholds and corresponding operational/management response will ensure that the adverse turbidity effects outside the disturbed areas are appropriately managed*' (pg. 56). He considered any adverse effects on Three Mile Reef would be avoided.
297. Mr Mortimer agreed with the Applicant's assessments and concluded that any adverse effects on commercial fisheries are unlikely.

Findings – Commercial Fisheries

298. We accept that the Applicant has provided catch effort information at the finest scale publicly available from MPI and that any finer scale information would need the approval of all the quota holders. No evidence was provided by submitters showing any significant overlap of the disposal sites with identified commercial scallop dredge areas.
299. We find that any adverse effects on the Bream Bay commercial fisheries will be confined to a small area and will be temporary.
300. We find that any adverse effects on fish stocks from a reduction in food availability will be minor and temporary. We consider this is related to the expected recovery of the benthic community (expected to be between 6-24 months) and find this recovery should be monitored following disturbance. We have focused on imposing receiving water quality limits to avoid turbidity effects on M1Mas and to minimise adverse effects on the CMA. We note that ecological compensation is proposed to address direct effects on benthic communities and indirect effects on fish. We discuss this later in our decision.

Recreation and Tourism

301. Mr Greenaway, for the Applicant, presented evidence on the existing recreational uses of the area and also an assessment of the potential adverse effects of the proposed dredging and disposal on these uses, based on his technical report included with the application (Application, Volume 2: Annexure 2: Technical Report (I)).
302. Mr Greenaway stated that the areas proposed to be dredged and surrounding areas are intensively used for recreational purposes. He stated the main uses are for boating, fishing, diving, swimming, surfing, kite surfing, shellfish gathering, and beach activities.
303. Mr Greenaway stated that dredging will disturb the sea floor and sediment released can reduce water clarity resulting in decreased amenity for contact recreation. The areas where these effects may occur are swimming and diving areas within the Whangārei Harbour and near the harbour entrance. Mr Greenaway relied on the evidence of Drs Stewart, Coffey, and Beamsley in respect to turbidity effects. In his opinion there is likely to be very little, if any, adverse effect on recreational dive and swimming sites, including on the marine life that attracts most divers. He stated the disposal sites are well removed from any recreation setting where underwater visibility could be an issue.

304. The proposed activities have a potential to alter the direction and size of waves. Both Dr Beamsley and Mr Reinen-Hamill considered that predicted changes in wave heights or energy would not have a discernible effect on the surfing amenity that occurs in Bream Bay or in the bays below Bream Bay. Mr Greenaway, relying on this evidence, also considered it very unlikely that there will be any effects on surfing amenity. He also noted that increased wave heights can affect diving and swimming, however, he stated that the modelling showed that the biggest effects (which are still small) occur during large wave conditions, being periods when such recreation activity is small.
305. Mr Greenaway stated that changes in wave energy had the potential to alter beach profiles but that, relying on the evidence of Mr Reinen-Hamill, the only changes would be confined to, at, or near Mair Bank, which is an important shellfish gathering area. He considered that the proposed mitigation measures, which involve depositing some dredge material in the ebb tide delta, will ensure that effects on recreation, including shellfish gathering at Mair Bank, will be effectively managed.
306. The proposed activities will affect the marine ecology in the areas where dredging occurs and at the disposal sites. Dr Coffey stated that there will be an initial reduction in the population of pelagic fish species that feed on benthos, including snapper, kahawai, sharks, and kingfish. However, these areas are expected to progressively recover within 24 months of the capital dredging and within 6 months of maintenance dredging. Mr Greenaway stated that these effects will result in some local displacement of fishing activity from the dredge and disposal footprints during the recovery period, noting that the dredge channel is within a popular fishing area, as are both disposal sites.
307. Mr Greenaway considered that the total regional level of participation in recreational fishing is unlikely to be affected as there are a high number of alternative fishing areas, but acknowledged that local displacement may increase fishing pressure at those other sites. In answers to questions, Mr Greenaway agreed that this displacement effect is one of the 'major effects' of the project, but that these effects are 'minor at worst'.
308. Mr Greenaway stated that there would be adverse effects on recreational fishing as a result of the capital dredging but that these would be minor. He noted that anchoring and fishing within the marked channel, being the area where the dredging is proposed, is prohibited by a NRC Navigational Bylaw.
309. Mr Greenaway stated that maintenance dredging would have a lower scale of effect during each event than the capital dredging but still adverse and minor.
310. Mr Daniel, for the Ruakaka Parish Residents and Ratepayer Association Incorporated, advised us that recreational fishing is very important in this area and he considered that little or no recognition was given to the recreational, tourism, and economic importance of recreational fishing to the local area. He provided statistics of boat ramp users collected in January and Easter 2017 – these data suggested that over 75% of users were from outside the Ruakākā district and 68% were from outside the Bream Bay area. He stated the users from outside the local area were tourists staying in rented or motel accommodation, which meant that they contributed to the local economy.

311. Mr Daniel expressed concerns about the recovery of the areas that are to be dredged given that maintenance dredging will be required on a regular basis, meaning that full recovery would be unlikely and these areas will therefore remain in a barren or semi-barren state. He stated that this would severely impact favoured recreational fishing that occurs off Home Point – this area probably being the most popular fishing spot in the whole of the Whangārei Harbour/Bream Bay area.
312. Mr Daniel stated that the Ruakaka Parish Residents and Ratepayer Association was strongly opposed to the use of Disposal Area 3.2 as it is ‘far to close’ to both Three Mile Reef and Five Mile Reef, both of which are important from an ecological and recreational fishing perspective.
313. Mr Milner advised us that the scallop fishery is very important, including for recreational divers. He noted that the Bream Bay area in the vicinity of Disposal Area 1.2 is a popular site for scallops to be collected. These effects are discussed in greater detail in the Commercial Fishery section of this decision.
314. In his submission, Mr Modrich, who did not appear at the hearing, stated that he did not consider the effects of the project on recreational fishing had been fully considered and that consultation with recreational fishers had been inadequate. He also considered that increased vessel traffic and increased wakes will affect kayakers. Mr Reinen-Hamill advised us that fully laden Suezmax tankers will not generate any increased wakes compared to those currently experienced when partially laden tankers arrive at the Refinery.
315. Mr Mortimer considered that the main effect of interest to recreation is the temporary displacement of some fishing activity from within and near the dredging area(s) or at the disposal sites. He stated that while fishers may have their own favourite spots within or near the affected areas, he considered the effects will be minor.
316. Mr Mortimer generally concurred with the conclusions reached by the Applicant in respect of effects on recreation and tourism. His only residual concern related to the potential effects on Mair Bank and its pipi beds.
317. Mr Griffiths highlighted the importance of water clarity to the public and the local community; and the normally very high water clarity in the area. He said that the Ministry for the Environment (MfE, 1994) noted people can generally detect changes in water clarity greater than 10-15%. He calculated a change in turbidity from 1 NTU to 15 NTU (the Applicant’s proposed Level 1 threshold) represents a 1,400% increase and that a plume of this intensity at 300 m from the dredge is going to be highly visible to the public.
318. Mr Griffiths recommended that water clarity standards are imposed based on a percentage of acceptable change and that a closed season for dredging be imposed. His recommended closed season was between October to January (inclusive) based on the recommendations contained in the Cawthron Report. While the closed season is primarily to provide protection to key species at the most vulnerable stages of their life cycles, Mr Griffiths noted that this period coincides with the period of high recreation used in the lower Whangārei Harbour, meaning that there would also be less effects on recreational users.

319. The Applicant considers there is no 'effects based' reason for a closed season and that such a restriction could result in significant costs to RNZ in terms of dredged plant demobilisation and remobilisation. However, the Applicant stated that if our view is that a closed season is necessary, then a similar approach to that for the RNZ's consents for dredging around its dolphins (being an 'open season' of 16 January to 20 December, inclusive, equivalent to a closed season of 21 December and 15 January) could be imposed for dredging in the inner Whangārei Harbour area only – this being on the basis that this area is subject to more intensive recreational/social use during this traditional holiday period.

Findings – Recreation and Tourism

320. We find that the most significant adverse effect of the proposed activities on recreational uses are those on recreational fishers within the lower Whangārei Harbour, in particular the areas in and around the areas to be dredged. We agree with Mr Greenaway that these adverse effects will be minor and temporary. We note that no dredging is proposed at or immediately adjacent to the No. 7 channel buoy near Home Point, this being a very popular recreational fishing area. We note the closest dredging is at two small areas to the north.
321. We agree with Mr Griffiths that including a closed season for dredging (October-January inclusive) will ensure that adverse effects associated with the dredging operations (both the capital and maintenance dredging) on recreational users in terms of amenity effects (including on water noise effects) will be avoided during the peak summer period when recreation activities occur. We do not consider such a closed season will result in additional costs to the Applicant, as it would still have eight months within which the works could be programmed, noting that the capital dredging is anticipated to take, at worst, six months to complete.

Cultural Values and Relationships

322. Effects of the project on cultural values and relationships were a key concern of many submitters including Whatitiri Resource Management Unit, Mr Mahanga, Ms Norris, PTB, Pehiaweri Resource Management Group - Ngāti Hau Resource Management Unit, Dr Pyle, Rewarewa D Māori Incorporation, Ringa Atawhai Trust and Whangārei Māori Executive Committee of Tai Tokerau Māori Council, Te Pouwhenua o Tiakiriri Kukupa Trust, the whānau of Henare and Tuihau Pirihi, Ms Kawiti-Tana, and Dr Kepa.
323. In summary, tangata whenua believe that the cumulative effects of previous developments, which have all occurred following the confiscation of their lands and a number of public works takings, combined with the effects of the project, will further undermine their relationship, kaitiakitanga, cultural values and traditional and cultural practices associated with Whangārei Te Rerenga Parāoa.
324. Mr Simmons, in his closing submissions (dated 29 May 2018), submitted that the Applicant did not dispute or challenge the cultural concerns of tangata whenua. His position was that RNZ has, throughout the entire process, acknowledged Whangārei Te Rerenga Parāoa forms an intrinsic part of the culture and heritage of tangata whenua and accepts the need to avoid, remedy and mitigate adverse effects of the project. He said that RNZ stands by the economic importance of this application being granted and the view that any significant adverse effects can be avoided.

325. Mr Simmons stated that through the design of the project and the proffered conditions, which have been revised during the course of the hearing, significant efforts have been made by the Applicant to address concerns expressed regarding cultural issues. He said that RNZ has approached these issues by consulting in a genuine, open manner and without any preconceived ideas. In doing so, he submitted RNZ has been inclusive and had engaged in a culturally sensitive way following input from the NRC's cultural liaison officer and iwi resource management representatives, and had listened to comments made at several hui held at different marae. He submitted the Applicant's cultural engagement, and the project itself, have also been shaped by its independent cultural expert, Mr Coffin. He said that RNZ had very carefully scoped and designed the project to minimise all environmental and cultural effects, and had responded to outstanding cultural concerns by proactively and constructively proffering mechanisms, including establishment and funding of a 'Kaitiaki Group' (**KG**), ecological enhancements, and steps to protect avifauna. Overall, he submitted that we can be confident that the consultation effort has been robust and genuine. On the basis of the evidence provided by RNZ, he further submitted that all relevant cultural effects have been appropriately addressed.
326. Mr Milner disagreed with the Applicant's position and recommended firstly, that we should place the application on hold until further discussions are had with Patuharakeke and other interested whānau, hapū, iwi, to discuss options for identifying the 'Cultural State of the Environment'. He considered that this would help inform the modelling and predictions of the impacts of this application. Secondly, he recommended the development of a suite of 'Cultural Health Measuring' tools and methodologies to assist in the complete assessment of this project and provide the ability for the next two generations to realign the pathway towards restoring health and mauri of Whangārei Te Rerenga Parāoa.
327. Fundamentally, the PTB's position is that potential effects on the cultural sites/mahinga mātaihai at Mair and Marsden Banks cannot be mitigated to an acceptable level. Ms Chetham was of the view that the potential adverse effects identified in the CEA cannot be mitigated, offset or compensated for, particularly given the current state of their taonga/sites of significance.
328. Ms Chetham concluded that the mitigation and compensation measures do not recognise and provide for the importance of Whangārei Te Rerenga Parāoa as a taonga to tangata whenua; and will not facilitate the knowledge and practice of kaitiakitanga or rangatiratanga in its true sense.
329. Ms Wakefield stated that this application is a continuation of putting the harbour and its cultural values at risk by proposing an activity with unknown and irreversible effects on the wider ecosystem surrounding and connected to the harbour's entrance and she supported both the CEA and the evidence put forward by PTB. She stated *'we aspire for revitalisation of the historic abundance of the harbour and again this resource consent does not guarantee that.'*
330. Ms Norris, for the Ringa Atawhai Trust, the Whangārei Māori Executive Committee of Tai Tokerau Māori Council and Te Pouwhenua o Tiakiriri Kukupa Trust, highlighted the cumulative effects on their taonga and the loss of the unique, collective spiritual and cultural values of Te Parawhau. She noted the loss of pipi from the northern side of the harbour, the importance of their role as kaitiaki, the history of inadequate access to traditional areas of customary use and the importance of restoration of kaimoana to uplift the mana of the hapū.

331. Mr Ruka stated that this application is a continuation of putting the harbour and its cultural values at risk by proposing an activity with unknown and irreversible effects on the wider ecosystem surrounding and connected to the harbour's entrance, including migrating species, shellfish, oceanic mammals, and sea birds, all of which are specific taonga to tangata whenua of the Whangārei Harbour.
332. The CVA was commissioned by the Applicant and prepared by Ms Chetham for Patuharakeke on behalf of Ngā Kaitiaki/Tangata Whenua o Whangārei Te Rerenga Parāoa (discussed below) in January 2015. It sets out the early process of engagement with tangata whenua in regard to the project, recording that the Applicant initiated specific consultation with PTB in October 2013. At PTB's suggestion, RNZ retained responsibility and ownership of the project/application while Patuharakeke, as mana whenua and MOU¹⁶ partner, endeavoured to work alongside RNZ to assist with facilitation of engagement and brokering of relationships with their whanaunga from neighbouring hapū and iwi with interests in the area.
333. Initial discussions were also held with the Ngātiwai Trust Board and in early 2014, PTB submitted a 'Tangata Whenua Engagement Process Terms of Reference' which recommended a pathway for engagement with all potentially affected tangata whenua around the harbour and a framework for cultural impact assessment going forward.
334. The CVA records that Patuharakeke hold mana whenua status over Poupouwhenua/Marsden Point. Ms Dixon pointed out that the CVA was reviewed by Mr Clive Stone (Ngātiwai Trust Board), Ms Marina Fletcher and Ms Mira Norris (Parawhau ki Toetoe), and Ms Hineamaru Lyndon (Ngāti Kahu o Torongare).
335. The purpose of the CVA was to present a 'Tangata Whenua o Whangārei Te Rerenga Parāoa ('tangata whenua') Cultural Values Assessment' to RNZ. The CVA identified tangata whenua values through their cultural relationships and uses with the resources, the subject site and surrounding areas, in order to inform the scope of the technical studies commissioned by the Applicant, as part of project scoping and design, as well as the assessment of alternatives exercise that was undertaken.
336. The collective hapū involved in the process referred to themselves as 'Ngā Kaitiaki/Tangata Whenua o Whangārei Te Rerenga Parāoa' and included the following groups as listed in the CVA:
- Patuharakeke;
 - Te Parawhau;
 - Te Parawhau/Toetoe;
 - Ngāti Kahu o Torongare me Te Parawhau;
 - Te Waiariki;
 - Ngāti Korora;
 - Ngāti Tu;
 - Te Uriroroi;
 - Te Kumutu;
 - Ngātiwai;
 - Ngāpuhi;

¹⁶ Memorandum of Understanding between PTB and RNZ.

- Ngāti Whātua;
 - Ngāi Tāhuhu;
 - Ngāti Manaia; and
 - Manuhiri (e.g. families at Marsden Village - some are 3rd generation).
337. The CVA stated that cultural effects on Māori (and their values, culture and taonga/treasures) are not defined in the RMA and have generally been poorly defined in terms of best practice. It noted –
- ‘...this lack of definition has often meant that “cultural effects” are narrowly scoped and “pigeonholed” or reduced as matters relating only to wāhi tapu or heritage seen in a “past tense” sense rather than understanding its continuous nature incorporating current events or activities as well as the past and that while these matters are critically important, they are only a sub-set of all the effects that a proposal might have on tangata whenua, their values and environmental concerns’.*
338. A CEA, dated 31 August 2017, was subsequently prepared by Ms Chetham, on behalf of tangata whenua. Ms Dixon submitted that the CEA provides a robust assessment of the potential effects of the project on the cultural values of tangata whenua, and most importantly that the CEA has been prepared by tangata whenua.
339. The CEA also appended an ‘Independent Technical Review’ which was commissioned by tangata whenua due to the large number and complex nature of background reports prepared by RNZ that required analysis. The final CEA was ratified by the following people:
- (a) Kris McDonald (Ngātiwai Trust Board);
 - (b) Richard Shepherd (Te Kahu o Torongare);
 - (c) Jared Pitman (Patuharakeke); and
 - (d) Pari Walker (Te Parawhau).
340. The CEA concluded that given the range and magnitude of effects identified, the consensus was that overall managing, mitigating or offsetting the effects would not be possible. It stated:
- ‘The various experts point to a number of minor effects that, in isolation, appear relatively benign. However, when occurring concurrently and in conjunction with past impacts, the cumulative effects in relation to marine mammals, benthic organisms, coastal processes, kaitiakitanga, and mauri for example are significant. Many effects are referred to in the studies as unlikely to occur or temporary/short term in nature and therefore no mitigation measures are suggested. We contend that even if an effect is of a temporary nature, it can represent a low probability but high impact effect. Tangata whenua therefore seek that the proposal in its entirety be avoided (i.e. should not proceed) as it does not align to our cultural values and therefore impacts further on the mauri of Whangārei Te Rerenga Parāoa and Te Akau (Bream Bay). As such, mitigation measures have not been recommended in this CIA report’.*

341. The implications for the practice of kaitiakitanga are further detailed and expressed in terms of effects arising from the project in the CEA. The CEA contained an assessment framework based on the RMA and detailed the response of tangata whenua as to whether the 'safeguards of the RMA' have been met. It provided a summary of the engagement conducted by the Applicant (in collaboration with the PTB) with a range of tangata whenua groups and describes the four-step engagement and cultural effects assessment road map agreed to by tangata whenua. Mr Milner described the CEA as '*...a compilation of three years of korero by experts in their own rohe moana, based on their own tikanga (custom), and kawa (protocols)*'.
342. The Applicant engaged Mr Coffin to peer review the CVA and CEA (Application Volume 2, Annexure 2: Technical Report (q)). Mr Coffin's peer review was included with the application but the CEA (with the appended CVA) was not.
343. In his evidence, Mr Coffin sets out his approach to the peer review as follows:
- 'In my review of the CEA (dated October 31, 2017) I set out the...concerns and effects of the Proposal on tangata whenua identified in the CEA. The importance of distinguishing the concerns and effects was mostly for the benefit of the applicant. This facilitated the applicant being able to focus technical responses to the effects and apply a broader consideration to concerns, particularly those matters which on the face of it had no or little correlation with the activities proposed. This has supported a three pronged approach. The first, developing measures that may avoid, mitigate or remedy effects of the Proposal (and be potentially included in draft conditions); secondly, identifying environmental and cultural enhancement projects or programmes that can contribute to the betterment of the harbour as a whole or in part (and be potentially included in draft conditions); and thirdly, the engagement process – continuing to identify, clarify and address both effects and concerns of tangata whenua'.*
344. Mr Coffin stated it appeared that many Māori submitters supported the preparation of, and the content of, the CVA and CEA prepared by Patuharakeke. He noted that submissions do not request further CEAs to be prepared, which he took to mean that no further cultural effects assessments are needed to inform the consideration of the application. He considered consultation had been conducted early, and was informed, resourced, open and attended by senior staff of RNZ. He highlighted that the Applicant had sought the assistance of tangata whenua in the design and implementation of consultation; that preparation of the CVA/CEA and the consultation was conducted in concert; and concluded that consultation and preparation of the CVA/CEA was consistent with best practice in New Zealand.
345. A number of submissions (Bream Bay Coastal Care Trust, Ms Norris, the whānau of Henare and Tuihau Pirihi, Ringa Atawhai Trust, Patuharakeke, Dr Kepa, and Whatitiri Resource Management Unit) were concerned that the CEA was not lodged with the application, or considered the Applicant had 'rejected' the CEA.
346. Ms Dixon raised this as a procedural matter and submitted that Patuharakeke take issue with the way in which the application was submitted to the NRC and subsequently notified without the CEA (and the appended CVA). She submitted that the CEA should have been included with the notified application, as with other technical reports commissioned by the Applicant.

347. Mr Badham, on behalf of PTB, stated that the CEA should be regarded as a technical report, much like the other technical assessments provided by the Applicant, and that it is crucial to understanding the cultural effects of the proposed development on identified cultural values. He added that the inclusion of a peer review, while excluding a copy of the document it assesses, is not best practice, nor does it assist the parties. In his view, this had led to dissatisfaction from Patuharakeke and other iwi/hapū and confusion amongst submitters.
348. The Applicant's position was that the CEA was in draft form at the time it wished to file the application and, that as ownership of the CEA lay with Patuharakeke, RNZ did not consider it appropriate to file the document in draft form. Ms Dixon submitted that, in contrast, those circumstances had not prevented the Applicant from having the draft CEA peer reviewed and lodging the peer review with the application.
349. Ms Chetham stated that given the process of consultation, tangata whenua were resounding in their deep disappointment at the decision by the Applicant to obtain a peer review of the CEA; and that this decision had led to a breakdown in the relationship to the extent that Patuharakeke, at least, felt they were unable to attend any further discussions both during and post-hearing. Further, Ms Chetham stated that the position of Patuharakeke is that its longstanding relationship with RNZ has been damaged and has departed from any engagement in 'good faith'.
350. Ms Dixon submitted that a peer review of the CEA is not appropriate as a matter of tikanga, nor is it a matter of best practice, and she referred to the evidence of Ms Chetham that in the period since 2006, this is the only CEA that she was aware of that has been subject to a commissioned peer review by an applicant.
351. Mr Milner noted in his evidence that the whānau of Henare and Tuihau Pirihi did not support the peer review of the CEA, as they believed that the consultation process and three-year period of engagement was robust and transparent enough to warrant the final outcomes and expectations outlined in the CEA. He described the Applicant's peer review report as 'merely a desktop review' without any input from those who had participated in the consultation process and considered it was therefore limited in context and value.
352. Ms Dixon referred to the PTB submission and the summary of the principal position that Patuharakeke takes on this matter, which stated '*...we assert that only mana whenua of the area can determine what the effects of a proposal are on their values and culture and the type and level of effect*'. In response to questions, Ms Dixon acknowledged that perceived issues with the peer review process should be dealt with separate to substantive determination of the resource consents sought and are not relevant to our decision.
353. In the right of reply, Counsel for the Applicant submitted that this matter was not relevant to our deliberation of the substantive application; and that RNZ strongly refutes any suggestion of procedural irregularity regarding the timing of release of the CEA. Mr Simmons submitted that the decision by RNZ, in not releasing the CEA until that document was finalised by its authors, was acting in accordance with what it understands to be best practice.
354. We agree with Ms Dixon and Mr Simmons that this is not a substantive matter that is relevant to our determination of the applications. While it is not necessary for us to make a finding on the appropriateness, or otherwise, of the Applicant obtaining a peer review of a CEA prepared by tangata whenua, we do make the following observations.

355. We acknowledge Ms Dixon's submission that Patuharakeke view the process taken as being culturally inappropriate, given the CEA was prepared in accordance with their tikanga and the effects of the project were assessed against their cultural values as tangata whenua.
356. We note, however, as we did during the hearing, that Mr Coffin's report is that of an independent peer reviewer of what is referred to as a 'technical report'. We are mindful that his report is not a standalone technical report obtained by the Applicant and that it is not put forward as an alternative to the CVA or CEA. In that regard, we consider it in a similar light to any other technical reviews of an AEE.
357. In answers to questions, Mr Kemble confirmed that the Applicant had commissioned Mr Coffin to undertake a peer review following receipt of a first draft of the CEA. It is clear to us that the Applicant would not have commissioned the peer review had the CEA not concluded that the potentially unacceptable effects of the project mean that managing, mitigating, or offsetting the effects is not possible. However, despite this, we have no doubt that the Applicant would have found the review particularly useful in helping it to understand the concerns and conclusions reached by tangata whenua, the relevance of those concerns within an RMA context and how they might then be able to respond to those concerns.
358. We record we have found the peer review to be helpful and consider it has been approached in a way that is respectful, without undermining the conclusions of tangata whenua as to the effects on their values and culture.
359. The CEA identified and articulated environmental, cultural, social and economic factors, risks, effects and concerns in a comprehensive list, which was helpfully set out by Mr Coffin.¹⁷ The CEA concluded that cumulative cultural effects from the past, present and the future are considered significant adverse effects that cannot be mitigated. We address cumulative effects in a separate section of this decision below, however, those effects related to uniquely cultural concepts are addressed in this section.

¹⁷ (a) Maintaining tangata whenua relationships with Whangarei Te Rerenga Paraoa;
(b) Providing for meaningful participation in decision-making;
(c) The protection and enhancement of mahinga kai (pipi, tuangi);
(d) Concern for birds, fish, shellfish, marine mammals and the ecosystem;
(e) Issues related to major infrastructure and industrialisation of the harbour and land use past, present and future;
(f) Risk of oil spill;
(g) Climatic changes;
(h) Protecting the potential for realising commercial fishing/aquaculture;
(i) Economic benefits of the Refinery among local Māori;
(j) Protection and enhancement of the harbour generally;
(k) Kaitiakitanga - The enduring, systematic and systemic loss of knowledge that has occurred post colonisation and may continue to be affected as a result of the Proposal, through loss of access to sites and mahinga kai, loss of original place names, and reduced abundance of mahinga kai;
(l) Treaty of Waitangi - The potential impact on tangata whenua customary and commercial rights and interests now and in the future;
(m) Ecological – the potential effects of marine mammal collision and entanglement with dredging operation;
(n) Ecological – cumulative significant effects of turbidity, lighting and noise effects of dredging on Mair Bank and Reotahi Bay shorebirds;
(o) Ecological – loss of benthic Fauna within dredging footprint;
(p) Coastal processes – secondary effects of shoreline erosion as a result of higher intensity storm events and surges (caused by climate change);
(q) Climate change – cumulative effects of climate change on coastal processes, geomorphology, and extreme weather events;
(r) Effects on the Mauri of Whangarei Te Rerenga Paraoa through the removal of sand out of the system, loss of benthic community, sediment plumes and any impacts on whales;
(s) Effects on Mana of iwi, hapu and whanau through constraints on participation in decision-making, past, present and future;
(t) Socio-economic effects such as noise, loss of amenity, industrialisation of harbour; and
(u) Socio-economic effects such as lack of positive effects for local community, future remediation costs, dredge footprint and loss of pipi and cockle, constraints on commercial and future aquaculture opportunities.

