| | |
|---|---|
| **IN THE MATTER** | of the Resource Management Act 1991 (RMA or Act) |
| **AND** | applications to the Hawke's Bay Regional Council by Port of Napier Ltd (the Applicant) for consent to construct a new wharf (Wharf 6); undertake Stage 1 capital dredging beneath the proposed new wharf, in the inner port area, swinging basin and part of the Deep Water Channel; undertake Stages 2 to 5 capital dredging within the inner port area, swinging basin, in and near the existing three channels and to form a new channel; dispose of dredged material from capital and maintenance dredging within an offshore area; and to occupy the common marine and coastal area for existing Port activities, being located at Port of Napier, Breakwater Road, Napier and various locations within the Coastal Marine Area (CMA). |

## 1. INTRODUCTION

### 1.1 APPLICATIONS

The Applicant wishes to construct a new wharf (Wharf 6) to meet its future berthage needs for larger vessels, and to undertake dredging to provide a safe and navigable approach channel for these larger vessels.

The proposed wharf is to be located alongside the northern face of the existing container terminal and to be 350 metres in length and 34 metres wide. The location is within the existing Port Management Area (PMA) and will take advantage of the sheltered area that is provided by the existing breakwater.

The dredging applications involve five stages of capital dredging (dredging that lowers the seabed to a greater depth than previous dredging) and subsequent maintenance dredging (dredging that removes any material that has started to fill in the area that has already been

capital dredged). The capital dredging work will deepen the existing swinging basin and harbour entrance, and progressively extend a larger channel out from the Port, to a final depth of 14.5 m. This will be done in five stages (or campaigns).

The first stage of capital dredging will provide full depth to 14.5 m under the proposed wharf and an adjacent "berth pocket". It will also include deepening of the swinging basin, parts of the inner harbour area and the first part of the area of the new channel closest to the Port to a depth of 12.5 m. This will involve approximately 1.14 million cubic metres of dredged material. Stages 2 to 5 will involve extending the new channel and increasing its depth by 0.5 m each campaign. Each of the campaigns 2 to 5 involve a similar volume of material; the overall total being approximately 3.2 million cubic metres.

The Applicant proposes to use both a backhoe dredge and a trailing suction hopper dredge with Stage 1 of the dredging expected to take approximately 50 weeks and each of the subsequent four stages expected to take eight or nine weeks.

A new coastal permit is also sought for the deposition and disposal of the dredged material some 4 to 6 km immediately to the east of the Port in water of 20 to 23 m depth. The proposed disposal area is approximately 342 hectares in area and is approximately 3.3 km southeast of Pānia Reef. The Applicant proposes to deposit and dispose of all dredged material, both capital and maintenance, in the newly proposed disposal site. It is noted that the Applicant holds an existing coastal permit (Coastal Permit CL970159D) to deposit dredged material near Westshore Beach.

The Applicant is also seeking a new coastal permit to authorise its existing and proposed occupation of the coastal marine area. Specifically, the Applicant seeks occupation consent for existing Port activities (replacing the existing coastal permits held by Port of Napier to occupy an area for Port purposes), the proposed new wharf, the adjacent berth pocket including the areas on both sides of the dolphins, and the new swinging basin.

## 1.2 SITE AND SURROUNDING ENVIRONMENT

The s42A report described the site and environment as follows:

> *"Napier Port comprises a significant reclaimed land area of approximately 52 hectares. The Port covers a total area (coastal water and land) of approximately 74 hectares.*
>
> *Napier Port is adjacent to Bluff Hill which is characterised largely by residential land use. Nearby Ahuriri is a mix of residential, light industrial and suburban commercial land use. The Applicant has stated that the surrounding areas have developed in parallel with the growth of the Port over the past 150 years.*

*The majority of the Port buildings are located toward the Breakwater Road frontage, with open hardstand on the seaward side. The breakwater extends out along the eastern edge of the Port to Hawke Bay and wraps around to the north.*

*The eastern part of the Port is used primarily for the marshalling of logs and processed timber products loaded along Cassidy Quay (Wharf No. 1) and Higgins Wharf (No. 2). The majority of the land area on the western side of the Port is occupied with container handling, although there is currently a further log assembly area in the northern section of the western part of the Port. The inner sheltered waters of the Port incorporate Geddis Wharf (No. 3) and Herrick Wharf (No. 4). Kirkpatrick Wharf (No. 5) forms the eastern edge of the main container terminal hardstand and marshalling area.*

*Sea access for vessels entering the Port is via three defined channels being the Deep Water Channel, Josco Channel and the South Channel. The South Channel approaches the Port from the east passing between the south end of Pānia Reef and the breakwater; the Josco Channel approaches north of but parallel to Pānia Reef; and the Deep Water Channel approaches from further north before merging with the Josco Channel.*

*The coast in the vicinity of the Port forms the western edge of Hawke Bay. While the coastal edge at the Port has been constructed over the years, north and south there has been less modification.*

*To the south of the Port, the coast comprises a broad northeast curve of steep gravel and sand barrier beach as far south as Cape Kidnappers. This beach is punctuated by river mouths at Clive some 2 km south of the Napier urban area and 6 km from the Port, being the mouths of the Tutaekuri, Ngaruroro and Clive Rivers (which reach the sea through a single estuarine mouth) and the Tukituki River some 2 km further to the south. The southern end of the barrier beach is effectively at the cliffs at Cape Kidnappers, some 10 km further to the south and east.*

*East and north of the Port the coast is more complex. A small sandy beach has formed here (referred to as Port Beach), aided by construction of a small breakwater to the west. Along Hardinge Road, as far as the edge of the Ahuriri channel at Perfume Point, there is either an absence of beach, or a mixed sand and gravel beach with a narrow steep north-facing form backed by some exposed rock in situ and a range of artificial armouring. Perfume Point also comprises a breakwater and both sides of the Ahuriri channel are armoured with rock or sea walls.*

*The Ahuriri mouth comprises a complex area known as the Inner Harbour with a number of mooring areas, marinas and slipways. Inland of this area is the extensive Pandora Estuary, Main Outfall Channel and associated wetlands. West of the Ahuriri mouth consent has recently been given for a new coastal protection structure involving a rock revetment, beach armouring and support structure along a short section of coast behind*

*Whakarire Avenue. This has not yet been constructed but is part of the existing environment in RMA terms.*

*The coastline west and north of the Ahuriri mouth is a similar sweeping curved barrier beach form facing to the east but on a slightly different angle to the coast south of Napier City.*

*The Esk River discharges into Hawke Bay some 8 km north of the Port, and the Tāngoio River and Pakuratahi Stream discharge from a shared mouth approximately 5 km further north. Beyond the settlement of Tāngoio the coastline comprises cliffs and small embayments.*

*The 1931 earthquake raised the land in the vicinity of Napier, modifying the lagoon areas in the vicinity of Bluff Hill, Westshore and Pandora and affecting the existing barrier beach both north and south. The raising of the land also modified the river mouths and the delivery of sediment from inland to the sea.*

*Napier Port occupies a portion of the Coastal Marine Area (CMA). The landward boundary of the CMA is generally the line of mean high water springs and the seaward boundary is the outer limits of the territorial sea.*

*Of notable interest and in the vicinity of the Port, described as a subsurface continuation of the hard strata forming Bluff Hill, Pānia Reef is a major seabed feature and is a Significant Conservation Area (SCA). Pānia Reef's formal status as a mātaitai means that commercial fishing is prohibited. Pānia Reef has been mapped as part of Napier Port's project investigations, and the location and shape of the reef is shown below by Figure 5 (not to scale). The southwest extent of reef is shown as the lower part of the image, and the northeast at the upper part of the image. Town Reef is a shorter and more southern reef, close to the beach south of the Port".*

## 1.3 BACKGROUND

The s42A report outlined background to the development of the Port, some historical context, and trends occurring in the shipping industry. This was of assistance in providing some understanding of the nature of the Port development and context for our consideration of the applications:

*"Napier Port is located on the southwestern edge of Hawke Bay adjacent to Napier City. It is not afforded the protection of a natural embayment so it is characterised by a substantial breakwater and is the North Island's only breakwater based port. Napier Port is the primary export and import hub for the Hawke's Bay region and also services other areas further afield and beyond the Hawke's Bay region. Napier Port is the fourth largest container terminal in New Zealand.*

*Napier Port is owned and operated as a fully autonomous subsidiary of Hawke's Bay Regional Investment Company (HBRIC), which has a 100% shareholding. In turn the Hawke's Bay Regional Council (HBRC) beneficially owns 100% of the shares in Napier Port through HBRIC Ltd. At the time of lodgement, the applicant requested that independent commissioners be appointed to make the decision on these consent applications to avoid any issues regarding conflicts of interest. This approach has been taken.*

*Napier Port comprises a significant reclaimed land area of approximately 52 hectares and has progressively been developed since the late 19th century to accommodate increased throughput. The Port covers a total area (coastal water and land) of approximately 74 hectares.*

*The applicant has detailed the historical context of port activities in Napier in section 1.3.2 of its application and AEE. In this historical account the applicant recognises the tangata whenua of Hawke's Bay and their strong traditional and cultural relationships with the coastal environment. Furthermore, the applicant recognises the important kaitiaki role that is played by tangata whenua and their guardianship of their coastal resources and responsibility to ensure that the mauri (life force) of these resources is safeguarded.*

*The historical context is summarised briefly below for context:*

- *Captain James Cook described the site that was to eventually become the Napier Port as a prominent "bluff head" with a sand or stone beach on each side. Between these beaches and the mainland is a pretty large lake of salt water.*

- *The large lake of salt water being the Ahuriri Lagoon saw the development of early port activity including dredging and reclamation within the Ahuriri Lagoon, the Inner Harbour and the Iron Pot.*

- *Increased development pressure and natural limitations led to the decision by the newly formed Napier Harbour Board to investigate the merits of a new harbour. From 1887 – 1890 the construction of the Port's breakwater took place. The typical breakwater design headed northwards before arching westward more or less parallel to Bluff Hill, creating a large area of coastal water which was sheltered from the high ocean waves.*

- *The 1931 Napier Earthquake resulted in significant changes to the land and coastal environment, with the bed of the inner harbour rising more than two metres, thereby removing its ability to act as a viable port. This natural disaster resulted in the development of the new Napier Port.*

- *In 1978–79, the Hawke's Bay Harbour Board carried out a major dredging operation to widen and deepen the entrance channel into the Port. This channel*

*was initially formed in 1973 to a clear overall depth of 12 m. The north end alignment of the channel (dredged to a depth of 12 m in 1976) had a north-easterly orientation to provide the shortest distance to the natural 12 m isobath.*

- *As ship size increased and with a need for improved navigational safety, pilots preferred to approach the entrance channel from a northerly direction. Before this, the main approach channel to the Port was to the south of Pānia Reef on the line of the Westshore beacons. The southern channel between Pānia Reef and the Breakwater was surveyed and buoyed in 2003.*

- *In 2012, limited capital dredging was undertaken to provide a clear overall depth of 12 m for the full width of the 200 m wide shipping lane as required by international and national standards to allow safe navigation in extreme weather conditions. Further capital dredging took place in 2015 to provide a clear overall depth of 12.4 m, the current depth.*

- *To obtain greater economies of scale, international shipping lines have greatly expanded the size of vessels in recent decades and in the process has placed pressure on ports to handle ever larger and more complex vessels with increasing speed, lower cost and continually improving systems.*

- *As with other ports, the growth of the container trade has led to a need for highly efficient handling processes and the use of off-site facilities for container storage. Significant growth has also occurred in bulk trades which do not rely on containers, including log and pulp handling. A further growth area has been in passenger liners, meeting the demand for safe and unique holiday opportunities in the South Pacifi".*

## 1.4 APPOINTMENT

We were appointed by the Hawke's Bay Regional Council as independent commissioners in terms of s34A of the Resource Management Act 1991 ("the RMA") to hear the Applicant, submitters, witnesses and the Council reporting officer and to determine the applications. The information available to us prior to the hearing included the applications, assessment of environmental effects (AEE) reports and other information; the submissions and reports prepared by the reporting officer of the Council, being the s42A report, and expert technical evidence.

## 1.5 NOTIFICATION

The Applicant requested that the application be publicly notified. The applications were notified on 29 March 2018, with the submission period closing on 1 May 2018.

## 1.6 BUNDLING PRINCIPLE AND ACTIVITY STATUS

The s42A report [1] outlined the applications made to the HBRC and the associated activity status.

| Consent No's | Purpose | Activity Status |
|---|---|---|
| CL180008C | To construct a new wharf (Wharf 6) and undertake associated activities. | Discretionary |
| CL180009E | To undertake Stage 1 capital dredging beneath the proposed new wharf, in the inner port area, swinging basin and part of the Deep Water Channel. | Discretionary |
| CL180010E | To undertake Stages 2 to 5 capital dredging within the inner port area, swinging basin, in and near the existing three channels and to form a new channel. | Discretionary |
| CL180011E | To undertake maintenance dredging within the areas for which capital dredging permits are sought (Stages 1 to 5). | Discretionary |
| CD180012W | To dispose of dredged material from capital and maintenance dredging within an offshore area shown in the application. | Discretionary |
| CL180013O | To occupy the common marine and coastal area for existing Port activities (replacing the existing coastal permits held by Port of Napier to occupy an area for Port purposes), the proposed new wharf, the adjacent berth pocket including the areas on both sides of the dolphins, and the new swinging basin, as shown in the plan attached to the application. | Discretionary |

We note that the s42A report outlined that some aspects of the proposed activities are permitted by the RCEP, that some elements are controlled activities and others are discretionary activities. The detailed description contained in the s42A report [2] is outlined as follows:

> *"Maintenance dredging in specific parts of the Port Management Area can be undertaken as a permitted activity under Rule 139 when this activity can be distinguished from capital dredging. Maintenance dredging in other parts of the Port Management Area is a controlled activity under Rule 140. The current proposal includes dredging outside the Port Management Area as well as capital dredging, and accordingly triggers discretionary activity Rule 130. Deposition of maintenance dredging material sourced from certain areas into specified areas is a controlled activity under Rule 150. The proposal includes*

[1] Pages 14 and 15, O'Leary s42A report.
[2] Page 15, O'Leary s42A report.

*deposition of material sourced from outside those source areas and to areas outside those deposition areas, and accordingly triggers discretionary activity Rule 151. The activities are intrinsically linked and relate to the construction of Wharf 6 and dredging (capital and maintenance) to provide a safe and navigable approach channel for larger vessels".*

Mr O'Leary had recommended that, given the nature of the applications and that they are linked to the wharf construction and dredging, the applications be bundled and considered as discretionary activities. The Applicant concurred with this approach through Mr Majurey's opening submissions and in the evidence-in-chief of Ms Allan.

We have considered this matter using the evidence we have received and concur that the applications be bundled and considered as discretionary activities.

## 1.7 DEFINITIONS

In this decision we use the following terms:

| | |
|---|---|
| AEE | Assessment of Effects on the Environment report |
| Applicant | Port of Napier Ltd |
| BMP | Biosecurity Management Plan |
| CIA | Cultural Impact Assessment |
| CMA | Coastal Marine Area |
| DDMP | Dredging and Disposal Management Plan |
| FINZ | Fisheries Inshore New Zealand |
| FLG | Fisheries Liaison Group |
| HBRC | Hawke's Bay Regional Council |
| HMO / UMO | Harmful / Unwanted Marine Organism |
| MPI | Ministry for Primary Industries |
| PMA | Port Management Area |
| RCEP | Hawke's Bay Regional Coastal Environment Plan |
| Regional Plan | Hawke's Bay Regional Plan |

| | |
|---|---|
| RMA | Resource Management Act 1991 and its amendments |
| WQMP | Water Quality Management Plan |

## 2. HEARING

The hearing was conducted on 21–24 August, and 28 September 2018 in the Hawke's Bay Business Hub, Bridge Street, Ahuriri, and the Hawke's Bay Regional Council Chambers, Napier.

Those appearing at the hearing included:

### 2.1 APPLICANT

- Mr Paul Majurey – Counsel
- Mr Todd Dawson – PNL Chief Executive
- Mr Michel de Vos – PNL Engineering Manager
- Mr Ross Sneddon – Ecology/ Fisheries Consultant
- Dr Ben Williams – Coastal Modelling Consultant
- Mr Chris Adamantidis – Coastal Modelling Consultant
- Dr Martin Single – Coastal Processes
- Ms Sylvia Allan – Consultant Planner

### 2.2 SUBMITTERS

- Napier City Council
  - Mr Matthew Lawson – Counsel
  - Professor Peter Cowell – Consultant, Coastal Processes
  - Ms Janeen Kydd-Smith – Planning Consultant
- Mr Richard Karn
- Mr Larry Dallimore
- Mr Steve Loughlin
- Ms Cathy MacDonald
- Mr Denis Pilkington

- Mrs Dorothy Pilkington
- Mr Bruce and Mrs Gill Wilton
- Fisheries Inshore NZ – Mr Oliver Wilson
- Mr Aaron Duncan and Mr Conor Paul
- Mr Jim Yeoman
- LegaSea Hawke's Bay – Mr Josh Barclay
- Ngāti Pārau – Mr Chad Tareha
- Mr Karl Warr

## 2.3 HAWKE'S BAY REGIONAL COUNCIL

- Mr Matt Conway – Counsel
- Mr Malcolm Miller – Manager Consents
- Dr Shane Kelly – Consultant, Marine Ecology and Fisheries
- Dr Terry Hume – Consultant, Coastal Processes
- Mr Richard Reinen-Hamill – Consultant, Coastal Processes
- Mr Reece O'Leary – Reporting Officer

## 2.4 PRE-HEARING MEETINGS

We were advised that two pre-hearing meetings had been held by HBRC. It was outlined by Mr O'Leary that submitters who had indicated in their submission that they would like to attend a pre-hearing meeting were invited to a pre-hearing meeting where they could elaborate on their submission and question the Applicant and Council in relation to the proposal and the consent process.

We noted that the meetings were facilitated by Mr Martin Williams, a local resource management lawyer and certified commissioner. He had prepared a report in respect of each meeting and these had been provided to us and all parties to the hearing.

## 2.5 SITE VISIT

We conducted a site visit on 20 August 2018. Representatives of the Applicant, submitters and Council were present. It involved visiting by boat the location of the proposed wharf, areas to be dredged, where material was intended to be deposited, and the current deposition area

adjacent to Westshore Beach. We also visited Westshore Beach by car and viewed the overall area from the top of Bluff Hill.

## 2.6 DIRECTIONS OF HEARING PANEL AND EXTENSION OF TIMEFRAMES

We issued various directions and a timeframe extension as follows:

- Direction No 1 (5 July 2018)

  This direction related to timeframes for the circulation of the s42A report and expert evidence; presentation of any rebuttal evidence; arrangements regarding the site visit; and a requirement for expert caucusing.

- Direction No 2 (16 August 2018)

  In response to a request from the Applicant's Counsel we considered and subsequently waived attendance at the hearing pursuant to s41C of the RMA, of the following witnesses:

  a) Mr Sean Bevin
  b) Ms Rachel McClellan
  c) Ms Deanna Clement
  d) Mr Craig Fitzgerald
  e) Mr David Wanty
  f) Ms Rachel de Lambert

  We noted that evidence from these witnesses had been pre-circulated. Notwithstanding the issuing of the waiver, we have determined that the witnesses be available, if required, by telephone on Tuesday 21 August prior to our hearing from Ms Sylvia Allan, to respond to questions the commissioners may have.

  We subsequently questioned Ms McClellan by telephone during the course of the hearing.

- Direction No 3 (27 August 2018)

  After adjournment of the hearing, we issued a further direction given that Mr Majurey had undertaken part of the Applicant's right of reply at the hearing and was to provide a written right of reply on all relevant matters. The direction outlined the process and timetable that would apply which then resulted in a reconvened hearing occurring on 28 September 2018.

- Extension of Timeframes (27 August 2018)

  Given the Applicant's request for an adjournment to be able to respond to the Fisheries Inshore New Zealand (FINZ) confidential report submitted in closed session, and our request for the provision of a written right of reply, we exercised our powers pursuant to sections 37 and 37A of the RMA. This was to extend the timeframe by when the hearing was to be completed. This was with the agreement of the Applicant's counsel.

  We also wished to provide the opportunity for the Council's experts to provide supplementary evidence in respect of the FINZ report.

  The timeframe for completion of the hearing was extended to 110 working days from the date the submission period closed.

  We wish to note that Mr Majurey, by way of memorandum dated 29 August 2018, stated that the Applicant opposed the report filed by FINZ dated 21 August 2018. He noted in the memorandum that FINZ did not advise the commissioners of the change in the report dated 21 August 2018 which showed CPUE for species in Figures 3 to 5 with grid lines of 2 km. The report dated 23 August 2018 had grid lines of 5 km.

  Mr Majurey stated that FINZ had not sought prior approval to circulate the report and did not provide any justification for doing so. Given this situation, he advised that the Applicant opposed consideration of the report.

  Subsequently, during the hearing on 28 September 2018, Mr Majurey withdrew the Applicant's opposition to consideration of the second Trident report dated 21 August 2018.

## 2.7 SECTION 42 RMA – PROTECTION OF SENSITIVE INFORMATION AND PUBLIC-EXCLUDED SESSION OF HEARING

During the hearing of submissions, we received an application from Fisheries Inshore New Zealand (FINZ), a submitter to the applications, to exercise our powers under s42 of the RMA to restrict the provision of information to be supplied to us in respect of the hearing.

FINZ is party to the proceedings as a submitter in respect of the Port applications to undertake dredging and construct a new wharf. The report to be provided relates to "Fishing catch and effort within the proposed [Hawke Bay][3] spoil dumping ground" and is subject to a confidentiality agreement between FINZ and Ministry of Primary Industries. It contains commercially sensitive information.

[3] "Hawke Bay" refers to the bay itself; "Hawke's Bay" refers to the region.

Having considered the request and the provisions of s42 (1)(b) of the RMA, we were satisfied that the order was necessary to avoid the disclosure of commercially sensitive information and unreasonable prejudice to the commercial position of the persons who supplied it. In addition, we considered that the making of the order outweighed the public interest in making the information available.

We therefore made an order, pursuant to s42 (2) of the RMA, that part of the hearing at which the report is to be referred to and discussed be held with the public excluded; and restricting the communication of the information contained in the report to the following persons: ourselves, as the three independent commissioners (Messrs Wasley and Kirikiri and Dr Green); Port of Napier representatives Mr Paul Majurey (Counsel), Ms Sylvia Allan (Planning Consultant), Mr Michel de Vos (Port of Napier Engineer), and Mr Ross Sneddon (Benthic Ecology and Fisheries Resources Consultant).

Representatives of the Hawke's Bay Regional Council to whom the information was restricted were Mr Matt Conway (Counsel), Mr Malcolm Miller (Consents Manager), Mr Reece O'Leary (Principal Consents Planner), and Dr Shane Kelly (Coastal Scientist).

The order was to have effect from when the information was received and cease to have effect upon the conclusion of proceedings, which is deemed to be when the Commissioners provide their decision on the applications to the Hawke's Bay Regional Council. At that time, the provisions of the Local Government Official Information and Meetings Act 1987 shall apply in respect of the information that is the subject of this order.

When giving consideration to the application, we advised all parties at the hearing on 23 August 2018 of the application and our desire to grant the order, and to sort out whether there were any objections to granting the order and restricting provision of the information to the listed above. No objections were received, and we then formally issued the order.

In terms of giving effect to the order, public-excluded sessions were held during the hearing to receive the information being the Trident reports, supplementary evidence from Mr Sneddon and Dr Kelly, and confidential closing submissions from Mr Majurey in relation to the Trident reports (dated 22 August and 23 August 2018) and related supplementary evidence.

We wish to observe that while the Trident reports and supplementary evidence provided some information on the nature of the fishery in Hawke Bay and were helpful to our consideration of the proposal, it was not critical to our determination of the applications.

## 2.8 CLOSURE OF HEARING

We formally closed the hearing on 12 October 2018 after we had commenced deliberating on the applications and concluded that we had sufficient information by which to determine them.

## 3. STATUTORY PROVISIONS CONSIDERED

In considering the applications, we have had regard to the matters to be considered as set out in s104 of the RMA and recognising consideration of the applications as discretionary activities. Activity status is discussed in section 1.6 of this decision.

Section 104B of the RMA states that a Council may grant or refuse the applications and, if granted, conditions may be imposed under s108. Furthermore, s105 and s107 apply to these applications and we consider these RMA provisions in section 9 of this decision.

We have had regard to the provisions of the relevant plans and statements and to Part 2, being the purpose and principles of the RMA.

## 4. SUBMISSIONS AND MAIN ISSUES RAISED

Forty-three submissions were received in total. Of these submissions, 1 was neutral, 12 were in support and 30 were in opposition.

The submissions in support highlighted matters which included:

- Ensuring that deposition of the dredging material was undertaken far off the shore, out at sea.
- Requesting that the excess material be discharged at Westshore Beach rather than at the offshore area east of the Port.
- The proposed dredging and construction is essential to the function of the Port.
- Ensuring conditions require cultural monitoring and Information sharing.
- Ensuring that there is a monitoring process for surf breaks and a condition for a management approach if effects arise.

The matters highlighted by submissions in opposition included:

- The dredging material should be dumped much further out to sea as Hawke Bay suffers from excess sediment levels. There is concern around the proximity of the proposed disposal site to Pānia Reef and Town Reef.
- The continued degradation of Pānia Reef and Town Reef as recreational and kai moana gathering areas and the importance of these reef systems for the Hawke Bay juvenile fish stocks.

- The potential adverse impact on marine flora and fauna.
- The appropriate materials from dredging be made available for beach renourishment.
- Move the Port out of the area so hours of operation, noise, pollution and dredging are not located close to the residential center or Pānia Reef.
- Concern regarding the 11.5 million tonnes of sediment entering Hawke Bay every year and the effects of the proposed 3.2 million cubic meters of dredged material when added to that.
- Increased sedimentation within the area and the state of the existing environment from previous dredging.
- The potential effects on tidal exchange, erosion and public access and amenity values along the coast and the marine environment.
- The depth of the channel and the swing basin as this may have an effect on erosion at Westshore and the wave environment.
- Inadequate information on the potential adverse effects on the marine environment and the benthic environment.

## 5. PRINCIPAL MATTERS IN CONTENTION

Having considered the application, submissions and evidence provided, and being guided by the assessment criteria of Regional Plans, we consider that there are several principal matters of contention between the Applicant, consent authority and submitters:

- The location for the dredged material to be deposited.
- Whether the information provided by the Applicant is of sufficient detail.
- The potential for the dredged material to be used as nourishment at Westshore Beach.

## 6. SUMMARY OF LEGAL SUBMISSIONS AND EVIDENCE

The following summary is not intended to be a full coverage of all matters raised at the hearing. Relevant parts of the evidence presented by the parties are referred to in the Main Findings section of this decision, where it forms a component of the findings by us, in deciding the application.

### 6.1 APPLICANT

- **Mr Majurey**

Mr Majurey presented legal submissions and reiterated that the applications were seeking to "undertake wharf expansion, associated capital and maintenance dredging, disposal of dredged material within the coastal marine area, and occupation of the coastal marine area."

He explained that the application was, in fact, set out under and met the procedural requirements of the RMA framework, notwithstanding the legal uncertainty over Part 2 RMA assessment matters arising from the *King Salmon* decision.

Mr Majurey noted that the evidence of the Port experts had been pre-circulated and by implication would require little, if any, elucidation on his part. He also noted that the hearing panel had earlier waived in-person attendance for some of the experts, but that there was opportunity for the panel to question them individually by telephone if necessary as part of the hearing.

Mr Majurey challenged the beach nourishment draft condition in the s42A report. He argued that the Project would have no adverse effects on Westshore Beach because any erosion there was because of the 1931 earthquake; the fine to medium dredged material trapped in the channel, is not material that would naturally nourish Westshore Beach; and the channel is part of the existing environment. In his view, the draft beach nourishment condition was *ultra vires* because it was not directly connected with an adverse effect, it required disposal at a different site from that applied for, and it was insufficiently defined to provide legal certainty.

Mr Majurey pointed out that granting consents on conditions sought by the Applicant was appropriate and in accordance with the purpose of the RMA.

He noted that the Port had offered to provide suitable material for beach nourishment to any party wishing to undertake that activity, on the understanding that that party took responsibility for any environmental effects that arise.

Mr Majurey stated that adverse effects on Pānia Reef from inshore disposal was a real risk, and one that the Port was not prepared to entertain, and this was a further reason for avoiding inshore disposal.

He indicated that the Port supported the need for up-to-date data on finfish and benthic ecological assessments.

Mr Majurey concluded that the Project would not only bring significant economic gains to the region but that the evidence also comprehensively showed that any potential adverse effects from the Project would be avoided, remedied or mitigated, and therefore the application had merit.

- **Mr Dawson** (evidence-in-chief)

Mr Dawson outlined the reasons for seeking consents to build a new 350 m wharf, dredge a berth pocket and swing basin and, in future, deepen and widen the existing shipping channel to enable increasing numbers of larger ships to call at the Port.

Mr Dawson commented that the Port's existing infrastructure has so far kept pace with the region's largely land-based production export needs. It is the nation's fourth largest container terminal and the sixth largest in overall tonnage. In the last 10 years, the Port has had a 73% increase in containerised cargo and a 180% growth in logs, and this made the Port a significant player in the country's economy. However, to capitalise on this growth, the Port would need to grow also.

He noted that the Port was the gateway to the region's growing tourism industry. He further noted that there will be increasing numbers of cruise liner visits, and that cruise liners of the future would be considerably larger than they are at present. He observed that the Port had 54 cruise calls last year and that a record 72 were booked for the 2018/2019 season. Mr Dawson further outlined that large cruise liners were having to be "turned away" because the Port could not cope with them.

Mr Dawson contended that cruise liners would not be able to berth at the Port without considerable modification including a purpose-built wharf and the widening and deepening of shipping channels.

He noted that critical to the Port's planning for the future was its commitment to the sustainable management of the environment in which it operates. The Port had made significant investments in measures to ensure that the marine environment in which it sits is not adversely impacted on by the Port's ongoing operations, especially during any activities that might arise from implementation of this proposal. The Port had contributed to the development of a 3D model of the topography of Pānia Reef, and to work on the Clifton to Tāngoio Coastal Management Strategy. Mr Dawson saw the commitment to the environment as a priority for the Port.

Mr Dawson outlined that the Port had engaged extensively with various sectors of the local community during this process and in his view, this widespread engagement had contributed significantly to the development of the application to date, and he expected this to continue in the future.

Mr Dawson outlined the extent of similar engagement with the Westshore community and other stakeholders. In his view "the open and transparent approach taken by the Port has been best practice and, most likely, thought-leading in the port industry".

Mr Dawson outlined a concern with the s42A report "that some of the draft conditions would require the Port to dispose of some material inshore, contrary to the advice on which the applications were based". In his view, expert advice clearly favoured offshore disposal because

the dredged material is not of a "suitable size to nourish Westshore Beach and that placing dredged material there may adversely affect Pānia Reef".

In summary Mr Dawson stated that:

- Port of Napier suffered from a lack of wharf space and capacity to take larger ships, which are already coming to New Zealand in increasing numbers;
- Port of Napier must upgrade its capacity to address this problem, otherwise the Hawke's Bay economy will suffer;
- the proposed dredging regime was a necessary part of such an upgrade;
- an alternative site for dredged material was necessary because of the unsuitability of such dredged material being deposited at or near Westshore Beach, and because of the possible adverse effects inshore disposal of dredged material may have on Pānia Reef;
- the proposal had been the subject of extensive consultation and detailed investigation;
- Port of Napier was committed to avoiding or limiting any potential adverse effects on the marine environment.

- **Mr de Vos** (evidence-in-chief)

Mr de Vos outlined that the proposed wharf development and dredging represented a significant investment for the Port and are key to the Port's future; the evidence supported a move away from the currently consented inshore spoil disposal site to an offshore site[4]; and a robust adaptive management process will ensure no significant adverse impacts from the dredging and disposal components of the Project.

Mr De Vos described the Hawke's Bay region's reliance on sea transport to shift imports and exports to and from the region. The global trend is for container vessels to significantly increase in size (beam and draft), but with manoeuvring constraints within the inner swinging basin, the Port cannot efficiently or at all, service larger vessels that are already calling on New Zealand. Mr de Vos projected that the Port will reach its single container berth capacity by 2020; already large cruise ships are being denied use of the Port because of limited berth availability and large ship size. Also, with an increase in ship beam width, larger cranes with longer reach are required to service ships, which puts a strain on wharfs. In the case of Wharf 5, rectifying this would

[4] We frequently refer to the applied-for disposal site in 20–23 m water depth off Marine Parade as the "offshore" disposal site, which contrasts with the currently consented disposal site in 6–7 m water depth at Westshore, which we refer to as the "inshore" disposal site. We use the term "nearshore" to refer to the area bounded by, roughly, the line of breakers in 2–3 m water depth out to 15–18 m water depth. The term "nearshore seabed off Westshore" refers to the seabed between the outer edge of the surfzone and the navigation channel, roughly. When we mention the "beach", we try to be explicit as to the part of the beach that we mean. For instance, the "subaerial beach" is the part of the beach that rarely gets inundated, and the "intertidal beach" is the part of the beach that emerges and submerges with the tide.

require significant strengthening by works that would severely impact Port operations for up to 3 years.