360. As summarised in the CEA, the key themes arising from the CVA included:
- The strong interrelatedness of Whangārei Harbour tangata whenua and their historic and contemporary association with the harbour through constructs such as whakapapa and ahi kā;
 - The relationship to parāoa/tohorā/whales;
 - Aspects of significant cultural landscapes and seascapes, and wāhi tapu in and around the project footprint;
 - The significance of mahinga mātaihai in and adjacent to the subject site; and
 - Current and future tangata whenua aspirations in relation to rangatiratanga and kaitiakitanga in this location.
361. In having regard to the CVA and CEA, we have focused our assessment of the effects on cultural values and relationships on the following matters:
- Interconnectedness and the relationship to parāoa/tohorā/whales;
 - Cultural landscape and seascape;
 - Mahinga mātaihai and customary fishing;
 - Kaitiakitanga;
 - Te Tiriti o Waitangi/Treaty of Waitangi;
 - Mauri; and
 - Mana.
362. These key themes are discussed separately below.

Interconnectedness and the Relationship to Parāoa/Tohorā/Whales

363. The CVA highlighted the interconnecting themes of mauri/life force and the concept of the harbour as a whole and living entity with the relationship of tangata whenua to the project location and surrounds. It described the naming of features and reiteration through pepeha/tribal sayings, whakataukī/proverbs and waiata/songs to demonstrate and describe the depth and closeness of their long-held relationship with the project site and surrounding area and their historical ties to all resources within it.
364. The CVA recorded that the name given to the harbour – ‘Whangārei Te Rerenga Parāoa’ is associated with different meanings according to various tribal traditions. A well-known korero is that the name given to this place signifies that it was a gathering place of chiefs of Ngāpuhi – the word ‘parāoa’ being a metaphor for chiefs, while Ngātiwai tradition states that the harbour was referred to as a ‘Riu’ or passageway for tohorā/whales, and was mentioned on numerous occasions by hui participants during the engagement process. The CVA emphasised that tohorā have a special place in Patuharakeke tradition and they are seen as kaitiaki or guardians and an indicator of cultural health.
365. The CVA recorded that concerns were voiced at hui about the potential for this project to modify the passageways of whales and other marine mammals and that altering the seabed could be a causal factor in marine mammal strandings. Tangata whenua sought to ensure potential adverse effects on marine mammals form part of any assessment of effects carried out by the Applicant in support of this project.

Cultural Landscape and Seascape

366. The cultural landscape within which the footprint of the project falls was described in submissions and evidence given by mana whenua and set out in the CVA. The CVA describes signifiers and sites of high cultural significance to Ngātiwai, Ngāti Kahu o Torongare, Te Waiariki and Parawhau along with Patuharakeke and others, in the area that forms the cultural landscape and seascape, including maunga/mountains such as Manaia, Matariki/Mt Lion, Te Whara/Bream Head and the Takahiwai and Pukekauri ranges. Islands, including Taranga and Marotiri/Hen and Chickens, Motukaroro, and Taurikura and Pou Ewe, are just some of the rocks and reefs of traditional spiritual and cultural importance. The CVA recorded that *'In the general vicinity of Te Wahapu o Whangarei Te Rerenga Parāoa there are a number of sites where specific locations cannot be revealed due to their cultural sensitivity.'* It also acknowledged the physical, spiritual and cultural sustenance Whangārei Te Rerenga Parāoa provided for the various hapū as a repository for taonga.

Mahinga Mātaitai and Customary Fishing

367. Key traditional mahinga mātaitai and customary fishing grounds are identified in the CVA. These included Patangarahi/Snake Bank, which was and remains, a tahuna/bank for kokota/pipi and cockles, and Marsden Point. The CVA stated that, according to Patuharakeke elders, a massive mussel bed covered the takutai/foreshore adjacent to the Refinery site prior to its construction – this mussel bed extended landward from the edge of the channel and ran from Mair Bank along to the current location of the Port Jetty. It noted this mussel bed was widely utilised for customary and recreational harvesting and was a 'jewel in the crown' of a harbour abundant with resources.
368. Kuaka/godwits are referred to in the CVA as there were a number of tahuna kuaka/sandbanks where godwits fed and rested on their migratory journey; and it is stated that they are considered kaitiaki and an indicator of cultural health in this area, featuring prominently in Ngāi Tāhuhu mythology and tradition. It stated kuaka *'...are considered to have guided the path of the ancestral migration to Aotearoa from Hawaiki'*.
369. The CVA stated Rauiri/Blacksmiths Creek was the site of a seasonal eel weir, and pā harakeke farmed and cultivated by Patuharakeke. There was also a large and important pipi bank where Northport is today. A number of other important mahinga mātaitai were located at Marsden Bay, McDonald Bank, Mair Bank, Marsden Bank, Calliope Bank and Urquharts Bay, along the coastline from Reotahi to Taurikura as well as Smugglers Bay, Peach Cove and Bream Bay. The various species of fish and shellfish harvested at these various locations and habitats are set out in the CVA and it is recognised that some of these locations, Mair Bank in particular, also have an important role to play in providing structural stability for the harbour entrance and therefore provide significant ecosystem services.
370. It is stated in the CVA that the waters of the harbour are considered a taonga gifted by the tūpuna/ancestors of these tribes which today's kaitiaki have a duty to conserve and protect for their mokopuna. The CVA clearly articulated how kaitiaki have been displaced stating that–

‘...more than a century of poor management practices has seen an immense decline in marine species as a result of degraded water quality, habitat loss and harvest pressure. The decline of kaimoana species, is accompanied by a decline in traditional knowledge in regard to those species, their uses and management practices. This impacts on the duty of tangata whenua as Kaitiaki and displaces an important role and function for their tamariki and mokopuna. Their mana as tangata whenua, is further diminished by an inability to practise manaakitanga to gather kai moana for the table both for their families and manuhiri. Not only does this impact on the cultural wellbeing of Tangata Whenua o Whangarei Te Rerenga Paraoa, but it has economic consequences, as it restricts the ability of whanau to put kaimoana on the table, a practice that has always supplemented low incomes. Therefore the RNZ’s technical information gathering exercise will need to be cognisant of the fact that the harbour ecosystem, and our mahinga mataitai listed above in particular, are already in a significantly degraded state. The desire of Tangata Whenua o Whangarei Te Rerenga Paraoa is to restore key mahinga kai and any activity that causes further deterioration will be unacceptable.’

371. The CVA recognised that the hapū of Whangārei Te Rerenga Parāoa also retain a contemporary cultural relationship with the site and its surrounds, emphasising that this is a living and contemporary relationship, not only a traditional or historic memory. It states that ahi kā is maintained and the marae at Takahiwai continues to hold its dominant position in the landscape and is a living and dynamic institution in continual use as a cultural centre for the surrounding district.

Kaitiakitanga

372. The CVA stated that ‘...as kaitiaki, Tangata Whenua o Whangarei Te Rerenga Parāoa are responsible for both the knowledge (mātauranga) and the practice (tikanga) of kaitiakitanga in relation to resources. This relationship is a responsibility rather than a right – a duty kaitiaki are bound to by both culture and tradition to maintain’. The CVA points to the erosion of the capacity to practise kaitiakitanga and the commitment of tangata whenua to ‘...a significant future role in the monitoring and protection of the health of the harbour catchment and the effects of developments such as this dredging proposal on the health of its ecosystems’.
373. The CVA examined contemporary kaitiaki practices and observed that, ‘...while kaitiakitanga still involves the use of traditional practices and mātauranga Māori, it also requires working knowledge of resource management policy and planning and western science techniques’. It notes kaitiakitanga is demonstrated through ‘...customary fisheries management and monitoring, marine mammal research and management, cultural heritage monitoring, provision of advice (e.g. Cultural Impact Assessments), and via participation in local and central government agency consultation processes’.
374. Mr Milan Ruka presented findings made by Mr Robert Ruka in his report of the Northland Harbour Board’s 1989 Whangārei Harbour Study which referred to kaitiakitanga as the kawa of the hapū, a unique traditional Māori management, protection and partnership system proposed to accord status to the hapū and iwi, which would balance out the interests of the community and benefits to the Northland region as a whole. In the study Mr Grant Pirihi of Takahiwai is quoted as saying –

‘Shellfish and other kaimoana have an intrinsic value placed upon them in Māori society. They are indicators of the health of the environment, it satisfies the traditional palate, it provides sustenance for a lot of people, and importantly it maintains and enhances the mana and standing of the tribe.’

375. The CEA identified that potential diminishing of the role of kaitiaki with flow on effects on mana, and their spiritual and physical wellbeing is a result of the project. It notes that kaitiakitanga is a relationship of responsibility rather than a right – a duty tangata whenua are bound, by both culture and tradition, to maintain. Tangata whenua pointed to the enduring, systematic and systemic loss of mātauranga (traditional knowledge including te reo Māori) and tikanga that has occurred post colonisation and may continue to be affected as a result of the project. They noted that mātauranga and tikanga can be affected by the loss of access to mātaimai sites and mahinga kai and the loss of original place names. They noted the reduced abundance of mahinga kai and, a loss of key knowledge around gathering locations and harvest practices has affected the intergenerational transfer of knowledge accompanied by a decline in traditional knowledge in regard to those species, their uses and management practices. The CEA stated that this impacts on their duty as kaitiaki and displaces an important role and function for their tamariki and mokopuna.
376. We heard extensive evidence from Mr Milner and Ms Chetham regarding the role carried out by Patuharakeke as kaitiaki to actively protect the harbour and its surrounds, including – gazetting the Rohe Moana Boundaries under the Kaimoana Customary Fishing Regulations 1998, providing extra opportunities and safeguards regarding restoring the mauri and health of customary fishery areas and species through taiapure or rāhui; beach ambassadors; kaitiaki customary permit issuers; Honorary Fisheries Officers; monitors and surveyors; and managers of areas of concern.
377. We were told Patuharakeke had been instrumental in working with MPI, NIWA and MfE advocating for temporary closures over customary harvest areas, specifically on Marsden and Mair Banks to see if this increases recruitment for the pipi, which is of particular relevance given both are, as Mr Milner described, *‘the cornerstone of this application’*.
378. Patuharakeke highlighted the fragile state of the pipi population and their massive decline over recent years on Mair and Marsden Banks and how this led Patuharakeke to advocate for a rāhui/placement of customary restrictions under the Fisheries Act 1996 (section 186A closure) in an attempt to protect this mahinga mātaimai and allow stocks to recover at Mair and Marsden Banks. Ms Chetham referred to Patuharakeke’s current involvement in a 5 year pipi monitoring programme in conjunction with NIWA. The CEA stated –
- ‘If mahinga kai or mātaimai sites, such as Mair Bank are further compromised by this project, this generation of kaitiaki will struggle to continue the restoration and enhancement they are currently progressing.’*
379. Mr Milner told us that the Patuharakeke Mana Moana Committee is mandated to be the voice, hands and feet, of the hapū in the rohe moana and work to improve the cultural and environmental aspirations of the hapū within Tangaroa’s (atua of the sea) domain. He said that a draft Mana Moana Management Plan had been developed by the Committee which focuses on a marae based kaimoana enhancement program to recover depleted stocks and to ensure Patuharakeke are capable of providing their taonga kaimoana at their marae and homes for their manuhiri/visitors. He emphasised the use of mātaimai reserves and how they have been working with MPI to develop an application to manage their customary kaimoana resources sustainably.

380. Mr Coffin observed that, while the CEA identified that a loss of knowledge may continue as a result of the loss of access to sites and mahinga kai, loss of original place names, reduced abundance of mahinga kai, it does not spell out the extent to which this may occur and the length of time (if relevant) this would apply. He considered that, on the face of it, this has the potential to be a 'minor to moderate' adverse effect of a temporary nature and suggested that kaitiakitanga can be enhanced by ensuring tangata whenua appointed representatives to the Applicant's proposed KG are provided with a role to participate in the implementation of consents, are resourced to do so, and have a role in projects and activities that will enhance environmental outcomes.
381. In response to the evidence of Mr Milner, Mr Coffin noted that he was not aware of the draft Mana Moana Management Plan referred to above, and considered it would be beneficial to review the plan once it had been finalised to see if there is information that can assist the proposed KG with its role and inform the various management plans being developed in the implementation of the consents.

Te Tiriti o Waitangi/Treaty of Waitangi

382. Several submissions seek the recognition of Waitangi Tribunal claims, Marine and Coastal Area (Takutai Moana) Act 2011 (**MACAA**) applications and customary title.
383. In relation to Te Tiriti o Waitangi/Treaty of Waitangi principles, the CEA and several submissions¹⁸ focused on the potential impact on tangata whenua customary and commercial rights, and interests now and in the future; particularly in terms of the governance of Whangārei Harbour, the legal recognition of customary rights (under the MACAA), commercial and customary fishing rights and iwi future aspirations for commercial development (aquaculture space). The CEA describes a context where tangata whenua are looking to future Treaty of Waitangi settlements with the Crown and recognition of their customary rights to the coastal marine area to address ownership and management issues in relation to the Whangārei Harbour in particular.
384. The CEA concluded that overall, tangata whenua consider the project would not strengthen their ability to exercise rangatiratanga and may undermine their right to develop in the future.
385. Mr Coffin pointed out that the Treaty of Waitangi settlement of aquaculture rights of 'Mandated Iwi Organisations' can be realised for new aquaculture space and are likely to be exercised in large scale operations, land-based or at coastal locations, some distance from the Refinery and shipping facilities and recreational boating activities. He confirmed that there do not appear to be any such rights identified at the present time and that these potential effects are regarded as less than minor.
386. Mr Coffin addressed Waitangi Tribunal claims in his evidence setting out the Waitangi Tribunal's process in relation to the Te Paparahi o Te Raki (Northland) inquiry (Wai 1040) and the current status of that Inquiry and noted that, until the Waitangi Tribunal makes its recommendations and these have been incorporated into statutory or legally binding provisions or policy, these matters are contextual and do not provide a direction for us.

¹⁸ These include the submissions of PTB, Rhonda Aorangi Kawiti and Mitai Paraone Kawiti.

387. The MACAA legislation provides ways for Māori to obtain legal recognition of their customary rights in te takutai moana, either through an agreement with the Government or by a High Court order. Several Whangārei hapū and iwi groupings, including Patuharakeke and Ngātiwai, have made applications for either customary marine title and/or protected customary rights that overlap with the RNZ project area.
388. Ms Dixon noted that on 3 April 2017, PTB applied for recognition orders under the MACAA legislation, within the area adjacent to the Takahiwai Block and over the area subject to the proposal extending to bream tail. She noted the position of PTB that customary title to the foreshore and seabed has never been extinguished. By section 4(2)(a), the MACAA repeals the Foreshore and Seabed Act 2004 and restores customary interests extinguished by that Act (section 6(1)). Ms Dixon submitted that the MACAA therefore merely provides the vehicle to have customary marine title or a protected customary right granted by way of order and that while the applications are still extant and are yet to be determined, the customary interests that Patuharakeke exercise in Mair Bank and the greater coastline will still be impacted by the project.
389. An applicant for resource consent, permit or approvals in the common marine and coastal area is required to notify and seek the views of any group that has applied for recognition of customary marine title in the area (section 62(2)-(3) MACAA). As Mr McNeill noted in his evidence, RNZ sent letters to some 21 customary marine title applicants, notifying them of the application for resource consents, and seeking their views on the same. PTB responded to that request and identified in its submission that the CEA represented the view of PTB and several other MACAA applicants.
390. Mr Coffin concluded that he is not aware of any issue under the MACAA affecting the application of the RMA to the consideration of the project, and if appropriate, the grant of resource consents for the application by RNZ.
391. Mr Simmons submitted that given no customary marine title or protected customary right orders have been issued in respect of the area of RNZ's resource consent application, the MACAA legislation is of no further relevance to the current application and should not (and cannot) affect our consideration of the proposal.
392. In response to our questions during the hearing, both Ms Dixon and Mr Badham confirmed their view that the Applicant has done all it needs to do under the MACAA; a matter also confirmed by both Mr Coffin, and Mr Mortimer in evidence. Messrs Badham, Mortimer and Kemble agreed that the proposal did not give rise to section 6(g) RMA matters.
393. The CEA records that there is still debate amongst hapū and iwi as to whether the MACAA is much of an improvement on its predecessor, the Foreshore and Seabed Act 2004. Ms Dixon noted in response to questions that despite section 6(g) RMA applying only to protected customary rights, the fact remains that Patuharakeke submit that they have never had their rights to the foreshore and seabed extinguished and the only process that remains is for those rights to be acknowledged by the High Court.

394. Ms Dixon submitted that Patuharakeke are somewhat hamstrung by the current MACAA framework, particularly in terms of the ability to have customary issues addressed before the Waitangi Tribunal processes have occurred. In response to our questions, Ms Dixon agreed that while section 6(g) of the RMA may not be relevant, what is of relevance is the relationship that Patuharakeke have with the moana and the marine and coastal area. As Mr Paki stated in his evidence, *'Patuharakeke's customary rights within the rohe stem from mana whenua, mana moana, ahi kaa, and the continuous exercise of those tikanga that have governed Patuharakeke mai rā ano/time immemorial.'*

Mauri

395. The CEA highlighted that effects such as removal of sand out of the system, the loss of benthic communities, sediment plumes, and any impacts on tohorā/parāoa/whales, for example, contribute to an overall adverse effect on the mauri and cultural health of the harbour/ecosystem as a whole. Tangata whenua measure effects on the harbour in the context of past and present effects, as well as the future effects anticipated as a result of the project. Mr Milner described mauri as an intangible cultural health indicator that is regarded as the life force of any object and representative of its level of health.
396. The CEA stated that the mauri of Whangārei Te Rerenga Parāoa has been seriously diminished as a result of decades of management decisions that tangata whenua had no part in. The CEA noted that from the late 1950s onwards, cement processing fines were dumped into the harbour at Portland, sediment dredged from the main channel was dumped on Snake Bank and at Takahiwai, and agricultural run-off has become a major issue, as were historical failures of Whangārei's main sewage treatment plant that saw untreated discharges entering the harbour regularly and as recently as the last decade. It noted that the Marsden Cove marina development and reclamation for creation of the Northport berths, along with existing and future Refinery consents, fisheries pressure and future climate change impacts all added to this mix of past, present and future stressors on the harbour.
397. The Ringa Atawhai Trust raised the matter of the environmental baseline before the Refinery was developed and a number of submitters identified the loss of 'spirit', 'beauty' and mauri of the Whangārei Harbour and approaches; as well as the issue of lack of tangata whenua participation in decision-making.
398. Mr Coffin stated that the matter of mauri is a rather personal and perceptive concept meaning many things to many people. He explained that:

'...specific species and groups of those species can be a representation of the mauri of a place, their presence giving sense to the life essence of a place. Mauri can also be considered an overall value of a place and its resources, its life-giving qualities as a whole rather than its constituent parts. The concept that mauri is tapu, and tapu is mauri denotes the spiritual or unseen forces of mauri. These mauri can be attributed to the Atua - realms of the environment and imbued in physical objects. Whatever the view of mauri is in this case, it is one of the most important principles to Māori.'

399. In his peer review, Mr Coffin stated –

'The concept of mauri has not in my opinion received much discussion within the context of the CEA. Mauri is a very important Māori principle and should be afforded some further consideration to assist interpreting the potential effects on mauri and how they may be avoided, mitigated or remediated.'

400. Ms Chetham stated that mauri is made up of a culmination of factors contributing to the overall health of the harbour. She considered that the total loss of the benthic communities within the dredge footprint and disposal areas represents a diminishing of the mauri of Whangārei Harbour that is unable to be mitigated. She did not consider that it was a simple matter of 'off-setting' stating that –

'If the mauri of one mahinga kai is adversely affected, you could arguably protect or enhance another mahinga kai elsewhere in the harbour. Overall, the mauri might be able to be enhanced. However, we are looking at a situation where mahinga kai are now virtually non-existent anywhere in the harbour, and another adverse impact will put the mauri beyond protection or enhancement. In my view, and consistent with my understanding of kaitiakitanga, mauri should be safeguarded in the first instance, rather than a matter we try to repair after the fact'.

401. In his Staff Report, Mr Mortimer acknowledged the conclusions on mauri set out in the CEA but commented that, based on scientific methodologies which will differ from the cultural perspective, the potentially measurable cumulative effects of the individual elements referred to do not appear likely to have a lasting adverse effect on the natural physical and ecological system(s) that exist. He added that it is irrefutable that the channel will be changed from its natural form.

402. Mr Coffin noted Mr Mortimer's 'heavy' reliance on the technical evidence of the Applicant in relation to mauri and relationships, and acknowledged that technical evidence may not reflect a cultural perspective. Mr Coffin provided the following explanation of the tensions between modern perspectives of the current environment and the effects of the project -

'Cultural perspectives will often involve experience through observation, seeing changes over time and the frequency of change. The observations will often be active rather than passive, associated with an activity such as harvesting pipi, going fishing or carrying out a programme. These observations are often couched in longer timescales, several generations of people with a baseline in the distant past. This facilitates a tension between modern perspectives of the current environment and the effects of the proposal within a certain time frame and tangata whenua perspectives.

These tensions are not easily resolved under the RMA, however the applicant has listened, consulted, resourced participation and input and agreed to a number of measures that will avoid, remedy or mitigate effects. It is acknowledged that tangata whenua may have residual concerns regarding the proposal. The participation in the proposal going forward is designed to provide meaningful expression of Kaitiakitanga in the application and confidence that the undertakings supported by technical information will deliver the expected environmental outcomes.'

403. In his response to the hearing evidence, Mr Mortimer presented a very considered assessment acknowledging that there has been much evidence presented that confirms tangata whenua, and particularly Patuharakeke in this location, maintain a close relationship with the harbour and its natural resources and that this has been made difficult by past land alienation and modification to the harbour environment, including through habitat degradation and pollution. He noted that he fully appreciated the intimate link between maintenance of the quality of the natural harbour environment and maintenance of cultural identity and traditional practices. He stated that when assessed from that viewpoint, he understood that any major modification to the harbour environment would be seen as an anathema to the maintenance and enhancement of cultural values.

404. Mr Mortimer observed that any major modification to the natural harbour entrance will inevitably affect its mauri as expressed by Ms Chetham and Mr Milner. He added that–

‘...given the RNZ proposal...involves major change to the natural channel, adverse cultural effects on mauri will be unavoidable and, we are told, significant for tangata whenua. Other effects on identified taonga, mahinga mātaītai, and sites of significance may be able to be approached using western science but, coming as it does from an entirely different philosophy from that underpinning the RMA, mauri cannot.’

Mana

405. In relation to mana, the CEA noted that as kaitiaki of all natural resources within their rohe, tangata whenua have a cultural and spiritual responsibility to ensure the mauri of these resources/taonga tuku iho is maintained, protected and enhanced. Tangata whenua consider an inability to manage their own taonga through constraints on decision-making, past, present and future, diminishes the mauri and has flow on impacts to their mana including the inability to practise manaakitanga to gather kaimoana for the table both for their families and manuhiri, which is something the people of Whangārei Te Rerenga Parāoa were formerly renown for.

406. Mr Milner stated in his evidence –

‘Our active responsibilities are driven by providing taonga, kaimoana at our marae and in our homes for manuhiri or visitors. These activities demonstrate the capability of Patuharakeke to engage in the environment and carry out our kaitiakitanga as mana whenua mana moana.’

407. Mr Coffin noted that a number of submissions seek more recognition of tangata whenua in involvement and participation of monitoring and research, in consultation, kaitiakitanga, and enhancement/restoration of the harbour environment. This included the submissions of Ms Kawiti-Tana, Mr Milner, Ms Norris, Mr Tana and Mr Mahanga.

408. Mr Coffin acknowledged that tangata whenua may not have been able to participate in historic decisions and implementation but that the Applicant has actively sought to involve tangata whenua throughout scoping and refining its project, including agreeing to and resourcing the production of cultural and technical inputs into the application process. He considered that the engagement undertaken with tangata whenua was, in his opinion, appropriate, meaningful and conducted in good faith; and that the proposed conditions regarding establishment of a KG seek to facilitate a meaningful role of tangata whenua in the monitoring, reviewing and implementation of the proposed activities.

409. In relation to mana, Mr Coffin concluded that the process undertaken by the Applicant to involve tangata whenua has exceeded the requirements of the current RMA legislation, when, as he pointed out, the Applicant has no mandate or control over past and future legislative provisions on Māori input into the decision-making process.

Wāhi Tapu

410. The CVA detailed a matrix of relationships that are sought to be recognised and provided for and identified a list of matters relating to wāhi tapu. However, other than potential adverse effects on important mahinga kai or harvesting areas the CVA stated the application does not affect any known or identified wāhi tapu as such.

411. Mr Milner and Mr Paki spoke of a taniwha that resides in the harbour. Mr Milner stated that Patuharakeke acknowledge within their traditional korero the presence of taniwha particularly at Te Koutu (where Marsden Point Wharf is now located), Kuramakanoa and Parua, the presence of which become apparent in natural phenomena. He stated that the loss and absence of these taniwha over the last three generations has coincided with the loss of control and management by Patuharakeke over their moana. Mr Milner told us the taniwha had been impacted by development over the years and that *'..he was beaten up, but he is there'*. Mr Milner did not elaborate further on the actual or potential effects, if any, of the proposed activities on the taniwha.
412. In his closing submissions, Mr Simmons noted the comments made in relation to the presence of wāhi tapu within the application area – a taniwha specific to Patuharakeke. He noted that no further information regarding its existence, location, or values attached to the wāhi tapu was forthcoming.
413. Following adjournment of the hearing, and as Mr Simmons points out, supposedly in response to information provided by RNZ (as directed by us), Te Parawhau commented that *'The proposed area of works subject to this application is where Te Rau o Te Taniwha lives. Any such work will desecrate spiritual and cultural values.'*
414. For completeness, we note that Dr Kepa considered in her original submission that RNZ did not care enough about their culture and belief in taniwha and named Atua/Gods. However, we note she did not expand on this in her evidence at the hearing.

Findings – Cultural Values and Relationships

415. We are highly cognisant of the continuous connection to the whenua and moana that Tangata Whenua o Whangārei Te Rerenga Parāoa have and the importance of the decisions to be made in this matter for both tangata whenua and RNZ. We are mindful that these decisions concern not only the economic, but the ecological and cultural welfare of this area into the foreseeable future.
416. It is clear from the overall findings of the CEA and the evidence of submitters that tangata whenua see the proposed dredging, when added to previous cumulative effects, represents a 'tipping point' in terms of their relationship with Whangārei Te Rerenga Parāoa. It is stated throughout both the CVA and CEA, and reinforced in the evidence of several submitters, that previous cumulative effects have already degraded the mauri of Te Rerenga Parāoa, which has resulted in lasting impacts on the mana of tangata whenua. However, it is not our role nor the role of the Applicant to seek to remedy the effects of degradation and displacement felt by tangata whenua as a result of historic activities affecting the harbour.
417. It is acknowledged by all parties that the Whangārei Harbour has changed over time and that a range of industrial, commercial and recreational activities have contributed to this change. It is also acknowledged that Whangārei Harbour still retains special characteristics, some of which have special protection and recognition in statutory documents. In our view, some of these protections recognise the cultural value of the harbour and importance of the relationship with tangata whenua.

418. As is often the case, the relationship of tangata whenua is articulated in the context of customary rights and Treaty rights and while the principles of the Treaty must be taken into account, we agree with Mr Coffin's view that future Treaty of Waitangi settlements with the Crown and the recognition of customary rights to the CMA to address ownership and management issues are contextual and we can take them no further in our consideration of the applications.
419. We accept Mr Simmons's submission that the Applicant has discharged its obligations under the MACAA and find that that Act does not contain any restriction on the processing or grant of resource consent applications, prior to any determinations under that legislation. We also agree that MACAA applications are for the High Court and/or the Crown to ultimately determine.
420. We nevertheless concur with Ms Dixon that it is the relationship of Patuharakeke with the CMA, and particularly the application area that is the subject of this proposed activity, that is important and relevant to our assessment under section 6(e) of the RMA.
421. We find that there is the potential for adverse effects on the traditional and continuing relationship of the Tangata Whenua of Whangārei Te Rerenga Parāoa with their marine environment, together with potential ongoing effects on their cultural landscape and seascape. The dredging of the harbour has the potential to affect the ability of tangata whenua to carry out their customs and activities relevant to this area, potentially limiting access to the sea and its bounty and reducing further the ability to have a significant influence upon the management and integrity of that environment for the duration of consents.
422. However, having established that, the question is whether or not the conditions offered by the Applicant are sufficient to avoid, remedy or mitigate the potential adverse effects on what are clearly matters of national importance under section 6(e) of the RMA.
423. As confirmed by Mr Coffin, whilst the project does not propose dredging at any of the mahinga kai sites, the proximity to these sites and the sensitivity of tangata whenua has influenced the minimisation of the dredging footprints, proposed baseline investigations and monitoring, and specific programmes and activities to enhance ecological values.
424. It is important to note that we acknowledge and appreciate the position of Patuharakeke as described by Ms Chetham at the conclusion of her evidence-

'Patuharakeke are often placed in the unenviable position in that while we oppose the application in its entirety, in our duty as kaitiaki, and as a result of our long experience with resource consents almost certainly being granted we are often obliged to participate in the minimised process of addressing and advocating conditions of the activity that we oppose. This is to ensure the ongoing leadership and involvement of Patuharakeke as mana whenua, mana moana and as hau kainga is central in development activities occurring in our rohe. This results in a perception that we are in agreement with the development as this is seen as "consultation, active participation and protection". The consenting processes generally compels us to negotiate conditions, yet we are clear that as a result this does not constitute either partnership or decision-making input. We have not seen a proposal of this size and significance since the Northport consents two decades ago. As was the case then, and remains the case now, we cannot enter into discussions on mitigation or compensation on the RNZ dredging and disposal application as we are not satisfied that the cumulative effects on the proposal in relation to coastal processes, geomorphology, ecology, kaitiakitanga and mauri can be addressed to ensure that adverse cultural effects are avoided. While we

value our relationship with RNZ and wish it to continue in an effective and meaningful way, we cannot place it above the importance of protecting what is left of the taonga tuku iho that were passed down to us from our tupuna, those taonga that are central to our cultural identity as Patuharakeke’.

425. At our direction PTB provided a response to the Applicant’s additional information and revised proposed conditions, with the precursor that PTB’s response was provided while maintaining opposition to the application due to the potential cultural effects, particularly on Mair Bank and Marsden Bank mātaihai. We have found that response particularly helpful and acknowledge PTB for providing further comment.
426. On the basis of the evidence, we find that the engagement with tangata whenua undertaken by the Applicant has been very comprehensive and reflective of the status of each hapū and iwi as tangata whenua. There has been a three year process of engagement and we find that there has been a genuine effort in meaningful consultation by the Applicant to identify and understand the concerns of tangata whenua. We agree with the Applicant that the fact that this process did not result in support of the application, is not a flaw of the application.
427. We agree that the role of tangata whenua in decision-making (or lack of it) to the extent it undermines their mana is not within the scope of this hearing nor attributable to the effects of the project.
428. We note that no further detail has been provided evidencing the existence of a taniwha at the application site, or more importantly how the proposed activities will adversely affect any taniwha or associated cultural values. We accept Mr Simmons’s submissions in terms of fair process in this respect and agree that there was no attempt to put any substance around the claim of wāhi tapu. Therefore, in the absence of such evidence, and taking note of Counsel’s submissions in relation to the guidance provided by the Environment Court on this issue in *Beadle v Minister of Corrections*¹⁹, we concur with Mr Simmons that we are unable to consider whether a taniwha exists and what effects the proposed activities might have on it.
429. We find that the volunteered conditions, which require ongoing engagement and involvement through the KG, appropriately recognise and provide for this relationship and enable decision making and funding for research and work to restore and enhance cultural values and relationships. While we have no jurisdiction to ‘put this application on hold’ as Mr Milner requested, we consider that the mitigation package offered by the Applicant will go some way towards supporting the development of the cultural health measuring tools and methodologies that he identified noting that one of the functions of the KG is to develop a Mātauranga Māori Monitoring Framework. We note also Ms Wakefield’s submission regarding the aspiration for revitalisation of the harbour and consider the mitigation package will allow the KG to identify, develop and support projects aimed at that revitalisation.
430. We find that the imposed conditions in relation to water quality monitoring, a closed season for dredging, investigation of the physical/ecological relationships at Mair Bank, harbour restoration and enhancement funding, and strengthening the role of the KG, including input into management plans, appropriately avoid, remedy or mitigate adverse cultural effects to the point that they are, in our view, acceptable; and that they respond appropriately (including providing the level of protection that we believe is required) to both the biophysical and metaphysical aspects of the cultural environment.

¹⁹ *Beadle v Minister of Corrections* A074/2002. See in particular paras [436] – [446] as referred to in Applicant’s Closing Legal Submissions, para 6.5.

431. In summary, we find that cultural adverse effects and concerns will be appropriately and effectively addressed by the project through a combination of the volunteered conditions and those which we have imposed. In particular, these conditions seek to recognise and provide for the ecological and cultural significance of Marsden and Mair Banks, in conjunction with the importance of maintaining a viable shellfish population to the stability of Mair Bank, by affording these areas the same level of protection of water quality as the other M1MAs on the north side of the harbour. To that extent, the potential effects on the cultural sites, mahinga mātaihai at Mair and Marsden Banks can be avoided, at worst remedied and at best even enhanced. This also recognises the kaitiaki role taken by Patuharakeke and other hapū in exercising their kaitiaki responsibilities to seek protection of that valued kaimoana source.
432. We acknowledge Ms Chetham's view that the measures proposed will not facilitate the knowledge and practise of kaitiakitanga or rangatiratanga 'in it's true sense', but while we have imposed conditions that seek to recognise and provide for kaitiakitanga and rangatiratanga, we have reached the extent of what is both necessary, given the adverse effects of the application, and what is required under the framework of the RMA.
433. Overall, we find the Applicant has listened, consulted, resourced participation and input, and developed and proposed a number of measures that will avoid, remedy or mitigate the cultural effects of this project. We find the Applicant has proposed a comprehensive package of measures to be included as conditions of consent with the most significant of mitigation measures proffered being the establishment and funding of a KG.
434. We consider that the mitigation package now offered by the Applicant together with our imposed conditions, directly address the issues raised by tangata whenua particularly in terms of mana and decision-making, and seek to support tangata whenua to have a significant influence upon the management and integrity of that environment for the duration of consents with provision for the health of the harbour to be enhanced.

Navigational Safety

435. We heard from Mr Collins for the Northland Chamber of Commerce, Mr Faithful for McKay Limited and Maintenir Limited, and Mr Nutting for Worley Parsons New Zealand Limited, who all stated the project will result in improved navigational safety for all commercial vessels accessing Whangārei Harbour. In addition, written submissions from Culham Engineering, Coastal Oil Logistics, North Tugz Limited, United Civil Construction and Mr Forsyth all supported the project as it would, *inter alia*, provide improved navigational and marine safety for vessels visiting the Refinery and other vessels visiting Northport.
436. Navigational safety issues were addressed in the application in technical reports appended to the application addressing alternative options and the risk assessment (Application, Volume 2, Annexure 2: Technical Reports (e) and (f)).
437. Mr Martin and Mr Reinen-Hamill explained that at the outset of the project various options were considered in terms of the unloading of fully Suezmax vessels. The preferred option from a financial perspective was dredging of an access to the RNZ's berths. Once this option had been settled on, the Applicant then assessed a number of different channel alignment options.

438. Mr Martin outlined the process that the Applicant followed in selecting 'Option 4.2' as its preferred channel alignment over the existing alignment and the other short-listed option, referred to as 'Option 2'. He stated that this process involved a range of multi-disciplinary investigations which included environmental considerations (avoiding sensitive areas where practicable), liaison with stakeholders (the Harbourmaster, Northport, and North Tugz), analysis in respect of international best practice guidelines for shipping channel design, and several rounds of simulations to test channel design options.
439. Mr Cross described the iterative process that was followed, including details of the various workshops and simulation studies that were undertaken. He stated that Option 4.2 was the preferred alignment and that it provides a significant improvement over the existing channel alignment and allows for safe vessel manoeuvring.
440. Mr Bermingham presented a comparison of the existing channel versus Option 4.2 and Option 2 in terms of compliance with the 'PIANC guidelines'²⁰, which Mr Cross stated are used throughout the world and are considered to be one of the leading publications in this field. As part of this process the alignments were divided into reaches, being straight lines (bearings) that the vessel travels before a turn is needed to enter the next reach.
441. Mr Bermingham stated that all the reaches of Option 4.2 were either 'optimal' or, at worst, 'adequate' under the PIANC guidelines; whereas the current channel had a number of reaches which were 'marginal' and one (near Home Point) that was 'inadequate' under the PIANC guidelines. He said Option 2 fell in between Options 4.2 and the current channel in terms of the PIANC guidelines. He stated that Option 4.2 offered significantly simplified navigation and vessel handling compared to the current channel.
442. Mr Bermingham outlined the six potentially significant consequences of vessels departing from the navigational track. These consequences involved contact with buoys/markers and the jetty as well as grounding and/or contact with sand or rock. Mr Bermingham stated that the navigational risk exercise identified that a range of operational control measures were required irrespective of which option was chosen and that if these were implemented they would reduce the risk of accidents happening. The navigational risks reduced where a channel alignment better met the PIANC guidelines, meaning that Option 4.2 had less risk than Option 2, which had less risk than the current channel.
443. Mr Bermingham considered Option 4.2 reduces the navigational risk to a level so as to meet the 'As Low As Reasonably Practicable' (**ALARP**) principle.
444. Mr Mortimer accepted that there will be significant positive effects on navigational safety as a result of the project.

Findings

445. We find that the Applicant has undertaken an extremely thorough and robust assessment of the navigational risks associated with the current channel as well as that being proposed in this application (Option 4.2). The work leading up to selecting Option 4.2 involved a multi-step process, considered many factors, and had input from key stakeholders.

²⁰ Being the "Approach Channels – A Guide for Design" published by the Permanent International Association of Navigational Congress (PIANC) and the International Association of Ports and Harbours (IAPH).

446. We find that Option 4.2 results in a significant improvement in navigational safety compared to the current channel and the other options considered and it better meets the internationally recognised PIANC guidelines.
447. We find that the navigational risk associated with Option 4.2 is reduced to a level which constitutes the ALARP.
448. We heard no evidence which disputes the findings and conclusions of the Applicant's experts. To the contrary, we heard from a number of submitters who concurred with the conclusions and supported the project as it would improve navigational safety.

Oil Spill Risk

449. A number of submitters raised issues regarding oil spills, these being from the Bream Bay Coastal Care Trust, Mrs Hicks, Ms Kawiti-Tana, Dr Kepa, PTB, Dr Pyle, Ringa Atawhai Trust and the Whangārei Māori Executive. The general thrust of these submissions was that fully laden Suezmax tankers visiting the Refinery will result in increased risks of oil spills.
450. Northport Limited's submission stated that the reduced number of deliveries combined with the proposed channel realignment will result in reduced environmental risk despite larger parcels being delivered.
451. The application included an environmental spill risk assessment for the project (Application, Volume, Annexure 2: Technical Report (g)).
452. Mr Oldham, for the Applicant, advised us that the project would allow fully laden Suezmax sized vessels to visit and that some Aframax tankers would continue to be used. However, he expected that the total number of tanker visits would reduce by 19% because the Suezmax sized vessels would be able to carry their full load, being approximately a quarter more oil on each visit than they currently deliver.
453. Mr Oldham presented details of the six principal activities that give rise to a risk of an oil spill in the vicinity of Marsden Point. He stated that, for all these activities, the risk of an oil spill was either the same or reduced by the project.
454. Mr Oldham undertook an oil spill risk assessment of the project. He employed a differential assessment approach which compared two scenarios, essentially being operations with and without the engineered channel. As part of this assessment he assumed that the operational regime changes that Mr Bermingham had identified as being needed (irrespective of whether the project went ahead) were implemented.
455. Mr Oldham undertook his assessment in two stages. The first stage involved assessing the number of transits and the amount of oil potentially spilled. The second stage considered the consequences of an oil spill. He stated that a 19% reduction in transits (visits) equates to a 19% reduction in the overall chance of a spill event in any given year. However, the expected volume of oil spilled for a given event would increase by 25%, this being the increase in the amount of crude oil a fully laden Suezmax tanker would carry. When assessing the consequences Mr Oldham undertook a multi-criteria analysis (**MCA**) which considered environmental, recreational, and cultural aspects. In his opinion the effects of any large spill would be profound over the short to medium term but he did not expect that there would be disproportionately more harm resulting from the increase in cargo size.

456. Overall, Mr Oldham considered that the reduced likelihood per visit due to channel improvements, together with the reduced risk exposure due to fewer visits, significantly outweighed the increased impacts that would occur due to larger oil cargoes (and subsequently spill volumes). He was of the opinion that the overall environmental risk of the project will be significantly lower than the current risks associated with crude oil deliveries to the Refinery.
457. Mr Mortimer accepted the general conclusion that the oil spill risk will not increase as a result of the channel deepening and realignment.
458. The Applicant tabled a letter from Mr Elliot, RNZ's Environmental Affairs Manager, which outlined the capabilities of marine oil spill equipment by the Refinery. He explained that the Refinery holds extensive oil spill equipment in a purpose-built Oil Spill Response shed and the letter summarised the equipment. He stated that the equipment is considered adequate by Maritime New Zealand (**MNZ**) to initiate a 'Tier 3' response in the region, this being spill event that is beyond the response capability of a regional council or operator. Tier 3 responses are nationally-led and co-ordinated by MNZ.

Findings

459. We find that there are currently risks associated with deliveries of crude oil to the Refinery using the Aframax and partially laden Suezmax tankers. We heard from only one expert, Mr Oldham, regarding the difference in risk associated with bringing fully laden Suezmax tankers via the proposed realigned and deepened approach channel compared to the current risks that exist. Accordingly, we must give significant weight to Mr Oldham's expert evidence.
460. Having considered Mr Oldham's evidence, we agree with his conclusions that the overall environmental risk of the project will be significantly lower than the current risks associated with crude oil deliveries to the Refinery. This reduced risk being due to the benefits provided by the channel improvements, together with the reduced risk exposure due to fewer visits. We accept these benefits significantly outweigh any potential increase in impact that would occur due to larger cargoes (and subsequently spill volumes).
461. We are also comforted by the information provided by Mr Elliot in respect of the significant amount of oil spill equipment that the Refinery has available within its purpose-built Oil Spill Response shed (we viewed that equipment during our site visit) and that it has several staff who are qualified and experienced oil spill responders.

Economics

462. We heard from Mr Martin for Air Zone Limited, Mr Faithful for McKay Limited and Maintenir Limited, and Mr Nutting for Worley Parsons who all confirmed that their businesses relied, in some cases significantly, on contracts that they had with the Refinery. Other written submissions from local businesses²¹ also confirmed that the Refinery was a significant client. We also heard from Mr Collins for the Northland Chamber of Commerce who confirmed that the Refinery is a significant employer in the region and that many of its members benefit from the downstream spending associated with the continued operation of the Refinery.

²¹ Culham Engineering Company Limited, Hansen Drainage and Earthworks Limited, Marsden Maritime Holdings Limited, North Tugz Limited, Northport Limited, and United Civil Construction Limited.

463. The application included a technical report assessing the economic effects of the project (Application Volume 2, Annexure 2: Technical Report (o)).
464. Mr Clough, for the Applicant, stated that the Refinery is New Zealand's only oil refinery and supplies most of the country's oil products. He stated it is of national significance for the country's fuel supply but that its economic significance is greater at a regional than national level. He stated that in 2015 it contributed 9% to Northland's GDP (\$542 million), 0.6% of its employment (\$68 million paid to 355 direct employees and 149 contractors), and 2% of its wage and salary payments. He stated that the Refinery also has substantial links to other industries and contractors in the region.
465. Mr Martin of RNZ advised us that the primary objective of the project is to enable larger parcels of crude to be delivered to the Refinery thereby improving freight economies. These economies will improve the Refinery's competitive position. Mr Martin outlined that New Zealand's demand for fuel is met by products refined at the Refinery and imported refined products. Mr Post advised us that to remain competitive with imported products the Refinery is continuously working towards achieving efficiencies in its operations.
466. Mr Post stated that competitive pressure from overseas refined products could potentially lead to the Refinery closing or being converted to a fuel import and distribution facility, however, he advised us that this is not currently being considered. Mr Clough advised us that should the Refinery be converted to such a facility it would probably employ only a tenth of the workforce that are currently employed and that the future timing of Refinery closure is uncertain.
467. Mr Post confirmed that the Refinery was not reliant on the granting of these consents for its immediate viability, but stated that being able to bring in fully laden Suezmax tankers would contribute to the Refinery's ongoing operation into the future by enabling the Refinery to better compete against the cost of importing refined products. Mr Clough confirmed that the application in front of us is not for the continued operation of the Refinery.
468. Mr Post confirmed that the project would result in increased profits for the Refinery's shareholders as well as being able to offer refined products to its customers, being the three major oil product wholesalers, at a cheaper price. Mr Clough noted that the cost savings will unlikely benefit the wider public (as oil product consumers) through cheaper fuel prices at the pump.
469. Mr Clough stated that the expenditure impacts of the project, which are expected to be in the order of \$37 million, on the Northland economy are likely to be modest because the dredging work will probably be undertaken by firms outside the region or even New Zealand. He stated that the project's principal economic impact is in prolonging the Refinery's operation and its continued contribution to regional economic activity. He noted that the precise length of the benefits associated with this prolonging is difficult to determine and is therefore uncertain.

Findings

470. It is accepted by all the parties, and we agree, that the operation of the Refinery contributes significant positive economic benefits to the Northland economy and that it is nationally significant infrastructure.

471. It is clear that the application in front of us is not for the continued operation of the Refinery and also that its continued operation is not reliant on gaining consents for the proposed activities. We note that the Refinery would continue to operate if the proposed works were not undertaken and the benefits the Refinery brings to the local economy would continue. However, we accept that undertaking the project will enable the Refinery to be able to provide refined products to its customers (the oil wholesalers) at a more competitive price than they may be able to import refined products, thereby prolonging the life of the Refinery, including the significant economic benefits that this brings to Northland's economy. However, what is unknown is what additional time this buys the Refinery and any attempt to predict this is, at best, speculative. We therefore afford little weight to the economic benefits provided by the project as a result of the cost savings provided to the Refinery.
472. We find that the direct economic benefits of the project will more than likely not be realised in the local economy because the works will likely be undertaken by firms from outside the region and probably from overseas. The cost savings provided by the project will result in benefits to the Refinery's shareholders and the oil wholesale companies it supplies, being the three major oil companies²² (who also happen to be major shareholders in the Refinery). We note that no benefit to the oil product consumers, which includes the public, through cheaper fuel prices 'at the pump' will be provided as a result of the proposed works.

Cumulative Effects

473. A key concern of many submitters in opposition to the application are the cumulative effects of this project on the harbour, given its existing stressed and degraded state. Some submitters view this application as a 'tipping point' for the mauri of the harbour, kaimoana species within the harbour and local bird populations dependent on intertidal areas, such as Mair Bank for feeding.
474. Ms Dixon highlighted the concluding remarks of the CEA that the proposed activities in conjunction with past impacts would result in cumulative effects in relation to marine mammals, benthic organisms, coastal processes, kaitiakitanga and mauri, which are significant. Further, the CEA stated:
- 'The position of tāngata whenua is that the proposed dredging of Whangārei Te Rerenga Paraoa does not provide for te reo māori ngā tikanga, and cultural and spiritual wellbeing. The proposed dredging will continue to erode the mauri of the harbour, and subsequently affect values such as kaitiakitanga, mātauranga māori, and mana. These cumulative effects span the past, present and future and are deemed by the tāngata whenua of the harbour to be significant adverse effects that are unable be mitigated.'*
475. Dr Mead, for PTB, stated that the cumulative impacts of the various modifications to coastal processes and biological processes had been poorly addressed by the Applicant – in his view the latter had not been addressed at all. He also stated the cumulative impacts of previous port developments at Marsden Point had not been well addressed by the Applicant, while the cumulative impacts of the consented (but yet to be given effect to) Northport reclamation had been disregarded/down-played by the Applicant.

²² BP, Mobil, and Z Energy.

476. Dr Beamsley confirmed to us that the consented Northport reclamation had been provided for in the numerical model and therefore the outputs reflect cumulative effects.
477. Mr Reinen-Hamill advised us that, in terms of cumulative effects, the overall changes to tidal flows and wave conditions resulting from the channel dredging and marine disposal are small and typically within the existing variability of tidal currents and wave energy. He stated that no changes to existing coastal processes are anticipated on the open coast from Marsden Point to Ruakākā River or along the rocky coast from Home Point to Smugglers Bay, on the ebb tide shoal and Mair Bank, or within the inner harbour area.
478. For recreation, Mr Greenaway stated the effects of the project are sufficiently slight to make it unlikely for cumulative adverse effects to arise. He stated there are no locally consented activities identified which have not been implemented which would increase the potential for adverse effects from the project.
479. Mr Styles addressed cumulative effects of noise. He stated that, because the noise effects will only be temporary in nature and generally over a very short-term compared to the overall duration of the project, an assessment of cumulative noise effects is limited. In his opinion the cumulative noise effects are only a potential issue at night when the noise emissions from the activities are permitted to be similar to that generated by the operation of the Refinery generally. In his opinion, these potential cumulative effects are negligible and therefore no mitigation is required to address this issue.
480. In respect of potential cumulative effects on marine mammals, Dr Clement stated that there will be few occasions when the dredges could be operating at the same time as commercial vessels are entering or leaving the harbour given the narrow entrance channel and shallow depths associated with this particular section of the project area. She stated that this reduces any potential cumulative effects from multiple vessel presence (and any associated masking effects on noise) leading to possible vessel strike. In her opinion, combining these factors together means that the chances of a whale being present, being in the vicinity of the dredge, the dredge moving, and moving fast enough to severely injure an animal if struck is very low.
481. Mr Brown's statement of evidence assessed cumulative effects on landscape, amenity and natural character. He stated the activities would give rise to multiple small scale effects, both above sea level and underwater and could give rise to cumulative effects that affect a combination of catchments and receiving environments around Marsden Point. In his view, the cumulative effects of the project as a whole would remain at a less than minor level.
482. Dr Coffey assessed the potential for cumulative ecological effects to arise. In his opinion the activities would not result in cumulative ecological effects that are greater than minor, when considered in light of the proposed conditions to avoid, remedy, and mitigate adverse effects. Dr Stewart agreed and concluded that cumulative effects from the activities on the ecology of Bream Bay and Whangārei Harbour will, in the long-term (more than 24 months), be negligible.
483. Mr Don advised us that the cumulative effects on coastal and pelagic birds and their habitats will be less than minor in the context of the existing environment, the activities proposed, and the recommended mitigation. He stated that the activities will not result in the avifauna, or the habitats utilised by them, reaching a critical point where the existing conservation values are compromised.

Findings

484. None of the experts we heard from concluded that the activities would result in unacceptable adverse cumulative effects and we note that Mr Mortimer generally agreed with the conclusions of the experts in respect of cumulative effects.
485. While the CEA and a number of the submissions in opposition to the application state that unacceptable adverse cumulative effects could or would arise as a consequence of the activities, we were provided with no expert evidence to substantiate these assertions. As such, we find that the activities will not result in unacceptable adverse cumulative effects.