Mr de Vos described the proof of concept. A new wharf is required to service larger vessels, with a preference that that did not require breakwaters or a reclamation, since these would be costly and had the potential to result in “substantial adverse effects”. The design also had to cope with long-period waves that rock moored ships, which can reduce productivity and even cause mooring lines to break. Simulations were carried out to investigate ship movements under a range of sea and weather conditions. These confirmed the proof of concept and provided significant input to the design of a deepened channel and swing basin, which are also required to service the larger vessels.

Mr De Vos described the detailed design of the dredging programme, which was based on extensive geological and geotechnical investigations, and of the new wharf, which includes a range of features to handle the anticipated large vessels. Special care was taken to limit the potential of the dredged channel and swing basin to change wave refraction patterns, which could impact shoreline erosion and surfing.

Two dredging technologies are proposed: back hoe dredger (BHD) and trailing suction hopper dredge (THSD), both of which are “standard” in New Zealand and around the world. Mr de Vos described both types of dredge and how they work. The BHD is fixed to a stationary pontoon and loads barges which are then towed to the disposal site. The BHD will be used to dredge Areas B, C and D of the channel. The THSD “sucks” material onboard from the seabed while underway. The THSD then sails to the disposal site and discharges its load by opening doors in the bottom of its hull.

Mr de Vos described the rationale for the Port applying for spoil disposal at an offshore site in 20 to 23 metres water depth off Marine Parade. Recently, the Port has disposed of maintenance dredgings at currently consented (CL9701S9D) inshore disposal sites IA and Rext in about 6 metres water depth off Westshore Beach. A total of 3.2 million cubic metres of material is planned to be uplifted from the seabed, which is “significantly greater than” any previous capital or maintenance dredging campaigns undertaken by the Port.

He noted that modelling advice from the Port’s consultant (Advisian) was that, under certain sea and weather conditions, fine sediment in the spoil disposed of at the inshore site could be transported by waves and currents to Pānia Reef, where it could cause a range of adverse effects on the reef ecology and recreational and cultural values. This finding was “supported by some stakeholder feedback”, which described sedimentation and poor visibility at Pānia Reef. Only “fine” sediment is predicted to behave in this way and coarser material will be moved onshore and caught up in the northwards-directed littoral drift, away from Pānia Reef.

Mr de Vos stated that the geotechnical investigations revealed that "only a small component" of the dredged material was that coarse. Furthermore, it was not practical to separate coarse from fine material, and so the Applicant decided to apply for disposal at an alternative location, east of the Port in 20 metres water depth. This site was assessed as being the most likely, out of other sites that were also investigated, to have "minimal effects on Pānia Reef".

Mr de Vos summarised the consultation conducted by the Port around the application, saying that it was constructive and positive, particularly the engagement with mana whenua hapū, which Mr de Vos described as an ongoing "cultural journey", which "has increased the Port's appreciation of cultural values, in particular relating to Pānia Reef".

Mr de Vos responded to matters raised in the s42A report, including the Port's opposition to the proposed consent condition requiring disposal of "suitable" material (derived from maintenance dredging of the channel) at the currently consented inshore disposal site, which Mr de Vos believed would be impossible to put into effect due to the varying opinions on what would be considered "suitable" material. He also noted other concerns, including that the current consent authorising inshore disposal expires in 2033, and that the annual limit of disposal at the inshore site is 350,000 cubic metres per year, which could be exceeded.

Mr de Vos responded to concerns raised by a number of submitters, including:

- Requests by many submitters for a portion of the dredged material to be placed at Westshore Beach to mitigate ongoing erosion in that location.
- Mr Morris' and others' concerns that the proposed offshore disposal area would affect Pānia Reef. In response, Mr de Vos referred to the modelling by Dr Williams and Mr Adamantidis that shows the risk to Pānia Reef is minimal and described how real-time water quality monitoring linked to an adaptive management scheme and ongoing assurance monitoring would help protect the reef.
- Requests to dispose of spoil in deep water "beyond the dropoff" to avoid any possible effects, which Mr de Vos argued would incur "substantially" increased costs that were not justified.
- Concern expressed by Mr Warr about effects on fish that might be attracted to the Port by flood-lighting, which Mr de Vos said could be avoided by replacing the existing traditional flood-lighting with LED-based technology, which the Port is about to commence.
- The provision for cultural monitoring and proposed information sharing with mana whenua hapū.
- Concerns with the claimed accuracy of the dredging raised by Mr Abel, which Mr de Vos dismissed with information on navigation systems and datasheets.
- Concerns expressed by the Surfbreak Protection Society on effects on surfbreaks.

- Request by Fisheries Inshore New Zealand (FINZ) to be involved in development of conditions, monitoring, information sharing and reporting.
- Plans for biosecurity monitoring.

Mr de Vos concluded by commending the design for incorporating many design iterations to minimise any adverse effects, confirming that dredged material would not be suitable for disposal at RExt because of risk to Pānia Reef posed by fine material in the spoil, and confirming the Port's commitment to a Water Quality Management Plan (WQMP), which included an adaptive management framework.

- **Mr de Vos** (additional statement)

Mr de Vos took issue with Dr Cowell's view that erosion of the beach at Westshore is in any way "connected" to trapping of sediment in the dredged shipping channel, and also alerted us to the confusion generated by misuse and loose use of terms that describe sediment grainsize such as "sand", "fine sand" and "very fine sand" [see Appendix 1 of this decision for the Wentworth scale for sediment grainsize]. This has made it very difficult to assess what is meant by material that is "suitable" for disposal at the inshore site for the purposes of nourishing and protecting Westshore Beach. Mr de Vos stood by his view that "the evidence shows that no material from the proposed development is suitable for renourishment at Westshore".

Mr de Vos commented on Ms Kydd-Smith's proposal that on the expiry of the consent that currently authorises inshore disposal, the Port should apply for a variation to the consent at that time (i.e., in 2033). Mr de Vos' view was that reliance on a future consent to be able to fully realise a high-value integrated project was completely untenable for a development of this size, and it would be financially irresponsible for the Port to entertain such an approach.

Mr de Vos took issue with Mr Karn's "claims that fictitious wind conditions were deliberately used for misleading purposes" and referred to Dr Williams and Mr Adamantidis for refutation of Mr Karn's arguments regarding the wind data used in the modelling. Mr de Vos also took issue with Mr Karn's claim that the October 2017 disposal of sand "close to the surf club is having a beneficial effect".

- **Dr Williams** (evidence-in-chief)

Dr Williams stood by the conclusions developed in Appendix D (but not including the assessment of surfing, which Mr Adamantidis dealt with in his evidence-in-chief) and Appendix F of the AEE, arguing that the methods were sound and in accordance with industry good or best practice, and the results could be relied upon to assess the spatial impact of the proposed dredging on wave refraction, sediment-transport pathways, and coastal response.

Appendix D (Coastal Process Studies) reported how the dredging design was optimised and assessed the potential effects of the final design on the wave climate and coastal processes along the shoreline west of the Port, including Hardinge Road and Westshore. Due to the orientation of the channel, the channel deepening only affects waves from the east around to the south. Hence, waves from the northeast sector were not studied.

Appendix F (Post-Disposal Fate of Dredged Sediments) described the movement and fate of sediment originating from two alternative disposal locations (west of the Port navigation channel at the current inshore disposal site in 6–7 metres water depth where disposal of material from maintenance dredging is currently authorised by Coastal Permit CL970159D, and east of the Port navigation channel at the proposed offshore disposal site in 22 metres water depth). The thickness of sediment deposit at the offshore site was assumed to rise 2 m above the current seabed. Transport and fate of very fine sand and sand were addressed, as these sediment types encompass the grain diameter ranges present in the bulk of the material that will be removed during both the capital and maintenance dredging.

Dr Williams noted reviews of the work by HBRC's expert advisors who found it to be of a high standard with the results fitting the "framework" and results of past studies.

Overall, the predicted effects of the proposed channel on the beaches west of the Port were predicted to be small or negligible.

Dr Williams responded to two matters raised in the s42A report. The first of these matters was a concern with the adequacy of the scientific evidence, which reflected the concerns of a number of submitters. Dr Williams responded in general terms, noting that Mr Reinen-Hamill and Dr Hume found the technical assessments to be comprehensive and of a high standard, and that the Joint Witness Statement by the coastal experts agreed that the hydrodynamic model is consistent with measurements of currents and that the modelling results are broadly consistent with present understanding of the nearshore oceanography. The second of these matters related to the conclusion in the s42A report that nourishment of Westshore Beach by disposing of "suitable material" (derived from maintenance dredging of the channel) at the inshore site Rext that is currently authorised for disposal of material from maintenance dredging would be an appropriate condition of consent. Again, Dr Williams responded in general terms, noting that sediment is suitable for nourishment only if it is of a similar grainsize to the native sediment and has a low proportion of silt and clay.

In responding to concerns of submitters, Dr Williams went into further detail on the matter of the disposal condition by providing a detailed analysis of the suitability of the dredged material for beach nourishment. Dr Williams concluded that material would not be suitable, because it did not meet certain engineering criteria for ensuring that nourishment is effective over the

long term, and because fine sediments in the dredged material could be transported by currents to Pānia Reef with ensuing adverse effects.

- **Mr Adamantidis** (evidence-in-chief)

Mr Adamantidis outlined that he stood by the conclusions developed in Appendix E of the AEE, arguing that the methods were sound and in accordance with industry best practice, and that the information from the modelling provided a sound basis for examining the potential effects of plumes on the nearshore ecosystem, including Pānia Reef.

He noted that Appendix E (Dredge Plume Modelling) described the results of detailed dredge plume modelling, including plume spatial extent and dispersion. Two plumes arise from the actual dredging activities, one associated with the digging and loading of material and another associated with disposal of the dredged material on the seabed at the proposed offshore disposal site. The potential effects of both plumes on Pānia Reef in particular, were assessed. The assessment was conducted for operations to be conducted during dredge campaign 1 and dredge campaign 5.

Mr Adamantidis considered the results to be conservative, as they are based on a relatively stormy period. The plume behaviour depicted in the model was also viewed as being representative of the full range of conditions that could be expected during the various dredging campaigns.

He stated that the conclusions regarding surfing amenity developed in Appendix D were sound, being based on the scientific literature on this subject.

Mr Adamantidis supported Dr Williams' conclusions regarding the suitability of dredged material for beach nourishment.

In response to concerns raised by submitters and in the s42A report, on the adequacy of the modelling, Mr Adamantidis presented further data that confirmed the accuracy of the FLOW hydrodynamic model[5].

Mr Adamantidis responded in detail to matters raised by submitters including the potential benefits of disposing of dredged material on the edge of the continental shelf, effects in and near to Ahuriri estuary, the adequacy of the modelling in relation to cultural impacts, and the assessment of surfing amenity.

[5] The models used by the Applicant's consultants are described in Appendix 2 of this decision. This includes model calibration and validation.

- **Dr Single** (evidence-in-chief)

Dr Single presented an overview of the physical coastal environment in the vicinity of the Port and summarised and commented on the assessment of potential effects of the dredging presented by Dr Williams and Mr Adamantidis. Dr Single wrote Appendix G of the AEE (Port of Napier Proposed Wharf and Dredging Project: Physical Coastal Environment).

Of particular significance to this application, Dr Single described how the 1931 Hawke's Bay earthquake resulted in "major changes" to the Westshore shoreline. Uplift during the earthquake resulted in Westshore Beach changing from a narrow gravel spit to a broad barrier with a wide sandy expanse on the seaward side. The seabed offshore from Westshore was raised, resulting in a "coastal morphology in disequilibrium with the process environment". This had resulted, ultimately, in beach erosion at Westshore, which continues to this day[6].

Drawing upon a range of information including that in Appendices D, E and F of the AEE, Dr Single described the wave climate, currents, bathymetry, beach and nearshore sediments and sediment-transport paths. Dr Single also provided a history of the Port development and described the beach erosion that had occurred at Westshore since the late 1970s to early 1980s and the subsequent mitigation that had been undertaken.

Since 1995, an annual average of 10,000 to 12,000 cubic metres of fine gravel had been placed at the back of the Westshore subaerial beach to nourish the beach and maintain an artificial gravel beach ridge.

In 1998, the Port was granted consent (CL970159D) to deposit up to 350,000 cubic metres of spoil removed during maintenance dredging of the Fairway north of gridline 719600m (NZ Geodetic Datum 1949, Hawke's Bay Circuit) over any 12-month period at inshore sites Ia and RExt. Site Rext, which is just offshore from Westshore Beach, allowed for deposition that may provide nourishment to Westshore. Only maintenance dredgings from the fairway may be disposed of under this consent, and the consent expires in 2033.

Since 1998, nearly 400,000 cubic metres of sediment has been placed at Rext, averaging ~22,600 cubic metres per year. Dr Single argued that only a small percentage – 5 to 10%, which equates to 1,000 to 5,600 cubic metres per year – of the placed material actually contributes to beach nourishment because its size is generally less than that required for effective beach replenishment. Only the coarser sands in the spoil are transported onshore to build the beach,

[6] The process can be likened to building a sand mound out from the beach with a bucket and spade, and then watching as the waves obliterate the mound (these are our words, not Dr Single's). Although experts and submitters spoke about a "sediment deficit" at Westshore (reflecting the human perspective on the beach erosion), our understanding is that, at least from the geological perspective, it is more accurate to speak of a "sediment excess" at Westshore.

but they are quickly lost to the north by longshore transport. Finer sediments in the spoil are transported offshore to the east and southeast (towards Pānia Reef) and can deposit in the navigation channel, adding to the need for maintenance dredging.

Dr Single noted his agreement with the conclusions expressed in Appendices D, E and F of the AEE and with the evidence of Dr Williams and Mr Adamantidis, including effects of the proposed works on waves and sediment transport and deposition.

Dr Single did not agree that the proposed condition in the s42A report requiring disposal of "suitable material" (derived from maintenance dredging of the channel) at Rext is justified, arguing that, based on the modelling evidence, this condition does not mitigate an effect relating to proposed activities. The effects of the proposed dredging and deeper channel, Dr Single opined, have been shown to be "very small" with regard to the physical coastal processes at Westshore. Dr Single also agreed with Dr Williams' engineering assessment of the suitability of the dredged material for beach nourishment (that is, that it is not suitable).

Dr Single summed up by saying that, apart from the deepening of the channel and the raising of the seabed at the offshore disposal site, the studies conducted by the Applicant have shown that the effects of the Project will be "mostly small, and of magnitudes within the variability of the natural environment". Furthermore, the conditions proposed by the Applicant in section 26.3 of the AEE appropriately provide for anticipated effects and would lead to the identification and provide for the mitigation off any unanticipated effects.

In his response to concerns raised by submitters, Dr Single provided his comments by the following themes: use of material for beach nourishment; proposed offshore disposal site too close to Pānia Reef; erosion of Westshore Beach as a result of the Port blocking sediment transport from the south; effects on surfing breaks; effects on the shore north of the Esk River mouth.

- **Dr Williams** (additional statement)

Dr Williams corrected some errors in his evidence-in-chief and clarified the terminology applied to sediment grainsize (by reference to the same Wentworth size scale that we show in Appendix 1 of this decision). In particular, Dr Williams clarified that the modelling in Appendix F of the AEE primarily dealt with "very fine sand" and "fine sand" as these terms "encompass the grain diameter ranges present in the majority of material" to be excavated. Dr Williams then went on to defend what Dr Cowell called the "excess shear stress" approach of calculating sediment transport, arguing that the approach is legitimate when applied to very fine sand (the method is not contentious when applied to fine sand and coarser)[7].

[7] Our understanding of this approach is that it treats sediment transport as advection by the superimposed steady current of material that is suspended from the seabed into the water column by the wave activity. Dr Williams argued

Dr Williams elaborated his argument that the dredged material would not be suitable for beach nourishment, since the component of "sand" that will provide the majority of benefit is, in fact, medium sand (250 – 500 microns) and coarse sand (500 – 1000 microns), not very fine sand or fine sand, and there is very little of this coarser grade in the material to be dredged.

Dr Williams responded to Dr Cowell's comments on the use of "representative" model boundary conditions, agreeing that there are challenges in this regard in any modelling task, but also noted that (1) one of the main products of the work is the conceptual model of sediment transport (Fig 8-3, Appendix D of the AEE), which was supported by the coastal experts in their Joint Witness Statement, and (2) the conceptual model of sediment transport patterns draws on a "wider body of information" than just the modelling, and is used as a "heuristic" indicator.

Finally, Dr Williams corrected some errors concerning wind data that Mr Karn brought to light, arguing that these errors make no real difference to the model predictions.

- **Mr Adamantidis** (additional statement)

Mr Adamantidis took issue with Dr Cowell's proposed variation to the condition proposed in the s42A report that requires placement of "suitable" material (derived from maintenance dredging of the channel) at the currently consented (CL970159D) inshore disposal site, Rext. Dr Cowell argued that a criterion for "suitable material" is material with a maximum of 10 percent sediment with size less than 63 microns (i.e., silt and clay, or "mud"). Mr Adamantidis noted that mud can remain in suspension for a "considerable length of time" and will travel in suspension with the prevailing currents. Since currents in the vicinity of Westshore have been measured and they are generally directed towards the east, this means that placement of spoil with such a "high proportion" of mud at the inshore site (as opposed to the applied-for offshore site) would pose a greater potential for the suspended-sediment plume to intersect Pānia Reef. Even mud (material less than 63 microns) that does manage to settle to the bed at the inshore site will be subject to continuous mobilisation and winnowing by wave action, with subsequent travel towards Pānia Reef.

- **Dr Single** (additional statement)

Dr Single argued that Dr Cowell had underestimated the role of sediment particle abrasion, but agreed that erosion at Westshore is ongoing, continues to exhibit adjustment to the 1931 uplift and associated changes in sediment supply and dynamics at Ahuriri, and has responded to replenishment of the (subaerial) beach with gravel.

that very fine sand is typically transported in this manner in combined wave–current flow, and therefore the method is sound when applied to very fine sand.

- **Mr Sneddon** (evidence-in-chief)

Mr Sneddon summarised the approach and methodology used in the benthic ecological and fisheries investigations, recapped the results (description of soft-sediment benthic habitats and reef habitats; description of the Hawke Bay inshore fishery; assessment of the direct impacts of dredging activities; assessment of far-field stressors, water quality and plume propagation; assessment of ecological effects from sediment plumes; assessment of effects on fish and fisheries resources) and stood by the conclusions developed in Appendix H of the AEE (Assessment of Effects on Benthic Ecology and Fisheries Resources from Proposed Dredging and Dredge Spoil Disposal for Napier Port).

Mr Sneddon noted that, although his "assessment concludes that significant adverse effects to marine ecological receptors are very unlikely, the scale of the Project and a level of uncertainty associated with some elements means that a precautionary approach to monitoring is warranted".

Mr Sneddon also commented on marine biosecurity risk, which was not addressed in Appendix H, and monitoring.

Mr Sneddon did not consider there was a particular biosecurity risk, and laid out the reasons why he thought that, and concluded that implementation of MPI's (Ministry for Primary Industries) existing requirements for mitigation of biosecurity risk from ballast water and sediment and from vessel fouling would reduce the risk of introduction of HMOs (Harmful Marine Organisms) via overseas vessels and equipment associated with the Project to an acceptable level.

Mr Sneddon responded in detail to matters raised by submitters, including: that dredge spoil disposal near Westshore kills any shellfish trying to grow there; that disposal of spoil at the proposed offshore site will effectively devastate sea life on Pānia Reef and was too risky to guarantee no impact; concerns about the importance of Pānia Reef and Town Reef as recreational and kai moana gathering areas and their importance for juvenile fish and crustaceans; concerns about monitoring; concerns regarding effects on fisheries, including that current disposal of maintenance dredgings off Westshore has "decimated" the yellow-belly flounder population; the cumulative effects of dredged material on top of sediments discharged to the Coastal Marine Area by rivers; concerns with light pollution; that hazardous substances have been ignored; concerns about impacts on "microbial sea life" and the creation of a "dead zone" along the Westshore and Whirinaki beaches; concerns that inshore disposal to date has had a long-term devastating effect on the benthic environment and fishing; that further work is required to assess the potential for adverse effects on the fishery and fishing industry.

Mr Sneddon also responded to matters raised in the s42A report, which related to three concerns raised by Dr Kelly being, the age of the benthic sampling data used in the AEE, the extent of epifaunal sampling data, and uncertainties regarding the assessment of the flatfish fishery.

- **Ms Allan** (evidence-in-chief)

Ms Allan outlined that the purpose of the applications was for the Port to expand to accommodate the increasing demand for additional berthage and to allow it to meet ongoing regional growth needs. The proposal was anticipated to have a moderate to significant economic benefit at a regional level.

The location and design of the proposed channel had involved considerable modeling design and optimization, taking into account both environmental and operational safety as well as efficiency considerations. The offshore disposal area was determined following consideration of potential environmental impacts and a range of possible alternatives; this included the scoping of alternative sites.

Ms Allan noted that it was not possible to separate out the dredging material into a larger-size sand fraction and smaller-size silt and mud fractions, and that these materials cannot be used for beach replenishment or coastal protection as they are not suitable.

In her opinion, the adverse effects on the environment associated with various components of the Project were generally less than minor when the mitigation measures are considered. The adverse effects that are minor were considered to be temporary only and specific provisions are required to address the one potential effect that is more than minor.

Ms Allan stated that the effect which has been assessed as potentially significant related to effects on individuals of the Little Blue Penguin population residing in the current rip-rap reclamation face. The management of this effect during wharf construction was subject to a number of suggested conditions which seek to minimize the effect.

Ms Allan noted that the Project as proposed was well-aligned with national and regional policy. She had concerns that some of the conditions proposed in the s42A report did not align with policy directives relating to Pānia Reef, particularly the need to avoid any adverse effects on the reef.

Ms Allan highlighted concerns that the s42A report contained unfounded assumptions about the adverse effects the proposal would have on the Westshore area and that it sought to require ongoing deposition of “suitable” material at Westshore.

Ms Allan stated that the Applicant’s evidence outlined in detail why the capital dredge material is unsuitable for inshore deposition. As a consequence of these assumptions, the Council reporting officer had recommended additional conditions of consent which are untenable on a

number of grounds. Ms Allan considered that there was a risk of adverse effects of turbidity and sediment movement in the nearshore area which could result in adverse effects on Pānia Reef and Rangatira Reef. In addition to the legal and practical problems with these draft conditions, the particular recommendations may result in adverse effects which have not been assessed, which are contrary to national and regional policy.

- **Ms Allan** (additional statement)

Ms Allan stated that she was concerned that both Ms Kydd-Smith and Dr Cowell refer loosely to "Westshore Beach" when they really mean the nearshore area seaward of the suburb of Westshore. Ms Kydd-Smith stated that Ms Allan's "understanding of coastal processes does not align with the Joint Witness statement". Ms Allan considered that Ms Kydd-Smith was conflating two aspects of coastal processes here, and that her own (Ms Allan's) statement was correct.

In regard to coastal processes, Ms Allan stated that Ms Kydd-Smith's understanding was incomplete. She quoted expert evidence which referred to the possible benefits of shallowing the nearshore area, which is different to direct beach nourishment. Additionally, she did not agree with Ms Kydd-Smith's statement that "any potential adverse effects on Pānia Reef and Rangatira Reef must be regarded as having been addressed" as the consent was granted in the 1990s under now-outdated regulatory documents.

Ms Allan stated that condition 2 and 6 would limit the source of material disposed in RExt to the current Fairway north of Gridline 719600m, and condition 15 would exclude deposition from the southern end of RExt.

In her opinion (regarding consent for deposition), the suggestion made by Ms Kydd-Smith that "PONL should be required to apply to the Council for a variation to the consent at that time" is highly risky for any applicant and indicates a lack of understanding of the importance of the Project as a whole to the future of the Hawke's Bay economy. Ms Allan also indicated problems with the specific maintenance dredging condition put forward, as this covers activities that may occur concurrently with capital dredging stages or may occur separately.

In response to the evidence of Dr Cowell, Ms Allan stated that he supports the conditions put forward and specifically advocates a "southerly extension of the near coast deposition area R". Ms Allan pointed out that use of this southerly part of RExt is precluded in the Port's current disposal consent and additional consents would be needed. There would also be a number of potential adverse effects associated with this activity which have not been assessed.

Ms Allan attached a version of consent conditions showing track changes. She included a new draft condition which would apply to all conditions which involve a certification process. She also provided alternative wording relating to the Dredging and Disposal Management Plan

(DDMP) and the WQMP if the conditions relating to "disposal of suitable material for beach nourishment" were applied in the decision. If such conditions are applied, she considered that the suggested wording provided in her evidence should be preferred.

Ms Allan included a "lapse condition" in all but the occupation consent, the purpose of which is to make it clear that a consent cannot be challenged in the future on the basis that it had not been given effect to. She also made minor modifications to wording and some changes to the requirements for the WQMP.

Ms Allan deleted conditions that would require any material to be disposed of under the Port's existing disposal consent.

Ms Allan included six new conditions in the disposal consent which set out the requirements for baseline ecological monitoring.

## 6.2 SUBMITTERS

- **Napier City Council**

**– Mr Lawson** in his submissions emphasised that adverse effects of the Project on Westshore Beach must and can be mitigated by disposal of "suitable" dredged material in the nearshore area at Westshore. In this respect, Napier City Council supported the recommendations in the s42A report, with minor adjustments (as proposed by Ms Kydd-Smith in her evidence-in-chief) to "ensure validity and enforceability of conditions related to the disposal of dredged material". With that "minor adjustment", Napier City Council supported the applications of Port of Napier.

He noted that the beach renourishment scheme that has operated since 1987 and that has involved the placement of some 15,000 cubic metres per year of gravel material landward of MHWS at Westshore. The purpose reflects a policy decision to "hold the line" in the face of long-term beach erosion and retreat, and in so doing protect private homes and important public infrastructure.

Since 1998, material dredged from the seabed within the PMA has been deposited within the nearshore area off Westshore under Coastal Permit CL970159D. In 2003, that permit was amended to allow disposal at inshore area Rext, the purpose of which was to enhance the effectiveness of the dredge spoil in protecting the beach.

Mr Lawson stated that the environment in which the Port's application must be considered is "the environment as it exists today and embracing the future state of the environment as it might be modified by permitted activities and resource consents which have been granted where it appears likely that those consents will be implemented". Furthermore, the "existing natural and physical resources represented by the existing development and infrastructure at

Westshore also forms part of the existing environment". Mr Lawson pointed out that Mr Majurey acknowledged this concept in his opening submission, when he said "the channel is part of the existing environment".

He discussed the relevance of an overall Part 2 RMA Assessment in the light of *King Salmon* and *R J Davidson Family Trust v Marlborough District Council*, in which the Court of Appeal held that the High Court had erred in holding that the Environment Court was not able or required to consider Part 2 of the RMA directly and was bound by its expression in the relevant planning documents.

Mr Lawson argued that the effects summarised in Table 23.1 of the AEE prepared by the Applicant did not include potential effects of (1) removing sediment from an area already agreed by the experts to be in a state of deficit, or (2) the increased loss of fine sands from the Westshore nearshore and beach system due to the increased trapping efficiency of the larger channel. These effects were acknowledged and agreed by all the coastal experts in their Joint Witness Statement.

Mr Lawson questioned the Applicant's position that using the inshore disposal site would avoid sedimentation and turbidity affecting Pānia Reef, arguing that no witness has contended that "turbidity at Pānia Reef had any correlation to the undertaking of dredging activities or the placement of dredged material in the nearshore" and that this proposition is contrary to the position of the coastal experts in their Joint Witness Statement, who agreed that "there is a potential effect due to the ceasing of disposal of dredged material at the inshore site".

He argued that the cumulative effect over time of the increased trapping of sand in the larger channel should be considered and opined that the "Applicant cannot claim the benefit of the existing channel being part of the existing environment when the means by which those existing effects were being mitigated [inshore placement of spoil] is to be discontinued".

Mr Lawson took issue with Mr Majurey's contention that the condition requiring disposal of "suitable" material at the currently consented inshore disposal site is *ultra vires*, arguing that the proposed condition is "directly related to an adverse effect of the activity on the environment". Furthermore, the contention that the proposed condition is *ultra vires* because it requires placement of spoil at a different location to that applied for "ignores the fact that a coastal permit [CL970159D] has already been granted and does not expire until 2033".

Mr Lawson argued that the obligation to avoid, remedy or mitigate effects lies with the Applicant, and therefore the Applicant's offer to provide material to a third party who would be responsible for obtaining consents and disposing of the material at Westshore, would be avoiding that obligation.

Mr Lawson concluded by stating that if the amended condition (requiring inshore disposal) of Ms Kydd-Smith is not to be imposed then consent for the capital and maintenance dredging should be declined.

**– Dr Cowell** provided a comprehensive analysis of the factors that cause erosion in the "Westshore Beach littoral cell". The dominant reason for the "chronic" erosion at Westshore "stems from the misalignment of the beach and nearshore seabed resulting from uplift that accompanied the 1931 earthquake" (as described by Dr Single in his evidence-in-chief). Readjustment would have initiated immediately after the uplift, but at first would have been manifest as coastal accretion, then a period of relative stability punctuated by periods of acute erosion. Chronic erosion at Westshore since about 1980 is "an expression of the final phase of natural readjustment".

Dr Cowell noted that, even before 1931, the shoreline had already been displaced seaward due to the construction of the Ahuriri Harbour moles in the late 1870s, resulting in the creation of "new land" along Westshore which was soon used by humans, not understanding that the fate of this new land was to rather quickly erode as the shoreline attempted to re-establish an equilibrium (just as the "new land" created by the 1931 uplift is being eroded).

Dr Cowell opined that "the post-uplift readjustment at Westshore remains ongoing", which is based on the simple facts that the nearshore seabed off Westshore continues to "deflate" and that nourishment of the beach with gravel is still required to counter deflation of the beach.

Dr Cowell commented extensively on the effect that dredging of the channel will have on the sediment budget. The navigation channels act as sediment sinks – as attested to by the need for maintenance dredging – and an "accelerated loss of nearshore sands can be expected due to artificial creation of additional sediment sinks through dredging of navigation channels in both the Inner Harbour and the approaches to Port Napier". Dr Cowell referred to a hydrographic plot circulated by Mr Dallimore as showing an asymmetry in the cross-section of the existing channel, from which he (Dr Cowell) inferred sediment accumulating from sand entering from the offshore direction. This is an interruption of the sand moving up from the south, bypassing The Bluff and the breakwater, and otherwise supplying sand to Westshore. This is consistent with the Applicant's modelling and with previous studies summarised by Komar (2005)[8]. The dredged channel also, in Dr Cowell's opinion, forms a probable sink for sand originating in the nearshore off Westshore.

Dr Cowell took issue with the way the Applicant's models either simplify or fail to account for some of details in the physics of sand transport under waves and currents, and the necessary

[8] Komar, P.D. (2005). Hawke's Bay Environmental Change, Shoreline Erosion and Management Issues. Report for HBRC, 244 pp.

simplifications and assumptions needed to run the models, such as modelling "representative" wave and current conditions, rather than a full spectrum of "real" conditions.

Our understanding of Dr Cowell's main criticism is that use of the "excess shear stress approach to wave–current transport" has resulted in the Applicant over-estimating the offshore transport by currents of fine sand that is resuspended by waves from the nearshore seabed off Westshore (as shown in, for example, Fig 8-7 and Fig 8-8 of Appendix D of the AEE, and Figs 5-5 to 5-8 in Appendix F). Dr Cowell argued that the influence of waves on sediment transport is under-estimated in these figures, and that wave-driven transport, of the type characterised in Fig 8-3 of Appendix D, is "more likely to be relevant to sand dispersal processes in the nearshore".

Bringing his criticisms of the modelling together, Dr Cowell opined that the Applicant has over-estimated the potential for fine sediments disposed of at the inshore site to intersect Pānia Reef, where they might exert adverse effects, and has over-estimated the potential rate of channel infilling and associated maintenance dredging requirement (caused by sediments disposed of at the inshore site being transported seawards). However, Dr Cowell did note that the excess shear stress approach is, in fact, much less problematic when applied to silts and clays (as opposed to fine sands).

Notwithstanding the above, Dr Cowell accepted that the modelling is, correctly, interpreted "heuristically" by the Applicant as "indicators of net [sediment] movement", while at the same time cautioning against false confidence in the models leading to seemingly definitive conclusions.

Dr Cowell noted that spoil disposal at Rext seems to have "temporarily ameliorated" the erosion at Westshore, concluding that placement of fine sand in the nearshore does provide a benefit to beach stability at intertidal elevations and above.

Dr Cowell examined information on sediment grainsize (from the vibrocore samples described in Appendix F of the AEE) and concluded that the grainsize of the material to be dredged is similar to the grainsize of the "native" (i.e., existing) sediment in the nearshore off Westshore. This makes the dredged material a good candidate for placement at Rext for beach nourishment. Furthermore, referring again to the vibrocore data, Dr Cowell noted that the majority of the samples have a maximum of only 10% of material less than 63 microns (which he termed "mud", which encompasses "silt" and "clay" on the Wentworth scale), which is less than the mud content of the native nearshore sediment.

Dr Cowell concluded, *vis-à-vis* the requirement in the proposed disposal condition in the s42A report, that the "criterion for suitability of dredge spoil applied in nearshore nourishment can therefore be put at a maximum of 10 percent sediment with size less than 63 microns". From

the Applicant's submarine mapping, "areas to be dredged in which sediments conform to this criterion can be identified as being north of line 719600 in respect of maintenance dredging, and in area "A" [as delineated in the AEE] for capital dredging". Suitability would be even further enhanced by the loss of the mud component of sediments during dredge uplift by the TSHD.