Overall Summary of Environmental Effects

486. We are required to assess the potential and actual environmental effects of the dredging project on an evidential basis. We have considered the expert evidence and the experience and observations of submitters, within the context of the relationship and values of tangata whenua and the local community, and the statutory framework.
487. We consider the existing environment has been sufficiently investigated to ensure the adverse effects of the project are understood. The Applicant has provided information from literature research, field measurements and surveys, and modelling. The scientific studies and surveys have been undertaken using recognised approaches and methodologies. The assessments have been subject to peer review and public comment. We consider we have sufficient baseline evidence to enable the scale and magnitude of environmental effects to be evaluated and to set limits and standards to avoid and manage effects.
488. We are mindful that we are required to assess the effects of this project on cultural values and relationships and ecological values within the context of the existing environment and that we cannot require the Applicant to mitigate and remedy the adverse effects of all previous development affecting the state of the harbour. However, we acknowledge we are required to have regard to any cumulative effects on ecological and cultural values.
489. We recognise that the project seeks to avoid significant adverse environmental effects and minimise its footprint, whilst achieving its overall objectives of having a safe and efficient entrance for ships. Overall, we find that the measures proposed by RNZ achieve both of these requirements.
490. Overall, on the basis of the evidence presented, we are satisfied that any potential or actual adverse effects on the environment, including cumulative effects, and any concerns raised by submitters can be sufficiently avoided, mitigated or remedied by the imposition of consent conditions and the implementation of management plans to such a degree that such adverse effects are, in our view, acceptable. We consider that the perception of risk of adverse effects is not sufficient to warrant the refusal of consent when the weight of evidence shows any potential adverse effects can be managed to a level of risk of low probability and low potential impacts.

SECTION 104(1)(ab) – ENVIRONMENTAL OFFSETS AND COMPENSATION

491. Section 104(1)(ab) of the RMA requires us to have regard to any measure proposed or agreed to by the Applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity.

492. The Applicant has proposed the following measures to offset or compensate adverse effects:
- (a) Installing, maintaining and inspecting (monthly) at least 15 predator traps and tracking tunnels (in consultation with DoC) on Motukaroro Island and/or within Whangārei Harbour/Bream Bay, six months prior to commencement of dredging activities and for the term of the consent – the purpose of this work is to enhance the breeding success of little penguin thereby offsetting or compensating for any adverse effects from any potential ‘turbidity barrier’ effects as described by Mr Don (proposed Conditions 30 and 31);
 - (b) Installing 24 nesting boxes either on Motukaroro Island, or in locations within Whangārei Harbour/Bream Bay (in consultation with DoC) and maintain the nesting boxes for five years – the purpose of this work is, like (a) above, to enhance the breeding success of little penguin thereby offsetting or compensating for any adverse effects from any potential ‘turbidity barrier’ effects (proposed Condition 32);
 - (c) Contributing \$7,500 to either DoC or the Bream Head Conservation Trust for pest control for grey-faced petrel in the Bream Head area – the purpose of this work is to offset or compensate for any mortality of grey-faced petrel from collisions with dredge vessels (proposed Conditions 34 and 35);
 - (d) Contributing funding to the KG of \$150,000 one month prior to the commencement – to enable the assessment and monitoring of effect of the project on the harbour (proposed Conditions 52(a) and 53);
 - (e) Contributing ten annual payments of \$50,000 to the KG as an ongoing kaitiaki fund – to enable the assessment and monitoring of the effects to continue for maintenance dredging (proposed Conditions 52(b) and 53);
 - (f) Contributing ten annual payments of \$50,000 to a Poupouwhenua Fund – to be used for restoration and enhancement projects as determined by the PTB representative on the KG (proposed Conditions 52(c) and 54); and
 - (g) Contributing \$150,000 for the design and implementation of a 12 month water quality monitoring programme for Rauiri/Blacksmiths Creek; or contributing \$150,000 towards ecological restoration projects in the harbour, including understanding pipi biology, re-seeding Mair Bank and Marsden Point, restoring and/or reseeded seagrass beds, studying bird habitats, maintenance or enhancement of habitat of the variable oystercatchers and other shorebirds, mahinga kai/kaimoana restoration, and works to improve coastal water quality (proposed Conditions 56–59).
493. Dr Stewart noted the proposed conditions for the enhancement of little penguin and grey-faced petrel habitat/nesting, and improvement of the Rauiri/Blacksmiths Creek area in recognition of the loss of benthic productivity at the dredge and disposal sites. He considered these measures more than compensated for the ‘minor loss’ of benthic communities.
494. Dr Stewart considered proposed enhancement of Rauiri/Blacksmiths Creek would reduce sediment and nutrient input into the harbour, improve water quality, and ultimately improve the health of benthic communities.

495. Dr Coffey agreed with Dr Stewart and recommended a 12 month monitoring programme to quantify the SSC and nutrient load contributions to the lower Whangārei Harbour from the Rauiri/Blacksmiths Creek catchment. He noted if it was making a significant contribution to SSC and nutrients to the harbour, RNZ would assess the feasibility of works to provide a functional sediment/nutrient trap in Rauiri/Blacksmiths Creek to reduce these inputs. He said that implementation of any settling ponds or wetlands would need to be a joint venture between RNZ and the local council, with the council undertaking the ongoing management of the facility. He noted if Rauiri/Blacksmiths Creek was found not making a significant contribution to the harbour, RNZ would provide further funding for other works to improve the health of the harbour, such as works to enhance seagrass/shellfish resource in partnership with the NRC. He said he had recommended \$150,000 based on the magnitude of the impact; and considered the positive changes this would generate will more than offset the impact of the project.
496. In response to questions, Dr Coffey provided us with the guidance criteria for environmental offset and compensation outlined in the RPS.
497. Mr Coffin stated in his rebuttal evidence that the Applicant's proposed KG conditions are linked to the role of the group representing tangata whenua to provide meaningful engagement and participation in the development of the various plans and their implementation. He noted that, in his experience, the most successful of such groups are those which have willing and able members, have a clear purpose, sound leadership and positive relationships.
498. In response to questions, Mr Coffin stated that he had not recommended the Rauiri/Blacksmiths Creek investigation and noted that tangata whenua had chosen not to recommend mitigation measures. He considered the compensation package proposed was sufficient given the assessment of effects.
499. Mr Kemble noted the Trust Power consents at Lake Coleridge and the risk that the compensation money may remain unspent without an appropriate management structure or identified mitigation measures.
500. Mr Simmons submitted that the proposed KG conditions represented an effective mechanism to recognise and provide for the kaitiakitanga of Māori who have a kaitiaki relationship with Whangārei Te Rerenga Parāoa, within the framework of these resource consents. He considered the purposes and roles of the proposed KG are broad in scope and will provide for meaningful participation of tangata whenua in the implementation of the resource consents, if granted.
501. DoC was supportive of the mitigation and enhancement measures. However, it noted these needed to include sufficient detail including targets. It supported implementation of a harbour enhancement programme and predator control.
502. Dr Kepa suggested that RNZ should be supporting the whānau and tangata whenua to restore the rich sound of birdsong to the Takahiwai hills.
503. PTB and Dr Pyle both challenged the priority given to Rauiri/Blacksmiths Creek for proposed harbour restoration and enhancement works given this is not directly associated with the affected area.

504. Ms Chetham explained the shortcomings of the Whangārei Harbour Health Improvement Fund (**WHHIF**) and Kaitiaki Roopu that arose from Condition 11 of the Northport consents; and observed that the Community Liaison Group (**CLG**) proposed under Condition 20 of the Mr Mortimer's Staff Report was hardly an improvement on the Northport conditions that are nearly two decades old. Her criticisms of the proposed KG, as it was then proposed in Condition 32 of Mr Kemble's evidence, related to it being limited to a reference or advisory group and in her experience, groups of this nature tended to have limited decision-making power, requiring a lot of tangata whenua time and effort in usually poorly resourced and frustrating processes.
505. Ms Chetham did not consider that the proposed Harbour Restoration Enhancement (then Condition 40), compensated for the potential loss of mahinga mātaītai and 1.44 km² of benthic community. She noted that, while Patuharakeke consistently advocate for the enhancement of Rauiri/Blacksmiths Creek, they are not willing to trade one site of significance for another. She noted that while they had previous experience with seagrass projects and cockle reseeded under the WHHIF fund, tangata whenua volunteers had primarily been called upon to give karakia. In terms of the cockle reseeded at Takahiwai, Ms Chetham stated it was yet to deliver cockles of a harvestable size some 14 years on and kaumātua felt that the scientists had ignored cultural advice about where re-seeding was likely to be more successful.
506. Overall, Ms Chetham did not agree that the potential adverse effects identified in the CEA could be mitigated, she had serious concerns regarding the establishment of a KG, and recommended that the application should be declined.
507. Mr Ruka noted that previous payments of compensation for the Northport development (\$50,000 over 10 years) were shown to be inadequate over the long-term and should not have had a termination date. He requested enough money be provided by the Applicant to undertake a full study of the wider Bream Bay fishery. He considered funding should have been made available to iwi to have the application independently assessed before the consent is granted.
508. Mr Gates highlighted his experience with the Northport CLG and the lessons which can be learned from that experience. He informed us that he had been the Chair of the CLG since 1999. He considered the performance of the group was 'mixed', and noted that while it had value, it also had limitations that wasted time and money. He recommended that the structure of any similar group should be carefully considered to ensure parties do not talk past each other in different technical or bureaucratic languages. Mr Gates also reflected on the use of the \$250,000 Northport Scientific Monitoring Fund (\$25,000 per year for 10 years) and the potential for individual long-term research projects to exhaust this fund even at moderate annual cost levels. He also outlined the combined \$650,000 Northport Whangārei Harbour Health Improvement Fund²³ (Stage 1 \$50,000 per year for 10 years, Stage 2 \$10,000 per year for 10 years, and \$10,000 for five years when the turning basin was cleared). He noted that approximately \$228,000 of this fund remained unspent and is now managed by the NRC overseen by Northport and a Kaitiaki Roopu, not the CLG. He considered only one project of the six projects part-funded could be rated as highly successful from a community perspective, which was the creation of the Motukaroro Marine Reserve.

²³ Later renamed the Whangārei Harbour Health Improvement Fund (WHHIF) Kaitiaki Group fund.

509. Mr Gates considered that overall there had been little direct and visible community involvement and benefit from the cumulative investment of \$650,000 in the restoration of harbour health. He was of the view the weakness in management of the funds was an inevitable consequence of allocating them to the NRC. He noted that the NRC has conflicting priorities and that its priorities for funding marine research and mitigation were not necessarily the same as those of the community.
510. Mr Gates considered the CLG had facilitated communication between the company and the community and mediated disputes. He noted the CLG had no 'back office' support to recommend studies or projects and that it is difficult to articulate the qualities of amenities they treasure into scientific environmental research language. He considered a different structure for administration and technical support would have made a difference. On the basis of his experience with the Northport CLG, he urged the Applicant to find a more effective way to engage stakeholder communities in environmental management. He stated a need for the formation of an effective administering authority for integrated management of the wider marine area north of Hauraki Gulf.
511. Mr Mortimer recommended that investigations into the physical/ecological interactions at Mair Bank should be the priority focus for any enhancement or remediation works given it is within the affected area and that protection of it is the focus of the sediment replenishment adaptive management approach. He recommended that the Applicant's proposed Conditions 56 and 57 be reoriented to focus on understanding the physical/ecological dynamics and interrelationships of Mair Bank as a first priority rather than focusing on Rauiri/Blacksmiths Creek. In response to questions, Mr Mortimer considered the RPS criteria²⁴ could be referenced in the conditions of consent to provide guidance criteria for considering potential enhancement projects.
512. Mr Griffiths was also of the view that the physical and ecological interactions at Mair Bank are the most appropriate priority focus for any enhancement or remedial works and should be a matter of first priority. He considered Rauiri/Blacksmiths Creek was not a priority project because of the distance from the areas affected by the project and the lack of relevance to the effects. He noted that RPS criteria (principles) for offsetting included encouragement of offsetting measures that are as close as possible to affected areas. He considered it was appropriate to refer to use of the RPS criteria to guide any decision-making process for the use of the compensation fund.

Findings

513. The offset and compensation conditions set out above have been volunteered by the Applicant in recognition of actual adverse effects on benthic communities with the dredge footprint and the disposal areas, and potential adverse effects on little penguin and grey-faced petrel. They also seek to provide tangata whenua the ability to exercise their kaitiakitanga by providing funding for assessing and monitoring effects of the project, and to identify and implement proposals for maintenance and enhancement of cultural and ecological values. We note that these conditions evolved during the hearing process, with the Applicant significantly increasing funding (tenfold) and agreeing to undertake predator control on Motukaroro Island for the little penguin for the term of the consent (35 years) instead of a much shorter duration as originally proposed.

²⁴ Included in the RPS Glossary definition of 'biodiversity offsets'.

514. We acknowledge there is a risk that the funds contributed may not result in meaningful and measurable enhancement initiatives. However, we consider the conditions proposed establish clear functions and roles of the KG and the necessary management structure and funding to achieve positive outcomes. While some submitters have questioned the value in, and/or operation of, the KG as proposed, we consider it represents the Applicant's genuine and informed attempt to facilitate the exercising of kaitiakitanga through the implementation of the resource consents.
515. We find the nesting boxes and predator control will enhance the potential breeding success of little penguin and is directly linked to the potential adverse effects posed by potentially disrupting access to and from the harbour as a result of the 'turbidity barrier'. We find this proposed work has the potential to have a significant positive effect, particularly given the predator control trapping and monitoring is now proposed for the term of the consent i.e. 35 years.
516. We consider that the one-off contribution for predator control in the Bream Head Scenic Reserve area will contribute to the breeding success of grey-faced petrel and is directly linked to the identified high risk of the mortality of fledging juveniles from collision with dredging vessels operating at night. We find it is appropriate and warranted. However, we note that, while the risks of collision will be greatest during the capital dredging due to vessels travelling to and from Disposal Area 3.2, these risks will continue over the term of consent when maintenance dredging material is taken to this disposal site. Accordingly, we consider the \$7,500 contribution for predator control in the Bream Head Scenic Reserve should not be a one-off contribution but the same quantum should be provided for each maintenance dredging programme. We have amended imposed Condition 34 to require this accordingly.
517. We agree with Mr Mortimer, Mr Griffiths and some submitters that the proposed investigations into the water quality impacts of Rauiri/Blacksmiths Creek and the identification of mitigation measures is not directly related to the effects of this project. We consider this funding should be used to investigate any potential adverse effects of dredging the berth pocket on shellfish recruitment at Mair Bank and to better understand the relationship between physical and ecological processes. This work is fundamental to understanding the decline of shellfish on Mair Bank and the ability to implement remediation such as pipi re-seeding initiatives. We have amended the Applicant's proposed Conditions 56–59 to reflect this.
518. We have considered the comments of Mr Ruka regarding the duration of the KG funding. We find that to require this level of funding per annum for 35 years would be unreasonable given the assessment of the direct effects of this project. We also find that to spread the funding out over 35 years could potentially prevent the early implementation of costly initiatives that may have higher chances of successful outcomes. On balance, we consider the level of funding proposed is appropriate given the most significant adverse effects of the project will occur during capital dredging operation.
519. We have considered the points made by Ms Chetham and Mr Gates and the experience gained from administering similar funding for environmental outcomes. We find that the proposed conditions have accounted for some of these concerns. We note that the hearing process has created a foundation of information on which to build any enhancement initiatives. We note that documents such as the CVA and CEA will assist the KG in identifying proposals with the potential to succeed and make a positive outcome.

520. While there was much focus on the make-up of the KG and concern expressed by Te Parawhau at Patuharakeke having an overriding say on the allocation of the Poupuwhenua fund, we do not consider that that is a matter we need to make judgment on. The proposed KG condition(s), and the associated funding, were proffered by the Applicant, during the course of the hearing, as *Augier* conditions and the reasons for it doing so are clearly set out in the evidence of Mr Coffin. We are nevertheless satisfied with the make-up of the KG and the purpose for each of the funds as finally proposed by the Applicant and concur that it accurately reflects the evidence that was put before us.

SECTION 104(1)(b) OF THE RMA – RELEVANT PLANNING PROVISIONS

521. We are required to have regard to the relevant objectives and policies of the NZCPS, the RPS, the RCP and the pRP.
522. An analysis of the relevant planning provisions was provided by Messrs Mortimer, Kemble and Badham. We have had regard to all of the relevant provisions outlined in evidence.
523. Mr Mortimer and Mr Kemble concluded that overall the application is consistent with the relevant objectives and policies of the statutory plans. Mr Badham disagreed.
524. Our assessment below focuses on key matters in contention in relation to each statutory document.

New Zealand Coastal Policy Statement (NZCPS)

525. Mr Badham drew our attention to Objectives 1, 2, 3, 4, 5 and 6; and Policies 1, 2, 3, 4, 5, 6, 7, 9, 11, 13, 14, 15, 17, 18, 19, 24, 25 and 26. We have had regard to all of these provisions.
526. The need to apply a precautionary approach, as required by Policy 3(1) of the NZCPS, was raised by several submitters. Mr Badham considered that the project does not implement a precautionary approach to the uncertainty regarding effects on the wider harbour and Mair Bank, as required by Policy 3.
527. We consider it is appropriate to implement a precautionary approach when there is uncertainty as to an effect that could be significant, or where such an effect could be unknown or little understood. Overall, we have found that the potential adverse effects of the project are generally well understood, the exception being the interrelationship between physical and ecological processes at Mair Bank. In light of the recent decline in the pipi population and the cultural and ecological importance of Mair Bank, we have determined that adverse effects of the project there must be avoided.
528. On the basis of the evidence presented, we are satisfied that with the imposition of conditions, this level of protection is achievable given the very small area directly impacted by the berth pocket dredging, the appropriate controls provided for by the water quality limits and implementation of the RMP adaptive management approach. We have taken into account the high sensitivity of Mair Bank to any cumulative effects from allowing the project and find that this application will not exacerbate the current decline of the pipi population. It is likely, however, that the investigations required by the conditions into the biology of the pipi and the relationship between physical/ecological processes will enable and assist with future initiatives to mitigate and remedy the existing decline of pipi on Mair Bank.
529. Policy 11(a)(i) of the NZCPS was highlighted by a number of submitters and witnesses.

530. Mr Badham noted that the term 'avoid' is clear and places a high threshold on potential adverse effects. He considered the evidence of Dr Mead indicated there is potential for significant adverse effects on the geomorphology and marine ecology of Mair Bank and therefore effects are not avoided there.
531. We have found that the project is unlikely to have any more than a minor effect on coastal processes and that adverse effects on benthic ecology (outside of the dredge footprint) and M1MAs (including Mair Bank) can be avoided by imposition of more appropriate TSS concentration limits and a closed season for dredging.
532. We have paid particular attention to Mair and Marsden Bank and have found that these (and all areas of the harbour north a line between the No. 6 and No. 3 channel buoys) warrant the level of protection required by Policy 11(a).
533. We note that Dr Coffey considered the areas falling within Policy 11(a) of the NZCPS are the Motukaroro Marine Reserve; kelp beds; and sponge gardens associated with the rocky reef habitats extending from Motukaroro Island and Busby Head. He said these areas contain nationally significant examples of indigenous community types and that adverse effects on these communities will be avoided.
534. We also note that Dr Coffey considered the areas falling within Policy 11(b) of the NZCPS, which require significant adverse effects to be avoided, include the channel, disposal areas, Calliope Bank, Mair Bank, and Three Mile Reef. We have found that Calliope Bank and Mair Bank warrant the same protection as those areas which fall under Policy 11(a) in applying a precautionary approach as required by Policy 3 and because of their ecological importance to tangata whenua and as significant feeding areas for threatened and endangered birds.
535. We note Mr Don did not consider Policy 11 of the NZCPS or Policy 4.4.1 of the RPS relevant based on the assessment there will no physical encroachment into M1MAs and no physical changes to benthic communities in M1MAs. We agree and have required this by imposing the same level of protection of water quality for all of the harbour, outside the dredging footprint.
536. Overall, we agree with Mr Mortimer and Mr Kemble that the application is generally consistent with the relevant objectives and policies of the NZCPS.

Regional Policy Statement for Northland (RPS)

537. Mr Badham drew our attention to Objectives 3.4, 3.14, 3.5, 3.7, 3.12 and 3.13; and Policies 4.4.1(a), 4.6.1, 4.6.2, 5.2.2, 5.3.2, 8.1.1 – 8.1.4 and 7.1 of the RPS.
538. We have had regard to these provisions. We note the direction of Policy 4.4.1(a) to 'avoid' adverse effects on indigenous flora and fauna that are threatened or at risk, is similar to Policy 11(a) of the NZCPS. As discussed, we are satisfied that any adverse effects on M1MAs can be avoided by the imposition of conditions.
539. We note Objective 3.12 and Policies 8.1.1 – 8.1.4 require us to recognise and provide for tangata whenua values and relationships. We are satisfied that the conditions imposed recognise the significance of the harbour and provide tangata whenua's role as kaitiaki.
540. Overall, we agree with Mr Mortimer and Mr Kemble that the application is generally consistent with the relevant objectives and policies of the RPS.

Regional Coastal Plan for Northland (RCP)

541. In having regard to the relevant objectives and policies of the RCP, we are mindful that it pre-dates the NZCPS and the RPS.
542. We have paid particular attention to the RCP provisions for M1MAs and the purpose of their protection. We note that the plan recognises the Motukaroro Marine Reserve boundaries as 'Reotahi Marine 1 (Protection) Management Area' on the basis of the following values: protected areas, birds, ecosystems and habitat values. The RCP notes the Motukaroro Marine Reserve was established for the purpose of preserving it in its natural state as the habitat of marine life for study. We have had regard to this purpose in making our decision.
543. We note the RCP recognises Home Point as 'Busby Head Marine 1 Management Area' on the basis of the following values: protected areas, ecosystems and habitats. The plan specifically records that the area provides internationally significant habitat for international migratory and New Zealand endemic wading and coastal birds, including threatened species. We have had regard to these in making our decision.
544. We note the RCP also identifies Calliope Bank and Mair Bank as two separate M1MAs on the basis of the following values: protected areas, ecosystems and habitats. The Plan specifically records that the inter-tidal area provides internationally significant habitat for international migratory birds and New Zealand endemic wading and wetland birds, including threatened species. We have had regard to these in making our decision.
545. We have discussed some of the relevant RCP policies in relation to land based disposal alternatives in our consideration of section 105 and 107 of the RMA below.
546. Overall, we agree with Mr Mortimer and Mr Kemble that the application is generally consistent with the relevant objectives and policies of the RCP.

Proposed Regional Plan for Northland (pRP)

547. Messrs Mortimer, Kemble and Badham agreed that we must have regard to the relevant objectives and policies of the pRP but that these provisions should be afforded little weight given the early stage of the plan hearing process. We agree.
548. The pRP combines the three existing M1MAs (Calliope, Busby and Reotahi) one large 'Significant Ecological Area'; and the Mair Bank M1MA has been enlarged to a 201 ha Significant Ecological Area encompassing both Mair and Marsden Banks, with the key ecological value relating to the pipi population.
549. Dr Coffey said he agreed with the combined larger Significant Ecological Area on the north side of the entrance but questioned the justification for identifying Mair Bank as a 'Significant Ecological Area' given the current ecological condition of the pipi population.
550. Dr Mead noted that comments made by Dr Coffey suggesting it was difficult to justify the identification of Mair Bank as a 'Significant Ecological Area' show he has completely disregarded the importance of Mair Bank in the function and stability of the harbour and the biogenic service that the shellfish in this location provide.

551. We agree with Dr Mead and have determined on the basis of the evidence that Mair Bank warrants the same level of protection as the M1MAs on the north side of the harbour.
552. Overall, we agree with Mr Mortimer and Mr Kemble that the application is generally consistent with the relevant objectives and policies of the pRP.
553. We note the pRP also identifies parts of the application as 'Significant Bird Areas' and 'Significant Marine Mammal and Seabird Areas'. We have had regard to these in making our decision.

SECTION 104(1)(c) – OTHER RELEVANT MATTERS

554. Section 104(1)(c) requires us to have regard to any other matters that are relevant and reasonably necessary to determine the application.
555. There are two iwi/hapū management plans that we consider are of relevance to our consideration of the project – the Patuharakeke Hapū Environmental Management Plan 2014 ('Patuharakeke EMP') and the Ngātiwai Iwi Environmental Policy Document 2015 ('Ngātiwai EPD').
556. These documents were addressed in evidence by Mr Kemble, Mr Coffin, Ms Chetham, Mr Badham and Mr Mortimer. The iwi/hapū management plans were also considered in detail in the CEA.
557. Ms Chetham set out the following key provisions of the Patuharakeke EMP of most relevance to this application (the Tangaroa Section):
- Objective 9.1.2 – Whangārei Te Rerenga Parāoa, Bream Bay and our estuaries are precious taonga and the home of myriad species and are respected for their taonga value above all else;
 - Policy 9.1.3 – Coastal water quality is required to be consistent with protecting and enhancing customary fisheries, and with enabling Patuharakeke to exercise their customary rights and safely harvest kaimoana; and
 - Objective 9.6.2 – The mauri and cultural health of Whangārei Te Rerenga Parāoa and cultural landscapes and seascapes are not further compromised by industrial activities at Poupouwhenua.
558. Ms Chetham further commented that – 'the plans were designed in a hierarchical fashion, and it is these type of higher level objectives and policies that should be afforded most weight in planning processes'
559. Mr Badham noted the strong directive language used within the provisions of both the iwi management plans and urged us to give these provisions appropriate weight given the current 'untested' status of the pRP.
560. Both Ms Chetham and Mr Badham agreed that the proposal does find some support in relation to certain matters within the iwi management plans, primarily in terms of provisions relating to engagement matters such as participation, resourcing and sharing of information. Subject, however, to Mr Badham's previously noted reservation regarding the non-inclusion of the CEA in the lodgement and notification of the application.