Although Dr Cowell recommended nearshore disposal of dredged material to nourish Westshore Beach, he also acknowledged that there were potential negative effects that had not been evaluated, these being effects on Pānia Reef, Ahuriri estuary, and surfing amenity.

Dr Cowell concluded his evidence by stating that disposal of suitable dredge spoil at the currently consented inshore site is a "golden opportunity" that will provide a cheaper and more efficient means of achieving the coastal management objectives at Westshore.

**– Ms Kydd-Smith** relied primarily on the evidence of Dr Cowell to inform her views. Ms Kydd-Smith took exception to Ms Allan's view that not disposing of dredged material at Westshore is an "actual or even a potential adverse effect that is of any significance", noting that Dr Cowell said that without nourishment of the subtidal seabed off Westshore, the lower intertidal beach and step will become predominantly composed of gravel.

Ms Kydd-Smith also took exception to Ms Allan's view that dredged material placed off Westshore has never contributed to beach nourishment as only a small part of that material has provided only a temporary benefit to the beach. Ms Kydd-Smith supported her opinion by referring to the Joint Witness Statement of the coastal experts, and the explanation by Dr Cowell of why deposition in the nearshore is important to the beach.

Regarding the risk posed to Pānia Reef by turbidity and sedimentation deriving from placement of dredged sediments at the currently consented inshore disposal site, Ms Kydd-Smith argued that, as long as the disposal complies with all of the conditions of the current consent, including the limit on the volume that may be placed, then any potential effects on Pānia Reef and Rangatira Reef "must be regarded as having been addressed". Ms Kydd-Smith offered this opinion in response to Ms Allan's contention that insufficient regard had been given by submitters and in the s42A report to potential effects of inshore disposal on Pānia Reef as required by NZCPS Policies 11, 13(1)(a) and 15(a), and by the Hawke's Bay RPS.

Ms Kydd-Smith endorsed Dr Cowell's approach to defining "suitable" material that could be incorporated into the condition proposed in the s42A report requiring inshore disposal of "suitable" material (derived from maintenance dredging of the channel) for the purpose of nourishing Westshore Beach. Ms Kydd-Smith accordingly drafted a change to the condition recommended in the s42A report and opined that this would alleviate Ms Allan's concerns about the definition of "suitable". Following Dr Cowell's advice, Ms Kydd-Smith's condition also required disposal of material from both maintenance and capital dredging at the inshore site.

Ms Kydd-Smith did not agree with Mr de Vos' request in his evidence-in-chief that condition 18 of CL18009E be amended so that the offshore disposal site may be used when the existing consent CL970159D expires in 2033, on the grounds that this would impose a finite period on the inshore disposal when the effects of the proposed dredging will extend beyond that. Ms Kydd-Smith's proposed remedy was to require the Applicant to apply for variation of the disposal consent in 2033 when it expired, which would ensure that "any potential adverse effects of changing the consent condition are appropriately considered at the time".

- **Mr Karn**

Mr Karn, a research engineer with a Master of Engineering specialising in aerodynamics, opposed the application but requested, if the application were granted, a condition that required that any sand or gravel yielded by both capital and maintenance dredging be disposed of at the currently consented inshore disposal site at Westshore, with the purpose of nourishing Westshore Beach.

Mr Karn challenged the assertion by the Applicant that spoil disposal to date off Westshore has not benefited Westshore Beach, by showing photographs of the beach, beach profiles, seabed bathymetry, sediment grainsize data (his own and the Applicant's), and images of wave patterns. Mr Karn challenged the claim that dredged material will not be of a suitable grainsize for beach nourishment, by comparing grainsize of native beach sediment with the grainsize of the material to be dredged, as given in Appendix B of the AEE, and concluding that "there is a considerable amount of valuable sand in Area A that contains very little fine material of concern".

Mr Karn took issue with the "energetic wind speeds" chosen by Dr Williams to model the sediment-transport patterns given in Figs 5-5 to 5-8 in Appendix F of the AEE, arguing that they were unrealistic and unfairly neglected calmer conditions, which occur for most of the time. He also identified an error in the units of wind speed applied by Dr Williams.

- **Mr Dallimore**

Mr Dallimore supported the application but requested that granting of the application be subject to all suitable sand being "dumped in the nearshore or piped to the southern end of Westshore", where the material will repair and restore the beach. He provided a range of information to support his submission.

Up until about 1980, Mr Dallimore outlined that the beaches between Westshore and Tāngoio were in a constant state of accretion. Problems began with the regular deepening of the shipping channel from 1973. The wave environment at Westshore has changed considerably as a result of erosion of the tidal zone and nearshore. The inshore seabed gradient has steepened,

which has changed the spilling waves that were typical up to the 1980's into more noticeable tumbling waves from similar swells at Westshore and Bayview.

Mr Dallimore agreed with Kirk and Single's (1999)[9] conclusions that the Port breakwater was not a contributor to erosion on Napier's northern beaches because this structure was in place for 100 years between 1887 and 1987 and, other than expected overtopping during extreme swell events, there was no significant erosion within the Bayview littoral cell.

He noted that there are differing views on whether and how much the Port might have caused erosion at Westshore. Overall, the Kirk and Single (1999) report described up to 13 causative factors for erosion at Westshore Beach. However, the report did not consider the effect of the shipping channel so in Mr Dallimore's view, it was flawed.

Mr Dallimore's assessment was that the current consensus seems to be that the channel does intercept sediment moving north into the Bayview littoral cell. ASR Consultants, commissioned by Napier City Council in 2001, were the first coastal experts that found the shipping channel was a significant cause of erosion at Westshore, by consistently removing sandy material from the littoral system and trapping it offshore where it could not be naturally transported to the eroding coastline. Coastal scientists and experts on Hawke Bay coastal processes are in full agreement that sand accumulating in the Port shipping channel would otherwise replenish Westshore and the beaches north to Tāngoio.

According to Mr Dallimore, the maintenance dredging programme during the 4 years between 2014 and 2017 removed 169,504 cubic metres of sand from the shipping channel. The majority of this greywacke sand entered the coast from the Tukituki River, and then was carried north by littoral drift and was transported to the shipping channel via the Marine Parade nearshore and tidal zone. This replenishment source must be reinstated to return and restore coastal protection between Westshore and Tāngoio.

Up until about 2013, large dredges have been used and spoil has been disposed of too far offshore (but still within the inshore consented area) to be able to come ashore and make a difference at Westshore Beach. Since 2015, smaller dredges have been able to deposit closer to shore, and this has had a demonstrable positive effect on at least the northern beach, opposite where the disposal has occurred. Photos of improvement to the beach and nearshore profiles based on HBRC survey data were clear evidence that the 83,000 cubic metres of clean sand, suction dredged from the shipping channel and discharged in 4.0 m water depth off The Esplanade, was highly beneficial to coastal protection and recreational value.

[9] Kirk, R.M. and Single, M.B., 1999. Coastal Change at Napier with Special Reference to Erosion at Westshore: A Review of Causativ Factors. Report for Port of Napier, 55 p.

On the issue of sediment grainsize, Mr Dallimore contended that a seabed and beach needs all grain sizes to make a stable system, and that there is absolutely no need to separate grain sizes of sand. The coarser sand tends to stay in the tidal zone and beyond, while the finer sand generally settles on the upper beach during calm conditions and returns to suspension during wave events when it moves within the longshore sediment drift. All sand from the Port shipping channel and made available to Westshore Beach since the "Pelican" suction dredge in 2015 and the "Albatross" suction dredge in 2017 has been and will continue to be "suitable beach replenishment" for Westshore and Bayview.

Mr Dallimore argued that not making suitable dredged material available for beach renourishment would violate RCEP Rule 140(e) which states that, where appropriate, material yielded by maintenance dredging within the PMA "must be made available for beach renourishment purposes".

Mr Dallimore quoted Komar (2005) who said that the disposal of all dredged sand close inshore would increase the input of sand and begin to offset the long-term losses that have led to the deepening of the Bay and loss of the Westshore sand beach, and concluded that reinstating and restoring Westshore Beach with dredged sand is the only durable and affordable solution to address existing erosion and predicted erosion due to rising sea levels from climate change.

In Mr Dallimore's view, the Port should not have the option to consider suitability. The decision must be based on recognising clean sand just as the Port operator or the Dredge Master did during the dredging projects in 2015 and 2017. All dredged sand material that would otherwise replenish Westshore Beach should be reinstated to rebuild the beach and restore coastal protection. Decisions should be based on sound experience.

Mr Dallimore noted that there are no added or extra costs involved by dumping sand at Westshore and, as often proclaimed by Port engineers, the costs are less than having the dredge steam out to any outer disposal zone. Pumping sand and/or "rainbowing" should be considered for the shallower southern end.

- **Mr Loughlin**

Mr Loughlin, drawing on his experience as a long-time resident of Napier and particularly of Westshore, and as a keen and experienced waterman (including surfing, kite surfing and paddle boarding, being in the water for well over 200 days a year), stated that he was in favour of the development of the Port, but opposed this application because of a number of matters.

Mr Loughlin's recollection of the 1970s was of a wide, flat and sandy beach, which is not the case today.

Mr Loughlin said he "was not convinced that the modelling [conducted by the Applicant] is reflecting reality enough to make the conclusion that depositing sand at Westshore will cause environmental harm to Pānia [Reef]". Mr Loughlin noted that the southern extremity of the Westshore embayment is in a very noticeable offshore-wind shadow, with the wind being light and patchy, even when the offshore-directed winds in the surrounding areas are quite strong. This led him to doubt the model predictions of wind-driven currents and associated sediment transport, particularly under offshore-directed winds, since winds appear to have been imposed uniformly over the model grid in the various model simulations. Mr Loughlin also questioned whether reflected waves from the breakwater, which he had personally observed, had been taken into account in the modelling.

Mr Loughlin was involved in the development of the Clifton to Tāngoio Coastal Strategy 2120, which depends on the continuation of nourishment at Westshore, by the current programme of gravel nourishment of the subaerial beach and by building an offshore sand bar, to effectively achieve the aims of the Strategy regarding hazard management of the coast between Clifton and Tāngoio. He expressed concern that ceasing disposal at Westshore was contrary to the Strategy and would jeopardise its aims. Furthermore, disposal in the nearshore is "best practice to recycle as a priority".

As a remedy, Mr Loughlin sought an "opportunity for the [sand resource] to be utilised for purposes by all parties/stakeholders".

- **Ms MacDonald (Westshore Residents and Development Association)**

Ms MacDonald opposed the application, and sought a condition requiring that fine sand uplifted by capital and maintenance dredging be disposed of at Rext. Ms MacDonald noted that the Port's placement of sand close to the surf club in October 2017 was the first time the placement had been close enough to the beach where it could "benefit the beach and nearshore area directly". Those benefits have been and continue to be quite noticeable.

Ms MacDonald also was concerned that the Applicant's plan to cease disposing of dredged material at Westshore is contrary to the spirit and intent of RCEP Rule 140(e), which she believed was intended to be an all-encompassing rule for maintenance dredging in the PMA. Furthermore, Ms MacDonald stated that it seemed logical that Rule 140 should apply to the maintenance dredging until the operations extended beyond the PMA.

- **Mr Pilkington**

Mr Pilkington, a resident of Westshore, supported the application, but was concerned about the state of Westshore Beach, and wanted to see "sand dredged from the shipping channel discharged at the currently approved site off Westshore Beach rather than in the proposed offshore area east of the Port".

Mr Pilkington described how the beach had changed – for the worse – since the early 1980s. He described the beach now as a "mess" and feared that the situation would only get worse in the future as sea level rises and causes further beach erosion. Mr Pilkington showed before-and-after photographs of the beach that well demonstrated how "serious the erosion problem at Westshore really is".

Mr Pilkington "strongly" rejected the theory that the erosion is and has been the result of uplift during the 1931 earthquake, pointing out that there were long-standing erosion problems before the earthquake and, following the earthquake, "the beach steadily built up over the following 40 or 50 years to reach the level shown in the 1970s/80s photographs" [before the current cycle of erosion began]. Mr Pilkington expressed the view that blockage of the northerly flow of replenishing sand around Bluff Hill caused by development at the Port was the major contributing factor. He pointed to a chart in Appendix C of the AEE that shows a "huge" (1.5 million cubic metres) bank of sand heaped up against the breakwater to support his view. This, he argued, is sand that should be on Westshore Beach. In addition, deeper dredging of the shipping channel since the 1970s has effectively prevented sand that does make its way around the breakwater from reaching the beach. If this were not so then why, Mr Pilkington asked, is it necessary to dredge the channel?

Mr Pilkington concluded that there is now a "major opportunity to utilise a potentially huge sand resource to renourish the beach", especially since recent disposal of sand at Rext has shown clear benefits to the beach.

- **Mrs Pilkington**

Mrs Pilkington, a resident of Westshore (previously of Bay View), opposed the application, but said that "in general, I do not object to the proposed project". Her principal objection to the application is the plan to dispose of dredged material at the offshore site and requested that there should be a condition requiring that fine sand from both capital and maintenance dredging be deposited at the currently consented inshore disposal site off Westshore.

Mrs Pilkington served as the coastal community representative of the Bay View community on the Northern Cell Assessment Panel working on the development of the Clifton to Tāngoio Coastal Strategy 2120. She said that the recommendations that she helped to develop for managing coastal hazards at Bay View and Whirinaki "depend for their efficacy on the continuation of renourishment at Westshore", which includes building an offshore sand bar, with renourishment material allowed to naturally migrate northwards and towards the beach, thereby raising foreshore levels.

Mrs Pilkington took exception to Mr Majurey's claim that there "are no adverse effects from the Project causing erosion" at Westshore, since the erosion (in Mr Majurey's view) is

"essentially a result of uplift of the seabed in the 1931 earthquake". To support her view, Mrs Pilkington referred to the publication "Port and People" (1975), which recorded the first instance of Westshore residents complaining about erosion in 1891. This was attributed by experts of the time to the effect of the "breakwater construction [begun in 1887] trapping shingle". Mrs Pilkington argued that the consent condition that she sought is directly related to an adverse effect due to the Port that has existed since 1891, and which has been exacerbated by successive developments at the Port. Mrs Pilkington opined that "the opportunity to utilise sand [from the dredging] should not be dismissed while there is not absolutely compelling real-world evidence of adverse effects".

Mrs Pilkington argued that "there is a lack of hard evidence" for impact on Pānia Reef and shellfish species of disposing of sand at Westshore, and noted that in the evidence given by Cawthron (Mr Sneddon) and by Mr O'Reilly in the CIA that there is "no empirical data that supports a reason for concern either about disposal at Westshore resulting in a negative impact on Pānia Reef or of a decrease in marine species in the area". Mrs Pilkington noted that "anecdotal observations" by divers of sedimentation at Pānia Reef over the past three decades can hardly be ascribed to the very recent placement of dredge spoil in the nearshore at Westshore.

Mrs Pilkington offered some personal observations of coastal processes in the area, and concluded that, without any hard data, there should be a "thorough real-world trial of using sand dredged from the shipping channel as replenishing material at Westshore".

We note that in response to a question put to Mr Pilkington by the panel regarding the date of construction of the last section of the breakwater, he subsequently advised through Mr O'Leary by way of an email dated 24 August 2018, that it occurred in 1973.

- **Mr and Ms Wilton**

Mr and Ms Wilton opposed the application and requested a number of concessions from the Port. These included disposing of dredged sediment a minimum of 10 km offshore and a minimum of 10 km from Pānia Reef, and a number of concessions related to noise. These included paying for 100% of dwelling noise mitigation costs and changing the criteria for qualifying for that reimbursement. Mr and Ms Wilton wanted the Port to advocate for shifting the Port to an out-of-town location and described the benefits that would accrue from such a move.

- **Mr Wilson (Fisheries Inshore New Zealand – FINZ)**

Mr Wilson represented the Area 2 Committee of FINZ and provided evidence on behalf of members who are quota owners, fishers and affiliated seafood industry personnel. Mr Wilson supported the concern expressed in the s42A report that there is uncertainty over the

importance of fisheries around the proposed offshore disposal site and the potential effects of the Project on the flatfish fishery in particular and opposed the application on that basis.

Mr Wilson questioned Mr Sneddon's authority to conclude that effects on fish stocks within the wider bay will be minimal when analysis has not been done to determine the nature of the sediment plume, including spatial and temporal dynamics; the extent of any species displacement; where the fish are expected to go if displaced; whether, once they are displaced, they would still be available to commercial fishers; and the economic impact of displacement locally and regionally.

Mr Wilson took issue with Mr Sneddon's data (using catch per hectare as a proxy for productivity; inadequate spatial resolution of data), opining that the approach used by Mr Sneddon was not "sophisticated enough to accurately reflect the importance of the inshore fisheries and the impact of the disposal site on these fisheries". A confidential report – the "Trident report[10]" – that Mr Wilson sought to table at the hearing showed, Mr Wilson claimed, that the proposed disposal site "overlaps with high catch rates for flatfish".

Mr Wilson argued that the application is not consistent with the vision and intent of the Hawke's Bay Marine and Coastal Group (convened by HBRC) to "achieve a healthy and functioning marine ecosystem in [Hawke Bay] that supports an abundant and sustainable fishery". On specific policy, Mr Wilson argued that the application failed to "adequately address" objectives in the Regional Coastal Environment Plan, most importantly, guideline (e) of policy 17.1. Mr Wilson also argued that inadequate attention has been paid to cumulative effects, which policy 16.3 requires to be addressed.

Mr Wilson opposed the application and sought that it be declined and noted that FINZ would support a review of the proposed disposal site to address their concern that the impact of offshore disposal on the inshore fishery, had not been adequately assessed. Mr Wilson also sought changes to conditions in the event the application is granted, including the establishment of a Fisheries Liaison Group (FLG), which would ensure potential effects on the fishing industry are recognised, and procedures are put in place to avoid, offset and mitigate potential adverse effects and better manage risk. Mr Wilson outlined how the FLG could be constituted and how it could operate.

- **Dr Helson (Fisheries Inshore New Zealand – FINZ)**

Dr Helson endorsed Mr Wilson's comments, and argued that the Applicant had not presented the information or analysis that would inform a good decision, and also that we needed to avoid "homogenising the fishing fleet" and recognise that each individual fisher would have a variable

[10] Middleton, D. (2018) Fishing catch and effort within the proposed Hawke Bay spoil dumping ground. Report to FINZ, 23 August 2018.

reliance on specific species, areas and times of year. Dr Helson concluded that the Applicant "incorrectly concluded that the proposed activity would not have any substantive effects on fisheries or *fishers* [our emphasis]".

- **Mr Duncan and Mr Paul (Freedom Divers Hawke's Bay Club)**

The Freedom Divers Hawke's Bay Club is a recreational group of like-minded freedivers (do not use SCUBA) and spearfishermen. It has 85 members and has been active for 19 years. Mr Paul has a degree in marine science and Mr Duncan is a local business owner with a passion for sustainability and the environment.

Mr Duncan stated that they are not concerned with the proposed new wharf, but they do have concerns about disposing of spoil at the proposed offshore site, which they feared could degrade Pānia Reef and Town Reef, and adversely affect opportunities for recreation and gathering kai moana, and the use of the reefs by juvenile fish stocks.

Mr Paul described how important Pānia Reef is to club members, noting that it is a "key site" for members given its proximity, range of depths, varied topography, diverse marine life and lack of alternative quality offshore reefs in Hawke Bay. Good visibility is important for underwater safety, and any diminishing visibility over Pānia Reef due to increased turbidity associated with the Project will reduce that safety.

Mr Duncan elaborated on their concerns, including that the offshore disposal site is "too close" to Pānia and Town Reefs; that the importance of the reefs to crustaceans and juvenile fish stocks has been overlooked; that the analysis of the movement and fate of sediment originating from the offshore disposal site (Appendix F of the AEE) was based on too short a period of data; that data used to calibrate the hydrodynamic model are from an unsuitable location and has yielded data that are not a "true reflection" of currents across Pānia Reef. Mr Duncan also was concerned about the adequacy of the proposed monitoring.

Mr Duncan further described his experience from diving around the reefs, arguing, in particular, that the Applicant's claims that there is a prevailing current to the east, away from Pānia Reef, are not consistent with his experience, which is that the most common current over the reef sets towards the north or northeast.

Mr Paul presented statements from senior members of the Club, including from Mr Ward, who attested to a decline in visibility and an increase in sedimentation at Pānia Reef and Town Reef.

On behalf of the Club, Mr Duncan sought two outcomes being the disposal of spoil significantly further offshore, to the "edge of the dropoff" (500 m water depth, 37 nautical miles offshore), and an "independent and transparent monitoring plan" linked to an action plan should adverse effects be detected.

- **Mr Yeoman (NZ Angling and Casting Association and supporting the Pānia Surfcasting Club)**

Mr Yeoman was opposed to the application, accepted the need for the Port to grow, but rejected the proposed offshore disposal site, partly because of its close proximity to Pānia Reef and Town Reef. In addition, Mr Yeoman expressed concerns about the adequacy and accuracy of the data used by the Applicant's consultants and took exception to the depiction of currents in the Bay, which was contrary to the local knowledge of divers, fishers and yachtsmen.

Mr Yeoman also argued that "silting is a huge issue affecting the Bay but that is no cause to accept adding to it".

Mr Yeoman opined that the "only possible safe option" is to dispose of spoil offshore in a depth of at least 500 m, and that the extra costs associated with that cannot be compared to the costs of "wilful destruction of our inshore benthic environment".

- **Mr Barclay (LegaSea Hawke's Bay)**

LegaSea Hawke's Bay was an "organisation of concerned recreational fishers. It was a branch of LegaSea New Zealand, which was an outreach arm of the New Zealand Sports Fishing Council. While not representing all the recreational fishers in the Bay, they had the support of seven Sports Fishing Clubs from Māhia to Porangahau.

Mr Barclay described concerns expressed previously about disposal of spoil at the inshore site at Westshore, which LegaSea thought had decimated what was once a popular recreational fishing area at Westshore and locations further north, and possible effects of inshore disposal on Pānia Reef and Town Reef, which had not been adequately thought through.

Although not opposed to the new wharf or dredging proposal *per se*, Mr Barclay expressed concern that the proposed offshore disposal site is "far too close to our Pānia and Town Reef systems and posed a major threat to the environmental, recreational and cultural values these areas have". Also, Mr Barclay argued, there needed to be a "rigorous monitoring programme" to protect Pānia Reef, Town Reef and the intertidal reef fronting Hardinge Road, which was used by school children in educational programmes.

Mr Barclay made a number of observations including: the proposed offshore disposal site is currently used by day boat commercial fishers and recreational fishers, particularly those with smaller boats; the importance of Pānia Reef and Town from ecological, recreational and cultural perspectives is well documented; the Applicant's modelling has been based on inadequate data and has resulted in depictions of current patterns that are at odds with local experience; there has been no assessment of the financial impact of the Project on both the recreational and commercial fishing industries.

Mr Barclay sought two outcomes being the disposal of all dredged material at the "edge of the dropoff" in some 500 m water depth, where currents will disperse the plume, and a detailed monitoring and action plan which included the foreshore fronting Hardinge Road as well as Pānia Reef and Town Reef at strategic locations.

- **Mr Tareha (Ngāti Pārau Hapu Trust)**

Mr Tareha expressed support for the conclusions and recommendations in the CIA (Appendix Q of the AEE), noting that Ngāti Pārau had worked alongside the Port over the past year in understanding the potential impacts to mana whenua of the Project. Ngāti Pārau also worked on the CIA.

Ngāti Pārau supported shifting to a new disposal site on the understanding that disposal at the currently consented inshore site may be affecting the mauri of Pānia Reef, and they wished to be kept informed on activities by way of summary reports. Ngāti Pārau also insisted that they be included in the assurance monitoring programme and be involved in the care and protection of taonga species that are likely to be impacted such as the Little Blue Penguin. Mr Tareha provided a number of suggestions to add to conditions related to cultural monitoring and information sharing.

- **Mr Warr**

Mr Warr was a resident of Bay View and a long-term commercial fisher of flatfish in Hawke Bay, particularly in the area designated for the offshore disposal of dredged material.

Mr Warr registered his "significant concern" about the offshore disposal location, noting that a "very significant part of my annual catch program is caught in and around the dredge spoil footprint", and took issue with Mr Sneddon's conclusion that the spoil is not of significant fishery value.

Mr Warr supported his view by providing data on his own catch and also by referring to the Cawthron data (Appendix H of the AEE) that "clearly points to the second highest harvest level of flatfish" being the proposed disposal site, and his own experience of "vast soundings of fish biomass" at the disposal site. Mr Warr also referred to the "massive amounts of juvenile fish recruited [at the offshore disposal site] all year round", and photographs that show "running ripe yellow-belly flounder from this area".

Mr Warr also stated that he had encountered black flounder – a rare native fish, the world's only right-eyed flounder that inhabits freshwater during its lifespan, and a culturally significant food source – using the ground at the offshore disposal site during winter, possibly for spawning. Mr Warr described his concern at seeing modelling results by Mr Adamantidis

showing currents at all depths in the water column and during the black flounder spawning season heading south from the offshore disposal site "straight towards the spawning grounds of the rare, unique fish".

Mr Warr opined that "a very great deal of further research, and proper research" needs to be undertaken to satisfy everybody that the offshore disposal ground is "ethical and best practice", and concluded that he opposed the application, and sought "compensation for loss of lifestyle as an affected party".

### 6.3 HAWKE'S BAY REGIONAL COUNCIL

- **Mr Conway**

Mr Conway in his legal submissions provided his opinion on how to interpret the meaning of "existing environment", confirming Mr Lawson's view that the existing environment includes the environment as it exists today and the environment as it might be modified by the implementation of resource consents that have been granted at the time the particular application is considered where it appears likely those resource consents will be implemented, but noting that recent decisions have emphasised that a "real world" rather than an "artificial" approach needs to be taken to determining the existing environment.

Mr Conway pointed out that if we decide that granting consents in terms sought by the Port would lead to "additional sediment being lost from the embayment", then we may decide to impose conditions to address that effect. On the question of whether a condition requiring inshore disposal of dredged material would be lawful, Mr Conway referred us to s108AA of the RMA, which lays out requirements for conditions of resource consents, and noted that there is "no particular numerical threshold of effects" that must be met before mitigation is warranted.

Mr Conway reminded us that Mr Majurey accepted, in response to a question from the Chair, that there is "nothing stopping reliance on the existing deposition consent provided its terms are complied with".

As for the potential impediment that the existing consent expires in 2033, Mr Conway provided us with options that could be pursued, which included granting shorter-term dredging consents to match the expiry date of the current disposal consent and requiring that dredging either associated with specified stages or beyond 2033 may not occur until an appropriate resource consent authorising inshore deposition has been obtained. Mr Conway discussed some possible consequences in the event the Port could not obtain a replacement disposal consent by 2033.

Mr Conway was of the view that if the conditions of the existing consent for inshore disposal were complied with then any adverse effects on Pānia Reef would already be authorised, since they would not be effects of activities for which consent has been sought by the Port. If more

information on effects of nearshore disposal becomes available in the future, then the review condition on the existing disposal consent could be used to, for example, impose triggers for environmental conditions under which disposal may not occur.

Mr Conway concluded by informing us that, as outlined by Mr Lawson, a very recent (in the week of this hearing) Court of Appeal decision had confirmed that Part 2 of the RMA can be considered when assessing an application for a resource consent.

- **Dr Kelly** (evidence-in-chief)

Dr Kelly stated that he considered the "scope of the marine ecology and marine mammal assessments to be relatively comprehensive" and that he agreed "with many of the conclusions arising from them". However, he stated two concerns.

The first concern was that the assessment of benthic epifauna at the proposed offshore disposal site was based on inadequate and old data. This matter was the subject of a s92 request for further information, which the Applicant supplied, but which Dr Kelly was still not happy with, stating that "insufficient contemporary information is provided to adequately characterise the current epifaunal community of the disposal site". This makes it "difficult to determine the significance of disposal impacts on benthic ecology in that area and more broadly".

The second concern related to the assessment of fisheries by the Applicant. Although Dr Kelly "agreed in principle" with Mr Sneddon's conclusions on this matter – essentially that the small size of the disposal site, limited and temporary nature of impacts on benthic macroinvertebrates, and fish mobility mean that disposal of spoil is unlikely to have an impact on fish, including the flatfish and gurnard that are targeted by commercial fishers – he also noted concerns raised about fishing raised by submitters, including the NZ Angling and Casting Association, Napier Fisherman's Association, Fisheries Inshore NZ and a local commercial fisher, Mr Warr, which warranted a response. In addition, Dr Kelly had misgivings about the MPI data that was used by Mr Sneddon to evaluate the relative importance of the proposed disposal site to the commercial fishery.

- **Dr Kelly** (additional statement)

Dr Kelly reiterated his concerns with inadequate and old data used to characterise the proposed offshore disposal site, effects on fishing, and marine biosecurity. Although declaring himself to be satisfied that the ecological assessment had done a good job, including the interpretation of information, he nevertheless opined that "effects will be less than minor", specifically that they would be "potentially significant at the local scale, potentially significant at the [Hawke Bay] scale, less than minor at the regional scale, insignificant at the national scale". Dr Kelly explained that he stated "potentially significant" at the local and Hawke Bay scales because some

uncertainties remained, these being related to the data used to characterise the disposal site, and the "lack of broader scale information to put the local values into a broader context". This uncertainty meant that he was unable to determine the validity of Dr Sneddon's assertion that "values in the affected area are similar to those in other parts of [Hawke Bay], especially given that higher value habitats and communities are often associated with the type of seabed that is around the Napier headland".

Dr Kelly noted that "uncertainties remain on the effects on fishing", despite the fact that he (Dr Kelly) would probably have used a similar approach as that used by Mr Sneddon, and that Mr Sneddon's "review and analysis of fisheries species [is] appropriate and informative". Dr Kelly understood that the restrictions placed on commercially sensitive fisheries data limit the resolution of analyses and the ability to fully assess effects; he also endorsed Mr Warr's opinions based on his (Mr Warr's) extensive commercial fishing experience.

- **Mr Reinen-Hamill** (evidence-in-chief)

Mr Reinen-Hamill stated that the technical assessments and modelling studies conducted by the Applicant were carried out to a high standard. Overall, he stated his agreement with the findings that: the 1931 earthquake resulted in the coastal system being out of equilibrium, and the system is likely to be still responding to that and anthropogenic drivers; the proposed channel dredging is likely to have "minor effects" on waves and currents; changes to longshore drift and the shoreline will be difficult to distinguish from normal variability; the dredged channel will provide greater trapping efficiency of sediment, and will fill with sediment from the seabed between Westshore and the channel as well as with sediment transported from the east, and this will result in an increased loss of sediment from the subtidal area of seabed off Westshore; although insufficient detail has been provided by the Applicant to accurately quantify the increase in interception of sediment by the channel, it is expected to be "larger" than, but of the "same order" as presently occurs; the quantity of suspended sediments at the areas of ecological significance (including Pānia Reef) resulting from spoil disposal at the proposed offshore site will be small.

Mr Reinen-Hamill noted that, while there were some errors of detail in the Applicant's technical reports, these did not appear to have actually been carried into the modelling, and that the models calibrated "reasonably well".

Mr Reinen-Hamill took issue with the Applicant's position that dredged material will be unsuitable for nourishment of Westshore Beach, stating that he is "confident" that ongoing disposal of "fine sandy material" at the existing inshore disposal site (i.e., at Rext) would continue to provide "[temporary] benefit manifest by higher nearshore seabed levels that will reduce wave action at the intertidal beach face while the placed sediment remains in the system". This will reduce the additional loss of sediment from the system that would occur if all dredged sediment were removed to the proposed offshore disposal site. Mr Reinen-Hamill

opined that "this would partially offset the effects of the proposed dredging", but also noted that neither this option (inshore disposal) nor disposal at the edge of the continental shelf (which is desired by some submitters) had been investigated in detail in this application. Notwithstanding that, there is evidence that placement of maintenance dredgings to date at Rext has been beneficial to Westshore Beach. Mr Reinen-Hamill concluded by supporting the proposed condition in the s42A report requiring disposal of "suitable material" at Rext.

- **Dr Hume** (evidence-in-chief)

Dr Hume stated that Appendices D, F and G of the AEE were "comprehensive and of a high standard", and that he "agrees with many of the conclusions".

On the matter of potential effects of proposed channel dredging on Westshore, Dr Hume opined that this would result in an increased loss of sediment from the nearshore off Westshore. This would occur because the dredged channel, which would be deeper and longer than the existing channel, would be more efficient at trapping sediment that enters the channel from both the east and the west. Sediment entering from the east is carried by the northwards-directed longshore transport along Marine Parade and around the Port breakwater and is material that otherwise would accumulate in the nearshore off Westshore.

Dr Hume agreed with the Applicant that the proposed channel dredging would not have a "significant effect" on the surfing amenity, and opined that it would be beneficial to place all maintenance dredgings (and possibly some capital dredgings) at Rext to remedy or mitigate coastal erosion, based on the observation that, essentially, sediment trapped by the channel originates from the nearshore off Westshore anyway or would end up at Westshore as a matter of course. As Mr Reinen-Hamill posited, disposal in the nearshore will initiate wave breaking further offshore, thereby reducing wave action at the shoreline and associated beach erosion. However, this would not be a permanent fix, and ongoing disposal would be required to protect the beach.

Dr Hume further opined that disposal of "fine sand" at Rext would not present a threat to Pānia Reef, at least from the perspective of coastal processes. The reason is that fine sand – which makes up most of the material removed by maintenance dredging – settles to the seabed quickly and would not move seawards to any great degree. Dr Hume conceded that there have not been any specific studies at Westshore to support his opinion, although the Applicant's modelling is indicative of his view.