561. Mr Kemble confirmed Mr Coffin's advice that the contents of the iwi management plans are useful in determining the nature of the mechanisms that can be used to remedy or mitigate effects that cannot be avoided.
562. Mr Coffin outlined how the project had responded to the iwi management plans essentially concluding that there are aspects of the policies and management statements within the plans that are consistent with the project, aspects that are not consistent, and aspects that are not relevant to the project.
563. Mr Coffin identified three further measures from the iwi management plans that if included in the project would, in his view, improve participation of tangata whenua and knowledge transfer, mitigate effects and/or enhance the environment generally. Furthermore, he noted that in his peer review of the CEA he identified some potential measures in the iwi management plans that would, if implemented as part of the project, address the inconsistencies with policies in whole or in part. He stated that many of those measures have, throughout the engagement process, been refined and articulated through the proposed conditions of consent.
564. In terms of iwi management plans, the CEA concluded the dredging proposal is inconsistent with the provisions and does not provide for fundamental policies such as:
- 'The mauri of Whangārei Te Rerenga Parāoa is not to be further compromised by industrial activities at Poupouwhenua and must be protected and enhanced to enable Tāngata Whenua to provide for their social, economic and cultural wellbeing; and that of generations as yet unborn. Further, major dredging programmes are to be avoided.'*
565. We note that the objectives and policy highlighted above focus on the coastal marine area and its ecological taonga, quality of water (and its mauri) being protected. We refer to our findings in relation to potential effects on water quality, benthic ecology, fish, birds and marine mammals. We acknowledge there are some inconsistencies between the project and the iwi management plans, however, we consider the preferred and imposed conditions of consent go a long way to addressing those inconsistencies. In particular, we consider that, in affording the benthic communities at Calliope Bank and Mair Bank the same protection as those areas which fall under Policy 11(a) NZCPS and in imposing a closed season for dredging, we have respected the importance of Whangārei Harbour and Bream Bay as precious taonga and the home of myriad species that are important to tangata whenua and therefore consistent with Policy 9.1.2 of the Patuharakeke EMP. We have imposed the same level of protection of water quality for all of the lower harbour, outside the dredging footprint and accepted the Applicant's preferred conditions in relation to establishment of the KG consistent with Policy 9.1.3. Furthermore, consistent with Objective 9.6.2 and Policy 9.1.2 above, there will be no physical encroachment into M1MAs and no physical changes to benthic communities in M1MAs adjacent to the dredge footprint. Overall, we find that the mauri and cultural health of Whangārei Te Rerenga Parāoa and cultural landscapes and seascapes will not be further compromised by the dredging operations.

566. During the hearing, we requested certain information regarding the resource consents granted for dredging at the Port of Tauranga, and the resource consents granted for development at Northport. We questioned the Applicant as to the relevance of the Port of Tauranga decisions/consents. Mr Simmons submitted that the decisions granting consent for dredging at the Port of Tauranga are broadly relevant as examples of judicial decisions on harbour dredging applications and that similarly, the consents granted, including conditions, are potentially broadly relevant as examples of the types of conditions applied by the Environment Court to other large-scale dredging projects.
567. Mr Simmons further submitted that due to the stark difference between the Port of Tauranga dredging and the dredging associated with this RNZ project, the Port of Tauranga decisions/consents are distinguishable from the present applications and are not particularly instructive in the present case. He highlighted the key differences between the two proposals in his submissions and concluded that overall, while both proposals unsurprisingly involve similar broad categories of relevant adverse effects, including cultural, ecological, geomorphological, economic and hydrodynamic effects, the particular contexts of each proposal with respect to such effects, and proposed mitigation relating to each, are very different.
568. We accept the submissions of Mr Simmons that the two matters can be distinguished in terms of the differing contexts of each proposal, however, we note for the record that we have considered and been mindful of the approach taken by both the Environment Court and High Court in that matter.
569. We have had regard to the Marine Mammals Regulations 1992 and to that extent we note that imposed Condition 21 requires the Applicant to lodge a MMMP which includes vessel operating guidelines to avoid the risk of vessel strike in compliance with the regulations.

SECTIONS 105 AND 107

570. Sections 105 and 107 of the RMA apply to this application because it includes a coastal permit to do something that contravenes section 15 of the RMA. These requirements are set out in our 'Statutory Considerations' section above.
571. In other sections of this decision we have discussed, and had regard to, the nature of the discharge and sensitivity of the receiving environment.
572. In answers to questions, Mr Mortimer addressed the sensitivity of the receiving environment to the proposed sediment discharges. In terms of effects on water quality, he considered the receiving environment has 'low' sensitivity due to good water quality and a high level of dilution. He considered the soft bottom benthic communities have a 'low' sensitivity due to the existence of extensive similar habitat nearby and the localised nature of effects. He considered Mair Bank, Home Point and Motukaroro Marine Reserve have 'high' sensitivity due to the ecological values present. He added that Mair Bank has 'high' sensitivity due to the importance of the pipi population to tangata whenua and in terms of its importance to birds. He considered Three Mile Reef to have 'moderate' sensitivity and the general wider Bream Bay area to have 'low' sensitivity. He considered marine mammals and birds have 'low to moderate' sensitivity. In terms of cultural values, he considered the harbour had 'high' sensitivity to adverse effects. In terms of cumulative effects, he considered the harbour entrance has 'moderate' sensitivity and the wider bay has 'low' sensitivity. In terms of adverse effects on coastal processes, he considered the nearshore environment and the ebb tide delta have 'moderate' sensitivity, and the wider bay has a 'low' sensitivity.

573. We generally agree with Mr Mortimer's assessment of the sensitivity of the receiving environment. We have particularly taken into account the high sensitivity of Mair Bank in concluding that the adverse water quality effects of all dredging works within the inner harbour (north of the No. 6 and No. 3 channel buoys) must be avoided. We have also had regard to this in determining a closed season for dredging is appropriate to avoid adverse effects on shellfish spawning and recruitment; and in requiring further research on the effect of the berth pocket dredging, physical/ecological relationships, and pipi re-seeding. The RMP and an adaptive management approach is also required because of the sensitivity of Mair Bank.
574. The remainder of this section discusses the possible alternative methods of discharge, including into other receiving environments, and the Applicant's reasons for its proposed choice.
575. The application seeks four coastal permits that involve discharges, of which two relate to the capital dredging and two relate to the maintenance dredging. The two discharges during capital dredging are – the discharge of decant water from a dredge hopper or barge; and discharge of sediment and water associated with spoil disposal at Disposal Areas 1.2 and 3.2. The two discharges for the maintenance dredging mirror those of the capital dredging. We therefore consider the discharges of decant water together, and the discharges associated with spoil disposal together, irrespective of whether they occur during capital or maintenance dredging.
576. The application seeks to undertake dredging (both capital and maintenance) at discrete locations and, as such, there are no alternative locations (receiving environments) to discharge the decant water during the dredging activity. However, we heard evidence that there were alternative discharge methods for the decant water.
577. Mr Cross advised us that decant water discharges would occur from the hopper of a TSHD if that type of dredge was used. He stated CSDs and BHDs do not have a hopper so the material dredged is discharged to temporary storage such as a hopper barge which would be located adjacent to the dredge.
578. Mr Reinen-Hamill advised us that most modern TSHDs discharge their overflows at the level of the vessel's keel rather than at the water surface. Mr Cross stated that in some cases a 'tremie pipe' is used by TSHDs to discharge the overflow/decant water (including entrained sediment) near the seabed. However, he did not consider that this was needed in this case given the relatively coarse nature of the material being dredged.
579. Mr Cross also stated that in some cases dredges are fitted with a 'green valve' which removes air from the water to be discharged, thereby promoting faster settlement of suspended solids and resulting in a discharge which has lower suspended sediment concentrations. He advised us that installation of a green valve would, in his opinion, provide a benefit and would not affect the speed at which dredging could occur and would have no cost implications.
580. Dr Beamsley and Mr Reinen-Hamill prepared a joint statement during the hearing on the performance of green valves and international practice in their use. In their opinion, the requirement to use a green valve for the proposed operations is not compelling because the dredged material is largely comprised of clean sand and the predicted plume extents do not indicate adverse environmental effects will occur. They note though that most medium size recently constructed dredge vessels are likely to have green valve capacity.

581. In the right of reply the Applicant stated that while a green valve is not seen by the expert advisors as necessary or appropriate, it has proffered a condition requiring that any TSHD must discharge overflow water at keel level as a turbidity reduction measure.
582. We heard no evidence to suggest that a green valve should be mandatory and we consider that the Applicant has appropriately assessed alternatives in respect to methods of discharge of the decant water. We agree that discharging to any other receiving environment is not practical in this case as the proposed works are at specific locations and the overflow discharges will need to occur at or very near to the dredging location.
583. In terms of the disposal of dredge spoil material, Mr Reinen-Hamill advised us that seven options were initially considered:
- (a) Area 1: ebb tide delta;
 - (b) Area 2: nearshore water depth within Bream Bay;
 - (c) Area 3: intermediate water depth within Bream Bay;
 - (d) Area 4: land based options;
 - (e) Area 5: beach replenishment;
 - (f) Area 6: deep water (greater than 100 m); and
 - (g) Area 7: unspecified location outside the CMA (i.e. within the Exclusive Economic Zone).
584. Mr Reinen-Hamill outlined the iterative process that was followed whereby some of these options were refined (which resulted in consideration of Disposal Areas 1.2, 2.2, and 3.2) by various experts and a Multi-Criteria Analysis (MCA) workshop was held which included iwi representatives.
585. Mr Reinen-Hamill stated that land based disposal and beneficial reuse were assessed as being the preferred option overall and that these should be progressed where practicable. He stated that because there were no specific land based disposal or beneficial reuse options defined at present, additional marine disposal sites needed to be considered. He also stated that it would be unlikely to be practicable or economic to dispose of the entire capital dredge volume to land.
586. Mr Reinen-Hamill advised us that the inner marine sites (Disposal Areas 1.2, 2.2, and 3.2) had a closer match of sediment properties on the seabed with the dredged material compared to deeper water sites (Disposal Areas 6 and 7). Further, he stated that the deeper (offshore) options were less feasible from a time, cost, and environmental risk perspective.
587. The MCA that was undertaken confirmed that Disposal Area 3.2 performed best to take the full capital dredge volume, however, some capital dredge material would need to be placed at Disposal Area 1.2 to provide resilience to the geomorphological system and Mair Bank.
588. During the hearing we asked the Applicant questions regarding the feasibility and practicality of land based disposal. This was an issue raised by a number of submitters and for which there is strong policy direction.

589. Mr Wilson, for FINZ, advised us that sea-based dumping should be a last resort and that the Applicant should need to prove that no land based sites are available prior to any consent being granted. He stated that sand is currently mined offshore at Pakiri for the building construction industry.
590. Mr Hollings, for the Northland Scallop Enhancement Company Limited, stated that none of the dredge material should be discharged to coastal waters and that it all should be discharged to land.
591. Mr Daniel, for the Ruakaka Parish Residents and Ratepayers Association, stated that the dredged material is a high-quality sand, with little silt, and as such is a high value resource which should not be treated as spoil and dumped into Bream Bay. He considered it should be disposed of to land and that the proposed Northport reclamation could be utilised or the area to the west of the Refinery (the old 'lay down' site) could be used to store the material. Further, Mr Daniel stated that the use of the dredged material for beach replenishment needs to be more fully explored.
592. A number of other submitters had raised similar concerns in their written submissions, namely Mr Lawson, Mr Tonks and the whānau of Henare and Tuihau Pirihi.
593. In terms of policy direction, Policy 22.4.7 of the RCP promotes land-based disposal of dredge spoil where this better meets the purpose of the RMA; and Policy 22.4.8 states that where land based disposal is 'proven' not to be a viable option, to require evaluation of options for the disposal of the material within the CMA and beyond territorial limits.
594. In addition, Policy D.5.19 of the pRP discourages disposal of dredge material in the CMA unless it is for:
- (1) beach replenishment or ecological restoration;
 - (2) restoration or enhancement of natural coastal defences that provide protection against coastal hazards; or
 - (3) associated with a reclamation.
595. We consider none of these apply for this application. Despite this, Policy D.5.19 states that if disposal of dredge material is inconsistent with these three clauses then it may be appropriate if it is demonstrated that the location is the best practicable option (**BPO**) given the type of material to be disposed of.
596. Mr Martin prepared a supplementary statement of evidence following our questioning which provided further detailed information on the feasibility of land based disposal of the dredged material.
597. Mr Martin stated that the Applicant is seeking flexibility to enable some disposal of dredged material to land but that other consents/authorisations would need to be obtained for such land-based disposal/use. He stated that land based options included reclamation, land development, beach nourishment, and supplying commercial sand markets and he provided detailed information on these options.

598. Mr Martin stated that he was aware of only one large potential reclamation site in the area, this being Northport's consented Berth 4 proposal which has the potential to take some 500,000 m³ of material. He stated that this is only 15% of the proposed capital dredge volume. He also stated that Northport may be considering further berth developments and that this may result in the need for around 700,000 m³ of material being needed for reclamation, equivalent to around 20% of the capital dredge volume. Mr Martin stated that the Refinery is committed to working with Northport, but that the timing of the further reclamation is unclear.
599. Mr Martin stated that there is some potential to use the dredged material for land development but that there are other lower cost alternatives, which make this option very unlikely.
600. Mr Martin advised that beach nourishment occurs in the area (One Tree Point and Marsden Bay) but that the annual volumes are relatively small (10,000 m³ and 5,000 m³ annually, respectively). Despite this, Mr Martin stated that there is potential to utilise some of the maintenance dredge material for this purpose (where this material is not required at Disposal Area 1.2 to maintain the ebb tide sediment budget).
601. Mr Martin advised us that the commercial sand market for Auckland and Northland is around 380,000 m³ per annum, equivalent to around 10% of the capital dredge volume. He stated that, in the unlikely event that the Refinery could secure 100% of the market, it would take around 10 years to use up the capital dredge volume (excluding any additional maintenance dredge volumes). He stated that there was potential for the maintenance dredging to supply the commercial market.
602. In summary, Mr Martin stated that it is highly unlikely that enough land-based area could be identified for the entire capital dredge volume. The additional costs to store this material ashore for future use would make the project uneconomic and result in an extremely large stockpile. He considers that the maintenance dredging campaigns may be better suited to some degree of land based disposal where this material is not required at Area 1.2 to maintain the ebb tide sediment budget.
603. The Applicant, in its right of reply, confirmed that the application is predicated on the basis that maintenance dredging material will be disposed of to land where practicable, subject to the overriding requirement for material to first be deposited at Disposal Area 1.2, as required and determined by the RMP. The Applicant states that the disposal strategy set out in the DMP will be reviewed prior to each maintenance dredging campaign and RNZ will be required to reconfirm the BPO, having specific regard to the possible land-based disposal options. The right of reply identified that there are practical, economic, and environmental constraints with land-based disposal.
604. Mr Mortimer considered the Applicant had undertaken a rigorous assessment of alternative receiving environments and methods.
605. We agree that land based disposal for the volume of material associated with capital dredging is not viable or practicable at this point in time.
606. We do not agree that the final conditions proffered by the Applicant in respect of prioritising land based uses for the maintenance dredging material are strong enough to achieve the goal that such disposal is the preferred option for that material, subject to the overriding requirement for material to first be deposited at Disposal Area 1.2 to maintain the sediment budget of the ebb tide delta.

607. We find that the Applicant should, prior to undertaking the first and subsequent maintenance dredging campaigns, provide the NRC with evidence that it has made genuine proactive efforts to address the practical, economic and environmental constraints that may exist in using or storing the material on land. We would expect the Applicant to undertake ongoing exhaustive efforts to either find a third party user for the material or secure the necessary consents and other authorisations to enable the material to be used and/or stored on land. We have imposed a condition requiring this accordingly. In the absence of such a proactive requirement, we believe that land disposal will repeatedly be assessed as not being the BPO due to the currently identified practical, economic and environmental constraints every time a maintenance dredging campaign is due. We traversed this matter with the Applicant during the hearing and were expecting the final set of proffered conditions to include additional clauses to reflect those that we have now imposed. However, we were surprised to find that the Applicant had not amended the relevant conditions in the final set to prioritise land disposal of maintenance dredging material.
608. We have had regard to section 107(1) matters and find there is no restriction on the grant of the discharge consents with the imposition of appropriate receiving water quality limits, after reasonable mixing.
609. We have explored the issue of appropriate mixing zones and we are satisfied a 100 m mixing zone for dredging near ecologically sensitive areas (within the harbour), and a 300 m mixing zone for other dredging and for the disposal site discharges (outside of the harbour), are appropriate on the basis of the sediment plume modelling. Drs Stewart and Coffey, and Mr Mortimer were of the view these were of the smallest extent practicable. We agree.
610. On the basis of the evidence presented and the imposition of appropriate water quality standards and monitoring, we are satisfied that the discharges are unlikely to give rise to any of the effects in the receiving waters set out in section 107(1)(c)-(g) after reasonable mixing.

PART 2

611. It was agreed between Messrs Kemble, Mortimer and Badham that there is currently some uncertainty regarding applying Part 2 of the RMA to consideration of resource consent applications. Mr Simmons stated that this uncertainty stems from a recent High Court decision – *R J Davidson Family Trust v Marlborough District Council*²⁵ (hereafter referred to as the *Davidson* case) – which found that the Supreme Court’s reasoning in *King Salmon* also applies to decisions on resource consents, namely that there is no ability for decision makers on resource consent applications to look at Part 2 unless there is invalidity, incomplete coverage, or uncertainty in the statutory planning documents. This position differs significantly from the pre-*Davidson* approach of an ‘*overall broad judgment*’ under Part 2 of the RMA.

²⁵ [2017] NZHC 52.

612. Mr Simmons stated that the High Court's decision on *Davidson* has been granted leave to appeal to the Court of Appeal and that several Environment Court and High Court decisions had considered and grappled with the application of the *Davidson* decision in the context of resource consent decisions. In answers to questions, Mr Simmons confirmed that many of the recent decisions made determinations using both the *Davidson* and 'overall broad judgement' approaches. Mr Simmons advised us to adopt a pragmatic approach to the application of section 104 and Part 2 of the RMA and not make a determination of the correct application of *King Salmon* – that is, he recommended that we apply both the *Davidson* and 'overall broad judgement' approaches and that in this case whatever approach is taken the outcome, in his view, is the same.
613. We note that Mr Kemble provided a Part 2 analysis. He concluded that the application was consistent with sections 6, 7 and 8 matters and would achieve the purpose of the RMA, as defined in section 5.
614. Mr Mortimer was of the view Part 2 need not be considered and therefore did not provide an analysis.
615. Mr Badham provided a Part 2 analysis. He concluded that the application did not adequately provide for the protection of Mair Bank as a nationally significant habitat for identified indigenous fauna (section 6(c)); or provide for the relationship of Māori with their culture and traditions, and their ancestral lands, water, sites, wāhi tapu and other taonga (section 6(e)). He considered the application had not had particular regard to section 7(a) because the project will diminish the role of iwi and hapū as kaitiaki due to significant adverse effects on the mauri of the harbour and mahinga kai (Mair Bank). He considered the application had not had particular regard to section 7(d) because of insufficient regard to the intrinsic value of the ecosystem of Mair Bank, as a nationally significant habitat for threatened and endangered birds. He acknowledged that while the application had taken into account some of the principles of the Treaty of Waitangi, it had not taken into account the ability for iwi and hapū to exercise rangatiratanga over their taonga, the ability to develop resources in the future, or the principle of acting in good faith.
616. We accept that the relevant statutory documents give effect to the purpose and principles of the Act and that the application is consistent with these provisions.
617. All the considerations we have described are subject to Part 2 of the Act (if the *pre-Davidson* overall broad judgement approach is taken). In accordance with Part 2, we consider that the project meets the purpose of the Act and is consistent with the principles of the sustainable management of natural and physical resources, as defined in section 5. We are satisfied that the section 6 matters of national importance, particularly section 6 (a), (c) and (e), have been recognised and provided for as best they can be; the section 7 matters, particularly section 7(a) and (d), have been given particular regard; and the section 8 Treaty principles have been taken into account. These matters have all been covered sufficiently in the evidence before us. We find the project will assist communities in the Northland region to provide for their social, economic and cultural well-being and their health and safety, while avoiding, remedying and mitigating significant actual and potential adverse environmental effects.

CONCLUSION AND OVERALL DETERMINATION

618. On the basis of the above assessment of effects on the environment, consideration of the measures proposed to offset or compensate adverse effects, and consideration of the relevant objectives and policies of the statutory provisions, we conclude that the project is unlikely to have any significant adverse effects on the environment and is generally consistent with the relevant statutory planning documents and provisions.
619. In taking into account the existing environment, we conclude that the Applicant's final proffered conditions and as changed by us in this decision, adequately avoid, mitigate or remedy the actual and potential effects of the project to a level that they are not significant and are, in our view, acceptable. Further, any residual adverse effects that are unable to be avoided, remedied, or mitigated have, in our view, been appropriately offset and compensated.
620. We have paid particular regard to potential cumulative effects and, in particular, the importance of maintaining the stability of Mair Bank.
621. Where the principles of Part 2 are engaged, we consider these have been appropriately recognised, considered and, as necessary, provided for, had regard to, or taken into account.
622. In our consideration and determination of this application we applied both the *Davidson* and the pre-*Davidson* 'overall broad judgement' approaches and found that the outcome is the same, that is that the purpose and principles of the Act are best achieved by granting the application sought, subject to conditions.

Conditions

623. There was a high level of agreement during the hearing between the Applicant and Mr Mortimer regarding consent conditions. We acknowledge the Applicant's willingness to meet concerns raised throughout the hearing by making ongoing amendments to proposed conditions. We also acknowledge the further comments from submitters on the circulated revised conditions and confirm we have considered these in determining the conditions that we have imposed.
624. We must record that we were somewhat disappointed that the final proffered conditions did not fully address a number of the matters that we raised during questioning in the hearing and which we were assured would be 'sorted' in the final set. This has resulted in us having to spend, in our view, unnecessary additional time addressing those matters.
625. We have outlined the substantive changes to conditions, including the reasons, throughout our decision in relation to requiring additional consideration of land based alternatives, receiving water quality limits, a closed season for dredging and the priority of any offset/compensation proposals. We do not repeat those here.
626. We have also made a number of typographical corrections and changes to improve the clarity and readability of conditions without changing their intent.
627. We are conscious that a number of conditions have been volunteered on an *Augier* basis, in particular those relating to the KG and Northport, and as such, we consider it is not appropriate for us to make substantial amendments to these conditions.

628. The conditions we have imposed relate to the effects of the proposed activities, and are enforceable, reasonable and appropriate. We record that the conclusions we reached on adverse effects, and our subsequent decision to grant the application, rely heavily on the Applicant fully complying with these conditions.

Duration

629. The Applicant has sought 35 years for all the resource consents, except for the resource consents for the navais, for which a consent term of 25 years is sought.
630. Mr Mortimer stated he had no issue with the 35 year consent term sought for the dredging activities; and 25 years for the navais in accordance with Rule 31.4.4(o) of the RCP.
631. In the absence of evidence or submissions to the contrary, we agree the appropriate consent term is 35 years for all of the resource consents sought, except for a 25 year term for the resource consent for the navais.

DECISION

For the above reasons, it is our decision on behalf of the Northland Regional Council, pursuant to sections 104, 104B, 105, 107 and 108, and subject to Part 2 of the Resource Management Act 1991, to **GRANT** the following resource consents to the **NEW ZEALAND REFINING COMPANY LIMITED**, subject to terms and conditions set out in Appendix 1, **attached** to this decision:

- AUT.037197.01.01** Capital dredging of the Whangārei Harbour entrance and approaches between the refinery jetty, at or about location co-ordinates 1735387E 6033137N, and a point within Bream Bay, at or about location co-ordinates 1735683E 6027182N;
- AUT.037197.02.01** Discharge decant water from a dredge hopper or barge into coastal waters as a result of capital dredging operations;
- AUT.037197.03.01** Deposition of capital dredging spoil at two defined marine disposal sites within Bream Bay, at or about approximate location co-ordinates 1736739E 6027636N and 1743686E 6024450N;
- AUT.037197.04.01** Discharge of sediment and water associated with capital dredging spoil disposal at two defined marine disposal sites within Bream Bay, at or about approximate location co-ordinates 1736739E 6027636N and 1743686E 6024450N;
- AUT.037197.05.01** Removal of sand, shell and other capital dredging material from the coastal marine area for land-based disposal;
- AUT.037197.06.01** Erection, placement, alteration, and maintenance and repair of navigation aids;
- AUT.037197.07.01** Maintenance dredging of the Whangārei Harbour entrance and approaches between the refinery jetty, at or about location co-ordinates 1735387E 6033137N, and a point within Bream Bay, at or about location co-ordinates 1735683E 6027182N;
- AUT.037197.08.01** Discharge decant water from a dredge hopper or barge into coastal waters as a result of maintenance dredging operations;
- AUT.037197.09.01** Deposition of maintenance dredging spoil at two defined marine disposal sites within Bream Bay, at or about approximate location co-ordinates 1736739E 6027636N and 1743686E 6024450N;
- AUT.037197.10.01** Discharge of sediment and water associated with maintenance dredging spoil disposal at two defined marine disposal sites within Bream Bay, at or about approximate location co-ordinates 1736739E 6027636N and 1743686E 6024450N;
- AUT.037197.11.01** Removal of sand, shell and other maintenance dredging material from the coastal marine area for land-based disposal;
- AUT.037197.12.01** Discharge water and contaminants (comprising predominantly seabed materials and construction materials) into water when installing the new aids to navigation, and relocating the existing aids to navigation; and
- AUT.037197.13.01** Take coastal water when undertaking dredging.

Dated this 17th day of July 2018

A handwritten signature in black ink, appearing to read 'S. McGarry', written on a light yellow rectangular background.

**Sharon McGarry
Hearing Commissioner (Chair)**

A handwritten signature in black ink, appearing to read 'Rob Lieffering', written on a light yellow rectangular background.

**Rob Lieffering
Hearing Commissioner**

A handwritten signature in purple ink, appearing to read 'Sheena Tepania', written on a light yellow rectangular background.

**Sheena Tepania
Hearing Commissioner**

APPENDIX 1

THE NEW ZEALAND REFINING COMPANY LIMITED, PRIVATE BAG 9024, WHANGĀREI 0171

To undertake the following activities in the Whangārei Harbour entrance and approaches:

Note: All location co-ordinates in this document refer to Geodetic Datum 2000, New Zealand Transverse Mercator Projection.