Dr Hume agreed with the Applicant that disposal at the proposed offshore disposal site would not present a threat to Pānia Reef, at least from the perspective of coastal processes, and that there will also be no significant effects on waves and sediment transport along Marine Parade or at Town Reef.

Dr Hume commented on the notion of disposing of dredgings in deepwater at the edge of the continental shelf, noting that this would represent a loss of sediment from the coastal sediment system, which is undesirable. Best practice from a coastal processes perspective would be to retain the sediments within the system.

Dr Hume concluded by supporting the proposed condition in the s42A report requiring disposal of "suitable" material at Rext.

- **Mr Reinen-Hamill** (additional statement)

Mr Reinen-Hamill presented a summary statement which comprised closing comments after listening to the Applicant's and submitters' evidence and presentations.

By way of confirmation of his own point of view, Mr Reinen-Hamill noted that Dr Single stated and Mr Dallimore illustrated that the existing channel traps sediment that enters from the east and from the west. As for the former, this material is prevented from reaching Westshore. As for the latter, this is material that would otherwise have "oscillated" for longer in the Westshore embayment.

The proposed lengthening and deepening of the channel will increase the channel trapping efficiency in proportion to the increase in area occupied by the dredged channel. Based on a planned doubling of that area, Mr Reinen-Hamill estimated that the channel trapping efficiency would double but noted that it was a "simplistic" estimate and that there had been no detailed technical assessment of the matter.

Mr Reinen-Hamill pointed out that, given that the channel traps sediment that would "either be sediment entering the bay from the seaward side or from the seabed within the bay" and that maintenance dredging is effectively a permanent requirement, then if all material so removed is placed offshore at the applied-for site then this will constitute a "cumulative effect over time … [of]… continual loss of sediment from the nearshore".

Mr Reinen-Hamill noted that he could find no explicit statements within the technical reports by the Applicant that fine sediment that might be placed at Rext can make its way to Pānia Reef. Instead, what is "clearly stated" is that fine sediment from Rext is likely to move eastward towards the Port and channel. Furthermore, when sediment at Rext is in motion, there would be widespread suspended sediment within the bay and he could see no way of attributing any effects only to those sediments from Rext.

Finally, Mr Reinen-Hamill proposed an amendment to Ms Kydd-Smith's proposed amendment of the condition in the s42A report requiring disposal of "suitable material" (derived from maintenance dredging of the channel) at the currently consented inshore disposal site to nourish Westshore Beach. Mr Reinen-Hamill supported Ms Kydd-Smith's proposal, based on Dr

Cowell's evidence, to apply the condition to maintenance and capital dredgings, but suggested a refinement to the sediment size criterion, *viz*. that the "maximum of 10% [of grainsize less than 63 microns]" be replaced with "a maximum of 12% with size less than 63 microns and no more than 5% comprising clays". These dual limits are the "upper limit of all the samples in the outer channel area, and the maximum clay fraction from the seabed area".

- **Dr Hume** (additional statement)

Dr Hume confirmed his view that the channel traps sand from the east and west, and the larger contribution appears to be from the east. Maintenance dredging and placement at Rext equates to "mechanical bypassing" of material that would otherwise have entered the Westshore embayment from the south (Marine Parade). Trapping by the channel, which is long term and cumulative, will be greater after deepening and lengthening. The increased trapping efficiency has not been quantified. Having said that, the "effect of the channel on the nearshore seabed at Westshore is less than the adjustment due to the earthquake".

Nourishment to date has always been carried out with the understanding that it will provide a temporary benefit and that it needs to be ongoing. In Dr Hume's opinion, the Applicant's experts have adopted a different basis for determining whether spoil is suitable for nourishment, *viz*. that it is suitable only if it confers a permanent or at least a long-term benefit.

The vibrocores reported on by the Applicant show that capital dredging from the outer fairway will yield very fine sand and fine sand that is suitable for "like-on-like nourishment of the nearshore". There will be, in Dr Hume's opinion, a large number of benefits of placing suitable material at Rext, including offsetting beach erosion and deflation of the nearshore seabed.

Dr Hume challenged the assertion by the Applicant that fine sediments placed at Rext pose a threat to Pānia Reef, noting that there are not many "transport pathways" revealed by the modelling that connect RExt to Pānia Reef and, in any case, the actual dredging activity will be closer to Pānia Reef and therefore more of a concern.

- **Mr O'Leary** (s42A report)

Mr O'Leary's report was taken as read. He highlighted various matters in the report, which included the summary of approach to recommendations. He recommended a grant of consent subject to further details in regard to the following matters:

- The potential effects on the finfish fishery as a result of the dredged material being disposed of at the proposed offshore disposal site.

- The anomalies in the sediment transport derived from wind-driven currents.

- The intended pathway to mitigate the effects the proposed dredging will have on the sediment supply to eroding Westshore Beach. In his opinion, there is a lack of information on the effect of nearshore disposal on coastal processes and marine ecology.

He noted that the Applicant had an existing consent which allowed for dredged material to be used at Westshore Beach to assist with protection from coastal erosion. Numerous submitters had argued that the dredged material should continue to be deposited at the beach. Mr O'Leary had recommended that the nourishment was best dealt with as a condition of consent.

Mr O'Leary outlined that the Applicant had commissioned a CIA and that Mr O'Reilly, who undertook the assessment, represented the four hapū for which the coastal environment holds significance. He noted that the CIA made two recommendations, these being to use the proposed offshore disposal site to ensure Pānia Reef was protected from additional sedimentation, and that mana whenua hapū be included in the assurance monitoring programme proposed by the Applicant.

Mr O'Leary outlined that the Applicant proposed to progressively modify the shape of the seabed in the vicinity of the Port by undertaking capital dredging over five stages, the potential effects of this having been assessed by coastal experts. He noted that the potential benefit and durability of fine sand placed in the existing nearshore location was the main disagreement between the coastal experts.

He further noted that the Applicant was not proposing to deposit dredged material in the nearshore area by Westshore Beach, but had an existing consent which enabled deposition in certain areas. In his opinion, this would be an appropriate use of a resource.

Mr O'Leary stated that the Project had the potential to have effects on water quality of the sea below the wharf and the other areas to be dredged. He was of the view that there was minimal contaminant risk associated with the proposed dredging and disposal and that any potential effects could be mitigated by the proposed WQMP.

The potential effect on benthic ecology, fisheries and marine mammals was a key consideration in regard to the Project, and Mr O'Leary stated that, in conjunction with the concerns raised by the submitters and the evidence of Dr Kelly, further information was required to determine the significance of disposal impact on benthic ecology before a definitive conclusion could be made on the potential effects in these matters.

Mr O'Leary noted that any potential effects on birds, construction, marine archaeology, access and recreation could be mitigated through conditions of consent. The potential effect on natural character and landscapes would be minimal due to the Port already operating from this location. He was of the opinion that the Project would not generate more than minor long-term or short-term term adverse visual effects on the area.

He was of the opinion that, having regard to the draft conditions of consent, any effects of the Project would be minor or less and consistent with the management framework set out by the New Zealand Coastal Policy Statement. Mr O'Leary was of the view that the Project was consistent with the Hawke's Bay Regional Policy Statement. He stated that the Project was in line with the Hawke's Bay Regional Coastal Plan but was of the opinion that providing for beach nourishment would be consistent with the provisions of the Policy.

## 6.4 APPLICANT'S RIGHT OF REPLY

**Mr Majurey** spoke to his written right of reply and referred to some fundamental first principles of the RMA that he felt needed to be highlighted with respect to some of the assertions made during the hearing. These included that the RMA:

- is not a "no risks" statute, i.e. there are no absolutes in the sustainable management of natural and physical resources;
- is not a "no adverse effects" statute, i.e. the RMA does not prohibit adverse effects on the environment or require that all adverse effects be "internalised";
- does not guarantee the *status quo* – proposals such as this must be assessed under an existing planning framework and not on how some might wish it to be; and
- does not allow for fears and perceptions of an effect to prevail – evidential proof must be provided to support an assertion of an effect.

Mr Majurey noted that there had been no opposition to the proposed new wharf or related coastal occupation. What was in contention are various matters regarding environmental effects that may arise from activities associated with the development and implementation of the Project.

Mr Majurey reiterated a point he underlined in his opening submission and which was supported by a number of other witnesses, that being that the Project would afford significant economic benefits to the region.

In respect of finfish and benthic ecology, Mr Majurey submitted that the Port is not required under the RMA to prove a negative effect. Rather a party can provide probative evidence supporting any assertion of adverse effects, and it is then for the hearing panel to assess the relevant evidence and decide as to weight.

Mr Majurey signalled the Port's support for: a Fisheries Liaison Group; the provision of an up-to-date baseline for assessing the potential impact and ecological recovery of finfish and benthic ecology; and for a Biosecurity Management Plan (BMP) aimed at minimising biosecurity incursion from a dredge vessel. Whilst there was some disagreement between the marine ecological experts over some aspects of a BMP, such as what might or might not be covered by

the Biosecurity Act 1993, there was nonetheless agreement on the need, prior to implementation of the Project, for a survey to update data on sensitive benthic species in the disposal area.

Mr Majurey pointed out that the proposed dredging *per se* is not in dispute; rather, it is the dilemma over inshore versus offshore disposal. The Port's preference for offshore disposal, Mr Majurey contended, is essentially drawn from expert evidence that concludes there is no sediment deficit at Westshore Beach. He argued that, on common ground, the existing channel is part of the existing environment, and that therefore the trapping of sediment by the existing channel is not an effect of the Project. In addition, Mr Majurey relied on the evidence of coastal experts, Dr Williams and Dr Single, that any increase in the size of the channel would have no effect on erosion on Westshore Beach.

Mr Majurey stated that the evidence did not point to inshore disposal as a viable option. Such a condition, requiring the Port to dispose of up to 350,000 cubic metres of dredged spoil every 12 months at Rext, he submitted was exorbitant and "at odds with established coastal engineering guidelines as to suitability of material and risks adverse effects on Pānia Reef".

Mr Majurey reiterated that a key reason for opposing inshore disposal is the cultural and ecological significance that attaches to Pānia Reef as described in the CIA and in expert evidence and lay submissions. He noted that Pānia Reef is variously described as an outstanding natural feature and is listed by Heritage New Zealand Pouhere Taonga as a wāhi tapū, thereby requiring protection.

Mr Majurey concluded that:

- the application was consistent with the relevant statutory instruments and Part 2 provisions;
- the proposal will add to the economic prosperity of the region;
- any potential adverse effects that might arise out of the Project would be avoided, remedied or mitigated;
- granting the consents on conditions sought by Port of Napier was appropriate and in accordance with the purpose of the RMA.

Mr Majurey also provided a confidential right of reply in respect of the Trident report. He concluded based on the evidence of the relevant experts, that the potential effects of the disposal area on the gurnard and flatfish stocks are likely to be minimal at the level of the Baywide fishery, and insignificant when compared to the effects of on-going commercial bottom trawling. He further stated in conclusion that based on the additional statements of Dr Kelly and Mr Snedden relating to the Trident report, any potential effects on fisheries would be localised and temporary and would be no more than minor.

## 7. MAIN FINDINGS

The application, submissions and s42A reports and the evidence presented at the hearing identified a range of effects for consideration.

### 7.1 EXISTING ENVIRONMENT

Section 1.3 of this decision describes the general environment of the Port and surrounding area. We have in addition given consideration of the "existing environment" from a resource management perspective.

It was common ground that the existing dredged channel was considered to be part of the existing environment. However, there were differing opinions on whether Coastal Permit CL970159D, which was granted in 1998 (controlled activity) and which expires in 2033, should be considered as part of the existing environment in our consideration of the application.

Mr Majurey was of the opinion that *Hawthorn*[11] cannot be relied upon as that case had been decided in the context of land use and subdivision consents that run with the land and that result in permanent change. Mr Majurey stated that case law was clear, and that a real world approach was required in determining the scope or nature of the existing environment.

Mr Majurey outlined:

> *"While CL0700159D permits the discharge of up to 350,000 cubic metres per annum, Dr Single confirmed this level of sediment has never been discharged. In fact, the annual discharge average has been 22,260 cubic metres and, of that volume, only 1,100 to 5,600 cubic metres per annum has had the potential to move inshore to Westshore, given the grain size of the sediment. These real world figures are to be preferred to the nominal capacity of the consent.*
>
> *Also disposal under CL970159D is not guaranteed to occur at Area Rext – the permit also authorises disposal at Area 1A (further offshore).*
>
> *Thus, the case law does not support the argument that CL970159D is part of the existing environment. Even if it is, the real world position is that the operation of CL970159D does not provide any meaningful nourishment of Westshore".*

We agree with Mr Majurey that we need to consider case law in the particular circumstances of a case.

[11] Queenstown Lakes District Council v Hawthorn Estates Limited 2006 NZRMA 424 CA.

The Napier City Council through Mr Lawson was of the view that Coastal Permit CL970159D formed part of the existing environment and that we should have regard to that situation.

Mr Conway considered that, under the approach confirmed in *Hawthorn*, the environment includes the existing environment and includes the environment as it might be modified by the implementation of resource consents that had been granted at the time a particular application is considered. He further noted that the existing environment is what is there at present including the results of previous dredging and deposition. Mr Conway outlined that the environment does not include the effects of resource consents that might be made in the future.

We noted that Ms Allan in her evidence-in-chief[12] stated that controlled activities cannot be considered as part of the existing environment. We were not provided with any case law authority for that statement, but our general understanding based on the approach discussed above from *Hawthorn* is that we cannot presume what will happen in a future consent application, or whether any such application might be made.

We have considered the evidence and legal submissions before us. We agree that features such as the existing channel can be considered as part of the existing environment. The channel physically exists and, apart from providing a navigation channel for vessels, it also traps sediment.

We are of the view that it is appropriate to consider Coastal Permit CL970159D as part of the existing environment, in so far as the permit exists, but noting it will expire in 2033 and we cannot assume that it will be part of the environment beyond its expiry.

We also note that, while we consider Coastal Permit CL970159D to be part of the existing environment while it is in place, that consent relates to the deposition of dredged material associated with current consents held by the Applicant. It is not part of the current applications for which consent is sought.

## 7.2 EFFECTS ON MĀORI CULTURAL VALUES

In achieving the purpose of the RMA, the protection of the relationship Māori and their culture and traditions have with their ancestral lands, water sites, wāhi tapū, and other taonga is a matter of national importance that shall be recognised and provided for. We note, and applaud, the fact that the Applicant has recognised the need to provide for these matters and has attempted to address them at every opportunity in the development of this proposal.

[12] Para 40 Allan evidence-in-chief.

We learnt from the s42A report that the Port's consultation with mana whenua hapū was thorough, which included meetings – in some cases spread over 12 months or so – with:

- Waiōhiki Marae Trustees;
- Ngāti Pārau Trustees;
- Maungaharuru–Tangitū Trustees;
- Maungaharuru–Tangitū Trust General Manager, Shayne Walker;
- Mana Ahuriri Komiti members;
- Ngāti Kahungunu Iwi Incorporated Board members; and
- then Ngāti Kahungunu Iwi Incorporated Chief Executive, Dr Adele Whyte.

The s42A report also informed us that hard copies of the notified application were sent to thirteen Māori organisations or their representatives, including those listed above. As expected, most are Hawke's Bay based, the two glaring exceptions being the New Zealand Māori Council and an addressee claiming to be representative "of all Māori". The point is that the Port has engaged comprehensively with Māori, arguably more so than might be expected.

We acknowledge that the coastal environment is very important to Ngāti Kahungunu, so that developments like the building of a new wharf as proposed by the Applicant is of more than just passing interest to local Māori. Iwi/hapū values are a crucial part of how Māori view proposals such as this.

The particular values at issue here are those espoused by mana whenua entities of the Ahuriri locale: Ngāti Pārau, Mana Ahuriri, Te Taiwhenua o Te Whanganui ā Orotū and the Maungaharuru–Tangitū Trust. These values are comprehensively described in the CIA commissioned by the Applicant and prepared on behalf of these hapū by one of their own, Laurie O'Reilly, and are the basis on which the s42A report on the effects on cultural values in large part rely. We have no issue with how the s42A report deals with this.

Key among the concerns for mana whenua hapū are the potential impacts, real or otherwise, that the proposed construction and dredging may have on the mauri (life principle) and natural resources of the rohe (area), in particular on Pānia Reef – a site of some considerable significance for mana whenua. Not surprisingly, therefore, concern for the long-term good health of Pānia Reef is central to the overall Māori response to the proposal. Also, not surprisingly, any suggestions for "dumping" dredgings further out to sea away from Pānia Reef were readily supported by mana whenua hapū.

The objectives of the CIA are instructive, and worth repeating here. They are to:

- document the cultural significance of the area within which the proposed project activities will occur, namely construction of a new berth and associated dredging and

disposal activities in the coastal marine area, and in the vicinity of Pānia Reef, including specific cultural values that may be affected;
- identify the potential effects (both favourable and adverse) on cultural values of the proposed activities;
- assist Napier Port to gain an improved understanding of the cultural values associated with the environment within which the proposed activities will be undertaken, and which may be affected by the activities; and
- identify appropriate measures to avoid, remedy or mitigate, where practical, any potential adverse effects of the proposed activities on cultural values.

In summary the CIA:

- supports the proposal, especially shifting the disposal site for dredge spoil from the current consented Westshore disposal area to the proposed offshore disposal area; and
- confirms that mana whenua hapū are committed to working with Port of Napier to ensure a healthy marine coastal environment for the Ahuriri port area, including direct participant in any Assurance Monitoring Programme.

Ngāti Pārau has gone further in recommending the inclusion of a separate Marine Cultural Health Programme (MCHP), as detailed in proposed conditions. This would be in addition to, but in conjunction with, the Assurance Monitoring Programme or any other such programme. Its main purpose will be to assist the consent holder to assess and monitor the cultural health of the Ahuriri marine environment, in particular Pānia Reef. The details of how, and with what mechanisms, this might be achieved have still to be finalised.

We support this recommendation.

By way of footnote, we note that Ngāti Pārau is the mana whenua hapū for the Napier City rohe, which includes the Port, because they have the strongest whakapapa (genealogical) links to Pānia and her son Moremore; legitimate overlapping rights of other Ahuriri hapū notwithstanding. This is reflected in the commissioning of a Ngāti Pārau member, Laurie O'Reilly, to prepare the CIA, and also by the fact that only one mana whenua representative presented during the hearing – Chad Tareha of Ngāti Pārau. In doing so, Mr Tareha confirmed the desire of Ngāti Pārau to be fully informed on any further developments on the proposal and to be an active and meaningful participant in those developments.

We are mindful of the efforts that the Port has made to address the concerns of mana whenua hapū, especially the commitment to ongoing engagement with these hapū and in concern for the health of the coastal marine environment in which the important ancestor Pānia is

immortalised. For that reason, we are satisfied that effects on Māori cultural values are adequately addressed.

## 7.3 EFFECTS ON COASTAL PROCESSES

- **Reliability and Adequacy of the Coastal Modelling**

Several issues were raised regarding the reliability and adequacy of the coastal modelling conducted by Dr Williams and Mr Adamantidis. It is important that the modelling be evaluated, as the modelling results largely underpin the Applicant's assessment of potential environmental effects.

Mr Dunningham, Mr Karn, LegaSea Hawke's Bay, Mr Paul and Mr Popplewell argued that westerly winds were over-represented in the model simulations and, when they do occur, strong westerly winds do not blow for "hours on end". Dr Williams responded in his evidence-in-chief by showing that analysis of 10 years of wind data from the Port reveals that W and NW winds occur for at least 23% and 10% of the time, respectively, and that strong winds from these directions can be sustained for many hours.

In this matter, we prefer to rely on the data, and we therefore accept the Applicant's characterisation of westerly winds used in the modelling.

Mr Paul, Mr Duncan, Mr Popplewell, LegaSea Hawke's Bay and the NZ Angling and Casting Association argued that the current modelling is based on data measured (by an Acoustic Doppler Current Profiler, or ADCP) at a site that is west of the channel and southwest of Pānia Reef, and therefore the data was not a true reflection of current flows across the reef. In response, Mr Adamantidis explained that the focus of the model was not to schematise currents on Pānia Reef itself. Instead, the aim of the model was to characterise the broader-scale current patterns, not the detailed flow at any particular place, including Pānia Reef, with a view to assessing the potential for currents to carry sediments from the dredge site and from the proposed offshore disposal site towards and across Pānia Reef.

We accept Mr Adamantidis' explanation.

Mr Karn challenged the FLOW model validation in three respects: (1) difficulty in reading the validation plots; (2) some periods when the match between measurement and prediction does not look too good; and (3) insufficient range of representative wind directions used. We understand that model validation is not an exact procedure, and there are no particular hard-and-fast rules dividing a "good" from a "bad" validation. Although we agree with Mr Karn's points in substance but not necessarily degree, we prefer to rely on the opinion expressed by the coastal experts in their Joint Witness Statement that the FLOW model was "accurately

calibrated" with "correct wind speed information". Taking a larger view, it is also significant that the experts all agreed that the modelling and results fit observations from past studies.

We find that, although there is some merit in Mr Karn's concerns, they are not sufficient for us to discount or ignore the model predictions.

A key observation presented by the Applicant, and backed by the hydrodynamic modelling, was that there is a persistent anticyclonic gyre NW of the Port breakwater, which drives a persistent current directed to the south and east out of Westshore embayment. The current is predicted to carry very fine sand and smaller that is suspended from the seabed by waves, towards the Port and beyond to Pānia Reef, where it might cause adverse effects. At the same time, a prevailing south-directed current takes material from the proposed offshore disposal site in a direction away from Pānia Reef, thus reducing the chance that sediments from that site will intersect Pānia Reef. These are significant findings, as the Applicant wanted to avoid effects on Pānia Reef, which justified their choice of an offshore site for disposal of dredged material, and why the Applicant challenged the s42A recommendation for a condition requiring disposal of suitable material at the currently-consented inshore site. Many submitters claimed that these persistent currents directed in these ways did not, in their respective experiences on the sea, exist. These included LegaSea Hawke's Bay, Mr Duncan and Mr Paul (most common current over the reefs sets to the N or NE), and the NZ Angling and Casting Association (currents swirl and in most cases flow back in the NW direction towards Pānia Reef and Town Reef).

This is a difficult issue. We understand that currents in the nearshore can be quite variable spatially, with depth and with time. Not to discount the observations of locals, but this does mean that a systematic approach is required to accurately characterise current patterns, which oceanographers do by measuring currents over long periods of time, at different depths in the water column, under different conditions, and at different locations. The Applicant had undertaken this, and their measurements confirmed prevailing currents as described. For example, Mr Adamantidis, in his evidence-in-chief, noted that their data at the proposed offshore disposal site now extends from 8 December 2016 to 18 September 2017, and the current roses constructed from this data clearly show prevailing currents to the south, away from Pānia Reef (Figure 8 in Mr Adamantidis' evidence-in-chief). Likewise, Fig 3-8 in Appendix D of the AEE shows currents over at least the medium term (May and August 2016) directed to the east and south at Beacons and Channel Approaches, both of these sites being within the Westshore embayment. These are referred to as "clear predominant flows" in Appendix D. Dr Williams showed in his evidence-in-chief recent data from Rext (September to November 2017, and April to June 2018) that further confirmed that, although the current direction is variable, as would be expected "in an environment with variable wind, waves and currents", there is a "net southeast current". Furthermore, this has been correctly captured in the sediment-transport modelling.

Although we appreciate that the local experience may be different at times and in places, we nevertheless accept the systematic data collected by the Applicant at several locations and over reasonable periods of time, which demonstrate prevailing (not exclusively and not always) currents as described above.

Mr Loughlin, drawing from his many years of experience as a waterman (including surfing and kite surfing) at Westshore, noted that the southern extremity of the Westshore embayment is in a very noticeable offshore-wind shadow, with the wind being light and patchy, even when the offshore-directed winds in the surrounding areas are quite strong. This led Mr Loughlin to doubt the model predictions of wind-driven currents and associated sediment transport, particularly under offshore-directed winds, since winds appear to have been imposed uniformly over the model grid in the various model simulations. We expect that Mr Loughlin is quite right about this, given his extensive experience on and in the water at Westshore, and that the result would be that currents are weaker, and sediment accordingly would tend to accumulate in this part of Westshore more than the model predictions suggest.

We find that the model predictions of currents and associated sediment transport in the southern extremity of Westshore have an extra level of uncertainty, and there may be a greater-than-expected tendency for dredged material disposed of at Rext to remain within the nearshore and beach system at Westshore.

A related issue is that tidal flows emanating from Ahuriri Inlet were not included in the modelling, which may further degrade the reliability of the model predictions of currents and associated sediment transport in the southern extremity of the Westshore embayment (Mr Karn, Mauri Protection Agency, Dr Cowell). Mr Adamantidis countered this issue by arguing that tidal currents emanating from Ahuriri are low because they are driven by only a relatively small tidal prism, that he was able to achieve good calibration of the models without considering these tidal currents, and that ongoing data collection indicates currents are “overwhelmingly wind-driven in this area”. Nonetheless, this exclusion in the modelling does strengthen our view, stated in the previous paragraph, that the modelling is more uncertain and likely to be missing key features in the southern extremity of Westshore than it is in other parts (e.g., in the vicinity of the proposed offshore disposal site).

However, this does not cause us to significantly doubt the broader results and implications of the modelling, including the conceptual model of sediment-transport patterns given in Figure 8-7 of Appendix D of the AEE, which drew on more than just modelling results, and which underpinned many of the Applicant’s arguments and assessments.

Figs 5-5 to 5-8 in Appendix F of the AEE generated a lot of discussion and criticism. Figs 5-5 to 5-7 show “total-load transport patterns” for: 100-micron sediment (very fine sand) under a storm wave superimposed on each of 6 wind directions; 125-micron sediment (boundary

between very fine sand and fine sand) under a storm wave superimposed on each of 6 wind directions; and 200-micron sediment (medium sand) under a storm wave superimposed on each of 6 wind directions. Figure 5-8 shows “mean annual” (or “annual average”) “total-load transport patterns” for 100-micron, 125-micron, 200-micron, 300-micron and 500-micron sediments. These figures are important, because they encapsulate and underpin much of the Applicant’s understanding of sediment transport and provide at least part of their justification for seeking consent to dispose of material offshore as well as their objection to a condition to dispose of material at the currently consented inshore disposal site.

The discussion around these figures was complicated by an error in the wind speeds used in the modelling that was noted by Mr Karn and some real confusion – by experts and lay submitters alike – around how the models were used to create these figures and what they mean.

Mr Karn took issue with the definition of the “energetic wind speeds” used in the model simulations, interpreting Figs 5-5 to 5-8 as representing winds so extreme that they have never been observed. Therefore, in Mr Karn’s view, the results are fiction, and it is “nonsense” to use these results to examine sediment movement around Westshore, when currents around Westshore are variable and probably more influenced by the “Ahuriri jet”. (Furthermore, Mr Karn asserted, these unrealistic energetic winds were chosen deliberately to show that disposal at Westshore would pose a threat to Pānia Reef, and disposal at the offshore site would not. We have no reason whatsoever to believe this assertion by Mr Karn.) Mr Pilkington interpreted these figures as showing that “reverse sand transport” (by which he meant transport offshore to the south and east, towards the Port and Pānia Reef) applies for only less than 24 hours per year and then only under certain wind directions, and appear to indicate that the risk of contamination of the reef from disposal of material at Westshore is “very slight”.

To sum this up, we understand that Mr Karn, Mr Pilkington and others throughout the hearing interpreted these figures as showing “snapshots” of transport patterns under certain wind conditions, which either have never occurred or only occur very rarely, and which seems like a highly biased and even nonsensical way to approach the analysis.

Our understanding of Figs 5-5 to 5-7, derived from Appendix F and from Dr Williams’ evidence and questioning of Dr Williams, is that they show patterns of sediment transport corresponding to a different “energetic” wind speed for each wind direction with one particular storm wave (combination of wave height and period) superimposed. The figures show vectors that represent sediment transport, with the length of each arrow proportional to the magnitude of the transport at each point and each arrow pointing in the direction of transport. No scale for the arrows is given; hence, absolute transport magnitudes cannot (and should not) be inferred from the figures, but relative magnitudes (across winds, and across different locations under the one wind) can. By assuming that the patterns of transport will be invariant by wind

direction, the patterns of transport shown in Figs 5-5 to 5-7 can be scaled by the percentage of time each wind direction occurs during the year to come up with "annual-average" transport patterns, which are shown in Fig 5-8 (which does not depict absolute transport magnitudes). We understand and accept that "tricks" (we do not mean that in any pejorative sense but cannot think of a better word) like this are necessary when trying to estimate broad-scale and long-term average patterns of sediment transport, as it simply is not feasible to apply direct calculation. In any case, somewhat more "idealised" or "simplified" patterns that are estimated by applying "tricks" are often easier to read and more instructive.

Fundamentally, it does not matter very much which wind speed was used to produce the patterns in Figs 5-5 to 5-7 since these, in effect, are simply "seeds" for creating Fig 5-8. Dr Williams explained that there is a practical reason for using energetic winds in this way, which is that the models "spin up" faster in that case.

We conclude that it is appropriate to make comparative statements and to study large-scale transport patterns using Figs 5-5 to 5-7 and, especially, Fig 5-8. The experts for the Applicant do restrict their comments in this way, for instance, in Section 5.3 of Appendix F of the AEE, on the persistent anticyclonic circulation of sediments finer than 125 microns west of the Port and navigation channel. Dr Williams pointed out that this feature is consistent with current-meter measurements in that same region, and that the patterns shown in Fig 5-8 are also consistent with the "analytical assessment of sediment transport" calculated from actual data at Beacons and Channel Approaches (both west of the Port in the Westshore embayment) and at the proposed offshore disposal site.

We acknowledge the concerns that submitters had with these figures but accept that they were produced using appropriate methods and that the Applicant has used the figures appropriately and with sufficient qualifications.

Mr Reinen-Hamill noted that there appeared to be some anomalies in the sediment transport predicted to occur under strong westerly winds, with transport being directed westwards, that is, against the wind. The s42A report raised this matter as a specific concern that needed to be resolved to ensure confidence in the modelling. The Applicant addressed this matter, to Mr Reinen-Hamill's satisfaction, in the "Response to Further Information Request for Question 2c of Joint Witness Statement" (no date). In essence, it was explained that the model is faithfully depicting a type of coastal upwelling, which causes coastal-ocean currents to be spatially complex and variable with depth in the water column.

We consider this issue to be resolved.

Ngaio Tiuka, Mr Paul and Mr Duncan questioned the representativeness of the "stormy period" of July 2016 used by the Applicant to drive the plume modelling. This refers to the results

resented in Figs 26 to 31 (plume dispersal during dredging Campaign 1) and Figs 32 to 37 (plume dispersal during dredging Campaign 5) in Appendix E of the AEE. In each case, two plumes were modelled: one associated with the digging and loading of material and another associated with disposal of the dredged material on the seabed at the proposed offshore disposal site. The potential effects of both plumes on Pānia Reef, in particular, were assessed.

In Appendix E, the representativeness of the "relatively stormy period" measured in July was assessed against a measured 10-year wind dataset. Mr Adamantidis, in his evidence-in-chief, argued that the period included "major wind events" when compared to wind data measured between 2005 and 2015, and that included strong W winds and a range of other wind directions, including SE, which has the highest potential to impact Pānia Reef. Mr Adamantidis argued that, since stormy weather results in larger, more widespread plumes, the modelling represents "worst case" in relation to potential plume impact on Pānia Reef.

We accept Mr Adamantidis' assessment that it is appropriate to weight the analysis of the plume towards stormy conditions, which represent worst-case conditions, and that a range of wind directions had been assessed, including the direction most likely to result in impacts on Pānia Reef.

Many submitters (LegaSea Hawke's Bay, Mr Paul, Mr Duncan, NZ Angling and Casting Association, Mr Popplewell, Ngaio Tiuka) took issue with the modelling of the post-disposal fate of dredged material placed at the applied-for offshore disposal site, arguing that the period 9 December 2016 to 16 January2017 is insufficiently short and not representative of the true range of conditions.

This refers to modelling reported in Appendix F of the AEE (post-disposal fate of sediment disposed of at the offshore disposal site), specifically, the section on sand transport at the offshore site, which was calculated from currents measured at the site between 9 December 2016 and 16 January 2017. Section 4.3 of Appendix F of the AEE explains how the calculations were done. Suffice it to say that the calculations are not actually for the period 9 December to 16 January. Rather, the calculations are "statistically scaled" from that period to yield the "expected magnitude and direction of transport over the course of the year". Still, Appendix F explains that "it is an inherent assumption of [this] approach that the [measured] current data … over a period of weeks and months is representative of that expected to occur over the course of a year".

The measured current rose for the period 9 December to 16 January is shown in Fig 6-2, which shows prevailing currents to the south and east, away from Pānia Reef. This concurs with the general pattern of currents in the region, which we have discussed above, *viz*. data from several locations and over several different periods, including new data since the AEE was prepared (Mr Adamantidis' evidence-in-chief, paragraphs 62–64), all seem to confirm a persistent (not

permanent) current associated with an anticyclonic gyre directed to the south and east out of Westshore embayment, and a persistent south-directed current from the offshore disposal site, away from Pānia Reef. The analytical estimates of sand transport calculated from the 9 December to 16 January measured currents are shown in Fig 6-3, which shows bedload and suspended-load transport accordingly directed to the south and east. The author of Appendix F acknowledges that "it is possible that the relative contribution of northerly versus southerly currents may change as more data is collected".

We agree that the period of data used to drive these calculations seems short and, as far as we have been able to determine, the representativeness of the data has not been explicitly assessed by the Applicant in detail. This does reduce our confidence in this particular set of predictions. However, we also note that the predictions of sand transport do seem to be consistent with the larger pattern of sediment transport described and analysed by the Applicant, and the results do not stand out in any significant or surprising way from that.

Ngaio Tiuka took issue with the duration of the simulation time (29 days) applied in the plume modelling in Appendix E of the AEE.

Appendix E described the results of detailed dredge plume modelling, including plume spatial extent and dispersion. Two plumes arise from the actual dredging activities, one associated with the digging and loading of material and another associated with disposal of the dredged material on the seabed at the proposed offshore disposal site. The potential effects of both plumes on Pānia Reef, in particular, were assessed. In his evidence-in-chief, Mr Adamantidis stated that he considered the one-month simulation time to be appropriate for two reasons (paragraph 76): firstly, the "maximum effect of sedimentation during dredging and disposal is captured by the one-month scenario which combines the effects of the TSHD with the backhoe dredging" and, secondly, "the one-month simulation time captures the effects of a full monthly neap and spring cycle".

We accept Mr Adamantidis' explanation and opinion that the 29-day simulation modelling used in the dredge plume modelling in Appendix E was appropriate.

Many submitters had less specific criticisms of the modelling but essentially outlining that they simply had no faith in it.

Although there is no doubt that there are over-simplifications and deficiencies in the models themselves and the different ways they were run, including boundary conditions (incoming waves, winds, flows from Ahuriri) and the length of time simulated, the coastal experts did all agree in their Joint Witness Statement that the models were sound and properly calibrated. Furthermore, there was broad agreement that the limitations of the models have been declared, and results interpreted accordingly. We find it significant that Dr Cowell, Dr Williams

and Mr Adamantidis all agreed that it is correct to look at the model results as indicative and heuristic, and that the model results are often held up against other types of information (e.g., sedimentology, channel dredging maintenance volumes) to check for consistency.

In our opinion, the Applicant has engaged in good modelling practice and the results of the modelling can be treated as being trustworthy.

- **Westshore Beach Erosion**

All parties agreed that there is erosion at Westshore Beach, and most also agreed that this is accompanied by "deflation" (lowering) of the subtidal seabed in the nearshore region off Westshore. Dr Cowell explained, in his evidence-in-chief, how, in fact, these two are inextricably linked.

Although there were a few differing opinions on the precise details, and how much this is an ongoing cause of erosion, there was a unanimous consensus amongst the coastal experts that the principal cause of beach erosion at Westshore is the coastal uplift that occurred during the 1931 earthquake. This resulted in displacement seawards of the shoreline, placing it in a state of "disequilibrium", which is being corrected by erosion by waves and currents of sediments from both the subtidal nearshore seabed and the subaerial beach. A very interesting point made by Dr Cowell was that the programme of beach nourishment initiated at Westshore in the 1980s has perpetuated the post-uplift misalignment of the shoreline. We note that this accords with our understanding that the issue here, is not one of a sediment deficit but is an issue of an *excess* of sediment; this would seem to be a genuine case of humans trying to hold a line against nature[13].

Disagreeing with the experts, Mr Pilkington "strongly rejected" the uplift theory, pointing out that not only were there erosion issues before the 1931 earthquake but there were also 40 to 50 years post-uplift when the beach steadily built up. This build up is not in dispute – Dr Cowell also described this, and we remarked previously that it seemed curious.

Dr Cowell noted that the training of the Ahuriri Harbour by the moles built in the late 1870s added to the excess of sediment in the nearshore and on the beach, and so was considered to be (and possibly still is) another cause of beach erosion. In the same vein, the artificial nourishment of the beach with gravel (about 15,000 cubic metres per year landward of MHWS since 1987) is seen as adding to the sediment excess and therefore being a further cause of erosion.

[13] Dr Cowell talked about a "negative sediment accommodation space", which means trying to stuff too much sediment into the one place, with the result that some has to be moved out. In essence, Westshore is that box, and it is overfilled with sediment, which is progressively corrected by waves and currents removing sediment from the box.

Mrs Pilkington noted that she had found, in her reading of accounts of Napier's history, that the first complaints about erosion at Westshore go back to 1891, which is hard on the heels of the birth of the breakwater in 1887. Consultants at the time definitively linked the two, insofar as the breakwater was considered to interrupt the supply of sediment to Westshore from the south, which most experts today agree is also a factor in the erosion at Westshore. Mr Pilkington argued that a major cause of beach erosion appears to be blockage of otherwise-replenishing sand from the south by the breakwater and pointed to a "huge" (1.5 million cubic metres) accumulation of sand up against the seaward-facing side of the breakwater as evidence of this. Presumably, in the absence of the breakwater, this sand would have made its way, over time, into Westshore embayment. Dr Cowell was quite forthright in his conclusion on this matter, saying that "I find it inconceivable that sand is not bypassed from south to north around the Bluff"[14].

Mr Pilkington argued that the dredged channel also interrupts supply of sand from the south. All of the experts held the same view as Mr Pilkington, as did other submitters (M Richards, Mr Abel). Most of the experts agreed that the dredged channel and inner harbour also trap sand that originates from the nearshore between Westshore and the channel. This is sediment that otherwise may have stayed in the Westshore nearshore and beach system. Mr Dallimore provided a very useful set of information, including technical and scientific reports, that confirmed his view that the shipping channel was and is a "significant cause for erosion at Westshore", and asserted that problems began with the regular deepening of the shipping channel from 1973, which interrupts the natural replenishment of the Bayview littoral cell with sand.

The exception amongst the experts was Dr Single, who argued with a significant conclusion of Dr Cowell's, *viz*. that sand moves from the nearshore at Westshore to be trapped in the navigation channel, and therefore an "effect of the channel is erosion of the seabed at Westshore". Dr Single argued that this conclusion of cause-and-effect is incorrect, since lowering of the seabed at Westshore is an "ongoing adjustment of the area towards an equilibrium state". Furthermore, the deflation of the nearshore would still occur even if the channel were not there. In our view, that may well be the case, but the channel *is* there, and the views of the other experts, that channel trapping of sediment exacerbates beach erosion, seem reasonable. Mr Abel summed this up rather well, in pointing out that if neither the Ahuriri training walls had been built nor the 1931 earthquake happened, then the breakwater and the "Road" (channel) would still have caused erosion at Westshore. We agree with this view.

Some of these factors may be a little puzzling. For instance, uplift, training of Ahuriri and gravel nourishment *add* sediment to the system, and breakwater and channel trapping *remove* sediment from the system, yet all are variously credited with "causing erosion". It is our

[14] Dr Cowell also noted, based on technical reports on the matter, that erosion at Westshore is also probably *mitigated* to some extent by wave sheltering by the Port breakwater.

understanding that processes that *add* sediment to the system can be thought of as providing the conditions necessary for the erosion to occur, and processes that *remove* sand from the system do just that.

We find, based on the agreement by the experts, that the ongoing adjustment to the uplift that accompanied the 1931 earthquake has been primarily responsible for providing the conditions necessary for erosion to have occurred and to continue to occur. Similarly, but less significant, are the collapse of the ebb-tide delta at Ahuriri when training walls were built, which added to the excess of sediment off Westshore, and the gravel nourishment programme since the late 1980s, which continues to add to the excess sediment in the beach system. Trapping of sand from the west by the channel and by the breakwater, which prevents sand from the south reaching the Westshore embayment, and trapping of sand from the east by the channel, which removes sand from the Westshore embayment, have caused and continue to cause removal of sand from the system.

- **Impact of Larger Channel on Westshore Beach Erosion**

The coastal experts all agreed in their Joint Witness Statement that there will be an "increased (unquantified but likely to be small) loss of fine sands from the Westshore nearshore system due to the increased trapping efficiency of the larger channel". The mechanism for this increased trapping efficiency is clear: as both Dr Williams and Dr Hume described, a deeper channel will "still" the wave activity at the bed of the deeper channel, which otherwise would keep sediments suspended in the water column, and the currents in the wider and deeper channel will be smaller, thus reducing their ability to flush the channel of suspended sediments. However, the experts also agreed that this increase is "likely to be a subordinate factor with regard to the sediment deficit and the disequilibrium at Westshore compared with: (1) the seabed adjustment in response to the 1931 uplift, and (2) the gravel nourishment programme".

Dr Reinen-Hamill was the only expert willing or able to offer a further opinion on the *extent* of the expected increase in trapping efficiency. Based on a planned doubling of the area occupied by the channel, Mr Reinen-Hamill estimated that the channel trapping efficiency would double but noted that this was a "simplistic" estimate and that there has been no detailed technical assessment of this matter. Mr Reinen-Hamill also pointed out that, given that the channel traps sediment that would "either be sediment entering the bay from the seaward side or from the seabed within the bay" and that maintenance dredging is effectively a permanent requirement, then if all material so removed is placed offshore at the applied-for site then this will constitute a "cumulative effect over time … [of]… continual loss of sediment from the nearshore". Dr Hume also made this point.

With no technical assessment of this issue, and notwithstanding Dr Reinen-Hamill's "simplistic estimate", we are bound to agree with the coastal experts that dredging of the channel will

increase its trapping efficiency. However, this increase will be small, and the increased loss of sediment due to the increased trapping efficiency will have only a small effect on beach erosion at Westshore.

- **Benefit to Westshore Beach – Inshore Disposal**

Opinion on whether disposal of dredged material at the inshore disposal site has been to date and would be in the future beneficial to Westshore Beach in terms of reducing beach erosion was sharply divided.

While the Applicant argued that the material to be dredged will, according to widely accepted engineering guidelines, be too fine to be used for beach nourishment, many submitters argued that inshore disposal of maintenance dredgings to date has been successful, and they therefore support the proposed condition (Mr Karn, Mr Pilkington, Mr Dunningham, Denis and Diane Cadwallader, Westshore Residents and Development Association, Mrs Pilkington, Mr Hart, Mr Ship, Mr Loughlin, Ms Hart, Brian and Christine Underwood, Napier City Council, Mr Morris, Mr Dallimore). The experts were somewhat divided on the matter.

Dr Cowell noted that spoil disposal at RExt seems to have "temporarily ameliorated" the erosion at Westshore, concluding that placement of fine sand in the nearshore does provide a benefit to beach stability at intertidal elevations and above. This is consistent with scientific knowledge of the way the beach face and the nearshore are coupled. Placement of sediment in the nearshore to nourish and protect the intertidal beach is, in fact, "commonplace throughout the world". The benefits will persist only for as long as the sediment remains in place.

Dr Hume described how raising the nearshore seabed (by placement of dredged material) initiates wave breaking further offshore, resulting in less wave energy attacking the beach and causing erosion. He noted a number of benefits that would accrue: offset deflation of the seabed, offset erosion of the beach, offset effects of channel trapping of sediment, maintain existing situation, beneficial and efficient use of dredgings, retain sand within the coastal system. Dr Hume also pointed out that it has always been recognised that nourishment would need to be ongoing, given that the system is still adjusting to the disequilibrium following uplift.

Mr Reinen-Hamill concluded, following his analysis of beach-profile data collected by NCC and HBRC, that he is confident that ongoing disposal of fine sandy material would continue to provide a temporary benefit to the beach. As for the benefit being "temporary", Mr Reinen-Hamill noted that survey data showed that material placed at Rext can remain in place (where it is helping to protect Westshore Beach from wave attack) for a "reasonable time period", given that maintenance dredging appears to occur every 2–3 years.

Mr Karn, Mr Pilkington and Mr Dallimore between them provided photographs and beach-profile and bathymetric data that showed that material placed at RExt, particularly most recently during October 2017, had raised the seabed in the nearshore region just offshore from Westshore Beach, which has been accompanied by growth of the beach and seaward progradation of the shoreline in front of the surf club.

Dr Williams did not dispute that the October 2017 campaign that included disposal at RExt had benefited Westshore, however he did provide context for that benefit. His analysis of data showed that the measured accretion along the beach could be due to natural seasonal variation in beach alignment and/or a long run of fine weather since the placement, noting that "not much wave energy has yet been available to move sediment from where it was deposited during the 2017 maintenance campaign".

All parties agreed that any benefit accruing from inshore disposal will be temporary. This raises the question of just how long "temporary" is.

Dr Williams provided a detailed analysis of this matter based on an accepted engineering method for assessing the suitability of dredged material for beach nourishment. The most important characteristic of the borrow material is its grain size relative to the grainsize of the "native" material, with the requirement being that the borrow material must be at least as coarse as the native material. It is also unacceptable if the clay and silt content of the borrow material exceeds a certain limit. The longevity of the nourishment – how long the material will stay in place – can be inferred from the compatibility of the borrow material with the native material and the prevailing hydrodynamic conditions. Dr Williams applied the method to assess the suitability for beach nourishment of disposing of sand to be dredged during the various campaigns at Rext. For this analysis, two bed sediment samples from Rext, GS3 and GS4, were used to characterise the nearshore bed-sediment grainsize, against which the material to be dredged was compared. Dr Williams concluded that the fill loss cannot be reliably predicted but will "probably be large over the long term". This, Dr Williams, concluded, clearly showed that the sand to be dredged is finer than native and would not remain in place "for long". Dr Single agreed with this assessment, noting that placing dredged material at Rext risks sediment being transported back to the shipping channel, fines going to the beach, Rangātira Reef and as far as Pānia Reef, and possibly sediment being deposited inside Ahuriri estuary.

It seems clear to us, from the principles of beach dynamics explained by Dr Cowell, the fact that nearshore spoil disposal to nourish the intertidal beach is common practice around the world, and the Westshore photographic, bathymetric and survey evidence – that disposal of dredged material at Rext can benefit Westshore Beach by providing protection from wave attack and offsetting sediment losses by a range of processes. What is really at issue is whether the material will remain in the system for long enough to be deemed to be "beneficial". On the one hand, it is reasonable to expect some durability; on the other hand, protection of the shoreline

during even during just a single big storm before the spoil is lost from the system might be deemed to be a worthwhile benefit.

The general commitment to ongoing nourishment (as evidenced by the ongoing programme of gravel nourishment of the subaerial beach since the late 1980s) to protect Westshore signifies to us that there is acknowledgment that benefits will be temporary. Inshore disposal, which likewise will provide temporary benefits, is therefore consistent with the established approach.

We acknowledge therefore that, although temporary, there will be benefits to Westshore Beach from disposal of dredged material at the currently consented inshore disposal site.

- **Adverse Effects – Inshore Disposal**

Although benefits to Westshore Beach may accrue, there may also be potential adverse effects associated with inshore disposal of dredged material.

The Applicant's position on this is clear: their modelling shows that there is a potential for fine sediments to be transported by the prevailing currents to the southeast from the currently consented inshore disposal site (see, for example, Figs 5-3 to 5-8 in Appendix F of the AEE), where they may cross Pānia Reef and cause adverse ecological effects. Furthermore, the shallow depth at RExt will allow for frequent remobilisation by wave activity of the bed sediments (Fig 5-1 of Appendix F), which then are available to be transported by the currents. These equate, in the Applicant's view, to unacceptable and avoidable risk to Pānia Reef, in particular.

The coastal experts in their Joint Witness Statement all agreed that placement of "fine sand" at Rext is unlikely to have an effect on the Pānia Reef Significant Conservation Area. The experts also agreed that placement of material with significant fines is not desirable due to potential adverse effects, which they did not quantify.

Dr Cowell listed three possible issues: inundation by sediment of Pānia Reef, degradation of surf quality, and increased sedimentation in Ahuriri estuary. None of these risks has been quantified (even though disposal already occurs in the inshore), but Dr Cowell's view is that the risk posed by inshore placement of fine sand is significantly less than might be concluded from the modelling because the modelling, in his view, underestimates the wave transport of fine sands.

Dr Hume agreed that no specific studies have been done to determine in any detail the fate of fine sand placed at Rext, particularly whether it has the potential to cross Pānia Reef. However, he conceded during questioning that we do have a reasonable understanding of sediment-transport pathways from the Applicant's modelling and he said that, with reasonable

confidence, only a small load of fines could make their way to Pānia Reef. Furthermore, Figs 5-5 to 5-8 in Appendix F of the AEE do not show many transport vectors "connecting" Rext to Pānia Reef, and disposal of material at Rext will continue the like-on-like disposal that has been undertaken under Coastal Permit CL970159D, for which there has been no measured impact to date.

Mr Reinen-Hamill supported Dr Hume's and Dr Cowell's assessments, but also noted that he could find no explicit statements to support the Applicant's view on this matter, and that disposing of sediment in the nearshore has not been investigated in detail as part of the application.

The coastal experts qualified their views by saying that they were from the perspective of coastal (physical) processes; Dr Kelly opined that additional data are required to make an *ecological* assessment of inshore disposal.

Mrs Pilkington opined that conclusions based on "anecdotal reports" and "vague statements" do not constitute a negative effect.

We agree with the Applicant that their current measurements and modelling show that there is a potential risk to Pānia Reef posed by inshore disposal of fine sediments. Furthermore, this and other potential effects as noted by Dr Cowell had not been assessed in a "modern and comprehensive manner" (to use Mr Majurey's words). Perhaps most significantly, we note that the coastal experts (rightly) have declined to offer an opinion on possible ecological effects, and we agree with Dr Kelly that additional data was required to make an ecological assessment of inshore disposal.

- **Reducing Risk to Pānia Reef – Inshore Disposal**

The risk to Pānia Reef so posed by inshore disposal of dredged material clearly can be reduced by ensuring that as little as possible *fine* sediment be placed, since fine sediment is less mobile than coarse material, and is most likely to be carried by prevailing currents towards Pānia Reef. Conversely, as the Applicant's modelling shows, and as Dr Cowell argued, coarser sediments are mobilised by wave activity for less time than finer sediments are (although not much less) and, when they are mobilised, they tend to be driven onshore (not offshore towards Pānia Reef) by wave-orbital motions. The fact that potential risk to Pānia Reef posed by inshore disposal of dredged material is contingent on the grainsize of the placed material is implicit in the proposed condition in the s42A report that would require inshore placement of "suitable" material. We now address the issue of what would constitute a "suitable" size of material that could be disposed of at Rext that would minimise the risk to Pānia Reef.

This issue generated a lot of debate. Unfortunately, the debate was rather confusing for a number of reasons, including inconsistency in the way various witnesses used terminology relating to grainsize, different views on the reliability of the Applicant's methodology for calculating the movement of sediment of different grainsizes, and differences of opinion on what constitutes "like-on-like" placement of spoil in the nearshore and consequent benefit to Westshore Beach.

As for what constitutes like-on-like placement in the nearshore, Dr Single, drawing from the data of Mead et al. (2001)[15], reported nearshore grainsize in the range 110 to 310 microns, with a mean of 150 microns. There is a band of coarser sand (> 250 microns) confined near the shoreline in 2–5 m water depth. Sampling by Beca (2016)[16] within the Port channel and harbour area also revealed predominantly (70–80%) very fine sand and fine sand, with a median of 125 microns. Appendix D of the AEE confirms this description, and reports data by the Hamilton Water Quality Centre that show the mud fraction (<63 microns) is limited to deep water areas greater than 5 m depth and generally comprised 10 to 20% of the sample. The sand fraction (63 to 2000 microns) generally comprised up to 80 to 100% of the sample, of which the bulk of the sand fraction was fine (125–250 microns) and very fine sand (63–125 microns). Sediment sampling and grading analysis by the Port and Cawthron (2005)[17] showed that sands within the Port area have a median size of 100–120 microns. The surface sediments are underlain by a stiff silt/siltstone of variable depth and basement rock at depth.

Dr Cowell referred to Komar (2005), who reported that the "offshore" seabed sediments are dominantly fine sand to very fine sand, these components making up 80–100% of most samples, with the remainder being mainly mud. Dr Cowell noted that this is consistent with the vibocore data shown in Appendix F of the AEE, which shows that many of the samples have maximum of 10% mud. Seaward from Westshore, very fine sand is 10% near the beach and very rapidly increases moving seawards, reaching 70% at 7 m depth. Beyond 15 m depth, very fine sand exceeds 70%. The fine sand is distributed oppositely.

As for the grainsize distribution of the material to be dredged, the Executive Summary of Appendix F of the AEE summed it up extremely succinctly: "the majority of spoil sediments correspond to a particle diameter between 100 microns and 200 microns [fine sand to very fine sand], with the median being around 125 microns [the boundary between very fine sand and fine sand]". Dr Williams confirmed this in his rebuttal at his paragraph 6: the modelling and analysis "primarily concerns *very fine sand* and *fine sand* [his emphasis] as these terms

[15] Mead, S.; Black, K.; McComb, P. 2001 Westshore Coastal Process Investigation: A study to Determine the Coastal Processes in the Bay at Westshore and Provide a Long-Term Solution to Erosion Problems ASR Ltd, 2001.
[16] Beca 2016 6 Wharf Development – Geotechnical Factual Report Prepared for Port of Napier Ltd. 3rd October 2016.
[17] Cawthron 2005 Assessment of Effects on Benthic Ecology for a Proposed No.6 Berth Development at the Port of Napier (Draft). Unpublished report prepared for the Port of Napier Limited. Cawthron Report No. 977.

encompass the grain diameter ranges present in the majority of material [to be] excavated from the navigation channel during capital and maintenance dredging".

The Applicant does in fact agree with this characterisation of the material to be dredged and the native nearshore material, but nevertheless takes the position that the planned dredging will yield material that is, in the main, unsuitable for nourishment at Westshore (e.g., Mr De Vos' rebuttal, paragraph 12, in which he says that none of the dredged material would be suitable). This position is based on the proposition that coarser-than-nearshore-native sediment is needed for successful nourishment. For example, Dr Williams (rebuttal, paragraph 15) argues that "the component of 'sand' that will provide the majority of any coastal protection benefit at Westshore will be *medium sand* and *coarse sand* [his emphasis] of which very little is observed in the material to be dredged". This accords with the Applicant's position, which we explored above, that placement of dredged material in the nearshore will only be beneficial to the beach if it remains in the system for a "long" time.

It is considered appropriate to conclude that the bed sediments in the nearshore off Westshore are composed primarily of *very fine sand* (63 to 125 microns) and *fine sand* (125 to 250 microns), with a *maximum of around 10% mud* (less than 63 microns). We conclude that the dredged material, being primarily very fine sand and fine sand, would be similar to the native material of the nearshore, that being also very fine sand and fine sand. Since we disagree with the view that *temporary* benefits to Westshore Beach provided by spoil disposal should be discounted, we find that the material to be dredged, which is similar to the native nearshore seabed, is suitable for disposal in the nearshore for the purposes of nourishing and protecting Westshore Beach.

Furthermore, we find that Mr Reinen-Hamill's proposed amendment to the condition proposed in the s42A report is sufficient to ensure (1) like-on-like disposal is achieved, and (2) that the proportion of fines in the borrow material is limited to an appropriate level.

- **Sorting of Material – Inshore Disposal**

The Applicant expressed concern that the proposed condition in the s42A report requiring disposal of dredged material at the currently consented inshore site would require the dredge operator to sort "suitable" from "unsuitable" material, which we accept from the Applicant's evidence is not practical or reasonable. We understand that the Applicant had this concern because they viewed the bulk of the material to be dredged as "unsuitable", since it is largely finer than what they considered was needed to ensure the placement benefited the beach, and that some kind of physical screening would be required to recover "suitable" material.

The draft condition requiring inshore disposal of suitably sized material does not imply that material must be sorted (material would be deemed to be either suitable or unsuitable as a whole). Hence, this issue is no longer in play.

- **Effectiveness of Inshore Disposal**

Dr Single stated that, since 1998, nearly 400,000 cubic metres of sediment has been placed at Rext, averaging ~22,600 cubic metres per year. Dr Single opined that only a small percentage – 5 to 10%, which equated to 1,000 to 5,600 cubic metres per year – of the placed material actually contributed to beach nourishment because its size is generally less than that required for effective beach replenishment. Only the coarser sands in the spoil are transported onshore to build the beach, but they are quickly lost to the north by longshore transport.

We take from Dr Single's evidence that the clear implication is that the disposal of spoil since 1998 can have had very little, if any, beneficial effect on the beach. Ms Allan confirmed this point of view, arguing that "all that can be said is that part of this [disposed of] material may make its way into the active surfzone and temporarily contribute to beach sediments". The crux of Ms Allan's argument, and what Dr Single seems to be assuming, is that material must become part of the surfzone or subaerial beach face to be considered as contributing to beach nourishment. This disregards the wider view, discussed above, that material that raises the nearshore affects wave breaking and therefore affords protection to the beach, which is a component of "nourishment", albeit temporarily in the case of Westshore.

Taking that wider view, we conclude that disposal of dredged material at the inshore disposal site will increase the protection of the beach from wave attack, which will decrease beach erosion. This matter is further discussed in section 7.13 of this decision.

- **Rule 140 (e) – Regional Coastal Environment Plan**

Mr Dallimore and the Westshore Residents and Development Association were concerned that the Applicant's plan to cease disposing of dredged material at Westshore is contrary to the spirit and intent of RCEP Rule 140(e), which they believed was intended to be an all-encompassing rule for maintenance dredging in the PMA. Furthermore, Ms MacDonald argued, it seems logical that Rule 140 should apply to the maintenance dredging, until such time as the operations extend beyond the PMA.

Rule 140(e) states that, where appropriate, material yielded by maintenance dredging within the PMA "must be made available for beach renourishment purposes". Ms Allan, in her evidence-in-chief (paragraph 89), explained that Rule 140 is a controlled activity rule under which applications can be made for maintenance dredging within the PMA. However, the Applicant was not applying for any consent under that rule, "as the capital dredging (which also

requires a maintenance dredging consent) extends beyond the PMA". Even if that were not so and the rule were to apply, there would be "no compulsion for the Port to seek consent under that rule".

We accept Ms Allan's interpretation of the application of the Rule as being correct, and that this addresses the issue raised by some submitters.

- **Effects – Surfing Amenity**

There were concerns over a number of matters regarding the potential effects of the Project on surfing amenity.

Mr Abel argued that the channel will reduce the height of waves close to the Port and along parts of Hardinge Rd and the southern part of Westshore, which will reduce the wave energy available for surfing. Mr Abel also questioned the accuracy of the dredging in reality, which is relevant to the computer modelling of surfing amenity which was based on precise dredging plans. In response to this concern about accuracy of the dredging, Mr de Vos provided information on navigation systems and datasheets. Mr Adamantidis said that minor changes in depth as the channel infills between maintenance dredgings will not affect wave refraction patterns; rather, it is the discontinuity between the dredged area and the surrounding seabed, which will not change significantly over time once the capital dredging is complete, and which is "fully captured" by the model.

Mr Abel opined that the Port is ignorant of local surf breaks and does not recognise or provide for them. On this matter, Mr Abel noted that the Port had used the Surf Guide for information on local breaks (importance, level of expertise, and so on) which, in Mr Abel's opinion, is outdated, not written by locals, and only a general guide. Mr Abel opined that Policy 16 of the NZCPS (surf breaks of national significance), does not apply because there are no listed surf breaks within the Hawke's Bay region, but that "any surf break is significant". Ms Allan responded that she correctly assessed that NZCPS Policy 16 does not apply, since there are no locally significant surf breaks that are listed.

Mr Shanks, representing the Surfbreak Protection Society, discussed other policy around surfing and surf breaks. In terms of Part 2 of the RMA, surf breaks "contribute to amenity values/recreational amenity and natural character of the coastal environment; surf breaks and surfing enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety". The RCEP has not mapped or identified any of the regional surf breaks, and therefore contains no policies for their protection but, understanding that surf breaks are not simply an amenity but are also natural features in their own right, and they therefore require the same care and protection as any other class of natural feature, then

Policies 13 (preservation of natural character), 14 (restoration of natural character) and 15 (natural features and natural landscapes) of the NZCPS prevail.

Mr Shanks stated that "Port Napier has provided 10 years' worth of baseline data that has provided sufficient information to our own peer reviewers that adverse effects on the four listed [by the Applicant in its AEE] surf breaks are unlikely". Dr Hume, in his evidence-in-chief, opined that "the proposed dredging channel will not have a significant effect on the surfing amenity", noting that the Applicant's consultant's analysis was comprehensive, and used accepted techniques and models that were calibrated and validated. Dr Hume did note one matter of possible concern – how sediment movement that "grooms" the breaks might be affected – but concluded this was unlikely to be an issue. Mr Adamantidis defended the analysis of surfing amenity, noting that the methods were appropriate and documented in the scientific literature, the SWAN wave model was validated comprehensively, and that the analysis was based on 10 years of wave data, which captured a wide range of conditions.

Mr Shanks described the Surfbreak Protection Society's experience in working with Port Otago and Port Lyttleton to develop monitoring and adaptive management plans for avoiding adverse effects on local surf breaks should they arise and sought to have similar conditions included should consent be given to this application. Mr de Vos responded by saying that, in his opinion, unlike other surf breaks in New Zealand which have been subject to monitoring, the local breaks at Napier have an "insufficient number of days per year to provide any meaningful data to support any assessment of potential effects". Furthermore, he noted that there is a consent to build a seawall at Whakarire Avenue, which may affect the quality of the surf breaks, and which is outside the control of the Port.

We understand that good surf breaks are a rare and precious resource, highly valued by surfers, and often extremely fickle. Hence, surfers are rightly concerned about activities that have the potential to degrade surf breaks, especially when those breaks are close to home. In this case, however, we accept the advice of the coastal experts that the analysis of surfing amenity has been comprehensive and conducted using appropriate techniques and good models that have been validated with a wide range of data. Furthermore, the results have been correctly interpreted as indicating that the risk of adverse effects on surfing amenity due to the Project is low. We agree with Ms Allan's assessment that Policy 16 of the NZCPS does not apply since no local breaks are listed in that policy. We agree with Mr de Vos that it would be extremely difficult to conceive of a monitoring programme that could distinguish any effects and attribute such effects to the Port, given the natural variability of surf, the expectation that any effects will be very small, and other factors. Accordingly, monitoring would be ineffective, and unwarranted in any case.

- **Coastal Processes – Overall**

Overall, we find that the issues around coastal processes that have been addressed by the Applicant have been done so comprehensively using appropriate methods and data, and we accept the conclusions given in Table 1 of the AEE regarding coastal processes that (1) there is a small potential for changes to wave height and direction on some parts of the coastline north of the Port due to changes to the swinging basin and fairway, and that the extent of effects will be negligible, and (2) there is a small potential for changes to wave height and no change to direction of waves at Marine Parade/Town Reef due to dredge disposal, and that the extent of effects will be negligible.

## 7.4 EFFECTS ON NATURAL CHARACTER AND LANDSCAPES

Several Appendices to the AEE contribute to an understanding of natural character. As natural character includes the biological environment as well as the physical environment, these include Appendices D, E and F (modelling and physical processes), Appendix G (physical setting and coastal processes), Appendices H and I (benthic ecology, fisheries, marine mammals) and Appendix L (birds), all of which are assessed elsewhere in this report.

Ms de Lambert, in her evidence-in-chief addressing landscape and natural character matters, summarised the conclusions in her report presented as Appendix N of the AEE (Proposed Wharf and Dredging Project, Landscape and Visual Assessment). Her principal conclusion was that "the proposed 350 m wharf structure and associated transient occupation of the new berth by ships will not generate more than minor long or short term adverse visual effects for users of the adjacent road network, walkways, coastal edge or other public places, as seen from the water, land or air".

Ms de Lambert outlined in Appendix N, visual simulations of the view of the completed development from the Bluff Hill Domain, which she deemed would be the "main public location" from which persons would view the Port. These demonstrated the "small relative scale and limited visibility of the wharf extension". As for residential viewers within the elevated catchment of Bluff Hill, Ms de Lambert opined that there will be a "minor to negligible visual effect". Furthermore, the view is consistent with the established presence of the Port.

For public and residential viewers on the flat (including Breakwater Road and the foreshore around to Perfume Point), the proposed new wharf will be out of view; however, actual ships will appear slightly differently, but not in a way that Ms de Lambert considered would "generate an adverse visual effect".

As for water-based viewers, the proposed new wharf will be consistent with the existing character of the environment, which includes the way the Port is juxtaposed with Bluff Hill.

Ms de Lambert also addressed the matter of effects that might arise from the dredging activities, including water discolouration, which she judged would be temporary and "not inconsistent with natural discolouration experienced at times" when rivers discharging at the coast are running high.

In terms of natural character of the coastal environment and its landscape character and values, Ms de Lambert opined that the landscape is already highly modified, and the Project would result in only "small-scale change contained within the confines of the established Port". Ms de Lambert addressed matters of natural character (RMA s6) and amenity (RMA s7) in Appendix N of the AEE, noting that the Port is already a "highly modified environment and that the proposals have been designed to avoid impacts on the important landscape feature of Pānia Reef".

Matters related to landscape and natural character were addressed in the s42A report, where it was concluded that the conclusions in Appendix N regarding effects on natural character and landscape "seem appropriate and support the conclusion that the effects of the new wharf structure should be less than minor". Furthermore, "dredging related activities should have a minor effect on natural character and landscapes".