- | | |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AUT.037197.01.01 | Capital dredging of the Whangārei Harbour entrance and approaches between the refinery jetty, at or about location co-ordinates 1735387E 6033137N, and a point within Bream Bay, at or about location co-ordinates 1735683E 6027182N. |
| AUT.037197.02.01 | Discharge decant water from a dredge hopper or barge into coastal waters as a result of capital dredging operations. |
| AUT.037197.03.01 | Deposition of capital dredging spoil at two defined marine disposal sites within Bream Bay, at or about approximate location co-ordinates 1736739E 6027636N and 1743686E 6024450N. |
| AUT.037197.04.01 | Discharge of sediment and water associated with capital dredging spoil disposal at two defined marine disposal sites within Bream Bay, at or about approximate location co-ordinates 1736739E 6027636N and 1743686E 6024450N. |
| AUT.037197.05.01 | Removal of sand, shell and other capital dredging material from the coastal marine area for land-based disposal. |
| AUT.037197.06.01 | Erection, placement, alteration, and maintenance and repair of navigation aids. |
| AUT.037197.07.01 | Maintenance dredging of the Whangārei Harbour entrance and approaches between the refinery jetty, at or about location co-ordinates 1735387E 6033137N, and a point within Bream Bay, at or about location co-ordinates 1735683E 6027182N. |
| AUT.037197.08.01 | Discharge decant water from a dredge hopper or barge into coastal waters as a result of maintenance dredging operations. |
| AUT.037197.09.01 | Deposition of maintenance dredging spoil at two defined marine disposal sites within Bream Bay, at or about approximate location co-ordinates 1736739E 6027636N and 1743686E 6024450N. |
| AUT.037197.10.01 | Discharge of sediment and water associated with maintenance dredging spoil disposal at two defined marine disposal sites within Bream Bay, at or about approximate location co-ordinates 1736739E 6027636N and 1743686E 6024450N. |
| AUT.037197.11.01 | Removal of sand, shell and other maintenance dredging material from the coastal marine area for land-based disposal. |
| AUT.037197.12.01 | Discharge water and contaminants (comprising predominantly seabed materials and construction materials) into water when installing the new aids to navigation and relocating the existing aids to navigation. |
| AUT.037197.13.01 | Take coastal water when undertaking dredging. |

Subject to the following conditions:

General Conditions for all Consents

- 1 The Consent Holder shall keep the coastal marine area free of debris resulting from the Consent Holder's activities.
- 2 The Consent Holder shall monitor the exercise of these consents in accordance with these conditions and Schedules 1–3 (**attached**).
- 3 The Consent Holder shall, on becoming aware of any contaminant associated with the Consent Holder's operations escaping otherwise than in conformity with these consents, undertake the following:
 - (a) Immediately take such action, or execute such work as may be necessary, to stop and/or contain such escape; and
 - (b) Immediately notify the council by telephone of an escape of contaminant; and
 - (c) Take all reasonable steps to remedy or mitigate any adverse effects on the environment resulting from the escape; and
 - (d) Report to the council's Compliance Manager in writing within one week on the cause of the escape of the contaminant and the steps taken or being taken to effectively control or prevent such escape.

For telephone notification during the council's normal opening hours the council's assigned monitoring officer for these consents shall be contacted. If that person cannot be spoken to directly, or it is outside of the council's normal opening hours, then the Environmental Hotline shall be contacted.

Advice Note: *The Environmental Hotline is a 24 hour, 7 day a week, service that is free to call on 0800 504 639.*

- 4 The council may, in accordance with Section 128 of the Resource Management Act 1991, serve notice on the Consent Holder of its intention to review the conditions annually during the month of March for any one or more of the following purposes:
 - (a) To deal with any adverse effects on the environment which may arise from the exercise of the consents and which it is appropriate to deal with at a later stage; or
 - (b) To require the adoption of the best practicable option to remove or reduce any adverse effect on the environment arising from the discharges; or
 - (c) To review any or all of the conditions relating to maintenance dredging and disposal activities should monitoring show that the areas disturbed by the dredging footprint and/or the disposal areas associated with the capital dredging have not recovered to the level specified by Condition 117(b) within two years of the completion of the capital dredging.
 - (d) To respond to any new technology, standards or monitoring parameters relevant to the environmental monitoring undertaken in accordance with these consents.

The Consent Holder shall meet all reasonable costs of any such review.

Advice Note: *Notwithstanding (and in addition to) Condition 4, the council may also, in accordance with Section 128 of the Resource Management Act 1991, serve notice on the Consent Holder of its intention to review the conditions any time for the following purposes:*

- (a) *To provide for compliance with rules relating to minimum standards of water quality in any regional plan that has been made operative since the commencement of the consent; or*
- (b) *To provide for compliance with any relevant national environmental standards that have been made; or*
- (c) *Where there are inaccuracies in the information made available with the application that materially influenced the decision on the application and where the effects of the exercise of consent are such that it is necessary to apply more appropriate conditions.*

5 These consents shall not lapse until their expiry.

Certification

6 Where any condition requires the Consent Holder to submit a report or management plan to the council for “**certification**” it shall mean the process set out in the following paragraphs (a) to (d) and the terms “certify” and “certified” shall have the equivalent meanings:

- (a) The Consent Holder supplies a report or a management plan to the council’s Compliance Manager, and the council assesses the documentation submitted to ensure that it achieves the requirements of the relevant condition(s) of consent (for management plans, this will include that the plan proposed for certification meets the objective(s) and content requirements set out in the condition(s));
- (b) Should the documentation supplied in accordance with (a) above, in the opinion of the council, achieve the requirements of the relevant condition(s), the council’s Compliance Manager shall issue a written confirmation to the Consent Holder that the requirements of the relevant condition(s) have been satisfied;
- (c) If the council is not satisfied that the documentation supplied in accordance with (a) above achieves the requirements of the relevant condition(s), the council’s Compliance Manager shall advise (in writing) the Consent Holder of the council’s concerns and ask that the report or management plan be modified so as to address the concerns, and then be resubmitted;
- (d) This process shall be repeated until the council’s Compliance Manager is able to certify that the requirements of the applicable condition(s) have been satisfied.

7 Where no written confirmation, pursuant to either Conditions 6(b) or 6(c), is provided within 20 working days of a report or management plan being provided to the council, the report or management plan shall be deemed to be certified for the purpose of the respective condition to which the document pertains.

8 **Suitably Qualified and Experienced Person** means a person or persons:

- (a) With a recognised tertiary qualification(s) relevant to the topic being assessed; and

- (b) Who has more than 10 years relevant experience in the topic being assessed.

Biosecurity

- 9 The Consent Holder shall, if a dredge vessel(s) is to be used that has not been in the coastal waters within the jurisdiction of the council for at least one month prior to the dredging event, provide a Biosecurity Management Plan ('BMP') to the council's Compliance Manager for Certification. The BMP shall be prepared by an independent Suitably Qualified and Experienced Person and be provided to the council not less than two months prior to the scheduled arrival of the dredge vessel(s) in New Zealand. The BMP shall set out the measures to be implemented by the Consent Holder to avoid the introduction of any unwanted or risk species through the use of dredging plant and equipment which is to be brought to the site from other locations. The BMP shall include details regarding the cleaning and inspection of machinery and plant brought into the Whangārei Harbour and of dredging plant personnel training, monitoring and reporting mechanisms.

The BMP shall have the following objectives:

- (a) To avoid the introduction of any unwanted or risk species into Bream Bay and the Whangārei Harbour from dredging plant and associated equipment, including support vessels and barges;
 - (b) To ensure effective treatment of all plant and equipment used in association with the dredging to ensure these do not become a vector for the spread of any unwanted or risk species; and
 - (c) To set out a dredging plant biodiversity monitoring and reporting system.
- 10 The BMP shall be prepared in general accordance with the draft BMP provided as part of the resource consent application (Annexure F to the evidence of Mr Justin Cross, *Refining NZ – draft Biosecurity Management Plan*, Royal HaskoningDHV, February 2018).
- 11 The Consent Holder shall undertake all activities authorised by these resource consents in accordance with the Certified BMP.
- 12 Prior to the first use of any dredging plant and equipment from an area known to harbour unwanted or risk species, the Consent Holder shall arrange inspection of the same for infestation of any unwanted or risk species and obtain certification by an independent Suitably Qualified and Experienced Person of the plant and equipment having been treated and inspected in accordance with the BMP. A copy of this certification shall be provided to the council's Compliance Manager on request. The Consent Holder shall not allow any plant or equipment used for dredging under its control or direction associated with the proposal to be used, that is not certified as having been treated and inspected as required by this condition.

Response to Adventive Pests & Weeds

- 13 Should the post dredging monitoring undertaken in accordance with Condition 102(c) of these resource consents demonstrate, in the opinion of an independent Suitably Qualified and Experienced Person, that adventive pest or weed species are dominating the re-colonisation of any disturbed area, the Consent Holder shall:
- (a) Within five working days, notify the Ministry for Primary Industries; and

- (b) Work collaboratively with the Ministry for Primary Industries, and the council's Compliance Manager to determine and implement appropriate procedures to control adventive pests and weeds present within the disturbed area, including eradication if practicable.

Noise Management

- 14 The Consent Holder shall, at least one month prior to the commencement of the capital dredging event authorised by these resource consents, lodge a Noise Management Plan ('NMP'), prepared by an independent Suitably Qualified and Experienced Person, with the council's Compliance Manager for Certification. The NMP shall apply at all times during dredging and must set out the specific restrictions applying (if any) on any dredging occurring north of the No.18 buoy when the noise limit in Schedule 1 of this consent is 45dB L_{Aeq} . All capital and maintenance dredging activities shall be carried out in accordance with the certified NMP.

The NMP shall as a minimum address the measures required to ensure compliance with the noise limits referred to in Condition 16 (and specified in Schedule 1) and the following matters:

- (a) Procedures for noise monitoring at the commencement of capital dredging for each dredge used to determine actual noise emissions;
 - (b) Based on the outcome of (a), details of the recalibration of the computer noise models for each dredge to determine whether any operational restrictions on dredging are required when dredging occurs north of the No.18 buoy when the noise limit in Schedule 1 is 45dB L_{Aeq} ;
 - (c) Ongoing monitoring methods and procedures to ensure compliance with the noise limits in Schedule 1, including any restrictions arising from (b) above;
 - (d) Procedures for the promotion of the awareness of noise management for the crew of each dredging vessel, including maintenance of noisy plant or equipment; and
 - (e) A procedure for the receipt, response and management of any noise related complaints received during the dredging period.
- 15 The NMP shall be prepared in general accordance with the draft NMP provided as part of the resource consent application (Appendix B to the evidence of Mr Jon Styles, *Whangarei Harbour Entrance and Marsden Point Channel Realignment and Deepening – draft Noise Management Plan*, Styles Group, 12 February 2018).
- 16 Noise generated by all dredging activities shall comply with the noise limits specified in Schedule 1. The night time limits of 45dB L_{Aeq} and 75dB L_{Amax} may be exceeded at the notional boundary of any occupied residential dwelling if the occupier of the residential dwelling has consented, in writing, to such an exceedance(s) and a copy of that written consent has been provided to the council's Compliance Manager beforehand.

Advice Note: *For the avoidance of doubt, all dwellings should be assumed to be occupied unless it can be proven otherwise.*

- 17 The Consent Holder may operate more than one dredge at a time provided that the following controls apply:

- (a) Two dredges shall only be operated northwest of Busby Head between the hours of 0730 and 2000 from Monday to Friday and 0730 to 1800 on Saturdays only;
 - (b) No more than one dredge can operate northwest of Busby Head at any other time; and
 - (c) Two dredges may be operated in any other area, at any time.
- 18 The Consent Holder shall undertake all activities authorised by these resource consents in accordance with the Certified NMP.
- 19 The NMP shall be reviewed prior to the commencement of any maintenance dredging campaign if one or more of the dredging vessels to be used differs from those used for capital dredging or any previous maintenance dredging campaign. Any amendments to the Certified NMP proposed by the Consent Holder shall be certified by the council's Compliance Manager.
- 20 The Consent Holder shall ensure that the dredge vessels and equipment used are maintained so as to minimise the generation of airborne noise as far as practicable.

Marine Mammal Protection

- 21 The Consent Holder shall, one month prior to the commencement of the capital dredging and disposal event, and two weeks prior to the first maintenance dredging and disposal event or pile driving for the aids to navigation ('navaid') placement, lodge a Marine Mammal Management Plan ('MMMP'), prepared by an independent Suitably Qualified and Experienced Person in consultation with the Kaitiaki Group, with the council's Compliance Manager for Certification. The MMMP shall address operational measures to protect any marine mammals within the vicinity of vessels used for or associated with dredging, spoil disposal or pile driving operations.

The MMMP shall, as a minimum, include the following matters:

- (a) Vessel operating guidelines to minimise the risk of vessel strike (including compliance with the Marine Mammals Protection Regulations 1992);
 - (b) Debris management guidelines to avoid entanglement of marine mammals or their ingestion of waste material;
 - (c) Underwater noise management, including passive acoustic monitoring for all capital dredging, and implementation measures for the shutdown zones provided in Condition 25;
 - (d) Department of Conservation and Iwi liaison procedures;
 - (e) Incident reporting procedures; and
 - (f) Training and observation procedures for on-board monitoring of marine mammals.
- 22 The MMMP shall be prepared in general accordance with the draft MMMP provided as part of the resource consent application (AEE Annexure 2: Technical Report (i) *Assessment of Effects on Marine Mammals from Proposed Deepening and Realignment of the Whangarei Harbour Entrance and Approaches*, Cawthron Institute, Report No. 2910, August 2017, Appendices 3 and 4).

- 23 The Consent Holder shall undertake capital and maintenance dredging in accordance with the Certified MMMP.
- 24 The Consent Holder shall monitor the presence of marine mammals in the vicinity of dredging, spoil disposal and pile driving works in accordance with Schedule 2, **attached**.
- 25 All dredging and/or pile driving activities shall cease immediately if a marine mammal is observed within any of the following distances, hereafter referred to as 'shutdown zones':
- (a) a 50 metre radius of an operating dredge;
 - (b) a 100 metre radius of a pile driver vessel using vibro-hammer equipment; or
 - (c) a 300 metre radius of a pile driver vessel using traditional impact equipment.

The dredge or pile driving activity shall not recommence until such time as the animal has visually been confirmed as having moved outside of the applicable shutdown zone or 30 minutes have elapsed since the last marine mammal sighting.

- 26 The Consent Holder shall, not less than two months prior to each maintenance dredging event, engage an independent Suitably Qualified and Experienced Person to test a representative sample of the marine sediments that are to be dredged. The independent Suitably Qualified and Experienced Person shall test the sediments to see if they contain contaminants that, if mobilised, would present a risk to the health of marine mammals. The independent Suitably Qualified and Experienced Person shall produce a report summarising their findings and advice prior to each maintenance dredging event commencing. If the independent Suitably Qualified and Experienced Person advises that contaminants are present in the sediment that could pose an unacceptable risk to the health of marine mammals (that is, if they are above the relevant Interim ANZECC Guidelines for Sediment (ISQG-Low), they shall recommend a strategy to reduce the risk to a point that is, in their opinion, acceptable. Sediment guidelines for contaminants which are considered to be bioaccumulative shall be the primary focus, in particular polychlorinated biphenyls (PCBs) and organochlorides. The Consent Holder shall implement the strategy recommended by the independent Suitably Qualified and Experienced Person.
- 27 Should the sampling undertaken in accordance with Condition 26 show that the marine sediments to be dredged do not pose an unacceptable risk to the health of marine mammals, for the first three maintenance dredging events, the Consent Holder may discontinue further monitoring (in accordance with Condition 26) for future maintenance dredging events. This exemption does not apply if the period between dredging events exceeds six consecutive years, in which case the sediments to be dredged shall be sampled in accordance with Condition 26.
- 28 The Consent Holder shall ensure that the dredge vessels and pile driving vessels and the equipment used are maintained so as to minimise the generation of underwater noise.

Coastal Bird Protection

- 29 The Consent Holder shall, following the completion of capital dredging, undertake the following monitoring:

- (a) A one-off survey, in the following November, of the breeding season habitat use of coastal birds between both:
 - (i) Marsden Point to Northport; and
 - (ii) Darch Point to Home Point;
- (b) A total of four surveys, in the following period February to March, of coastal bird abundance and habitat use in the following areas:
 - (i) Two surveys at Mair Bank;
 - (ii) One survey between the Refinery jetty to Northport; and
 - (iii) One survey at Urquharts Bay; and
- (c) A one-off survey, in the following period November to January, in the embayments from Reotahi Bay to Urquharts Bay (inclusive) to record the daily dusk arrival counts of kororā (little penguins).

The Consent Holder shall complete the monitoring and provide a written report on the findings to the council's Compliance Manager and the Kaitiaki Group within 18 months of the completion of capital dredging.

Kororā (Little penguin)

- 30 The Consent Holder shall, in consultation with the Department of Conservation, seek to enhance the breeding success of kororā by:
 - (a) Installing at least 15 predator traps on Motukaroro Island and/or in locations within Whangārei Harbour/Bream Bay where suitable kororā breeding habitat occurs. The predator traps are to be placed to maximise the number of predator species that are trapped. If located on the mainland, traps are to be placed in locations to minimise the number of pest incursions from the mainland to the Island.
 - (b) Installing tracking tunnels at the same time as the traps are installed. The tracking tunnels shall monitor the effectiveness of the predator traps and are to be placed in areas where predators are expected to frequent.
 - (c) Arranging for traps and tracking tunnels to be inspected monthly.
- 31 The trapping and monitoring required by Condition 30 shall commence not less than six months prior to the commencement of capital dredging and shall continue for the term of these resource consents.
- 32 Within one year of commencement of the first trapping and monitoring exercise required by Condition 31, the Consent Holder shall, in consultation with the Department of Conservation, install 24 nesting boxes either at Motukaroro Island, or in locations within Whangārei Harbour/Bream Bay that are likely to be attractive for kororā. The Consent Holder shall maintain the nesting boxes for five years following their installation.
- 33 The Consent Holder shall, within six months of the installation of the nesting boxes required by Conditions 30 and 31 above, invite Kaitiaki Group representatives to inspect the works carried out to enhance the breeding success of kororā.

Advice Note: *Installing predator traps, tracking tunnels and/or nesting boxes may require third party landowner approval.*

Ōi (Grey-Faced Petrel)

- 34 At least six months prior to the commencement of capital dredging and also at least six months prior to each maintenance dredging campaign, the Consent Holder shall contribute \$7,500.00 (inclusive of GST) (CPI adjusted from the date of commencement of these resource consents) to either the Department of Conservation, the Bream Head Conservation Trust or another suitable conservation body that the council's Compliance Manager agrees is able to undertake the works needed for the purposes of pest control for ōi in the Bream Head area. The purpose of the contribution is to compensate for any mortality of ōi from collisions with dredge vessels, while also recognising the likely benefits of the contribution to other bird species. The Consent Holder shall provide written verification of the contribution being made to the council's Compliance Manager within five working days of the payment being made. The payment shall not bear interest, and a default shall not attract a financial penalty under these conditions.
- 35 In the event that a suitable community or conservation body cannot be identified or does not exist at the time the contribution is due to be made under Condition 34, the Consent Holder shall make the contribution towards a similar avifauna initiative/programme endorsed by the Department of Conservation.
- 36 Any dredge vessel used for works authorised by these consents shall be audited by an independent Suitably Qualified and Experienced Person. The purpose of the audit shall be to ensure appropriate levels of light spill from dredge vessels, to minimise the potential for bird strike. The audit shall make recommendations of any changes/modifications to dredge vessels or precautions that need to be taken to ensure appropriate levels of light spill, and may include:
- (a) reduction in unnecessary deck and cabin lighting;
 - (b) where possible orientation of all deck lights to a downward position and appropriate shielding of these to prevent upward or horizontal light projection;
 - (c) use of light dimmers and/or timers for areas where people are not constantly active; and
 - (d) use of coloured and/or LED lights to reduce overall light intensity.
- 37 A copy of the lighting audit shall be provided to the council's Compliance Manager for Certification, within one month of audit completion. The Consent Holder shall ensure that any audit recommendations are implemented before dredging commences (with written confirmation of such implementation to be provided to the council's Compliance Manager) and are maintained throughout dredging. If an 'un-audited' vessel is intended to later commence dredging, it shall be audited (and any recommendations complied with) prior to commencing dredging.

Advice Note: *Nothing in Conditions 36 and 37 above is intended to prevent or restrict compliance with maritime safety requirements, including pursuant to the Maritime Rules.*

Refining NZ Marsden Point Liaison Committee (MPLC)

- 38 The Consent Holder shall resource the existing Marsden Point Liaison Committee with respect to the dredging and spoil disposal activities authorised by these consents. The Consent Holder shall invite the following groups to provide one representative to sit on the MPLC:

- (a) Department of Conservation;
- (b) Whangarei Harbour Marine Reserve Advisory Committee;
- (c) Whangarei Heads Citizen Association;
- (d) Ruakaka Residents and Ratepayers Association;
- (e) Fisheries Inshore NZ;
- (f) Northland Scallop Enhancement Company;
- (g) Bream Bay Coastal Care Trust;
- (h) Bream Head Conservation Trust;
- (i) The Kaitiaki Group established by these resource consents; and
- (j) Any other directly affected party that the MPLC identifies and recommends for inclusion with the agreement of the Consent Holder.

39 The role of the MPLC shall be as follows:

- (a) To receive reports from the Consent Holder as to progress on the channel deepening and realignment;
- (b) To discuss management plans to ensure that relevant concerns and needs are taken into account in their preparation/implementation;
- (c) To receive the results of monitoring undertaken by the Consent Holder in relation to the activities covered by these consents and to be advised of the implications of the monitoring results;
- (d) To identify, develop and establish suitable studies or projects designed to improve water quality, coastal processes, environmental, ecological, and cultural health of the Whangārei Harbour entrance [including its shores] and northern Bream Bay; and
- (e) To receive copies of any reports on environmental incidents requested by the council, in relation to the exercise of these resource consents.

40 The Consent Holder shall appoint two senior officers, either one of whom will represent the Consent Holder at all meetings of the MPLC.

41 The Consent Holder shall ensure that where the Chair of the MPLC considers it necessary, appropriate technical experts attend meetings of, or provide information to, the MPLC.

42 The Consent Holder shall provide the venue and administrative support for all meetings of the MPLC. Meetings are to be held in a suitable venue at Marsden Point unless otherwise agreed.

43 The Consent Holder shall hold meetings with the MPLC at least once every 12 months, unless a simple majority of the nominated representatives decide otherwise, whereby the meeting frequency could be reduced or the recurrent meetings stopped. The Consent Holder shall keep a record of each MPLC meeting held. Meeting records shall list the names of those who attended the meeting, the main topics of discussion and any agreed outcomes/areas of disagreement. They shall also record any decision of the majority to reduce the frequency of, or to stop the recurrent meetings. The Consent Holder shall provide a copy of any meeting record(s) to the council's Compliance Manager on request, and to the attendees of each meeting.

Kaitiaki Group (KG)

44 The Consent Holder shall, at least six months prior to the date that the capital dredging is intended to commence, provide a written offer to the relevant representative entities of tangata whenua groups of Whangārei Te Rerenga Parāoa to establish and maintain a Kaitiaki Group ('KG').

- (a) For the purposes of these resource consents the 'relevant representative tangata whenua groups' are: Patuharakeke, Te Parawhau, Ngāti Kahu o Torongare, Te Waiariki, Ngāti Korora, Ngāti Tu, Te Uriroi, and Ngātiwai;
- (b) The entities nominated to represent the tangata whenua groups listed in clause (a) of this condition shall be identified by tangata whenua. Tangata whenua shall advise both the Consent Holder and the council as to whom their representative entities will be; and
- (c) Other tangata whenua groups may be invited to join the KG where they have been endorsed by the majority of the members of the KG and confirmed by the council.

Advice Note: *There are several existing groups exercising various roles aimed at improving the health of Whangārei Te Rerenga Parāoa, including, for example the "Kaitiaki Roopu" which was established under resource consents granted to Northport for its port expansion.*

45 Each of the above parties listed in Condition 44 who accepts the Consent Holder's offer may nominate one representative and an alternate representative to the KG. The Consent Holder may also nominate one representative and an alternative representative to the KG.

46 As soon as practicable after acceptance of the Consent Holder's above offer by one or more parties, a Charter establishing the KG shall be executed by the Consent Holder and the accepting parties, following which the KG shall be constituted. The Charter shall set out/include the following, as a minimum:

- (a) The name by which the KG shall be formally known;
- (b) The functions of the KG in accordance with Condition 47 below, and how such functions shall be exercised by the KG;
- (c) The composition of the KG and the process by which membership may be amended;
- (d) How the KG intends to carry out its functions, including the frequency and format of KG meetings, and methods for decision-making;
- (e) A dispute resolution process whereby any differences that may arise in establishing and/or operating the KG may be resolved by direct discussions between the parties in dispute, and failing that, by reference to mediation by an AMINZ affiliated mediator (the costs of the mediator to be met by the Consent Holder);
- (f) The rates of remuneration for members of the KG; and
- (g) The period the KG shall operate for; which shall be no shorter than is necessary to fulfil the KG's functions under these resource consents.

Functions of the KG

47 The functions of the KG are to:

- (a) Recognise and provide for the importance of Whangārei Te Rerenga Parāoa as a taonga to tangata whenua, within the framework of these resource consents;
- (b) Recognise and provide for the kaitiakitanga of Māori who have a kaitiaki relationship with Whangārei Te Rerenga Parāoa, within the framework of these resource consents;
- (c) Facilitate the involvement of Māori who have a kaitiaki relationship with Whangārei Te Rerenga Parāoa in the exercise of these resource consents;
- (d) Facilitate the incorporation of kaitiaki responsibilities and values in the exercise of these resource consents; and
- (e) Provide a forum for engagement between Māori who have a kaitiaki relationship with Whangārei Te Rerenga Parāoa, the Consent Holder and the council regarding the exercise of these resource consents.