An issue relating to natural character was raised by Mr Shanks, representing the Surfbreak Protection Society, in his discussion of policy around surfing and surf breaks. Mr Shanks opined that, in terms of Part 2 of the RMA, surf breaks "contribute to amenity values/recreational amenity and natural character of the coastal environment; surf breaks and surfing enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety". Furthermore, understanding that surf breaks are not simply an amenity but are also natural features in their own right, and they therefore require the same care and protection as any other class of natural feature, then Policies 13 (preservation of natural character), 14 (restoration of natural character) and 15 (natural features and natural landscapes) of the NZCPS prevail.

We find that that the assessment by the Applicant of landscape and natural character matters has been comprehensive and has used appropriate information and methods. Furthermore, we agree with the conclusion that the Project will not generate more than minor short-term (associated with the dredging and wharf construction) or long-term (associated with the new wharf and changes in ship movements) adverse visual effects, and that effects on natural character and landscape will be less than minor and contained within the confines of the established Port, which itself is already a component of a highly modified environment. Regarding the policy issue raised by Mr Shanks relating to surf breaks, we have been provided with no evidence that suggests that the fabric of the surf breaks will be altered by the Project;

if the natural character resides in the breaking waves themselves, then the technical assessment indicates that changes to breaking waves will be small.

## 7.5 EFFECTS ON BENTHIC ECOLOGY, FISHERIES AND MARINE MAMMALS

Many submitters variously attested to the cultural, ecological, spiritual and recreational significance, values and many uses of Pānia Reef, Town Reef and Hardinge Road reef.

Mr O'Reilly, in Appendix Q of the AEE, and speaking "on behalf of mana whenua for the Ahuriri area", described Pānia Reef as being "of great significance for mana whenua hapū", and explained that the reef is the embodiment of Pānia, who is a prominent ancestor of mana whenua. It is also the only "significant" offshore reef system in the Hawke's Bay region, west of Māhia Peninsula; a Significant Conservation Area; an important source of kai moana for mana whenua; and a registered wāhi tapū site on the Historic Places register of Heritage New Zealand. Mr Duncan and Mr Paul said that Pānia Reef is a key dive site for members of the Freedom Divers Association, and they explained why and how the reef and their use of the reef is degraded by sediments; LegaSea Hawke's Bay noted that Pānia Reef is used extensively by divers and fishers, and Hardinge Road reef is used in educational programmes; Mr Popplewell noted the importance of Pānia Reef and Town Reef for Hawke Bay juvenile fish stocks; and Ngaio Tiuka referred to the significant cultural values for tangata whenua.

The Joint Witness Statement of the marine ecology experts (17 August 2018) recorded agreement that:

- Dredging will result in loss of benthic biota within the dredging footprint. Recovery will occur through colonisation, but disturbance will be periodically repeated during maintenance dredging.

- Disposal at the offshore ground is likely to:

    - Alter the physical characteristics of the seabed, at least temporarily, through deposition of novel off-site material (e.g., clumps of cohesive material).
    - Cause loss of biota buried under the spoil. The spoil will be deposited over an extended period, be subject to redistribution, and not uniform. Hence, impacts and recovery will be occurring simultaneously.
    - Recover through recolonisation, but alteration of physical characteristics of the seabed means that the future benthic community is likely to have different community structure.

Furthermore, there was agreement that:

- The modelling indicates that Project-related impacts of suspended sediments are "unlikely to significantly exacerbate" the adverse ecological effects of sediment on Pānia, Town and Rangatira Reefs or the Westshore embayment.
- That outside of a narrow margin around the disposal area, yellow-belly flounder are unlikely to be "significantly affected".
- That the fisheries assessment is "sound and has not ignored available information", but submitters may yet bring additional insights.

- **Baseline Data**

The "main issue of disagreement" was whether the 2005 "baseline" ecological data sufficiently characterise the benthic ecology at the proposed offshore disposal site.

Dr Kelly pointed out that the Applicant's assessment of the benthic epifauna[18] at the proposed offshore disposal site was based on four dredge samples that were obtained 13 years ago in 2005. While acknowledging that the Applicant had supplemented the 2005 data with 2016 data (four infauna samples from the outer fairway, 2 epifaunal dredge samples from the outer fairway and 2 from the surrounding area, data from the inshore disposal site and associated reference site, but no new data from the proposed offshore disposal site), and agreeing that no species reported by the Applicant are uncommon and that similar habitats to the offshore disposal ground are likely to be present in the broader area, Dr Kelly nevertheless asserted that reliance on old data results in uncertainty about likely effects and outcomes. Specifically, questions remain about what will be lost from the offshore disposal site, the importance of that, what it will be replaced by and how quickly, and whether indirect effects could extend beyond the local footprint.

Dr Sneddon acknowledged that there was not enough time to revalidate the characterisation of the offshore disposal site, since it only became included in the Project after the 2016 ecological fieldwork had been conducted. However, considering the weight of evidence, Mr Sneddon concluded further fieldwork at the offshore disposal site was not necessary.

As we understand it, the principal issue here is that, if epifauna are now present at the offshore site, then they could be providing nursery habitat for juvenile fish, and this habitat would be buried under dredged material. Dr Kelly conceded, though, that such biogenic habitat provided by epifauna would be sensitive to bottom trawling, implying that significant epifauna are either unlikely to be present or any epifauna present may already be impacted. Dr Kelly also noted that there were substantial differences in epifaunal species between the dredged channel area,

[18] Epifauna are animals that live on the surface of the seabed and include "biogenic" species that form habitats and three-dimensional structure that supports other species, thus enhancing biodiversity. Biogenic species include sponge gardens and shellfish such as horse mussels and scallops.

the inshore disposal area at Westshore, and the proposed offshore disposal site, which is inconsistent with Mr Sneddon's claim of ubiquity of soft-sediment habitats in the area.

On the latter point, Mr Sneddon replied that, given the range of depths and shore proximity in a wave-dominated environment combined with periodic dredging disturbance, he would be surprised if there were no differences in epifauna. In fact, Mr Sneddon argued, "epifaunal and infaunal data represent a logical continuum of highly over-lapping species distributions with depth and distance from shore. As such, they support the relative ubiquity of soft sediment habitats and community assemblages (within the constraint of water depth) in the vicinity of Napier".

On the matter of there being overlooked important or significant epifauna at the proposed offshore disposal site, Mr Sneddon acknowledged that epifauna can be patchily distributed, but he has done tows at the offshore disposal site of nearly 2 linear km, no divers have ever reported significant shellfish beds or sponge gardens, and the location of the disposal site in a relatively productive area for flatfish is consistent with the absence of significant habitat-forming epifauna, since it is unlikely that significant emergent biogenic features such as sponge gardens or horse mussel beds could co-exist with the trawling activity.

Mr Sneddon concluded that there is no evidence to suggest that the offshore disposal ground is or may have become [since 2005] ecologically distinct from vast area of soft-sediment habitat that exists locally in similar depths, but also acknowledged that a baseline ecological survey of the proposed offshore disposal site prior to dredging operations commencing is warranted.

In the Joint Witness Statement following Conferencing of Marine Ecological Experts (17 August 2018), Mr Sneddon and Dr Kelly agreed that "a new survey of the disposal area prior to Project commencement would be beneficial in providing an up-to-date assessment of the actual impact and subsequent ecological recovery of the area".

Dr Kelly (supplementary statement) laid out what he saw should be the purpose of the baseline monitoring. Mr Sneddon and Dr Kelly subsequently, and after various discussions, agreed (Joint Witness Statement Following Caucusing of Marine Ecological Experts on Aspects of Proposed Conditions of Consent, 12 September 2018) on wording and scope of a condition that would require a benthic baseline survey, which would commence prior to dredging operations beginning and which has the aim, amongst other things, of developing data that could be used to fully characterise the infaunal and epifaunal communities and to identify and establish the distribution of any high-value habitats and/or features (such as extensive biogenic structures provided by epifauna) in the proposed offshore disposal area. There is a provision in the proposed conditions to avoid disposing of any dredged material within 50 m of any areas found to contain high-value habitats and/or communities identified in the baseline survey.

In the Joint Statement of Planners Relating to Proposed Conditions of Consent (14 September 2018), Ms Allan and Mr O'Leary presented a full list of agreed and non-agreed conditions. This included a condition for a baseline survey that follows the 12 September caucusing statement of Mr Sneddon and Dr Kelly. Ms Kydd-Smith and Mr O'Leary fully agreed all of the agreed conditions, including those to do with the baseline survey. There were no non-agreed conditions relating to the baseline survey.

We accept that epifauna provide important biogenic habitat, and that the lack of recent data on epifauna at the proposed offshore disposal site reduces confidence that such habitat will not be lost as a result of the disposal of dredge spoil at the offshore site. However, we also accept that the currently-available data, including diver observations, and the fact that the offshore site is trawled by commercial fishers, indicate a low probability that the offshore disposal site hosts habitat that is significantly different to the surrounding soft-sediment habitats. Given the low probability of finding anything "special" at the offshore disposal site, and that there is an action if something is found, we find that the finally-agreed condition requiring a baseline survey is appropriate to deal with this issue.

- **Threats to Pānia Reef – Dredging**

Many submitters expressed concern that Pānia Reef, and its associated values and uses, would be threatened by the dredging operations, and sought avoidance of this threat by disposing of dredged material seaward in water depths of hundreds of metres, mostly at the edge of the "dropoff", in 500 m of water, 37 nautical miles seaward of Napier, where ocean currents are expected to disperse the dredge plume (LegaSea Hawke's Bay, Napier Fisherman's Association, Mr Jones, New Zealand Angling and Casting Association, Mr Popplewell, Mr Moeke and Mr Dick, Mr Duncan and Mr Paul, Mr Hunt). The Seascape Environmental Society (supported by Bruce and Gillian Wilton, Ms Hasselman, Mr McCorkindale, Mr Taylor and Ms Fanning) advocated for disposal of dredged material at least 10 km offshore and at least 10 km from Pānia Reef. Several submitters said they believed it was common practice for dredge operators at many or even most New Zealand ports dispose of spoil in very deep water.

The coastal experts in their Joint Witness Statement all agreed that disposal in such deep water would represent a loss of sediment from the coastal sand system and would be costly. Dr Hume added that, from a coastal processes perspective, it would be best practice to retain the sand in the system. The coastal experts also agreed that locations further seaward have not been assessed, to which Mr Adamantidis added that there would be very little deepwater data of any kind to calibrate/validate any model that would be needed for such an assessment.

Mr Sneddon disagreed with what seemed to be the submitters' main assumption, which is that disposal of spoil in very deep water would be readily dispersed and have no effect on benthic ecology or fisheries resources. In fact, Mr Sneddon argued, these depths are less disturbed by

natural events and therefore they are able to attain a higher level of stability and structure; this makes them more vulnerable to disturbance than inshore areas, which are frequently disturbed. Also, it would be very difficult to conduct monitoring at these depths.

We accept Mr Sneddon's and Dr Hume's comments, and note that the Applicant has not applied for deepwater disposal of dredged material.

- **Proposed Offshore Disposal Site**

Many submitters argued that the proposed offshore disposal site is too close to shore and would have detrimental effects on Pānia Reef and Town Reef (e.g., Mr Jones, Mr Hunt, Mr Somerville, Mr Warr, Napier Fisherman's Association, LegaSea Hawke's Bay, Mr Popplewell, Ngaio Tiuka, New Zealand Angling and Casting Association, Maungaharuru–Tangitū Trust, Mr Duncan, Mr Paul).

Underlying these concerns is a lack of confidence in the data and modelling used by the Applicant to assess potential adverse effects on the benthic ecology, which includes the reefs. We note that Dr Kelly's review of Appendix H of the AEE (Assessment of Effects on Benthic Ecology and Fisheries Resources from Proposed Dredging and Dredge Spoil Disposal for Napier Port) concluded that the scope of the investigation was "suitable"; there was "significant" detail; the results were supported by complementary studies on coastal processes, hydrodynamics and sediment dispersal; key matters were addressed (with the exception of biosecurity); and that, for most matters, issues were identified and details were appropriate. Specific to concerns about Pānia Reef, Dr Kelly, in his evidence-in-chief, opined that the results of the dispersal modelling indicate that there are unlikely to be increases in suspended-sediment concentration that will "significantly" exacerbate adverse ecological effects on Pānia Reef, Town Reef, Rangatira Reef or the Westshore embayment. As for the plume modelling, the coastal experts in their Joint Witness Statement all agreed that they had confidence in the modelling, and that the modelling shows no deposited sand migrates directly to Pānia Reef; and that there may be on occasions up to 1 mm deposition of silt and clay in the conservation zone around Pānia Reef, but not on the Reef itself, due to scouring by waves. Furthermore, Mr Sneddon opined that the proposed monitoring will be sufficient to protect Pānia Reef; if a trigger is breached, the Port will be alerted and there will be a management response.

In this matter, we accept the view of the experts that the assessment of risk to Pānia Reef and Town Reef posed by the proposed dredging operation is based on sound field and modelling data and is correctly assessed as being low.

- **Town Reef**

Several submitters questioned whether Town Reef was given adequate attention in the Applicant's assessment of potential adverse ecological effects (Ngaio Tiuka, Mr Duncan, Mr Paul, Mr Popplewell).

Mr Sneddon responded that assessment of Town Reef was included in section 7.4.4 of Appendix H of the AEE (as were Rangatira Reef, immediately west of the entrance to Ahuriri Inlet), and Hardinge Road reef (the small western embayment adjacent to the Port) but was not part of the surveys. In his assessment, Mr Sneddon relied on the modelling to assess the increase over background levels in suspended sediment at Town Reef. Furthermore, Mr Sneddon argued, the continuous turbidity monitoring and the assurance monitoring proposed for 8 locations along Pānia Reef will also be protective of other reef areas within the modelling domain. In part, this is because the monitoring data will be used to validate the modelling, which predicts low risk of adverse effects at other locations.

We accept that Town Reef has been given adequate attention in the assessment of ecological effects, and that monitoring at Pānia Reef will also be protective of Town Reef.

- **Significance of Reef Habitats**

The Mauri Protection Agency, Mr Popplewell, Mr Duncan and Mr Paul were concerned that it hadn't been recognised that both Pānia Reef and Town Reef are important habitat for juvenile fish and crustaceans. Mr Duncan and Mr Paul reported that they regularly encounter juvenile tarakihi on Pānia Reef while freediving and that, as a spawning ground, these reefs may hold genetic material that is important to the inshore fishery.

Mr Sneddon responded that he had assessed (in Appendix H of the AEE) the life cycles of a range of important fisheries species including crustaceans and paddle crabs. He was not aware of any information concerning the specific importance of Pānia Reef or Town Reef as breeding or nursery areas for fisheries species, that he could find no reference in scientific literature or online for the occurrence of juvenile aggregations at levels required to be important, and that there is little to suggest that any important fisheries species has a "critical reliance" on the Pānia/Town reef system. Furthermore, Pānia Reef is not large enough to function as a critical nursery area for fisheries species (5 square km, *cf*. Wairoa hard of 300 square km), and the modelling results show that the Pānia and Town reef communities will not suffer "significant or lasting deleterious effects" due to sediment plumes. Mr Sneddon concluded by noting that the protection afforded by the monitoring/action plan will also cover any nursery function associated with the Pānia/Town reef habitats.

We accept Mr Sneddon's opinion.

- **Cumulative Effects – Dredge Spoil**

Mr Duncan, Mr Paul, the Napier Fisherman's Association, LegaSea Hawke's Bay, Ngaio Tiuka and the New Zealand Angling and Casting Association argued that the cumulative effect of the dredge spoil on top of 3.2 million cubic metres per year of sediment in river runoff into Hawke Bay had not been considered.

Mr Sneddon responded that he did not see this as an issue as only a small mass of silt will be stripped from the excavated material as it descends to the seabed from the dredge and most of the material that reaches the seabed will stay there, which is in contrast to the high silt load in river runoff which will eventually settle out over a large area. Furthermore, silt in river runoff is geochemically dissimilar to native seabed material that will be dredged, and therefore causes more disturbance of the seabed ecology than the dredged material, which will be deposited on geochemically similar seabed.

We accept Mr Sneddon's opinion.

- **Assessment of Potential Adverse Effects – Inshore Flatfish Fishery**

A key issue is what Dr Kelly viewed as the inadequacy of the assessment of potential adverse effects on the Hawke Bay inshore flatfish fishery.

Mr Sneddon concluded that flatfish and possibly gurnard are the commercial fish species of primary concern, and that there will be very little environmental impact on these fisheries, citing a number of reasons:

- effects to benthic communities outside boundaries of disposal area will be localised to margins and temporary;
- his professional experience at other locations around New Zealand;
- his recent analysis of a 5-survey sediment and benthic community dataset covering the Westshore inshore disposal site and a corresponding control site spanning the last 20 years;
- the area of the offshore disposal site at 346 ha is small compared to the area of similar substrate in similar depths throughout Hawke Bay;
- the offshore disposal ground represents <1% of the nominally trawlerable area, and, according to publicly-accessible MPI data, is located in the northern sector of a cell (E) that appears to be half as productive as cell F to the south;
- fish will avoid the grounds while dumping is occurring;
- benthic communities will recover within 6–12 months to a similar level of diversity of surrounding area;

- fish will come back, even during the recovery, as successional [benthic] communities are used by fish too.

Furthermore, Mr Sneddon opined, the monitoring will provide data on the effects of deposition and the extent of subsequent recovery, which will allow assessment of any changes to the area as a foraging ground for fisheries.

Dr Kelly opined that although, in principle, Mr Sneddon's conclusions seemed reasonable, the experience and concerns of local commercial fishers needed to be taken into account. Furthermore, the spatial resolution of the MPI data used by Mr Sneddon in Appendix H[19] in his analysis did not allow for proper evaluation of the contribution of the offshore disposal site to the fishery relative to the contribution of the surrounding areas.

Mr Warr, a local commercial flatfish fisher, showed information that demonstrated that a "very significant" part of his annual catch is caught in and around the dredge-spoil footprint, which is contrary to the Applicant's conclusion that the spoil site is not of significant fishery value. Mr Warr noted that he was not aware of any fishing ground in the North Island which produces more sole per square metre of seabed, consistently over the year. He also said that he has photographs of yellow-belly flounder running ripe at the disposal site, and that "massive amounts" of juvenile fish are recruited there year around. Mr Warr also noted that he has found the culturally significant, rare native fish, the black flounder, to the south of the disposal site during winter, which may indicate the fish use this area for spawning and as an over-wintering site. Mr Warr pointed out that the Applicant's modelling and current measurements show currents setting to the south from the disposal site, which could carry suspended sediments directly to the presumed spawning grounds of the black flounder. Finally, Mr Warr asserted that basic information on ecology and behaviour of many fish species is lacking, which Dr Kelly agreed with in his supplementary statement.

Mr Wilson, for Fisheries Inshore New Zealand (FINZ), supported the position that the assessment of the flatfish fishery was inadequate, noting that the fishery data used in the analysis goes up to only 2015, and that Mr Sneddon's analysis had only addressed the "biology characteristics of the fish species in question", and had not addressed the impact on the fish

[19] Quoting from Appendix H of the AEE: "Fisheries catch data has historically been collated from catch effort landing returns (CELR) into a Ministry of Fisheries (MFish, now Ministry for Primary Industries, MPI) database by Fisheries Statistical Area (FSA) within the EEZ. For each species or group, fishers reported catches to a unique FSA. For the last decade, such data have been recorded, for vessels longer than 6 m, at specific locations (latitude and longitude) instead of broad statistical areas. … A fisheries data request was submitted to MPI Data Management Group under the Official Information Act. This covered catch data over the most recent three-year time period to a spatial resolution of 0.1 ° (approximately 6 Nm). In order to optimise the data for assessment purposes, it was necessary to aggregate species within the data request. This is because MPI terms for the release of data include a 3 client / 3 vessel rule whereby, if fewer than 3 vessels or clients are represented within a defined cell and stratum, the data must be withheld as potentially commercially sensitive. Species aggregation is one way to minimise the information withheld by this rule and was preferable in this case to decreasing the spatial resolution from the specified 0.1 ° grid size."

themselves, or the subsequent adverse effects on the marine environment and associated fisheries. Furthermore, a full analysis should address:

- the nature of the sediment plume, including spatial and temporal dynamics;
- the extent of any species displacement;
- where the fish are expected to go if displaced;
- whether, once they are displaced, they would still be available to commercial fishers;
- the economic impact of displacement locally and regionally.

LegaSea Hawke's Bay also raised this issue (that economic and financial impacts on both recreational and commercial fishers had not been addressed by the Applicant).

Mr Wilson also took issue with Mr Sneddon's claim that there is no concentration of landed catch in the "specific vicinity" of the disposal site, since that claim was based on him using catch per hectare as a proxy for productivity based on 0.1-degree spatial resolution data [which, we understand, is the only resolution data that MPI will publicly release]. Mr Wilson referred to a confidential report – the "Trident report[20]" – that Mr Wilson sought to table at the hearing to support his position. The Trident report uses higher-resolution data (5 km, which is higher resolution than the 0.1-degree data Mr Sneddon used); Mr Wilson asserted that Mr Sneddon's analysis of the importance of the proposed offshore disposal site did not "provide the required spatial resolution to inform decision makes (*sic*) of the potential impacts of the proposed activities on the local fisheries".

Dr Helson, also for FINZ, tabled a second version of the Trident report[21], which differed from the first version that Mr Wilson sought to table in that the data shown therein were displayed at 2 km resolution (Mr Wilson's version of Trident had 5 km resolution data). In addition to endorsing Mr Wilson's comments, Dr Helson concluded that the Applicant "incorrectly concluded that the proposed activity would not have any substantive effects on fisheries or *fishers* [our emphasis]".

Dr Helson outlined that the Applicant had not presented the information or analysis that would inform a good decision, and that we need to avoid "homogenising the fishing fleet" and recognise that each individual fisher will have a variable reliance on specific species, areas and times of year.

Both Dr Kelly and Mr Sneddon provided commentary on Trident in their respective supplementary statements.

[20] Middleton, D. (2018) Fishing catch and effort within the proposed Hawke Bay spoil dumping ground. Report to FINZ, 23 August 2018.
[21] Middleton, D. (2018) Fishing catch and effort within the proposed Hawke Bay spoil dumping ground. Report to FINZ, 21 August 2018.

Principally at issue here is whether the fishing data provided in Trident contradict Mr Sneddon's claim, based on lower-resolution, publicly available MPI data, that the offshore disposal site is of no particular importance for commercial take of flatfish, especially compared to the wider inshore region, or whether the Trident report supports FINZ' and Mr Warr's position that the opposite is the case. We now examine this matter.

Dr Kelly noted some criticisms of Trident: there is no justification for the assumptions in the report about the size and centring of the sediment plume from the disposal site and the area that Table 1 (number of fishing events by method and form that landed certain species) refers to is not clear, making its value questionable. Dr Kelly also cautioned that the way the data were presented in some cases could skew the results, and that there were apparently some discrepancies between the Trident data and the MPI data used by Mr Sneddon.

Dr Kelly found that the information on trawl starting positions shown in Trident was consistent with Mr Sneddon's position - that the offshore disposal site is of no particular importance for commercial take of flatfish. However, referring to Mr Warr's experience, he noted that, since the fisher can weave through an area and double back, trawl starting positions (as shown in the Trident maps) alone provide an unreliable measure of the spatial distribution of trawling effort at the local scale. Hence, Dr Kelly argued, one should take into account catch and effort from the cell containing the disposal site and from the adjacent cells when considering the relative importance of the disposal site to the GUR and FLA fisheries. Mr Sneddon, agreed, but pointed out that in doing that an equally likely outcome would be over-estimation of catch and effort.

Notwithstanding the apparent inconsistencies between the Trident data and the MPI data that Mr Sneddon used, Dr Kelly concluded that:

- The area around Napier is locally important for the commercial flatfish fishery.
- The proposed disposal site is an area targeted by trawlers seeking flatfish.
- The actual impacts on the fishery have not been accurately quantified, however, rough estimates based on information in submissions and evidence [including Trident] suggest it could have a small to moderate impact on the catches of local commercial fishers targeting flatfish, with local effects and even effects in the areas slightly beyond the disposal site expected to be in this range.
- Impacts on the broader scale fishery will be insignificant.

Dr Kelly also pointed out that the FINZ submission primarily concerns effects on fisheries and fishers, which are socioeconomic issues that depend on maintenance of the fish stock. The evidence a suggests the impacts of spoil disposal on gurnard and flatfish stocks are likely to be insignificant compared to the effects of commercial fishing itself.

Mr Sneddon, in his supplementary statement, provided detailed comments on Trident.

Mr Snedden opined that the information on trawl starting positions shown in Trident was consistent with his original position that the offshore disposal site is of no particular importance for commercial take of flatfish.

Mr Snedden pointed out that the Trident depiction of the size of the area that will be covered by the plume is larger than and a different shape to that that comes out of the modelling in Appendix E of the AEE, and therefore overstates the influence of the plume (which was predicted very conservatively to begin with). Mr Sneddon's own conclusion, which is based on an accurate depiction and understanding of the plume as revealed by the modelling, was that there will be no direct effect of FLA or GUR beyond a narrow margin (100s m) from the boundaries of the disposal site

Mr Snedden was critical of the use of descriptors such as "high" in Trident, which was not given any context. In this regard, Mr Sneddon noted that a "critical limitation" of the interpretation of Trident by Dr Helson is that it excluded the southern inshore area of Hawke Bay, and so the inshore fishery in the vicinity of the disposal site cannot be placed into any wider context that allows one to interpret words such as "high". Likewise, Mr Warr emphasised the "importance" of the area, but gave no actual data that could support the meaning of "importance".

Mr Sneddon's analysis of the low-resolution MPI data extended from Clive to Cape Kidnappers, and indicates that this area, which lies to the south of Napier, is significantly more productive for FLA in terms of catch weight. Furthermore, recent analysis of FLA for Quota Management Area 2 (Schofield et al., 2018, funded by FINZ, done by Trident) reported that FLA 2 primarily operates within the shallow inshore waters of Hawke Bay and that the majority of the FLA 2 catch between 2008–16 was taken between just north of Tāngoio and Cape Kidnappers, *with the CPUE from the target fishery being greater closer to Cape Kidnappers* (Mr Sneddon's emphasis). Hence, there is a gradient in FLA CPUE increasing southwards from Napier. Mr Sneddon concluded that it is necessary to include this information to provide proper context for deciding the "importance" of the inshore flatfish fishery around the disposal site, which Trident did not do. Mr Sneddon overlaid the Trident data with his (Mr Sneddon's) data to demonstrate his point (Fig 1, Mr Sneddon's supplementary statement), concluding that "available flatfish data for the southern [Hawke Bay] area indicates the vicinity of the disposal area appears to be approximately half as productive as the Bay area south of latitude S 39.55°".

In response to Mr Warr's claim that he knows of no other area in the North Island that is more productive of sole per area, Mr Sneddon pointed out that Mr Warr was not specific as to which fishing ground he was referring to, but if it was the disposal site, then this would seem to be at odds with Trident Fig 7, which shows significantly higher FLA catches than in the immediate vicinity of the site[22].

[22] While sole is only 1 of 8 commercial species of FLA, it is the greatest species contributor by weight (45%) in FLA 2.

To support his comments on black flounder, Mr Warr provided his own trawl data at species level for 2013–17, but only for trawls that included catch of black flounder. Mr Sneddon argued that, although limited, these data are largely consistent with Trident: all of the 70 trawls which Mr Warr reported occurred inshore of the disposal site, inside of 19 m depth, and all but two were inside 16 m depth. The closest of the start points to the disposal site was greater than 5 km south of the disposal ground and some 6 km to the North. Mr Sneddon concluded that, given the spatial distribution of Mr Warr's black flounder catch relative to the disposal site, it appears very unlikely that effects will impinge on critical habitat for this species.

In response to Dr Helson's claims that fish avoid areas of high turbidity which makes them less available to catch, Mr Sneddon countered by noting that Dr Helson gave no rationale or sources for that claim, and in fact there are studies and meta-analyses of the effects of suspended sediment on fish (described in paragraph 99 of Mr Sneddon's evidence-in-chief) that show that threshold levels for effects on species that forage over fine substrates are substantially higher than the plume concentrations predicted for areas outside a narrow margin around the disposal area.

In response to Mr Wilson's claim that Mr Sneddon has not addressed cumulative effects of sediments, Mr Sneddon responded that the dredge spoil cannot be considered as simply additive with riverine sources in assessing cumulative effects and gave clear reasons for why. Mr Sneddon characterised Mr Wilson's statements as misconstruing this as a dismissal of cumulative effects *per se*, which (Mr Sneddon asserted) it was not.

As for Mr Wilson's argument that a full analysis should address a number of issues, Mr Sneddon responded as follows.

- *The nature of the sediment plume, including spatial and temporal dynamics*. Mr Sneddon responded that this was fully addressed in the modelling, as reported in Appendix E (Dredge Plume Modelling) and Appendix F (Post-Disposal Fate of Dredged Sediments).

- *The extent of any species displacement*. Mr Sneddon responded that this was covered in Appendix H of the AEE. The commercial species likely to be displaced are FLA and GUR, which is consistent with Trident. Based on these species' known habitat preferences, which includes a high natural tolerance to high turbidity, and the plume modelling, the area affected will not be more than "the low hundreds of metres from the spoil ground boundary".

- *Where the fish are expected to go if displaced and whether, once they are displaced, they would still be available to commercial fishers*. Mr Sneddon argued that this is not

likely to be a problem from a seabed area that is 1% of a much larger (and frequently more productive) area and given that species displaced (FLA and GUR) are not territorial in nature and they are surrounded by suitable habitat. Furthermore, the surrounding wider area is significantly harvested so it is not likely to be at carrying capacity for these fish. Hence, displaced fish would not at any time become unavailable to commercial fishers.

- *The economic impact of displacement locally and regionally*. Mr Sneddon replied that the local impact would likely be not very much, given Trident data on trawl starting position. Mr Sneddon conceded that he had not looked at economic impacts, but expected, based on the Trident data, and his own assessment of the effects on commercial species, that significant impact at the regional scale would "not be expected".

Both Mr Warr and LegaSea Hawke's Bay argued that dredging by the Port has already resulted in considerable damage to the inshore fishery. Mr Warr said that he has personally witnessed first-hand the obliteration of the Westshore yellow-belly flounder population, which he attributed to the disposal of maintenance dredgings at the currently consented inshore disposal site, and that he has never seen fish come back after leaving to avoid the disturbance. LegaSea said that they have seen dramatic and long-term adverse effects on the benthic environment and fishing at the inshore site, and it will only be worse at the offshore site.

In response to Mr Warr, Mr Sneddon said that the most recent survey of the inshore disposal site, in November 2017, three months after disposal, showed no evidence for decline or change in benthic communities and, although he did not sample for yellow-belly flounder, juvenile sole and paddle crabs were "common". Furthermore, Mr Sneddon stated that yellow-belly flounder were unlikely to be affected because they favour inshore silted areas and thrive in turbid water; they are free-ranging and not territorial; and they are known to move offshore to spawn.

In response to LegaSea, Mr Sneddon said that he was aware of concerns about the decline of the inshore fishery, but analysis of monitoring data over the past 20 years of disposal at Westshore shows effects on the seabed are transient, and the seabed at the disposal site is indistinguishable from habitats in the wider area after a couple of months. Furthermore, there has been no persistent change in the seabed or its communities, or even elevated variability that is normally associated with successional recovery.

On balance, we do not see the Trident data as making the case that there is a significant concentration of fishing effort over or very near to the proposed offshore disposal site. Mr Sneddon's data, which cover a larger area than the Trident data, showed that fishing effort further to the south in Hawke Bay is significantly greater than in the vicinity of the offshore

disposal site. Understanding this relativity is important for providing context to the submitters' use of qualitative terms such as "high" and "important".

We accept Mr Sneddon's view that Trident is misleading in this respect, due to the way the data displays were truncated. Furthermore, and notwithstanding Mr Warr's point that trawl starting positions (as shown in the Trident maps) alone provide an unreliable measure of the spatial distribution of trawling effort at the local scale, Trident does not show any particular importance for commercial take of flatfish at or near to the proposed disposal site.

We accept that there will be disruption to fishers wishing to work the disposal site and its immediate surrounds; however, we understand that Napier-based fishers who may experience that disruption can and do travel widely throughout the Bay to take fish and are not in any way bound to fish on the disposal site or nearby. On that matter, it is significant that the offshore disposal ground represents <1% of the nominally trawlerable area in the Bay.

With no evidence offered to the contrary, we accept Mr Sneddon's assessment that, based on the extent of the plume as shown by the modelling, flatfish's tolerance to high turbidity, the species displaced are not territorial in nature, and the disposal grounds are surrounded by suitable habitat, the most likely outcome is that fish will avoid the disposal site, at least during dredging operations, and possibly until benthic communities begin to recover, which Mr Sneddon puts at 6–12 months, or sooner. We also accept Mr Sneddon's assertion that, with surrounding habitats below carrying capacity (because they are fished), displaced fish will readily be assimilated into neighbouring habitats, where they will still be available to fishers to take.

We also accept Mr Sneddon's comments on the monitoring data from the Westshore inshore disposal site which indicate that disposal of dredgings there to date has had no long-lasting effect on the benthic habitat.

We find that the adverse effects on the fishery will be moderate at the local scale (the disposal site and immediate surroundings) but insignificant at the scale of Hawke Bay.

We acknowledge that the Applicant has not done any analysis of socio-economic issues related to disruption of the inshore fishery, but we expect that, given that the impact on the fishery will be minimal at the regional scale, so too will the socio-economic impacts.

- **Monitoring Requirements – Inshore Fisheries**

Mr Warr sought to have monitoring requirements included for the purpose of detecting any effects on fish and fisheries.

Dr Kelly (supplementary statement) said that there would be multiple influences on fish abundance and catchability, which were anyway highly variable in time and space, and therefore "careful consideration" would be required to design a monitoring programme that would be capable of separating the effects of disposal from other factors. Mr Sneddon argued that "the risks from Project-related stressors to these fishery stocks are not high enough to warrant direct monitoring", and that disposal-site benthic surveys in the WQMP proposed by the Applicant will establish the extent of recovery towards the original habitat and benthic communities that constitute the principal food source for gurnard and flatfish. Mr Sneddon considered it to be extremely unlikely that "benthic foraging fish species would not return quickly to an area where such recovery had occurred".

We accept the advice of Dr Kelly and Mr Sneddon that monitoring for the purpose of detecting any effects on fish and fisheries would be very difficult to design; we also accept Mr Sneddon's proposition that monitoring of the inshore disposal site will be an effective proxy. Given that, and our conclusions above regarding the expected extent and scale of adverse effects on the fishery (moderate at the local scale and insignificant at the scale of Hawke Bay), we find that direct monitoring of fish and/or fisheries is not warranted.

- **Fisheries Liaison Group**

In the Joint Statement of Planners Relating to Proposed Conditions of Consent (14 September 2018), Ms Allan and Mr O'Leary presented a comprehensive list of agreed and non-agreed conditions. In response to submitters' concerns and largely following Mr Wilson's recommendations, this included a number of conditions establishing and setting out purposes and processes for a Fisheries Liaison Group. Mr Wilson sought changes to conditions in the event the application is granted, including the establishment of a FLG, which would ensure potential effects on the fishing industry are recognised, and procedures are put in place to avoid, offset and mitigate potential adverse effects and better manage risk. Mr Wilson outlined how the FLG could be constituted and how it could operate.

The conditions in the Joint Statement of Planners concerning the FLG also adopted the suggestions by Dr Kelly (Joint Witness Statement Following Caucusing of Marine Ecological Experts on Aspects of Proposed Conditions of Consent, dated 12 September 2018) which would confer authority on the FLG to recommend commissioning additional research or monitoring to fill key knowledge gaps. Ms Allan recommended that this be included in conditions as an advice note, that she considered this to be an *Augier* condition, and noted that this was acceptable to the Applicant.

Mr Sneddon, in his evidence-in-chief, disagreed with the proposal to give the FLG authority to act in this way, arguing that monitoring is taken care of elsewhere, and additional research on

fisheries should fall outside the scope of the consent. Nonetheless, no disagreement was recorded in the Joint Statement of Planners.

We find that the conditions in the Joint Statement of Planners concerning the FLG would help to protect the interests of FINZ and inshore fishers in general and would be appropriate to include as a condition of consent.

- **Effects on Benthic Ecology and Inshore Fisheries – Overall**

Dr Kelly, in his supplementary statement, stated that, in his view, the ecological effects of the proposed activity are "potentially significant at the local scale, potentially significant at the [Hawke Bay] scale, less than minor at the regional scale, insignificant at the national scale". Dr Kelly said: "I say, potentially, at the local and [Hawke Bay] scale because some uncertainties remain. These include recent and detailed information on the values of the disposal site, and also the lack of broader scale information to put the local values into context". On the latter, Dr Kelly said that he did not have sufficient information to "determine the validity of [Mr Sneddon's] assertion that values in the affected area are similar to those in other parts of [Hawke Bay]", and that "caution on this matter is warranted because the activities are located around the Napier headland, which is a unique feature in the bay", and "higher value habitats and communities are often associated with such features and … there is no reason to believe this would not be the same in this case".

Our understanding is that Dr Kelly's concern is with uncertainty in the information from the Applicant, which leads him to assume a position of caution, and state that adverse effects are potentially significant at the local and Hawke Bay scales. We have addressed the matter of the ecological characterisation of the seabed ecology at the proposed offshore disposal site and concluded that there is only a low probability that the offshore disposal site hosts habitat that is significantly different to the surrounding soft-sediment habitats.

We have also concluded that Mr Sneddon has provided appropriate fisheries data to put the potential effects on the inshore fishery in a regional context, and that the adverse effects on the fishery will be moderate at the local scale (the disposal site and immediate surroundings) but insignificant at the scale of Hawke Bay. We also have concluded, and the marine ecology experts have agreed, that the assessment of risk to Pānia Reef and Town Reef posed by the proposed dredging operation is based on sound field and modelling data and is correctly assessed as being low. We therefore do not accept Dr Kelly's concern with uncertainty in the information from the Applicant that leads him to conclude there are adverse effects are potentially significant at the local and Hawke Bay scales.

Overall, we find that the issues around benthic ecology had been comprehensively addressed by the Applicant using appropriate methods and data. Furthermore, we accept the overall conclusions given in Table 1 of the AEE regarding benthic ecology that:

- The indirect effect of disposal of dredged material on Pānia Reef and other reef areas through sediment plumes and elevated turbidity during dredging campaigns will be less than minor.

- The indirect effects of dredging and disposal of dredged material on soft-sediment benthos within the immediate proximity of active dredging and disposal areas will be less than minor.

- The longer-term impacts of resuspension of sediment from the disposal area will be negligible.

As for the direct effects of the dredging, this will result in loss of benthic biota within the dredging footprint and recovery will occur through colonisation, but disturbance will be periodically repeated during maintenance dredging.

As for the direct effects of disposal of dredged material, this will alter the physical characteristics of the seabed, at least temporarily, and will cause loss of biota buried under the spoil. Recovery will occur through re-colonisation, but alteration of physical characteristics of the seabed means that the future benthic community is likely to have different community structure.

Overall, we find that the issues around inshore fisheries have been comprehensively addressed by the Applicant using appropriate methods and data. We find that the direct and indirect effects of dredging and disposal of dredged material, and any dredge plume, beyond the disposal site and the immediate vicinity of the disposal site (100s of m) will be negligible. At the disposal site and in the immediate vicinity of the disposal site, the effects will be moderate.

- **Marine Mammals**

Dr Clement, in her evidence-in-chief, stood by the conclusions regarding marine mammals in Appendix I of the AEE (Assessment of Effects on Marine Mammals from Proposed Capital Dredging and Spoil Disposal for Napier Port).

Four species of marine mammal regularly or seasonally frequent the inshore waters of Hawke Bay being the New Zealand fur seal, common dolphin, orca and southern right whale. Dr Clement referred to available data to conclude that Hawke Bay coastal waters are “not more ecologically significant in terms of feeding, resting or breeding habitats for any species relative to other regions along the North Island’s southeastern and central coastlines. Instead, Hawke

Bay waters represent a small proportion of similar habitats available throughout nearby regions". Furthermore, "most species' normal ranges extend across hundreds to thousands of kilometres". However, the southern right whales may use Hawke Bay for winter nursery habitat.

Dr Clement considered what she assessed to be the most relevant direct effects of dredging and construction activities: vessel strikes, underwater noise (especially during construction), and entanglement, and concluded that "the actual likelihood of [these effects] occurring in this case are *low* [her emphasis] and overall, I am of the opinion that the effects are deemed *de minimis* with recommended actions in place".

As for indirect effects, which included physical change to the habitat, Dr Clements assessed these as "temporary and are not expected, in my opinion, to be detrimental for local or visiting marine mammals in the region".

Dr Clements proposed mitigation methods for further minimising the risk of rare events, such as vessel strike, and monitoring that will improve understanding of how marine mammals respond to activities, rather than testing of specific predictions of effect. Dr Clements supported the conditions in the Marine Wildlife Management Plan and the Construction Noise Management Plan as incorporating the mitigation measures and best management practice to "avoid or minimise any relevant direct effects on local marine mammals".

The s42A report did not raise any issues related to marine mammals nor did any submitter.

We find that that the assessment by the Applicant of the potential direct and indirect effects of dredging and construction activities has been thorough and appropriate, and we agree with Dr Clement who considered the potential effects to be *de minimis* with recommended actions in place. Furthermore, we agree with Dr Clement's assessment that the conditions in the Marine Wildlife Management Plan and the Construction Noise Management Plan are suitably constructed to avoid or minimise any relevant direct effects on local marine mammals.

## 7.6 EFFECTS ON WATER QUALITY AND MARINE BIOSECURITY

Section 2 of the RMA defines contaminants as including any substance (including liquids, gases, solids, odorous compounds and organisms), energy or heat that on its own or in combination with the same or other substances, energy or heat, when discharged into water, changes or is likely to change the physical, chemical or biological condition of water. "Water quality" therefore covers a wide range of possible matters.

- **Water Quality – Sediments**

The key matter regarding water quality identified by the Applicant that is relevant to this application is the effects of turbidity and suspended sediments in seawater deriving from extracting material from the seabed and disposing of the extracted material elsewhere in the marine environment. Both turbidity and suspended sediment can have adverse effects on marine biota: the former affects underwater light climate, which primary producers are dependent on, and the latter can smother benthic communities when it deposits on the seabed out of the water column. Other matters relating to water quality are identified as chemical contamination and contaminants in stormwater runoff.

The potential effects of turbidity, suspended sediments and deposited sediments have been addressed by the Applicant in a number of technical investigations that are interlinked. Broadly speaking, these investigated the behaviour of dredged material once released into the environment, where it is then subject to the action of waves and currents.

The nature of the seabed and the nature and volume of material to be dredged are described in Appendix B (6 Wharf Development – Geotechnical Factual Report) and Appendix C (6 Wharf Development: 3D Geological Model and Dredge Volumes) of the AEE. Appendix B reports geotechnical data derived from land-based and barge-based boreholes, vibrocores of the seabed, downhole shear wave velocity tests, and laboratory testing (sediment classification and particle settling speed). Appendix C interprets the data, which includes a three-dimensional geological model that describes the various sediment/rock layers in and around the Port. Within the area to be dredged:

- approximately 20% of sediments are finer than 0.1 mm (very fine sand),
- approximately 70% of sediments are sized between 0.1 mm and 0.2 mm (very fine sand and fine sand),
- approximately 10% of sediments are coarser than 0.2 mm (fine sand and medium sand) and, of these, 1% are >0.5 mm (coarse sand and coarser) and 3% are >0.3 mm (medium sand and coarser)
- the median particle size is approximately 0.125 mm (boundary between very fine sand and fine sand).

The material is therefore largely fine sand and very fine sand, with a small portion of medium sand and very little coarse sand or gravel. Appendix C also reports dredge volumes by sediment type and location of dredging (area A – outer channel; area A1 – transition between areas A and B; area B – inner channel; area C – swing basin; area D – 6 Wharf berthing pocket), which were calculated from the geological model. Simplifications and assumptions are listed.

Appendices D, E and F use models to predict the dispersal in the coastal marine area of sediments released into the water column during dredging and disposal, and also sediments resuspended from the proposed offshore disposal site post-disposal. Sediment data from

Appendices B and C are used as appropriate; for instance, the analysis of the dispersal of plumes associated with the actual dredging and disposal activities addresses all sediment grainsizes, including silts and clays, whereas the post-disposal assessment focuses primarily on very fine sand and fine sand. Appendix G provides information on the physical setting and coastal processes. Appendix H uses information from the other reports as needed to assess effects on benthic ecology and fisheries.

The potential effects of turbidity, suspended sediments and deposited sediments on benthic ecology and fisheries have been addressed extensively by us in a previous section, which we will not repeat here.

- **Water Quality – Chemical Contaminants**

Dredging also has the potential to disturb sediments containing chemical contaminants that may be present in seabed sediments. This issue was raised by Ngaio Tiuka and the Mauri Protection Agency, who expressed concern that there was no consideration of hazardous chemicals / contaminants in the dredge spoil

Mr Sneddon responded that this matter had been addressed in section 6.1.2 of Appendix H of the AEE. It was reported that, in samples from the fairway and vicinity, all trace metals were at concentrations well below ANZECC (2000) ISQG–Low guideline values, and semi-volatile organic compounds and organotin compounds were all below detection limits for the four samples that were analysed. Mr Sneddon posited that the main reasons for this are likely to be that the fairway sediments have a relatively low proportion of silts and clays and exist outside of the confined boundaries of the Port in a relatively high-energy, dispersive environment. In addition, the absence of vessel maintenance facilities at the Port is also notable as these can represent a significant source of contamination. Mr Sneddon referred to toxicity testing in 2016 that indicated no detectable toxicity and it was concluded that the sediment represented by the seabed sample may be considered “non-toxic” for potential impacts on water-column biota during dredging operations. As for the swing basin and berth pockets, there is only a limited amount of information, but testing carried out by NIWA since 2006 has reported no evidence of toxicity for any sediment sample.

We accept that the available data and the absence of vessel maintenance facilities at the Port makes it very unlikely that hazardous chemicals / contaminants in the dredge spoil will be an issue.

- **Water Quality – Stormwater**

Stormwater runoff also affects marine water quality. The Port currently holds a stormwater discharge permit that provides for the discharge of stormwater from the Port premises and

surrounding area into the coastal marine area and/or gravel beach immediately adjacent to the coastal marine area. The consent requires that all reasonable measures be taken to ensure that the discharge is unlikely to give rise to effects in any receiving water after reasonable mixing associated with: oil or grease films, scums or foams; floatable or suspended materials; conspicuous change in colour or visual clarity; emission of objectionable odour; rendering of any aquatic organism unsuitable for human consumption; and significant adverse effects on aquatic life.

The Port has a stormwater monitoring programme in place and reports the results to HBRC. Mr Sneddon, in his evidence-in-chief, said that bi-annual monitoring between 2006 and 2012 has resulted in no metal analyte exceeding the ISQG–Low threshold, and TPH (total petroleum hydrocarbons) have been consistently below analytical detection limits.

As for the proposed development, the stormwater generated from the new wharf will flow overland from the newly constructed hardstand area into slot drains to discharge from the existing consented stormwater outlets into coastal waters. A new slot drain will service the new development and three existing slot drains will be upgraded. The AEE notes that "the catchment area is of a nature and scale that any stormwater generated is minor both in volume and in terms of potential environmental impact on coastal waters. Stormwater discharges will meet the overall receiving water standards, after reasonable mixing, as required. The increased discharge will be consented by a modification to the existing permit immediately prior to construction and will be managed within the context [of the existing conditions relating to stormwater]".

The AEE concluded that, in regard to the discharge components of the Project, "all standards and requirements relating to water quality [in the RCEP] are met" (see AEE section 9.7 for more information).

- **Water Quality – Overall**

Dr Kelly in his evidence-in-chief, stated that overall, he agreed with the Applicant in relation to potential effects on water quality.

Overall, we find that the issues around water quality have been comprehensively addressed by the Applicant using appropriate methods and data. Furthermore, we accept the overall conclusions given in Table 1 of the AEE regarding water quality that (1) dredged material will be "clean" (i.e. contains no problem chemical or organic contaminants) and that discharge to water of any hazardous contaminants will cause no effect; (2) localised and temporary effects of turbidity and suspended sediments near to dredged and disposal areas during dredging activity will be less than minor; (3) the longer-term potential for resuspension of material disposed of at the offshore site to affect Pānia Reef will be negligible.

- **Water Quality – Monitoring Principles**

Mr Sneddon, in his evidence-in-chief, said that the scale of the Project and uncertainty in ecological assessments warrant robust monitoring to validate the findings of the assessments and to initiate remedial action in the case of unforeseen outcomes. There should be two types of monitoring: (1) monitoring to collect real-time water-quality information for use in adaptive management, and (2) direct or indirect monitoring of important ecological receptors to provide assurance that significant adverse effects are not occurring.

Appendix H of the AEE lays out the thinking behind monitoring to provide for adaptive management and assurance. Appendix R provided a draft WQMP based on this thinking, which was endorsed by Mr Sneddon in his evidence-in-chief. Performance objectives included:

- No exceedance of environmental limits as a result of suspended sediment from the disposal of dredge spoil associated with dredging activities above the increases predicted by the dredge plume modelling.
- Assurance that significant ecological effects attributable to the activity are not occurring on Pānia Reef.

The draft WQMP was to be indicative only, recognising that it would be further developed during the Hearing.

The first component of the draft WQMP (called "Adaptive Dredge Management", or ADM) is planned for the operational phases of the Project to ensure that turbidity related to the dredging and disposal[23] does not exceed predictions (which formed the basis of the ecological assessments that concluded minimal effects). The second component provides assurance that significant ecological effects are not occurring.

The adaptive management component of the draft WQMP is founded on baseline monitoring data collected to date using two telemetering monitoring buoys (each measuring turbidity, salinity, water temperature and conductivity) deployed at Pānia Reef (one buoy at Pānia East site and one buoy at Pānia West site). The principal metric is turbidity[24], which, Mr Sneddon explained, is a convenient proxy for both light and suspended sediment; adaptive management schemes based on turbidity are "common". Turbidity data collected to date (with the Pānia Reef buoys and during other surveys) indicate turbidity is generally low (< 10 NTU), and reaches

[23] The AEE notes that the wharf construction itself involves removal of the existing revetment material, minor reclamation below MHWS, and placing of replacement armour material, pile driving into the seabed, and construction of the wharf over the sea surface. These processes will cause some localised turbidity, and the construction will be managed in a way that construction materials including concrete and fluids are not accidentally discharged into the marine environment. A detailed construction management plan will be a requirement of any consent to ensure that any potential for contaminant discharge from the wharf construction is avoided.

[24] Turbidity is measured in nephelometric turbidity units (NTUs) and is an optical quality of water.

30–50 NTU during events, which occurs when rivers discharging to the coast run high and when there are large waves. Section 9.3 of the AEE provides a succinct description of turbidity and other components the water quality of the receiving environment.

The ADM relies on a system of "triggers" linked to management actions in a "tiered response framework". Section 9.1.6 of Appendix H of the AEE gives a "suggested framework for consent conditions around turbidity monitoring and compliance" (Table 24) and a "conceptual decision tree" (Figure 48), which shows how turbidity triggers could be used for assessing and managing compliance of capital dredging operations. The triggers were developed from the baseline turbidity information and the ecological investigations. Appendix H provides a brief overview of how the triggers were developed, noting that a conservative approach was taken. The triggers have a "duration component", recognising that brief periods of elevated turbidity occur naturally and therefore have very little ecological risk. In his evidence-in-chief, Mr Sneddon said that the turbidity triggers that he had developed were incorporated in the draft WQMP.

The real-time data (from the Pānia East and Pānia West buoys), after "smoothing" by applying an industry-best-practice method[25], are compared to the triggers; if the smoothed data exceed the triggers, then the tiered response framework is consulted to determine whether a management response is required and, if it is, what that response has to be. Recognising that failures of the monitoring equipment can occur, the ADM includes contingencies for instrument malfunction, which may interrupt the real-time datastream.

Exceedance of trigger levels requires reporting to HBRC, and reporting will require a determination of whether the exceedance is dredging-related. Analysis using a range of methods and information will be applied to make a judgement as to the latter and will take into account the fact that waves and river runoff associated with high rainfall also cause elevated turbidity, at times significantly higher than normal ambient conditions. Section 9.1.4 of Appendix H discusses this matter.

In the case that the exceedance is determined to be dredge-related, the notification shall include details of management measures to be taken or being undertaken. The management measures will depend on many factors and may include: reducing the rate of dredging and disposal; if practical, relocating the dredge to a different area with more coarse material; disposing in an alternative part of the offshore disposal area; using the existing consented inshore disposal area.

[25] Data are "smoothed" using an Environmentally Weighted Moving Average (EWMA) for comparison against prescribed trigger values. The EWMA approach overcomes much of the "spikiness" and noise inherent in turbidity monitoring data and allows it to be more effectively used in applying environmental triggers.

The purpose of the assurance monitoring is to "ensure that the underlying assumptions and ongoing management of the Project is achieving the objectives of the WQMP, in particular to ensure that the effects of the Project are no greater than anticipated and to provide protection to the physical, ecological and cultural environment" (Appendix R of the AEE). Results from the assurance monitoring may be used to evolve the ADM as dredging proceeds over the years.

Ecological monitoring would involve periodic surveys of ecosystem condition, with Pānia Reef being the principal focus, and would focus on ecological changes related to sediments. This is not intended to serve the day-to-day adaptive management, rather it is intended to identify "any more serious or distinct effects where causation is rather more obvious" and to provide "assurance that the actual condition of the prime receptor of concern is being monitored during the Project, regardless of prior assessment findings".

Four components of the assurance monitoring are given in Appendix R these being;

(1) Plume modelling validation. The purpose of plume modelling validation is to ensure that the predictions of plume intensity and spatial extent (reported in Appendix E of the AEE), upon which much of the ecological assessment was hung, are generally in accordance with data.

(2) Bathymetric surveys. Bathymetric surveys of the offshore disposal ground will be compared against the predicted sediment dynamics from the sediment transport modelling.

(3) Pānia Reef dive surveys. Surveys of the communities at Pānia Reef will be undertaken by suitably qualified scientists at various intervals, using methods and locations in accordance with those used in Appendix H of the AEE.

(4) Benthic surveys. Benthic surveys to determine the biological nature of the benthic habitats at the offshore disposal area will be conducted at 5 yearly intervals following completion of Stage 1 dredging and will include infauna cores and grab samples and epifaunal dredge trawls, within the boundary of the offshore disposal area and beyond the boundary.

Mr Sneddon in his evidence-in-chief explained why Pānia Reef is the focus of the assurance monitoring: (1) Pānia Reef is a unique feature in southern Hawke Bay with high ecological, cultural and amenity values; (2) Pānia Reef is located between the outer fairway to be dredged and the disposal area and is the closest reef area to the boundary of the disposal area; (3) being located offshore, Pānia Reef is not as frequently exposed to high turbidity, so elevation of turbidity above background is likely to be greater (and therefore more readily identified).

Many submitters asked for more information on the monitoring, contending that not enough information was given in Appendix H of the AEE. Mr Sneddon countered, in his evidence-in-chief, by providing a succinct summary of the proposed monitoring, what it hopes to achieve and what methods would be used. Mr Sneddon provided references to the various reports where the monitoring plan is more fully described.

We accept that the Applicant has provided appropriate detail on the purpose, objectives and methods of water quality monitoring, which includes ecological monitoring as part of an assurance programme.

- **Water Quality – Water Quality Management Plan**

Based on information provided by the Applicant in Appendix R, the s42A report included a WQMP in a set of recommended (draft) conditions, to be applied should consent for the Project be granted. The s42A report concluded that "the effects on water quality can be appropriately managed by the proposed WQMP".

Dr Kelly in his evidence-in-chief reviewed the draft WQMP and generally agreed with its content. He recommended the inclusion of provisions requiring (1) monitoring of contaminants in the material being taken from the inner port basin and the material at the disposal site, including, at a minimum, the heavy metals/metalloids arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc, and (2) monitoring of sediment texture at the disposal site, because it has a strong influence on benthic communities.

Ms Allan, in her additional statement of evidence (20 August 2018), included in her proposed amendments to the draft WQMP a requirement for contaminant monitoring, as recommended by Dr Kelly. The requirement for monitoring sediment texture (recommended by Dr Kelly) was already included in the draft WQMP at this point. Ms Allan also proposed a new provision, which would apply to all conditions, including those that related to the WQMP, that involve a certification process, which was designed to provide certain safeguards to the Applicant.

In the Joint Statement of Planners Relating to Proposed Conditions of Consent (14 September 2018), Ms Allan and Mr O'Leary presented a full list of agreed and non-agreed conditions. Ms Kydd-Smith and Mr O'Leary fully agreed all of the agreed conditions, including those to do with the WQMP. There were no non-agreed conditions relating to the WQMP.

Overall, we accept the purpose and methods of the conditions relating to the WQMP provided in the Joint Statement of Planners Relating to Proposed Conditions of Consent. Furthermore, we find that the effects on water quality can be appropriately managed by the proposed WQMP.

- **Dredge Plume Model**

Ms Allan also proposed removing from the draft WQMP the requirement for model validation on the back of Dr Adamantidis' evidence-in-chief where he presented a validation of the D-WAQ PART particle-tracking model used to simulate the dredge plume dispersal. The field data used in the analysis were collected over the course of 2 days during a maintenance dredging campaign that was undertaken during October and November 2017. Tested against the data were measurements of vertical plume structure, horizontal extent and spreading of plume, and TSS[26] concentrations within the plume. In all respects the model was found to be performing well. Ms Allan opined that this constituted a proper validation of the model, which means there be no need for a condition requiring that model validation. Mr Reinen-Hamill agreed with Ms Allan.

We agree that the dredge plume model has been appropriately validated with data.

- **Marine Biosecurity**

While neither the AEE nor Appendix H of the AEE addressed marine biosecurity issues, these were discussed in the response to a s92 request for further information dated 16 March 2018. In that, it was argued that for there to be a risk of unwanted marine organisms (UMOs) in dredged material they would need to be present in the material but not the disposal area, and they would need to be able to survive the transfer to the disposal site and be able to establish a self-sustaining population at the disposal site once there. Furthermore, the "human-induced" transfer of UMOs would need to be more significant than natural transfer (by, for instance, waves and currents).

Mr Sneddon outlined in his evidence-in-chief, that this was unlikely since the transfer distance (around 5 km from the Port to the offshore disposal site) is small. Mr Sneddon concluded that there will therefore not be any increase to the existing biosecurity risk, and that implementation of MPI's existing requirements for mitigation of biosecurity risk – which the Port is bound to do and does – will reduce the risk to an "acceptable level".

Despite this, the recommended draft conditions proposed in the s42A report included a BMP, which requires description of (1) how the risk of a biosecurity incursion from a dredge vessel is to be reduced "to the greatest extent practicable", and (2) the steps to be taken if dredging activities discover UMOs.

[26] Total suspended solids (sediments).

In the Joint Witness Statement following Conferencing of Marine Ecological Experts (17 August), Dr Kelly opined that, while acknowledging the difficulties in accurately assessing biosecurity risks, "the methods now proposed for dealing with these risks [in the s42A recommended draft conditions] are appropriate in this instance".

In the Joint Witness Statement Following Caucusing of Marine Ecological Experts on Aspects of Proposed Conditions of Consent (12 September 2018), Dr Kelly recommended changes to the s42A biosecurity conditions, essentially requiring specific elaboration of the measures to be taken to confirm (1) whether UMOs are present on Port wharf structures, (2) staff training procedures to recognise UMOs, and (3) procedures to be followed in the event that UMOs are discovered. The main justification was that the Biosecurity Act (1993) provides requirements in relation to UMOs being *knowingly* [Dr Kelly's emphasis] communicated, released or otherwise spread, and there is concern that these procedures might be avoided through unintentional or wilful ignorance of HMOs. Dr Kelly's recommended changes would remedy this, making sure that staff "know what they are looking for". Mr Sneddon disagreed with Dr Kelly, and supported the s42A biosecurity conditions, arguing that Dr Kelly's measures would not stop the spread of UMOs, and that it is preferable to require consideration of emerging risks (national and regional) with an updateable BMP, rather than have this fixed in consent conditions.

In the "Joint Statement of Planners Relating to Proposed Conditions of Consent" (14 September 2018), Ms Allan and Mr O'Leary presented a full list of agreed and non-agreed conditions. This included the s42A BMP, which does not have Dr Kelly's measures. Ms Allan, not agreeing with Dr Kelly's measures, preferred the s42A recommendation regarding the BMP. Ms Kydd-Smith's position on this matter was not recorded.

Overall, we find that some elaboration of the biosecurity measures and initiatives already in place is required, which information would be certified by the Council prior to beginning Stage 1 capital dredging.

## 7.7 EFFECTS ON BIRDS

The Port area is home to a variety of shorebirds and seabirds. The Ahuriri estuary is the most significant habitat of its kind between Wellington and the Bay of Plenty, with over 70 bird species, including some that are *Nationally Threatened* or *At Risk*, to be found there. Furthermore, Hawke Bay is an important feeding ground for numerous seabirds.

The potential effects that this proposal may have on avifauna in the Port area were investigated by Wildland Consultants Ltd (Wildlands), and they made recommendations for managing any risk to birdlife that may arise from the proposed dredging and construction activity.

At the outset, the Applicant recognised that "the Project has the potential to affect birds within the vicinity of its operations and proposed works. The potential effects primarily arise from direct habitual disturbance during the construction period and effects on feeding areas as a result of the disposal of dredged material".

We were advised that the species most at risk was the kororā (Little Blue Penguin), who inhabit the existing revetment at the container terminal where the new wharf is proposed. The Port is a haven from predators because it is subject to ongoing pest control, and because dogs are prohibited from the area. Being prone to mammal predation, the existing revetment is therefore a preferred nesting place for the kororā.

Wildlands' investigations concluded that deconstruction of the affected revetment would have unavoidable effects on the kororā population that nest there, but that the effects would be minor because of the species' tolerance of disturbance. Wildlands recommended a set of management options for dealing with this situation, which were eventually encapsulated in a draft condition that includes other bird species as well. That draft condition for the sustainable management of kororā (and other bird species) is to be found under the umbrella of an Avian Management Plan (AMP). Essentially, it is a mechanism to "as far as practicable avoid but otherwise mitigate or remedy, adverse effects on the populations of Little Blue Penguin and other species established in and nearby the existing revetment during the construction period".

Other species like Black-Billed Gulls, White-Fronted Tern and shag once nested nearby – outside the Project construction area – and Wildlands reports that if they were to return it would likely be to another part of the Port. Wildlands therefore concludes that potential effects of construction activities on other bird species are likely to be less than minor, albeit that the draft condition referred to above includes other species as well as kororā.

We were persuaded that an appropriate management regime is necessary for the survival of all bird species in the Port area, and that for the reasons given, the kororā required particular attention.

We note, too, that the kororā is regarded as a taonga (treasured species) by mana whenua hapū, and that the move by the Port to ensure its survival is welcomed by these hapū. Moreover, mana whenua hapū are keen to "partner" Port of Napier in this process.

## 7.8 EFFECTS ON RECREATION AND ACCESS

Public access to the Port working area is restricted, for safety and biosecurity reasons – such is the nature of establishments like ports.

Access to the surrounding coastal environment on the other hand is permissible, in particular for recreational activities such as surfing and gathering of kai moana, including recreational fishing. Commercial fishing is dealt with elsewhere in our decision.

We accept the Reporting Officer's assertion that access to the coastal environment for recreational fishers will not be affected by the activities associated with the building of the new wharf, other than the normal need to safeguard human life (for example, when in transit past dredging vessels), and possible disruption at or near the proposed new disposal area. Recreational fishing opportunities can, of course, always be accessed elsewhere along the Hawke Bay if construction activities prevent this in the vicinity of the Port.

With respect to surfing, the s42A report and AEE refer to two popular surf breaks – City Reef and Hardinge Road – and the admission that the proposed dredging will change the nature of the seabed. The effects this would have on such surf breaks and the surfing amenity values of surfers have been comprehensively investigated by the Applicant. In summary, any effects are likely to be minor.

In section 6.3 of our decision we refer to the evidence of coastal experts Dr Terry Hume and Mr Richard Reinen-Hamill on surfing. They both agreed with the Applicant that the proposed channel dredging is unlikely to have any significant adverse effects on the surfing amenity in the vicinity of the Port. Mr Reinen-Hamill based his assessment on his conclusion that the proposed channel dredging is likely to have only minor effects on waves and currents.

In our view, there is sufficient expert evidence to conclude that the potential adverse effects on surf breaks and surfing amenity are likely to be minor.

Recreational diving is also discussed in more detail elsewhere in this decision, but it is worth repeating here that diving for kai moana for "cultural/recreational purposes" is a key issue for mana whenua, for much the same reason as outlined by the Freedom Divers Hawke's Bay Club. The main concern for recreational divers, like those of mana whenua hapū, is the health of key diving spots like Pānia Reef and having an assurance that disposal of dredged material will have minimal, if no, adverse effects on this taonga gives pause for supporting the proposal.

The s42A report also highlights that beach access is unlikely to be affected other than perhaps during construction, through noise activity at the time. This matter is covered in another part of our decision, and suffice it to say here that the aim is to maintain noise at the highest construction standards.

In general, it would seem sensible to adopt the s42A premise that whilst there may well be a degree of disruption to access and recreation activities in and around the Port area during

construction, these will be localised and of a short-term nature and are likely to be less than minor.

## 7.9 EFFECTS ON MARINE ARCHAEOLOGY

Archaeological sites are protected under the Heritage New Zealand Pouhere Taonga Act 2014 and are regarded as being of national importance that need to be recognised and provided for in proposals like this one.

The s42A report refers to the existence of eight historic heritage features in the Hawke's Bay coastal environment, two of which are within close proximity to the Port – an ex freezing works site and a shipwreck (the Montgomery – an immigrant and cargo ship from England).

The Reporting Officer agrees with the Applicant that the freezing works will not be affected by the development of a new wharf as proposed by the Port. There is no evidence that would cause us to disagree.

The shipwreck on the other hand is located in shallow water where it could be compromised by the proposed activities if there was a significant change in existing wave climate. According to evidence from coastal experts it is highly unlikely that the wreck will be affected by the small change in wave climate expected. The Reporting Officer sees no reason to disagree with this conclusion, and neither do we.

## 7.10 EFFECTS OF OCCUPATION

The applications include Application 6, which applies to occupation of the Coastal Marine Area (CMA). Port of Napier now wants to extend its area of occupation, and port activities. As noted, HBRC is responsible for activities within the CMA, and Napier City Council has responsibilities outside the CMA.

A permit to occupy effectively provides for the exclusive access to, and use of, an area on the basis that such occupation is “reasonably necessary for another activity”, in this case the operation of the Port.