Roles of the KG

48 In fulfilling its functions, the role of the KG shall be to:

- (a) Nominate up to two people with knowledge of mātauranga Māori to train as marine mammal observers;
- (b) Nominate a representative to sit on the MPLC;
- (c) Receive reports and information from the Consent Holder required pursuant to these resource consents, including but not limited to, predator control and installation of nesting boxes for kororā/little penguin (see Condition 30), and notification of any discovery of archaeological material (see Condition 66);
- (d) Review and comment, as necessary, on the following (amongst other things): the MMMP required by Condition 21; the Harbour Restoration and Enhancement monitoring programme required by Condition 56; the BEMP required by Condition 99; and the RMP required by Condition 124;
- (e) Review and comment, as necessary, on the monitoring reports produced by the Consent Holder prior to them being submitted to the council to ensure the KG views are made known to council prior to any review;
- (f) Work collaboratively with the council and the Consent Holder to determine and implement appropriate procedures to control any adventive pests and weeds present within any disturbed area;
- (g) Receive updates every five years on new technology and processes related to the Dredge Management Plan;
- (h) Develop a Mātauranga Māori Monitoring Framework;
- (i) Receive from the Consent Holder notification of any receiving water quality limit exceedances (see Condition 108); and consult with the council's Compliance Manager regarding any receiving water quality limit exceedances in accordance with Condition 108;
- (j) Provide advice on enhancing access to mahinga kai sites;

- (k) Identify, develop, establish and/or approve suitable studies or projects designed to improve water quality, coastal processes, environmental, ecological, and cultural health of the Whangārei Harbour entrance (including its shores) and northern Bream Bay; and
 - (l) Receive requests from Māori who have a kaitiaki relationship with Whangārei Te Rerenga Parāoa for the undertaking of any cultural ceremonies relating to the exercise of these resource consents, including without limitation in the event of discovery of kōiwi; and for facilitating the provision of any such cultural ceremonies the KG reasonably deems to be appropriate.
- 49 The Consent Holder shall provide written confirmation to the council's Compliance Manager within two weeks of execution of the Charter establishing the KG pursuant to Condition 46.
- 50 The first KG meeting shall be held as soon as practicable after execution of the Charter establishing the KG. The KG shall determine how it conducts/administers its functions under these resource consents.
- 51 The Consent Holder shall:
 - (a) Meet the reasonable costs, up to a maximum of \$10,000 per year, incurred by the KG in fulfilling its functions under these resource consents, including KG meetings and remuneration of KG members; subject to normal business practices, including invoicing and accounting, and in accordance with the Charter produced under Condition 46;
 - (b) Give members at least three weeks' advance notice of the date, time and location of KG meetings;
 - (c) Take Minutes of KG meetings, which shall be forwarded to KG members and the council within three weeks of each meeting;
 - (d) Provide copies of the relevant reports and documentation required by the conditions of this resource consent to the KG;
 - (e) Provide the KG with opportunities to review and comment on the following documents: the MMMP required by Condition 21, the Harbour Restoration and Enhancement monitoring programme required by Condition 56, the BEMP required by Condition 99, and the RMP required by Condition 124;
 - (f) Have particular regard to any relevant comments provided by the KG under Condition 51(e) in the preparation and implementation of the documents (including any subsequent amendments) referred to in that condition; and
 - (g) Provide monthly email updates to the KG on any dredging undertaken, and on the outcomes of monitoring conducted in general accordance with these resource consents.
- 52 The Consent Holder shall provide funding to the KG as follows:
 - (a) An initial payment of \$150,000 (plus GST, if any) within one month of the KG being constituted in accordance with Condition 46 (referred to below as the 'Initial Kaitiaki Fund');
 - (b) Ten annual payments of \$50,000 each (plus GST, if any), with the first payment to be made within six months of completion of the capital dredging authorised by these resource consents (referred to below as the 'Ongoing Kaitiaki Fund');and

- (c) Ten annual payments of \$50,000 each (plus GST, if any), with the first payment to be made within six months of completion of the capital dredging authorised by these resource consents (referred to below as the 'Poupouwhenua Fund').
- 53 The Initial Kaitiaki Fund in Condition 52(a) above is intended to provide immediate working capital for the KG to assess the effects of the capital dredging authorised by these resource consents on Whangārei Te Rerenga Parāoa. The Ongoing Kaitiaki Fund in Condition 52(b) above is intended to enable the KG to continue to monitor the effects of the exercise of these resource consents on Whangārei Te Rerenga Parāoa, including maintenance dredging. Nothing in this condition, however, is intended to limit the use of the funding provided by the Consent Holder pursuant to Condition 52, provided such use is consistent with the KG's Charter.
- 54 The Poupouwhenua Fund in Condition 52(c) above is to be utilised towards restoration or enhancement projects at Poupouwhenua, including (without limitation) the examples set out in Condition 59 below. The Poupouwhenua Fund shall be held and administered separately to the Initial Kaitiaki Fund and Ongoing Kaitiaki Fund. The use of the Poupouwhenua Fund shall be determined by the Patuharakeke representative to the KG at their discretion. The Patuharakeke representative may, entirely at their own discretion, include other members of the KG in determining how the fund is used.
- 55 Except where the context requires otherwise, all the Consent Holder's obligations with respect to the KG under these resource consents are conditional on the KG being validly constituted, including execution of the KG Charter through agreement by the relevant parties.

Harbour Restoration and Enhancement

- 56 The Consent Holder shall, not less than six months in advance of dredging commencing, appoint an independent Suitably Qualified and Experienced Person to:
- (a) design a monitoring programme in close conjunction with the KG to better understand:
 - (i) the physical and ecological interactions at Mair and Marsden Banks;
 - (ii) pipi spawning, larval development, and juvenile recruitment, including the importance of the "berth pocket" area for pipi recruitment on Mair and Marsden Banks
 - (b) implement the monitoring programme required to be prepared by clause (a); and
 - (c) prepare a report that summarises the results of the monitoring programme required by clauses (a) and (b) and advises:
 - (i) whether works or actions can be practicably undertaken to assist in the successful recovery of the shellfish population and biomass, including particularly pipi, on Mair and Marsden Banks. The report shall include an assessment on whether re-seeding shellfish beds on Mair and Marsden Banks is likely to be successful in achieving recovery of the shellfish populations; and
 - (ii) if works or actions can be practicably undertaken, recommends the specific works or actions that shall be undertaken.

- 57 If the independent Suitably Qualified and Experienced Person advises that works or actions can be practicably undertaken to assist in the successful recovery of the shellfish population and biomass, including particularly pipi, on Mair and Marsden Banks, the Consent Holder shall consult with the council, the MPLC, and the KG over the implementation of any works or actions recommended in the report required by Condition 56(c). Should the council agree to advance the works or actions with the Consent Holder, the Consent Holder shall contribute \$150,000.00 (GST inclusive) to the implementation of those works.
- 58 Should the independent suitably Qualified and Experienced Person advise that works or actions cannot be practicably undertaken to assist in the successful recovery of the shellfish population and biomass, including particularly pipi, on Mair and Marsden Banks or the council advises that it does not agree to advance the works or actions in accordance with Condition 57, the Consent Holder shall contribute \$150,000.00 (GST inclusive) towards other ecological restoration projects in the Whangārei Harbour as specified in Condition 59. The fund shall be administered by the Consent Holder and allocated to projects identified and agreed by the MPLC and KG.
- 59 The contributions made or works undertaken in accordance with Condition 58 shall be for the purpose of enabling improvements to the health of the Whangārei Harbour entrance and northern Bream Bay area, and may include:
- (a) Enhancing benthic communities in any Marine 1 Management Areas ('M1MAs') (as shown on the planning maps attached in Schedule 4) in the lower Whangārei Harbour;
 - (b) Restoring and/or extending seagrass beds;
 - (c) Studying coastal bird nesting/roosting/feeding areas;
 - (d) Maintenance or enhancement of habitat of oystercatcher and other shorebirds;
 - (e) Mahinga kai/kaimoana enhancement and restoration initiatives; and/or
 - (f) Works to improve coastal water quality in the lower Whangārei Harbour.
- 60 The contributions made or works undertaken in accordance with Condition 58 shall be paid/completed within ten calendar years of the first dredging event being undertaken in accordance with this resource consent. The Consent Holder shall provide written verification of all contributions made in accordance with Condition 58 to the Consent Authority Manager within five working days of each payment being made. The payments shall not bear interest, and a default shall not attract a financial penalty under these conditions.

Website Obligations

- 61 At least six months prior to the commencement of capital dredging the Consent Holder shall have in place, and maintain for the duration of these resource consents, a website that is accessible to, and readily usable by, the public.
- 62 The website shall include contact details for the Consent Holder; and the following documents (as they become available):
- (a) A copy of these resource consents;
 - (b) A copy of the AEE;
 - (c) A copy of all of the Certified management plans required by these conditions;

- (d) A mechanism for members of the public to raise matters with, make an enquiry of, or lodge a complaint with, the Consent Holder during capital and maintenance dredging; and
- (e) A statement that projects the timing and duration of the next maintenance dredging event to be conducted in accordance with these resource consents.

Complaints

- 63 The Consent Holder shall keep a register of complaints lodged with it in respect of the exercise of these resource consents.
- 64 The register maintained in accordance with Condition 63 shall record the following details for each complaint that is made:
- (a) The date and time of the complaint;
 - (b) The name and contact details of the complainant (if they are provided to the Consent Holder);
 - (c) A description of the complaint;
 - (d) Any investigations that the Consent Holder undertook in response to the complaint;
 - (e) Any action that was undertaken to address the concerns raised in the complaint; and
 - (f) Any feedback provided to the complainant.
- 65 The Consent Holder shall provide a copy of the complaints register to the council's Compliance Manager within five working days of receiving a request to do so from the council.

Accidental Discovery Protocol

- 66 In the event of any discovery of archaeological material, the Consent Holder shall immediately:
- (a) Cease dredging operations in the affected area, and mark the affected location using GPS coordinates on the dredge vessel(s);
 - (b) Notify the council's Compliance Manager;
 - (c) Notify the Northern Regional Office of Heritage New Zealand Pouhere Taonga; and
 - (d) Notify the KG (if established) and/or other tangata whenua representatives as appropriate.

- 67 If the archaeological material is determined to be kōiwi (human bones) by Heritage New Zealand Pouhere Taonga, the Consent Holder shall immediately notify the New Zealand Police and tangata whenua representatives. Kōiwi is not to be further disturbed until such time as tangata whenua and Heritage New Zealand Pouhere Taonga have responded. Heritage New Zealand Pouhere Taonga representatives and the Consent Holder will engage with tangata whenua representatives to determine the appropriate procedures in accordance with mana whenua tikanga to ensure the safety of contractors and workers, tangata whenua, and the public. Mana whenua will take the lead role in carrying out appropriate customary and cultural rites and practices to ensure the safety of all parties.
- 68 Dredging may only recommence at the marked location if the council's Compliance Manager provides written confirmation to the Consent Holder that it is appropriate to do so.

AUT.037179.01.01 and AUT.037179.07.01 – Capital and Maintenance Dredging

- 69 No capital or maintenance dredging shall be undertaken between 1 October and 31 January (inclusive).
- 70 These consents apply only to the parts of the Whangārei Harbour entrance and approaches identified in colour on the **attached** Royal HaskoningDHV Ltd drawing referenced as "Northland Regional council Plan Number. **4782/1**".
- 71 The design depth of capital and/or maintenance dredging in the channel areas, excluding the refinery jetty berth pocket, shown on the drawing referenced in Condition 70 shall not exceed that shown on the **attached** drawing, referenced as "Northland Regional Council Plan Number. **4782/2**", plus an additional overdredge allowance of up to 0.3 metres.
- 72 Capital and maintenance dredging in the refinery jetty berth pocket shall not exceed a design depth of 17.9 metres below chart datum, plus an additional overdredge allowance of up to 0.3 metres.
- 73 Dredging in the refinery jetty berth pocket shall occur only during daylight hours. At all other locations, dredging and disposal activities may occur at any time, subject to the Consent Holder complying with all of these conditions.
- 74 The volume of capital dredging shall not exceed 3,700,000 cubic metres.
- 75 The volume of maintenance dredging shall not exceed 122,000 cubic metres per year, annualised averaged over the period between maintenance dredging events. Material shall only be removed from the channel, for the purpose of maintaining the depths set out in Conditions 71 and 72.

Advice Note: *Rates of sedimentation in the dredged channel are estimated to require maintenance dredging of up to 122,000 cubic metres per year. However, it is recognised that maintenance dredging campaigns will not necessarily be carried out annually.*

- 76 The dredge volumes in Conditions 74 and 75 above shall be determined by reference to the bathymetric surveys required pursuant to Conditions 85 and 88 below. An analysis by an independent Suitably Qualified and Experienced Person to determine the amount of material dredged shall be provided to the council's Compliance Manager within one month of completion of each survey.

- 77 The Consent Holder shall ensure that a copy of this consent is provided to the person who is to carry out the dredging, prior to any work commencing. A copy of the consent shall be held on the dredger, and available for inspection by the public, during the work.
- 78 The Consent Holder shall notify the council, the MPLC Chairperson, and the KG in writing of the date each dredging event is intended to commence at least two weeks before commencing work. The notification shall include details of the location, volume, type and method of dredging, location for disposal of dredging spoil, and duration of the planned work. For maintenance dredging, bathymetric plans for the area to be dredged shall also be provided to the council at this time.
- 79 The Consent Holder shall publicly advertise the location and timing of the dredging in the Northern Advocate at least one week but not more than two weeks, in advance of commencing dredging operations on each occasion.

Dredge Management Plan (DMP)

- 80 The Consent Holder shall, at least two months prior to the commencement of the capital dredging event and one month prior to the first maintenance dredging event authorised by these resource consents lodge a Dredge Management Plan (DMP) with the council's Compliance Manager for Certification. The objective of the DMP is to specify procedures for the management of Dredging operations to ensure that any actual or potential adverse effects of dredging are appropriately avoided, remedied or mitigated.

Advice Note: *Potential effects relating to other commercial users of the Whangārei Harbour, including Northport and ships visiting Northport, are addressed in Conditions 91-94 below and are not included within the scope of the DMP.*

- 81 The DMP shall, as a minimum, include:
- (a) The number and types of dredge vessels to be used;
 - (b) The dredging methodology(s) and disposal strategy(s) to be used, including (subject always to the requirement for dredged material to be deposited at Disposal Site 1.2 in accordance with the Replenishment Management Plan) whether disposal of maintenance dredging material to land is the best practicable option;
 - (c) How the location and quantities of dredged material discharged to the disposal sites are to be recorded;
 - (d) The planned maintenance of the equipment and systems that are to be used during dredging;
 - (e) How hazardous substances on the dredge vessel(s) will be handled and stored during dredging;
 - (f) The outdoor lighting measures that are to be used to reduce light spill (to minimise the potential for bird strike);
 - (g) The measures that will be implemented to manage any potential conflicts between the dredging programme and any recreational activities in Whangārei Harbour and/or Bream Bay;

- (h) Any turbulence-reducing mechanism or systems that are to be incorporated into the dredge vessel(s) to minimise turbidity;
 - (i) Training to be given to dredge vessel crews to ensure compliance with the conditions of these consents and the DMP;
 - (j) All other operational dredging measures, systems, and training that will be implemented to avoid, remedy or mitigate adverse effects on the receiving environment; and
 - (k) Contaminant testing procedures for maintenance dredging material that will be removed.
- 82 The DMP shall be prepared in general accordance with the draft DMP provided as part of the resource consent application (Annexure E to the evidence of Mr Justin Cross, *Refining NZ – draft Dredge Management Plan*, Royal HaskoningDHV, February 2018) and including the principles set out in the *Comment by Richard Reinen-Hamill in Response to Minute #7 of Hearing Commissioners*, dated 13 April 2018.
- 83 The Consent Holder shall undertake all activities authorised by these resource consents in accordance with the Certified DMP.
- 84 The Consent Holder shall notify the council's Compliance Manager in writing as soon as each dredging event is complete, and, within one month of completion of capital dredging the Consent Holder shall, in writing, notify:
- | | |
|------------------------------|----------------------|
| Hydrographic Surveyor | Maritime New Zealand |
| Land Information New Zealand | PO Box 27006 |
| PO Box 5501 | Marion Square |
| Wellington 6145 | Wellington 6141 |
- The Consent Holder shall include a bathymetric plan of the completed dredged area with the notification to each of the above parties.
- 85 For a period of five years after the capital dredging authorised by these consents is completed, the Consent Holder shall, to the extent that it is not already being undertaken by third parties and made available to the Consent Holder, undertake an annual survey of the bathymetry of:
- (a) the dredged areas of the harbour channel and approaches;
 - (b) Mair Bank;
 - (c) the shallow subtidal part of the ebb tide delta above the 5 metre depth contour; and
 - (d) Disposal Site 1.2.
- The bathymetric surveys should be sufficient to enable an assessment of the volume of material to be dredged and the changes in volume between the survey periods.
- At the same time, an annual assessment of wave monitoring at the Wave Rider Buoy and water levels recorded at the port shall also be undertaken.
- 86 Within three months of completion of each annual survey required by Condition 85 (or receipt of such survey data from another party), the Consent Holder shall provide the council's Compliance Manager with a written report detailing:

- (a) changes in bathymetry from the previous survey and associated rates of sediment deposition or erosion;
- (b) areas requiring maintenance dredging, if any, and the proposed timing of such dredging; and
- (c) any need for and volume of maintenance dredging spoil disposal at Disposal Site 1.2 in order to maintain the sediment budget of the ebb tide delta.

The report shall include an electronic copy of all survey data (x, y, z).

- 87 After five years, the results of all the annual bathymetric surveys required by Condition 85 and the wave and water level monitoring shall be evaluated to confirm that the effects on physical coastal processes arising from capital and maintenance dredging and spoil disposal activity are consistent with the predictions set out in Section 5 of the Tonkin and Taylor Limited report, dated July 2017, and entitled:

Crude Shipping Project – Coastal Processes Assessment. Job Number 30488.CPA.v9

A written report on the evaluation shall be provided to the council's Compliance Manager and the KG within two months of completion of the review. If the actual effects differ materially from those predicted then the council may review the maintenance dredging and spoil disposal consent conditions in accordance with Condition 4.

- 88 Following each maintenance dredging operation, the Consent Holder shall provide a bathymetric plan of the areas dredged, and records of volumes dredged, to the council's assigned monitoring officer within one month of completion of dredging. The bathymetric plan shall show the positions of the channel marks and shall indicate by shading or similar identification the locations where maintenance dredging was carried out.
- 89 All dredged spoil disposed of within the coastal marine area shall only be at the disposal sites authorised by **AUT.037179.03.01** and **AUT.037179.09.01**.
- 90 Appropriate navigation signals shall be shown at all times during dredging activities.

Crude Shipping Project Management and Safety Plan (CSPMSP)

- 91 Following consultation with members of the Whangarei Harbour Safety Committee including representatives from Northport Limited, North Tugz Limited and the Harbourmaster, the Consent Holder shall, prior to the commencement of capital dredging, lodge a Crude Shipping Project Management and Safety Plan ('CSPMSP') with the council's Compliance Manager for Certification.
- 92 The objective of the CSPMSP is to specify procedures for the management of dredging operations to ensure that any actual or potential adverse effects of dredging – including with respect to harbour safety and vessel navigation – on other commercial shipping operations in the Whangārei Harbour/Bream Bay area are appropriately avoided, remedied or mitigated.
- 93 In order to achieve the objective set out in Condition 92, the CSPMSP shall, as a minimum, include:

- (a) The processes and procedures that will be implemented to manage commercial shipping schedules, including for ships visiting Northport;
 - (b) The measures/procedures that will be implemented in relation to dredging operations to manage any potential conflicts between the dredging programme and other commercial shipping, including ships visiting Northport;
 - (c) The measures/procedures that will be implemented in relation to dredging operations to maintain the safety of all commercial users of the Whangārei Harbour and Bream Bay area;
 - (d) Any changes required to the existing Dynamic Under Keel Clearance System as a result of the dredging, and the necessary implementation processes for any such changes; and
 - (e) The training and/or information regarding the above matters that will be provided to dredge vessel crews.
- 94 The Consent Holder shall undertake all activities authorised by these resource consents in accordance with the Certified CSPMSP.

Potential Sedimentation at Northport Structures and Turning Basin

- 95 The Consent Holder shall, not less than three months before capital dredging is completed, engage an independent Suitably Qualified and Experienced Person to assess any survey data provided to it by Northport directly relevant to potential changes in the bathymetry of the areas in the immediate vicinity of the Northport structures and turning basin post capital dredging.
- 96 The independent Suitably Qualified and Experienced Person engaged in accordance with Condition 95 above shall review any data provided to the Consent Holder in accordance with that condition, and (if data is provided by Northport) prepare a report that, as a minimum:
- (a) Describes the levels of sedimentation, if any, in the areas in the immediate vicinity of the Northport structures and turning basin, and outlines any changes that have occurred since the most recent survey data provided by Northport or any preceding report produced in accordance with Condition 97; and
 - (b) Based on the monitoring undertaken, stipulates whether or not it is possible to conclusively determine that any increased sedimentation at the Northport structures or turning basin has been caused by the capital dredging and, if so, whether the capital dredging has in fact caused the increased sedimentation.
- 97 The Consent Holder shall no later than 18 months following the completion of capital dredging, submit the first report required by Condition 96 to Northport, if the requisite survey data has been provided. Thereafter, reports shall be submitted annually to Northport for a further five years, if required in accordance with Conditions 95 and 96.
- 98 Where a report produced under Condition 96 concludes that the capital dredging has conclusively caused increased sedimentation at the Northport structures or turning basin, the Consent Holder shall engage with Northport to determine an appropriate mechanism to fund the actual and reasonable costs of any maintenance dredging required to be undertaken by Northport to return the levels of sedimentation at the Northport structures or turning basin to pre-capital dredging levels.

Advice Note: *The above conditions do not require the Consent Holder to obtain any authorisations required for any dredging of the Northport structures or turning basin required under these conditions, which shall remain the responsibility of Northport. It is anticipated that any dredging of the Northport structures or turning basin required by these conditions shall be carried out by Northport under existing maintenance dredging consents held by Northport.*

Benthic Ecology

Benthic Ecology Management Plan (BEMP)

- 99 The Consent Holder shall, six months prior to the commencement of the capital dredging event and one month prior to the first maintenance dredging event authorised by these resource consents, lodge a Benthic Ecology Management Plan ('BEMP'), prepared by an independent Suitably Qualified and Experienced Person in consultation with the KG, with the council's Compliance Manager for Certification.
- 100 The BEMP shall be prepared in general accordance with the updated draft BEMP provided as Appendix B to the Supplementary Statement of Evidence of Dr Brian Coffey dated 8 March 2018 entitled "*Benthic Ecology Management Plan (BEMP): Crude Shipping Project, FINAL DRAFT*", prepared by Kerr & Associates March 5, 2018".
- 101 The Consent Holder shall undertake all activities authorised by these resource consents in accordance with the Certified BEMP.
- 102 The objective of the BEMP is to specify procedures for the monitoring and management of dredging operations to ensure that any actual or potential adverse ecological effects of dredging are adequately understood, and appropriately avoided, remedied or mitigated. Specific purposes of the BEMP are:
- (a) *Pre-dredging monitoring:* To set out monitoring sites and procedures for the acquisition of baseline data for benthic communities in Marine 1 (protection) Management Areas of the lower Whangārei Harbour; including macroalgae, sponges, seagrass and shellfish communities exhibiting considerable temporal variability in order to remove the temporal variability component; and for pre-impact communities that will benefit from additional description.

Advice Note: *This monitoring will be used in conjunction with existing baseline information on benthic communities derived from sources summarised in Table 6 of the report entitled 'Crude Shipping Project: Assessment of marine ecological effects excluding seabirds and marine mammals', prepared by Brian T Coffey and Associates, and dated 10 August 2017.*
 - (b) *During-dredging monitoring and management:* To set out effective monitoring sites and procedures during capital and maintenance dredging, including so that management responses to ecological indicators, including water clarity, total suspended solids (TSS) concentration, and turbidity can be effectively implemented;
 - (c) *Post-dredging monitoring:* To set out effective monitoring sites and procedures after capital dredging to enable effects from dredging to be understood (including regarding comparisons between the effects of dredging versus effects predicted in the AEE; and the state of ecological communities before dredging versus after dredging).

- (d) Overall, to facilitate the acquisition of data through monitoring so that the combined data from pre-dredging, during-dredging and post-dredging monitoring will enable adverse effects of the proposal to be confirmed.

103 The BEMP shall, as a minimum include the following matters:

(a) *Pre-dredging monitoring and reporting: seagrass, shellfish and dredging footprint baseline monitoring*

- (i) Monitoring that is to be completed before dredging within the dredging footprint generally and in order to define the extent of benthic communities in M1MAs (as shown on the planning maps attached in Schedule 4) in the lower Whangārei Harbour; including macroalgae, sponges, seagrass and shellfish communities within or adjacent to the dredging footprint.

(b) *During-dredging monitoring/management: water quality*

- (i) The methods the Consent Holder will implement to monitor water clarity and total suspended solids concentration/turbidity during capital and maintenance dredging in order to determine whether receiving water quality limits are met after reasonable mixing (see Condition 108); including the equipment type, number, and location, and the methodologies of the monitoring to be implemented in general accordance with the water quality monitoring required by the conditions of these consents.; and
- (ii) The photoquadrat methodology the Consent Holder will implement to monitor the state of health of hard shore communities within the Motukaroro Island Marine Reserve and Home Point, including multivariate analysis.

(c) *Post-dredging benthic ecology monitoring*

- (i) Monitoring to be completed once dredging is complete, including in order to:
 - Compare the actual benthic ecological effects of dredging and disposal with effects predicted in the AEE, in particular the rate of recovery of the benthic ecological communities; and
 - Compare the state of benthic ecological communities, including within adjacent M1MAs (as shown on the planning maps attached in Schedule 4), before and after dredging and disposal.
- (ii) The Consent Holder shall complete post-dredging monitoring within 12 months of the completion of capital dredging. Further surveys shall be completed by the Consent Holder each year following the completion of capital dredging, unless an independent Suitably Qualified and Experienced Person determines that the affected ecological communities within the dredge footprint and disposal sites have recovered at least to the level required by Condition 117(b).

Baseline Water Quality Data Collection

104 The Consent Holder shall collect turbidity (measured in nephelometric turbidity units (NTU)) and TSS concentration data for a period of not less than 12 months prior to the commencement of capital dredging operations, at the following locations:

- (a) In the vicinity of the Motukaroro Marine Reserve (the exact location shall be decided in consultation with the council's Compliance Manager);
- (b) In the vicinity of Busby Head (the exact location shall be decided in consultation with the council's Compliance Manager);
- (c) Mair Bank;
- (d) In the outer channel (the exact location shall be decided in consultation with the council's Compliance Manager) when sea conditions permit;
- (e) Within Disposal Site 3.2; and
- (f) Within Disposal Site 1.2.

Turbidity measurements shall be recorded at sites (a) and (b) using fixed turbidity meters of the same type, specifications and manufacture. Turbidity measurements at sites (c), (d), (e) and (f) shall be made using a hand-held turbidity meter of the same manufacture as the fixed turbidity meters.

105. At the same time and location as turbidity measurements are undertaken in accordance with Condition 104, water samples shall also be taken and analysed as follows:

- (a) Three replicate water samples shall be collected from each site at no less than weekly intervals, sea conditions permitting, and the time that each water sample is collected shall be noted so that it can be correlated with the corresponding turbidity measurement for that same location;
- (b) Each of the three samples shall be sent to an accredited laboratory and TSS concentration shall be measured.

- 106 After a period of not less than 12 months, the results of monitoring in accordance with Conditions 104 and 105 shall be assessed by an independent Suitably Qualified and Experienced Person to determine whether a scientifically robust relationship exists between field turbidity measurements (NTU) and TSS concentrations for each site.

If required, sample collection and field turbidity measurements shall continue to be undertaken every week until a scientifically robust relationship, in the opinion of the independent Suitably Qualified and Experienced Person, is established between field turbidity measurements and TSS concentration.

The Consent Holder shall use the baseline water quality data to determine the range of ambient values for each site and a robust relationship between ambient NTU and TSS for each site shall be calculated.

Advice Note: *A scientifically robust relationship for the purposes of this condition will likely be constituted if the coefficient of determination (R^2) value is greater than 0.75.*

Receiving Water Quality Limits

- 107 The Consent Holder shall monitor turbidity in the vicinity of dredging and spoil disposal activity in accordance with Schedule 3, **attached**.
- 108 The dredging and disposal activities shall not result in any exceedances of the following default water quality limits in the receiving waters at the edge of the specified mixing zone:

<i>Location</i>	<i>Mixing Zone - Distance from point of discharge</i>	<i>Maximum Allowable TSS Concentration (g/m³)</i>	<i>Maximum Allowable Percentage Change in Water Clarity Between Up-current and Down-current</i>
<i>All dredging activity, including discharge of decant water and any discharge arising from the transfer of dredging spoil to land, within the lower Whangārei Harbour (adjacent to M1MAs), being the area north of a line drawn between No.6 and No.3 buoys.</i>	100 metres	15	20%
<i>All other dredging activity and Disposal Sites 1.2 and 3.2.</i>	300 metres	20	33%

109 The Consent Holder may request the council to update and replace the default TSS concentration limits specified in Condition 108 following collection and analysis of the baseline water quality data required by Conditions 104 to 106. Any replacement of the default TSS concentration limit shall be based on the 95th percentile statistic of the baseline water quality dataset for that location. Any replacement TSS concentration limit shall not take effect until it has been certified by the council, in writing. In considering certification of any replacement TSS concentration limit the council shall have regard to the robustness and quality of the data collected, and any spatial variation.

110 Compliance with the default TSS concentration limits specified in Condition 108, or any replacement TSS concentration limits provided for by Condition 109, may be based on turbidity measurements if a scientifically robust relationship between turbidity and TSS concentrations has been established in accordance with Condition 106. The applicable turbidity (NTU) values for each TSS concentration limit specified in Condition 108 shall be determined by an independent Suitably Qualified and Experienced Person and described in a report that shall be submitted to the council for certification.

Advice Note: *In the event that the Consent Holder has satisfied the council that it can use turbidity as a surrogate for TSS concentrations, as provided for in this condition, then it does not need to collect water samples in accordance with Conditions 111 to 113 and may rely on field measurements of turbidity to assess compliance with the TSS concentration limits in Condition 108. However, in the event that the Consent Holder has not satisfied the council that it can use turbidity as a surrogate for TSS concentrations then the Consent Holder will need to collect water samples and have them analysed for TSS concentration and the results used to determine compliance with the limits in Condition 108.*

111 Receiving water quality monitoring shall be undertaken daily (no less than 15 minutes after commencement of dredging activities) when dredging operations occur within the lower Whangārei Harbour, being the area north of a line drawn between No. 6 and No. 3 buoys, as follows:

- (a) measurement of water clarity of the receiving waters up-current of the dredging and at the edge of the 100 metre mixing zone down-current using a Secchi disc; and

- (b) collection of water samples or field measurements of turbidity at the edge of the 100 metre mixing zone down-current of the dredging.

The monitoring required by this condition shall occur when the dredge is operating at the closest point to any M1MA boundary (as shown on the planning maps attached in Schedule 4) for that day of operation.

- 112 Receiving water quality monitoring shall be undertaken daily (no less than 15 minutes after commencing dredging activities) for the first week of operations and thereafter weekly when dredging operations occur outside of the lower Whangārei Harbour, being the area as south of the No. 6 and No. 3 buoys, as follows:
- (a) measurement of water clarity of the receiving waters up-current of the dredging activity and at the edge of the 300 metre mixing zone down-current using a Secchi disc; and
 - (b) collection of water samples or field measurement of turbidity at the edge of the 300 metre mixing zone down-current from the point of the dredging.
- 113 Receiving water quality monitoring shall be undertaken daily (no less than 15 minutes after commencing and no more than 30 minutes after completing disposal activities) for the first week of operations and thereafter weekly when disposal activities commence at each of the disposal sites, as follows:
- (a) measurement of water clarity of the receiving waters up-current of the disposal activity and at the edge of the 300 metre mixing zone down-current using a Secchi disc; and
 - (b) collection of water samples or field measurement of turbidity at the edge of the 300 metre mixing zone down-current from the point of discharge.
- 114 If any of the water quality limits specified in Condition 108 are exceeded, the Consent Holder shall:
- (a) immediately cease the dredging or disposal activity in that location;
 - (b) implement operational controls to avoid sediment impacts on M1MA (such as moving to another location, only operating when currents/tides direct the sediment plume away from M1MA, reducing rates of dredging, operating south of the No. 6 and No. 3 buoys);
 - (c) notify the council and the KG within 48 hours of the exceedance;
 - (d) undertake an assessment of the cause of the breach and the effectiveness of any operational response by an independent suitably qualified person; and
 - (d) provide the council and the KG with a copy of the assessment required under clause (iv) within two weeks of the breach.
- 115 During dredging and disposal activities, no discharge of wastes (e.g. sewage, oil, bilge water) other than hopper or barge decant water shall occur from any vessel associated with the exercise of these consents.

Benthic Ecological Reporting

- 116 An independent Suitably Qualified and Experienced Person shall prepare, in consultation with the KG, a pre-dredging or 'baseline' monitoring report in advance of the capital dredging event that is authorised by these resource consents. The report, which shall be complete prior to the capital dredging event proceeding, shall present and discuss the results of pre-dredging monitoring and shall be provided to the council's Compliance Manager at least one month prior to the commencement of capital dredging.
- 117 An independent Suitably Qualified and Experienced Person shall review the relevant post-dredging monitoring data and prepare an annual report that, as a minimum:
- (a) Describes the benthic ecological communities that exist within, and adjacent to, the disturbed areas (dredge footprint and disposal areas) and outlines any changes that have occurred from the baseline results and also since the preceding report produced in accordance with this condition (if one exists);
 - (b) Assesses whether the benthic ecological communities of the disturbed areas (dredge footprint and disposal areas) have recovered to a level where they support at least 50% of the species richness and abundance for macrofauna benthic taxa of comparable reference sites; and
 - (c) In the event that the benthic ecological community of any disturbed area(s) has not recovered to the level specified in clause (b), assesses whether the recovery in that area is progressing in line with the predictions made in the Assessment of Environmental Effects provided with the application, and if not, why not.

The Consent Holder shall no later than 18 months following the completion of capital dredging submit the first report required by this condition to the council's Compliance Manager. Thereafter, reports shall be submitted annually until an independent Suitably Qualified and Experienced Person has determined that all the affected habitats have recovered to the level specified in clause (b) of this condition.

- 118 An independent Suitably Qualified and Experienced Person shall prepare, in consultation with the KG, a comprehensive post-dredging monitoring report after the completion of the capital dredging event authorised by these resource consents. The report shall provide a summary of all the ecological monitoring, investigations and operational responses that were conducted/implemented before, during and after the dredging. The post-dredging monitoring report shall include the following:
- (a) A summary of all of the monitoring that was undertaken prior to, during, and following the capital dredging;
 - (b) A list of the operational responses that were implemented by the Consent Holder, including: to respond to any exceedances of the water quality standards; to respond to any instances of non-compliance with the conditions of these resource consents; to address any complaints; or to respond to any other matter; and
 - (c) Recommendations from the expert as to the changes (if any) to operations (including disposal strategies) and to monitoring that need to be undertaken for maintenance dredging events in accordance with these resource consents.

The Consent Holder shall submit the post-dredging report to the council's Compliance Manager no later than six months following the completion of all post-capital dredging monitoring.

AUT.037179.02.01 and AUT.037179.08.01 – Discharge of Decant Water

- 119 Any discharge of decant water into coastal waters from a hopper or barge receiving and/or transporting dredging spoil shall meet the receiving water quality limits set out in Condition 108.

AUT.037179.03.01, AUT.037179.04.01, AUT.037179.09.01 and AUT.037179.10.01 – Marine Dredging Spoil Disposal

- 120 These consents apply only to marine disposal of dredging spoil at Disposal Site 1.2 and Disposal Site 3.2 as identified on the **attached** Tonkin and Taylor drawing, referenced as "Northland Regional Council Plan Number. **4782/3**".
- 121 The total volume of capital dredging spoil disposed of at Disposal Site 1.2 shall not exceed 185,000 cubic metres and the total volume disposed of at Disposal Site 3.2 shall not exceed 3,607,500 cubic metres.
- 122 The total volume of maintenance dredging spoil disposed of at either Disposal Site 1.2 or Disposal Site 3.2 shall not exceed 122,000 cubic metres per year (on average over the term of these consents).
- 123 Any trailing suction hopper dredge (TSHD) used for capital or maintenance dredging shall discharge overflow water at keel level as a turbidity reduction measure.
- 124 The Consent Holder shall, one month prior to the commencement of the first capital dredging event authorised by these resource consents, lodge a Replenishment Management Plan ('RMP'), prepared by an independent Suitably Qualified and Experienced Person, with the council's Compliance Manager for Certification against the below objectives.
- 125 The RMP shall establish the performance indicators and mechanism to determine the volume of dredged material to be placed at Disposal Site 1.2, and the area of placement of that material. The objectives of the RMP shall be to:
- (a) Maintain the sediment budget of the active part of the ebb tide delta affected by the dredging activities; and
 - (b) Increase the sediment budget to the ebb tide delta to address natural erosion cycles and possible climate change effects.
- 126 The RMP shall be prepared in general accordance with the draft RMP provided as part of the resource consent application (*Draft Replenishment Management Plan for Site 1.2* (rev 2) forming Appendix C to the Applicant's closing legal submissions dated 29 May 2018).
- 127 The Consent Holder shall undertake activities authorised by these resource consents in accordance with the Certified RMP.
- 128 Not less than two months prior to commencing each maintenance dredging campaign, the Consent Holder shall either:

- (a) re-confirm to the council's Compliance Manager that its disposal strategy set out in the DMP remains the best practicable option, including having specific regard to the RMP and the requirements of Conditions 129 to 131 which require the Consent Holder to take all practicable steps to find land-based disposal options and document the efforts made; or
 - (b) advise the disposal strategy to be adopted for the upcoming maintenance dredging.
- 129 In respect of maintenance dredging, any amount of dredged material not required to be disposed of at Disposal Site 1.2 pursuant to the RMP shall be disposed of on land, where practicable.
- 130 The Consent Holder shall, following the capital dredging, take all practicable steps to try to find land based uses and/or storage facilities (so that the material can be made available for future land based use) for the material that is expected to be dredged during the maintenance dredging operation not required to be disposed of at Disposal Site 1.2 pursuant to the RMP.
- 131 The Consent Holder shall, not less than two months prior to undertaking each maintenance dredging campaign, provide the council with a report in respect of the material that is expected to be dredged during the next maintenance dredging operation not required to be disposed of at Disposal Site 1.2 pursuant to the RMP, which outlines the efforts it has made in respect of:
- (a) Finding land based uses for the material, either by the Consent Holder and/or third parties; and
 - (b) Securing resource consents and other authorisations to store and/or use the material.

AUT.037179.05.01 and AUT.037179.11.01 – Land-based Dredging Spoil Disposal

- 132 Any discharge arising from the transfer of dredging spoil from a hopper or barge to land shall meet the receiving water quality standards set out in Condition 108.

AUT.037179.06.01 and AUT.037197.12.01 – Erection, Placement and Alteration of Navigation Aids

- 133 This consent applies to the erection, placement, alteration and maintenance and repair of the following existing and new navigation aids (navaids) as shown on the **attached** Royal HaskoningDHV Ltd drawing referenced as "Northland Regional Council Plan Number. **4782/4**".

Activity	Navaid	Purpose
Alteration (relocation)	existing Fairway Buoy and channel marker buoys 2, 3, 5, 8, 11, 12, 14 and 18	Marking of water navigable by large vessels
Placement	new port and starboard channel markers	Marking seaward end of extended channel
Alteration (upgrading)	existing lead lights	Improved port entry guidance
Placement	two new lead lights on Calliope Bank	Additional navigation guidance
Erection	new west cardinal beacon	Marking of extremity of rocky reef off Home Point

134 All navigation aids shall conform to Maritime NZ requirements, and the **International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) system 'A' Maritime Buoyage System.**

135 At least one month before the erection, placement or alteration of the navigation aids tabulated in Condition 133, the Consent Holder shall obtain approval for the required works from the Director of Maritime Safety, Maritime New Zealand (MNZ), following consultation with the Regional Harbourmaster for Northland. The Consent Holder shall provide a copy of the MNZ authority to the council's Compliance Manager within two weeks of its receipt and shall erect, place or alter the specified navigation aids in accordance with that authority.

Advice Note: *An Application to establish Aids to Navigation may be made using Maritime Safety Authority form MSA16006.*

136 Within one month of the erection, placement or alteration of the navigation aids specified in the table at Condition 133, the Consent Holder shall, in writing, notify:

Hydrographic Surveyor
Land Information New Zealand
PO Box 5501
Wellington 6145

Maritime New Zealand
PO Box 27006
Marion Square
Wellington 6141

Northland Regional Council
Private Bag 9021
Whangārei Mail Centre
Whangārei 0148

Northport Limited
PO Box 44
Ruakākā 0151
NEW ZEALAND

The Consent Holder shall provide details of the location co-ordinates of the new and relocated navigation aids with the notification to each of the above parties.

137 Any discharge arising from the maintenance and repair of navigation aids shall meet the receiving water quality standards set out in Condition 108.

138 Use of dry and wet abrasive blasting, water blasting, hand scraping, sand paper, spray painting, and hand painting as methods to maintain navigation aids 'in situ' shall only be undertaken with the prior written approval of the council's Compliance Manager.

EXPIRY DATE: **31 MARCH 2042**
 31 MARCH 2052

AUT.037197.06.01 only (navaids)
All other consents

Note: *The plans attached to this consent are reduced copies and therefore may not be to scale and may be difficult to read. In the event that compliance and/or enforcement action is to be based on compliance with the attached plans, it is important that the original plans, are sighted and used. Originals of the plans referred to are available for viewing at the council's Whangārei office.*

SCHEDULE 1

NOISE LIMITS FOR DREDGING ACTIVITIES

(Referred to in Condition 16)

Time of Week	Typical Duration	Noise Limit	
		L _{eq}	L _{max}
Weekdays	0630 – 0730	55	75
	0730 – 1800	70	85
	1800 – 2000	65	80
	2000 – 0630	45	75
Saturdays	0630 – 0730	45	75
	0730 – 1800	70	85
	1800 – 2000	45	75
	2000 – 0630	45	75
Sundays and public holidays	0630 – 0730	45	75
	0730 – 1800	55	85
	1800 – 2000	45	75
	2000 – 0630	45	75

The above noise limits are based on Table 2 of New Zealand Standard (NZS) 6803: 1999 “Acoustics – Construction Noise”, Standards New Zealand.

Sound levels shall be measured and assessed in accordance with NZS 6803:1999 “Acoustics – Construction Noise”. Measurement shall be at the notional boundary of any occupied dwelling.

Advice Note: *For the avoidance of doubt, all dwellings should be assumed to be occupied unless it can be proven otherwise.*

SCHEDULE 2

ECOLOGICAL MONITORING PROGRAMME

The Consent Holder, or its authorised agent, shall undertake the following monitoring:

1. BENTHIC ECOLOGY

[Refer to Conditions 99 to 118]

2. COASTAL BIRDS

[Refer to Conditions 29 to 37]

3. MARINE MAMMALS

3.1 Visual Sighting Data Collection

A trained marine mammal observer (at least two of whom may be nominated by the KG) shall be stationed on board all dredge vessels during daylight hours for the duration of the capital and maintenance dredging.

Operators of vessels associated with the project shall also be instructed to keep a lookout for any marine mammals in the vicinity. Steps shall also be undertaken by the Consent Holder to encourage commercial and recreational boaties and the general public to report any sighting to the Consent Holder or the Department of Conservation.

All reported marine mammal sightings in and around Whangārei Harbour and within Bream Bay shall be recorded from one month before capital dredging to one month after completion of capital dredging; and for any maintenance dredging

Records shall include the following information:

- Date and time of first sighting
- General location
- Location co-ordinates
- Species involved
- Number of animals
- Animal activity
- Sighting vessel type and activity at the time of sighting
- Observer
- Weather and sea conditions
- Shutdowns and duration of shutdowns

3.2 Acoustic Data Collection

Passive acoustic monitoring for the presence of marine mammals shall be undertaken during each of the following periods:

- (a) One month prior to the start of capital dredging;
- (b) Two separate fortnightly periods during the capital dredging period; and
- (c) One month following the completion of capital dredging.

During each of the periods, passive acoustic moorings shall be placed in a minimum of four locations within the harbour entrance and within Bream Bay. Exact sites shall be selected in consultation with the council's Compliance Manager.

4. REPORTING

Written report on the results of the monitoring, as required by Sections 1, 2 and 3 of this schedule, shall be provided to the council, the KG, the MPLC and the Department of Conservation within three months of the required monitoring being undertaken.

SCHEDULE 3

TURBIDITY MONITORING PROGRAMME

The Consent Holder, or its authorised agent, shall undertake the following monitoring in relation to dredging and dredging spoil disposal operations:

1. DREDGING Adjacent to Marine 1 Management Areas

This monitoring provision applies to any dredging within the lower Whangārei Harbour, being the area located north of a line drawn between the No. 6 and No. 3 buoys.

Prior to dredging operations, a minimum of three continuous recording, data transmitting turbidity meters shall be deployed along the open channel boundary of the adjacent Marine 1 Management Area mounted below the surface of the water at a sufficient depth (suggested 1-2 metres) where wave induced air bubbles and/or any freshwater and/or any brackish layer do not adversely affect the data.

Turbidity levels shall be recorded in nephelometric turbidity units (NTU).

Real time data shall be sent from the recorders and a running six hour average NTU calculated from this data. Results shall be submitted to the council's assigned monitoring officer weekly, in excel format, via fax or email. Copies of the weekly data will also be provided to the KG and MPLC.

The turbidity meters used shall be verified prior to deployment and thereafter in accordance with the recommendations of a Suitably Qualified and Experienced Person.

Should any of the turbidity meters suffer a malfunction (such that they are no longer operable) or be lost, dredging within 300 metres of that meter location shall cease until either:

- (a) the meter is repaired or replaced, or
- (b) an interim monitoring methodology is agreed with the council's Compliance Manager and implemented by the Consent Holder.

2. DREDGING IN Other Areas

During dredging operations outside of the lower Whangārei Harbour, being the area south of a line drawn between the No. 6 and No. 3 buoys, the Consent Holder's nominated agent shall use hand-held turbidity meters to assess levels upstream (current) and downstream (current) of the dredging activity. Such monitoring shall be undertaken daily during the first week of dredging, and then once per week thereafter.

On each sampling occasion, three separate turbidity measurements shall be taken at a depth of two metres approximately 100 metres up-current of the dredge site and the average background turbidity in NTU determined.

Three separate turbidity measurements shall then be taken at a depth of two metres at the channel edges approximately 300 metres down current of the dredge location determined using either a floating line, a drogue, or GPS, whichever is the most practicable.

Results of the daily turbidity measurements are to be recorded in a written log book by the Consent Holder, and submitted to the council's Compliance Manager weekly, in excel format, via fax or email. Copies of the results of daily inspections will also be provided to the KG and MPLC.

3. DREDGING DISPOSAL SITES 1.2 and 3.2

During dredging spoil disposal operations, the Consent Holder's nominated agent shall use hand-held turbidity meters to assess levels upstream (current) and downstream (current) of the dredging activity. Such monitoring shall be undertaken daily during the first week of commencing disposal at that disposal site, and then once per week thereafter. This is required for each disposal site.

On each sampling occasion, a drogue shall be released at the dredge disposal site and tracked using GPS until it either:

- (a) reaches the disposal site boundary or,
- (b) if after 15 minutes it has not reached the boundary, a straight line shall be extended from the release location and the location of the drogue.

Three separate turbidity measurements shall be taken at a depth of 2 metres at the boundary in accordance with (a) or (b) above, whichever is applicable, and the average turbidity in NTU determined.

Three separate turbidity measurements shall then be taken at a depth of 2 metres on the opposite (up-current) side of the dredge disposal site and the average background turbidity in NTU determined.

Results of the daily turbidity measurements are to be recorded in a written log book by the Consent Holder, and submitted to the council's assigned monitoring officer weekly, in excel format, via fax or email. Copies of the results of daily inspections will also be provided to the KG and MPLC.

Regional Council Planning Maps



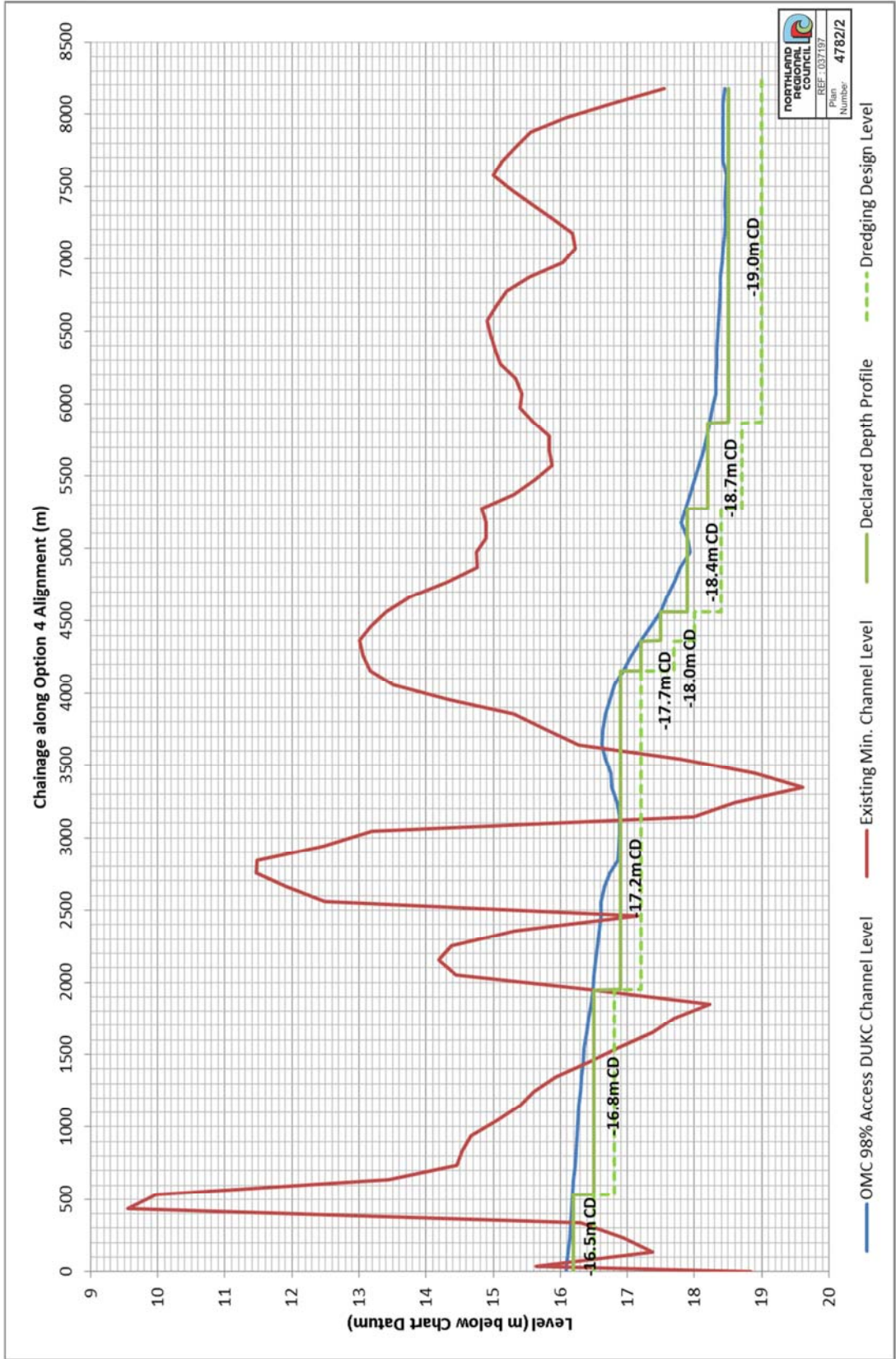


Figure 3: 16.8m Vessel Draft Channel Design Profile