Currently the Port has two coastal occupation consents, both due to expire in 2026, even though they were issued at different times. The first was issued by the Minister of Transport in 1966 and the other in 2003 by the Hawke's Bay Regional Council following a further reclamation of 2 hectares.

The Applicant is now seeking a new consent to replace the two existing ones, and which will also cover the full extent of the Port’s operations following the proposed development. This

will include the new wharf and berth pocket, and the new swinging basin area, and will run for 35 years. We support the need for 35 years in order to provide the Port a degree of certainty in its long-term planning and budgetary considerations. In addition, it gives the wider community some certainty as well.

The AEE outlined the rationale as to why the Port requires a permit to occupy, including the need to protect the Port's assets and operations, and the need to provide for the health and safety of the community. The s42A report agreed that exclusive occupation was justified. We see no reason to disagree.

Health and safety concerns were key matters with respect to occupation and, in our view, these appear to be adequately catered for. The need for 24-hour uninterrupted access for vessels seeking to access and use Port facilities is another, and from what we were advised there are no known concerns. The AEE 's observation that the current occupation permits are not known to have caused any inconvenience to other parties is also noted.

We concur with the s42A report that the principal effect to be considered "is the potential for the Applicant to exclude other users from the water area as and when necessary". In the Applicant's view this would be less than minor. We heard no evidence to the contrary.

## 7.11 CONSTRUCTION EFFECTS

The Project will require the construction of a new wharf and dredging of the seabed. The dredging component of the Project is entirely within the Coastal Marine Area (CMA) and other ancillary activities which should be expected as part of operating the Port. The proposed dredging will be undertaken in accordance with any management requirements required by conditions of the consent. The contract conditions will manage Port access, security and other aspects which are not subject to RMA requirements.

The construction of the wharf could take more than two years, including the time required to clear the proposed wharf site and set up the construction area. The proposed location is separated from residential dwellings; however, the sites are anticipated to notice the construction.

The RCEP has provisions specifically related to Port noise. The emissions of noise for both the construction of the wharf and dredging activities will not exceed the permitted activity requirements. The vibration effects are expected to be negligible due to the large separation distance from the proposed construction works to nearby residential areas.

All proposed works will be required to be in accordance with a Construction Management Plan and a Traffic Management Plan. The potential adverse construction and associated transport

effects can be mitigated and therefore the effects of construction are deemed to be less than minor.

## 7.12 POSITIVE EFFECTS

The positive effects associated with the proposal are substantial and must be given regard to because they contribute towards the purpose and principles of the RMA. Part 2 of the RMA gives regard to enable communities to provide for their social, economic and cultural well-being and for their health and safety.

The Applicant provided an economic assessment of the contribution of the Port to both the local and regional economies. The Port and associated operations contribute $207 million annually to regional production revenue, with ongoing capital maintenance expenditure contributing a further $20 million annually.

Upon completion of the development, the Port's operations will directly and indirectly raise its Employment from 523 currently to an estimated 700 – 810 by 2025. The development will be able to service all future requirements of the region, thus meaning that there will be no requirement to outsource to other out-of-region facilities.

The development is designed so that two container vessels can work simultaneously, and will allow for two cruise vessels to dock. This increases tourist numbers to Napier by 12,000 per annum. The proposal is anticipated to bring great economic benefit to Napier and its Region.

Through the consultation process, the Applicant has been on a journey of discovery with mana whenua hapū. The Project has provided for the development of a better understanding of the cultural values of the area for the Port management itself. Subject to conditions, the granting of the consent will enable the relationship between the Applicant and mana whenua hapū to continue developing. This will allow hapū to work with the Applicant to share information and provide and protect the sites of great significance to mana whenua hapū.

## 7.13 INSHORE DISPOSAL- CONSIDERATION OF REQUIRING SUCH DISPOSAL

Two issues were not assessed in the AEE, these being the potential effects of the increased loss of fine sands from the Westshore nearshore and beach system due to the increased trapping efficiency of the larger channel and the merits of disposal of sediment in an area already agreed by the experts to be in a state of deficit. These effects were acknowledged and agreed by all the coastal experts in their Joint Witness Statement, and we have discussed them elsewhere in this decision. These are important, because they go to the heart of whether we believe it is appropriate to impose the s42A report recommended condition requiring the disposal of "suitable" dredged material at the currently consented inshore disposal site.

We understand that, if activities to be undertaken by the Port cause or contribute to the erosion of Westshore Beach then, under s108 and 108AA of the RMA, we may impose conditions that would avoid, remedy or mitigate that erosion. This, of course, is the basis of the proposed condition in the s42A report requiring disposal of suitable dredged material at the currently consented inshore disposal site.

We have been presented evidence concerning two possible ways the activities to be undertaken by the Port could cause or contribute to the erosion at Westshore, which could justify accepting the s42A report recommended condition. The first concerns the increased trapping efficiency of the dredged channel, which will cause sediment that otherwise may have stayed in the Westshore nearshore and beach system to become trapped in the channel, with beach erosion ensuing. The second concerns the disposal of dredged material at the inshore disposal site. The argument here is that, since disposal of dredged material has benefited Westshore Beach (by reducing beach erosion), then continuing that disposal would mitigate an adverse effect of the activity on Westshore Beach.

We understand that the starting point for the assessment of effects must be the existing environment. We discussed in section 7.1 how we understand the meaning of the "existing environment", and we concluded that the navigation channel as it exists today is a part of the existing environment, as is the disposal of dredged material at the inshore site that is authorised by Coastal Permit CL970159D.

With that finding, we can now assess the effects of increased trapping efficiency of the channel and the value of inshore disposal.

As for channel trapping, we concluded in section 7.3 (subsection Impact of Larger Channel on Westshore Beach Erosion) that dredging of the channel will increase its trapping efficiency, but the *increase* (over the trapping efficiency of the existing channel) will be small, and that increase will result in only a small effect on beach erosion at Westshore. We find, therefore, that this is not sufficient justification for imposing the s42A report recommended condition.

As for the value of inshore disposal, we concluded in section 7.3 (subsection Benefit to Westshore Beach – Inshore Disposal) that inshore disposal of sediment does curb beach erosion, albeit temporarily, and in section 7.3 (subsection Effectiveness of Inshore Disposal), that disposal at the inshore disposal site will increase the protection of the beach from wave attack, which will decrease beach erosion at Westshore. As for the "size" of the benefit, the evidence indicates that there is a benefit to Westshore Beach in terms of progradation of the shoreline and a change in breaking waves that are measurable and apparent to the interested observer, but it has not been made clear to us, from the evidence presented, whether that

translates into a significant benefit in terms of actually protecting Westshore Beach from erosion.

There are pertinent factors, however, that lead us to the view that the benefit conferred to Westshore Beach, although real, is not significant. Firstly, the benefit to date has been both episodic (insofar as maintenance dredging campaigns to date have been episodic) and temporary (subject to the vagaries of the currents, waves and littoral drift that remove sediment from the Westshore littoral cell). Secondly, Coastal Permit CL970159D, which authorises the inshore disposal of dredged material, expires in 2033, also allows for disposal at Area 1A (which is offshore from RExt), is not required to be exercised, and can be surrendered at any time.

We consider, given these considerations, that the inshore disposal is more correctly viewed as an *ad hoc* and opportunistic nourishment effort, and cannot be viewed as a systematic, planned or durable beach nourishment campaign. Therefore, we conclude that inshore disposal can only be regarded as having a minor mitigation effect, over the medium and long terms, on Westshore Beach. We find, therefore, that this too is not sufficient justification for imposing the s42A report recommended condition.

## 8. ASSESSMENT OF ALTERNATIVES

Four alternative wharf options were considered by the Applicant. These included retaining the *status quo*, redevelopment to provide the wharf to take gantry cranes, extension of the wharf to gantry compatible status, and western development including reclamation. These options all had limitations including being short-term bridging, creating major disruption to the operation of the Port, not allowing the Port to grow to its operational capacity, and causing greater environmental and amenity impacts.

Having considered this matter, we are satisfied with the conclusions contained in the AEE in respect of the appropriate consideration of alternatives.

## 9. SECTIONS 105 AND 107 – RMA

Sections 105 and 107 of the RMA provide specific additional considerations for s15 applications (discharges including within the CMA). Specifically, s105(1)(a),(b),(c) and 107(1) and (2) apply.

We have considered the applicant's analysis of s105 and s107 contained in the AEE and further outlined in the s42A report. Both the AEE and 42A report reach similar conclusions. These included that the discharge is a naturally-occurring sediment, the disposal area for sediment discharge has been chosen so the environmental effects can be mitigated to being less than minor, and the discharges meet the requirements of being temporary in nature. We adopt the

analysis and conclusions on this topic in the AEE and s42A report having regard to s113(3) of the RMA.

We are of the opinion that the sensitivity of the receiving environment has been appropriately considered in the AEE, and we have considered these matters in our decision.

It is for these reasons that sections 105 and 107 do not prevent the proposed activity being granted consent.

## 10. NZ COASTAL POLICY STATEMENT

It is considered that the New Zealand Coastal Policy Statement 2010 (NZCPS) is of relevance to the consideration of the application as it applies to the coastal environment. The NZCPS must be given effect to through planning and decisions of both the Regional and District Councils.

Ms Allan provided a detailed assessment in her AEE and we agree with her findings. The application is not inconsistent with the NZCPS. The proposed option has been chosen above all other options to avoid potential significant adverse environmental effects.

The conditions proposed mitigate the potential adverse effects the proposal could have. These include the proposed mitigation and remedy of natural character (in particular local avifauna, as an element of local natural character) and cultural monitoring.

Given we concur with the assessment contained in the AEE, the s42A report analysis and associated evidence, we adopt those in accordance with s113(3) of the RMA.

## 11. REGIONAL INSTRUMENTS

- **Hawke's Bay Regional Policy Statement**

The Regional Policy Statement (RPS) and the Regional Coastal Environment Plan (RCEP) require consideration. The RCEP applies to the coastal environment and contains several objectives and policies which are particularly relevant to the proposed activity. Mr O'Leary provided a comprehensive table in his s42A report.

Objective 33 of the RPS provides recognition that some infrastructure which is regionally significant has specific locational requirements. The investment and ongoing development proposed is in line with this regional policy. The dredging and associated activities, through mitigation, is consistent with Objective 6. The Applicant intends to minimise adverse effects on Pānia Reef while also providing monitoring information. It is for these reasons that the proposal is in accordance with the RPS.

We have considered the assessments contained in the AEE and the s42A report and associated evidence, and we adopt those assessments in accordance with s113(3) of the RMA.

- **Hawke's Bay Regional Coastal Environment Plan**

The Planning Maps provide for Port activities in the PMA. Because of this, some of the maintenance dredging proposed is permitted or controlled under Rules 139 and 140. Chapter 16 (Discharge of contaminants into CMA), 17 (Disturbances, depositions and extractions into CMA) and 18 (Structures and occupation of space in CMA) relate directly to the activities for which consent is sought. The Applicant has provided a detailed assessment against the proposal. We concur with the Applicant's findings and we believe the proposal is in accordance with the RCEP.

Whilst Mr O'Leary and Ms Allan agreed on most matters relating to the RCEP, they disagreed on Policy 17.1, which sets out environmental guidelines for the management of deposition and extraction of material within the CMA and disturbance of the foreshore and seabed. Guideline 3 (b) states that initiatives to deposit dredged or excavated sediment in designated disposal areas within the CMA shall be provided for where the deposit will help to nourish beaches adjacent. The Applicant has stated in their application that the dredged material is unsuitable for nourishment on the Napier city beaches but, if it is suitable, renourishment can be provided for under an existing deposition permit. Mr O'Leary stated that further investigation should be done to determine the nature of the material and the use of this material would be consistent with Chapter 15 of the RCEP. We consider this issue in section 7 of this decision.

## 12. OTHER MATTERS

- **Clifton to Tāngoio Coastal Hazard Strategy**

Mr Loughlin and Mrs Pilkington were concerned that ceasing disposal of dredged material at Westshore seriously undermined the Clifton to Tāngoio Coastal Hazard Strategy 2120, which depended on the continuation of nourishment at Westshore, by the current programme of gravel nourishment of the subaerial beach and by building an offshore sand bar, to effectively achieve the aims of the strategy regarding hazard management of the coast between Clifton and Tāngoio.

Ms Allan, in her evidence-in-chief (para 121) outlined that the Strategy report has been released in February 2018 and that it has "no statutory status at this stage", and that the recommendations in the report are "only that" and have not been costed or adopted. The s42A report (para 204) noted that the Strategy was only "somewhat relevant as background to this consent process".

Ms Allan advised that the report "should not be influential in the consideration of the current applications".

Having considered this matter and noted that the strategy had not been formally consulted on through a local government consultation process at this stage, we accept Ms Allan's position and note that the strategy has not been considered in terms of our determination of the applications.

## 13. PART 2: RESOURCE MANAGEMENT ACT 1991

As noted above, we conclude that the proposal aligns with the relevant policy statements and planning documents and note that both Ms Allan and Mr O'Leary reached a similar conclusion. No party raised with us that there was any invalidity, incomplete coverage or uncertainty with the planning documents or any suggestion that they have not been competently prepared in accordance with Part2.

However, for completeness we have also considered Part 2 directly, and note it has led to us reaching the same outcome as has the consideration of the higher order planning documents.

- **Section 5 – Purpose**

Section 5 details the purpose of the Act, which is to achieve sustainable management. Sustainable management is defined as "managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety".

The Applicant proposes to use and develop through wharf construction and capital dredging an area of the CMA within the PMA. This is intended to enhance the functionality of the Port to enable it to meet local and regional needs. These needs have been outlined by the Applicant and Mr O'Leary.

The proposal will result in increased employment generation and enable the Port company to service the requirements of both exporters and importers.

The proposed wharf will enable greater efficiency in working container vessels and provide increased capability to accommodate cruise ships.

Overall, we consider that there will be tangible benefits such as employment opportunities and economic benefit generated by the proposal.

The proposal therefore contributes to the social, economic and cultural well-being locally and in the wider regional context. Matters relating to potential environmental effects can be mitigated through the imposition of consent conditions.

Therefore, the proposal provides for the sustainable management of physical and natural resources, and results in the development of a facility for existing and future generations.

- **Section 6 – Matters of National Importance**

We are required to recognise and provide for matters of national importance; and all matters outlined in s6, subsections (a–h) in respect of the proposal, require such consideration.

We note the analysis outlined in the AEE both in sections 23.2 and 24.6 [27] and generally accept the analysis and conclusion reached.

We have considered the natural coastal character values of the Port area and conclude that they are not high. There has been significant modification to the coastal character since establishment of the Port and, while it is proposed to construct an additional wharf, it is adjacent to an existing reclamation.

Ms de Lambert had concluded that any effects arising from the construction and operation of the new wharf would have no more than minor effects on natural character matters and Ms Allan had also reached a similar view.

We concur with those conclusions and find that any effects on natural character are no more than minor.

In respect of s6(b), we are of the view that outstanding natural features such as Pānia Reef will not be impacted by the proposal. Having regard to the evidence presented to us and the AEE documentation, we consider that any effects on the reef will be avoided. We were advised that the proposal had been developed to avoid adverse effects on Pānia Reef and nearby onshore reefs.

We note that the revetment will be disturbed and reconstructed as part of the wharf construction process. The Applicant is proposing to avoid, remedy or mitigate any effects in respect of the disturbance of the Little Blue Penguin habitat. No other areas related to the proposal are proposed to be affected in respect of indigenous fauna and vegetation in regard to s6(c) matters.

[27] Pages 201 and 224, Napier Port Proposed Wharf and Dredging Project November 2017.

In regard to s6(d) considerations, public access to and along the CMA is already excluded in the PMA as defined by the RCEP. We note that the existing Port areas which are available to the public will not be reduced.

Ms Allan outlined that the Applicant had endeavoured to consult with and take into account the relationship with Iwi and hapū, with the CMA and Pānia Reef and those matters outlined in s6(e). This was reflected in the Applicant committing to having a CIA and acting in good faith in developing an ongoing relationship with Iwi and hapū.

Ms Allan outlined that s6(f) was of relevance as she acknowledged Pānia Reef wāhi tapū as a place listed by Heritage New Zealand Pouhere Taonga. Having considered relevant evidence and application documentation, we are satisfied that the proposal avoids any adverse effects on those values.

In respect of s6(g) matters, we were advised that although there were claims for customary rights over the Port area, they had not progressed to the stage where such claims had RMA status. In addition, we were satisfied that the proposal would not have any effects on Pānia Reef[28].

The management of significant risks from natural hazards is appropriately considered as the Applicant has designed the proposed wharf considering matters related to sea level rise, and has modelled extreme wave conditions, storm frequency and intensity. We are satisfied that the proposal adequately provides for this matter.

Overall, having considered the relevant matters, we conclude that such matters have been appropriately addressed and that there are no effects greater than minor, in respect of s6 matters. We believe relevant matters of national importance have been recognised and provided for.

- **Section 7 – Other Matters**

Section 7 of the RMA outlines various matters that we as decision makers shall have particular regard to in order to achieve the purpose of the RMA.

Matters of relevance include kaitiakitanga, ethic of stewardship, efficient use and development of natural and physical resources, maintenance and enhancement of the quality of the environment, the intrinsic values of ecosystems, the maintenance and enhancement of amenity values, and the effects of climate change.

[28] Page 224, Napier Port - Proposed Wharf and Dredging Project November 2017.

In regard to kaitiakitanga, we were advised by Ms Allan that the proposal had been developed having regard to the environment and the natural character and processes of the CMA. She noted that kaitiakitanga is inherently provided for by local Iwi and their relationship with Pānia Reef and the formal status and rights as a mātatai. In relation to the application, a kaitiaki role is provided for through an ongoing relationship between the Port of Napier and local Iwi and hapū, including ongoing roles in environmental and cultural monitoring.

The efficient use and development of natural and physical resources is reflected by the proposal intending to make efficient use of the established facilities such as the reclaimed area, while providing a new wharf facility adjacent to the existing reclamation.

Amenity values and environmental quality are intended to be maintained due to the location of the new wharf and the disposal area, and the proposed management of construction and dredging stages, and ensuring any adverse effects are mitigated, avoided or remedied.

It is considered that the values of ecosystems, both intrinsic and other, have been recognised by the proposal and any effects are no more than minor given the proposed conditions.

The potential effects of climate change are to be addressed through the design of the proposed wharf.

We are of the opinion that all relevant s7 matters have been given appropriate regard.

- **Section 8 – Treaty of Waitangi**

Section 8 of the RMA requires those exercising functions and powers relating to managing the use, development and protection of natural and physical resources to take into account the principles of the Treaty of Waitangi – the oft referred to 3 “P’s” (Partnership, Participation and Protection).

Port of Napier has consulted actively and thoroughly with local Māori in the development of this application, as outlined in the section on cultural values above. In doing so, they have demonstrated a respect for mana whenua hapū values in a meaningful way by, for example, acknowledging the traditional and ongoing significance of the Ahuriri marine environment – in particular Pānia Reef – to those hapū.

Furthermore, the willingness of the Applicant to commission a CIA, and in turn to accept and support the two key recommendations made in the CIA, is a show of good faith in our opinion, on the part of the Port of Napier.

We are satisfied that s8 matters have been appropriately considered and taken account of.

## 14. CONCLUSIONS

We have considered all matters placed before us including all application documentation, evidence, submissions and subsequent statements of evidence made by the parties at the hearing, the s42A report and associated reports from Council staff, together with the relevant RMA provisions and provisions of relevant regional instruments.

We are of the opinion that the modelling that has underpinned the assessment of effects has produced results that are trustworthy.

We recognise the cultural, ecological, spiritual and recreational significance, values and many uses of Pānia Reef, Town Reef and Hardinge Road reef.

We conclude that benthic biota within the dredging footprint will be lost, and recovery will occur by colonisation. Disposal of dredged material will alter the physical characteristics of the seabed, at least temporarily, and will cause loss of biota. Recovery will occur by colonisation.

We accept that the lack of recent data on epifauna at the proposed offshore disposal site reduces confidence that valuable habitat will not be lost because of disposal, but that this will be remedied by the finally-agreed condition requiring a baseline survey.

We conclude that there is low risk to Pānia Reef and Town Reef posed by the proposed dredging and disposal operations.

We conclude that dredged material will be clean of chemical and organic contaminants.

We note the concern of fishers regarding the offshore disposal site, and find that the adverse effects on the fishery will be moderate at the local scale (the disposal site and immediate surroundings) but insignificant at the scale of Hawke Bay.

We conclude that monitoring for the purpose of detecting any effects on fish and fisheries would be impractical and ineffective, but that monitoring of the inshore disposal site will be an effective proxy.

We find that establishment of a Fisheries Liaison Group would assist in both information provision and discussion between parties, would help to protect the interests of FINZ and inshore fishers in general, and would be appropriate to include as a condition of consent.

We conclude that the risk of adverse effects on surfing amenity is low, and that monitoring of surfing waves would be ineffective, and unwarranted in any case.

We find that there is not sufficient justification or evidence for imposing a condition of consent requiring the disposal of dredged material at the currently consented disposal site, for the purpose of mitigating erosion at Westshore Beach.

We are of the opinion that there will not be more than minor short-term or long-term adverse visual effects, and that effects on natural character and landscape will be less than minor and contained within the confines of the established Port.

We find the potential effects on marine mammal to be *de minimis* with recommended actions in place.

We find that the purpose, principles and design of the Water Quality Management Plan, which includes an adaptive management plan based on turbidity trigger points and associated management actions, and ecological monitoring as part of an assurance programme, are clearly laid out, well explained, sufficiently detailed and appropriate.

We find that the Avian Management Plan will, as far practicable, avoid but otherwise mitigate or remedy adverse effects during the construction period on the populations of Little Blue Penguin and other bird species.

We accept that, whilst there may be a degree of disruption to access and recreation activities in and around the Port area during construction, these will be localised and of a short-term nature and are likely to be less than minor.

We accept that issues around construction noise and traffic will be appropriately managed by the agreed conditions.

We conclude that there are no issues around occupation of the CMA.

We see no issues with conflicts with relevant policies, including the NZCPS, the Hawke's Bay Regional Policy Statement (RPS) and the Regional Coastal Environment Plan (RCEP).

As for s5 matters, we believe the proposal provides for the sustainable management of physical and natural resources, and results in the development of a facility for existing and future generations.

We are of the opinion that, in respect of s6 RMA matters, that there are no effects greater than minor and that such relevant matters of national importance have been recognised and provided.

We are of the opinion that all relevant RMA s7 matters have been given appropriate regard to.

As for s8 matters, we are of the opinion that Port of Napier has consulted actively and thoroughly with local Māori and, in doing so, have demonstrated a respect for mana whenua hapū values in a meaningful way. We are satisfied that s8 matters have been appropriately considered and taken account of.

We are of the opinion that s105 and s107 of the RMA do not prevent the proposed activities being granted consent.

We are of the opinion that the proposal will enable Port of Napier to further develop, which will result in substantial positive effects.

Having considered all relevant matters, the evidence and submissions before us, we have concluded that it is appropriate to grant consent to the applications subject to a range of conditions.

## 15. DECISION

***That pursuant to sections 104, 104B and 108 of the Resource Management Act 1991, the Hawke's Bay Regional Council grants consent to the applications of the Port of Napier Limited for the discretionary activities outlined as follows, for the reasons outlined in this decision report including those summarised in section 14; and subject to the conditions as contained in Attachment 1, applying to each consent numbered as follows:***

| Consent Nos | Purpose | Property Address |
|---|---|---|
| **CL180008C** | **To construct a new wharf (Wharf 6) and undertake associated activities.** | **Port of Napier, Breakwater Road, Napier and various locations within the Coastal Marine Area (CMA)** |
| **CL180009E** | **To undertake Stage 1 capital dredging beneath the proposed new wharf, in the inner port area, swinging basin and part of the Deep Water Channel.** | |
| **CL180010E** | **To undertake Stages 2 to 5 capital dredging within the inner port area, swinging basin, in and near the existing three channels and to form a new channel.** | |
| **CL180011E** | **To undertake maintenance dredging within the areas for which capital dredging permits are sought (Stages 1 to 5).** | |

| | | |
|---|---|---|
| **CD180012W** | **To dispose of dredged material from capital and maintenance dredging within an offshore area shown in the application.** | |
| **CL180013O** | **To occupy the common marine and coastal area shown in the plan attached to the application to manage and operate Port activities.** | |

**Bill Wasley**

**Chair, on behalf of the Hearing Panel**

**Date: 5 November 2018**

## Attachment 1

**Conditions of Consent: CL180008C**

**Purpose:** to construct, use, operate and maintain a new wharf (Wharf 6) and undertake associated works and ancillary activities.

**CONSENT DURATION**

This consent is granted for a period of 35 years from the date of commencement of consent.

The construction component is granted for a period of 15 years from the date of commencement of consent.

**LAPSING OF CONSENT**

This consent shall lapse in accordance with S125 of the RMA 10 years from the date of commencement if it is not exercised before that date.

**General Accordance and Certification**

1. The consent holder shall undertake all operations in accordance with any drawings, specifications, and statements of intent, proposed mitigation measures and other information supplied as part of the application for this resource consent. Except where modified in accordance with these conditions, the consent holder shall undertake all operations in accordance with the following documents provided in support of the application:

    a) Proposed Wharf and Dredging Project, Resource Consent Applications and Description and Assessment of Effects on the Environment (Volumes 1, 2 and 3 and supporting documentation).

    If a conflict arises between any conditions of this consent and information in the application documentation, the conditions of consent shall prevail.

2. All works and structures relating to this resource consent shall be designed and constructed to conform to the best engineering practices and shall be maintained and repaired as necessary to ensure that the structure remains in a safe and serviceable state.

3. Where any condition requires the consent holder to provide the Council with a plan or similar document "for certification" the following shall apply:

    (a) No less than two months in advance, the consent holder shall formally advise the Council of its intention to submit a management plan.

    (b) the consent holder shall provide the plan to the Council in accordance with the timeframe specified in the applicable condition;

    (c) where a plan is required to be prepared in consultation with any third party, the plan shall outline the extent of the consultation that has been undertaken and

demonstrate how the views of that party have been incorporated, and where they have not, the reasons why;

(d) the consent holder may commence the activities to which the plan relates in accordance with the submitted plan unless the Council advises the consent holder in writing within 20 working days of receipt of the plan that it refuses to certify it on the grounds that it fails to meet the requirements of the condition which requires such a plan to be provided, and the Council provides reasons why that view is held;

(e) should the Council refuse to certify the plan, the consent holder shall submit a revised plan to the Council for certification. The Council shall certify the plan as soon as is practicable. Clause (d) shall apply for any resubmitted plan;

(f) once certified, the plan may be varied by the consent holder. The certification process for any variation to the plan shall follow the process outlined in (a) to (e) above.

(g) The consent holder shall comply with the requirements of the certified plan.

**General Duty**

4. The consent holder shall undertake all consented activities in a manner that applies all reasonable and practicable steps to avoid, remedy or mitigate actual and potential adverse effects on the environment.

5. The consent holder shall ensure that any contractors engaged to undertake work authorised by this consent abide by the conditions of this consent. The person responsible for the work on site shall be familiar with the consent conditions and management plans. A copy of this consent and all management plans shall be present on site or vessel at all times while the work is being undertaken.

**Inadvertent Discharges**

6. Where, for any cause (accidental or otherwise), contaminants associated with the consent holder's operations escape to water other than in conformity with the consent, the consent holder shall:

a) immediately take all practicable steps to contain and then remove the contamination from the environment,

b) immediately notify the Council (Manager Compliance) of the escape,

c) report to the Council (Manager Compliance), in writing and within 7 days, describing the manner and cause of the escape and steps taken to manage it and prevent its reoccurrence.

**Complaints Received**

7. The consent holder shall notify the Council (Manager Compliance) of any complaints relating to the exercise of the consent within 7 days of being received by the consent holder.

**Marine Wildlife Management Plan**

8. A Marine Wildlife Management Plan (MWMP) shall be prepared in consultation with the Department of Conservation prior to commencing any construction or dredging works. The purpose of the MWMP is to avoid or minimise the potential for adverse effects on marine mammals and birds. The MWMP shall address:

    a) Responsibilities for observation and monitoring of marine mammals,

    b) Advisory practices, such as maximum vessel speeds,

    c) Responsibilities for liaison with the Department of Conservation over the Project period,

    d) Responsibilities for recording and reporting types of and frequencies of any marine mammal sightings during any Project activity, including transiting to or from the dredge material disposal site,

    e) Measures to minimise underwater noise from construction and dredging activities,

    f) Monitoring within designated safety zones, including the use of trained marine mammal observers, during and immediately following pile driving activities (during daylight hours only),

    g) Application of soft-start procedures and other noise dampening techniques,

    h) Methods of avoiding entanglement,

    i) Methods to ensure records of all entanglement incidents (regardless of outcome) are provided to the Department of Conservation,

    j) A description of the lighting being used, including any methods to reduce potential for bird strike.

    This plan must be certified by Council prior to any works commencing. Furthermore, any changes to the plan in future shall be discussed in advance with the Council and the change is to be submitted and certified prior to any activity associated with the change commencing.

**Cultural Monitoring and Information Sharing**

9. Within one month of the commencement of the consent, the consent holder shall, in partnership with mana whenua hapū, commence the preparation of a Marine Cultural Health Programme (MCHP).

10. The purpose of the MCHP is to ensure that the cultural health of the marine environment, and in particular Pānia Reef, is surveyed, monitored and reported upon; to assist the consent holder, in partnership with mana whenua hapū, to assess the state of the marine environment from a cultural perspective; and to assist mana whenua hapū with cultural assessment through marine environmental monitoring and reporting.

11. The MCHP shall include, but not be limited to, the following:

    a) Mapping and description of the area to be subject to the MCHP.

    b) Specification of marine cultural indicators to be surveyed and monitored, including appropriate marine cultural health limits or baseline values and triggers to measure change against.

    c) A description of how the MCHP will align with the Water Quality Management Plan (WQMP) programme of dive surveys relating to Pānia Reef, and the ecological monitoring required for the dredge material disposal area and environs.

    d) Methodologies for marine cultural health surveying and monitoring.

    e) Liaison and reporting requirements.

    This plan must be certified by the Council prior to any works commencing. Any changes to the plan shall be discussed in advance with the Council and the change is to be submitted and certified prior to any activity associated with the change commencing.

12. The frequency and nature of any specific marine cultural health surveying and monitoring shall, where practicable, be carried out alongside other related surveying and monitoring of Pānia Reef.

    **Advice Note:** The benefits of Port of Napier personnel and hapū working together and sharing best practice, tikanga Māori, scientific and cultural information and indicators, are recognised. It is expected that the consent holder shall meet the reasonable costs incurred by hapū.

13. The consent holder in partnership with mana whenua hapū shall ensure a MCHP surveying and monitoring summary report is provided at least annually to hapū information networks.

    **Advice Note:** More detailed information should be made available to hapū should they request. All of the above should be set out in a "communication plan" developed in partnership with hapū.

14. The consent holder shall: act in good faith; share all relevant information with representatives of mana whenua hapū involved in cultural health monitoring; shall provide administrative services and shall meet the reasonable costs of meetings and hui.

**Archaeological or Cultural Finds**

15. In the event of an archaeological site, archaeological or cultural taonga find, or kōiwi being discovered or disturbed during the activities authorised by this consent, the consent holder shall immediately cease further work and inform:

    a. Heritage New Zealand Pouhere Taonga (If necessary);
    b. Appropriate representatives of mana whenua hapū, and
    c. the Council (Manager Compliance).

    Further work at the site shall be suspended while mana whenua hapū carry out their procedures for removal of taonga. and/or any additional requirements (including obtaining any necessary archaeological authority) are met. The Council will advise the consent holder when work at the site may recommence.

    **Advice Note:** In the event that human remains are found the police should be contacted immediately and all works shall cease until advice is given that works can continue.

**Contaminant Release**

16. The consent holder shall take all practical measures to limit the amount of sediment and to prevent external contaminants from entering the Coastal Marine Area from land or construction activities during wharf and associated construction works. Such measures shall include, but are not limited to:

    a) Refuelling and carrying out machinery maintenance at least 10 m inland from MHWS[29].

    b) Ensuring that wash water from tools, equipment or machinery is not discharged into the Coastal Marine Area.

    c) Minimising the use of machinery within the Coastal Marine Area where practicable.

    d) Providing appropriate wash-down facilities for all concreting equipment to the satisfaction of the Council (Manager Compliance) to prevent wash water from entering the Coastal Marine Area.

    e) Storing any hazardous substances (as defined by the Hawke's Bay Regional Resource Management Plan, 2006) so that they will not enter the Coastal Marine Area.

    f) Ensuring that during pile or wharf installation and ancillary work no wet concrete shall enter the Coastal Marine Area.

**Noise**

[29]For the avoidance of doubt, this applies to land based machinery only, and not to marine plant.

17. Construction noise must not exceed the limits recommended in, and measured and assessed in accordance with, New Zealand Standard NZS6803:1999 “Acoustics: Construction Noise”.

**Construction Management Plan**

18. The consent holder shall submit a Construction Management Plan (CMP) to the Council for certification at least one month prior to any works commencing. Works shall not commence prior to certification. The CMP shall include, as appendices, the Construction Noise Management Plan and Traffic Management Plan (required by this consent). The objective of the CMP is to ensure that all wharf construction and associated activities are managed in a way that is in general accordance with the information referred to in Condition 1 of this consent and the detailed requirement of the CMP Appendices (Construction Noise Management Plan and Traffic Management Plan)

    Any changes to the certified CMP shall be discussed in advance with the Council and the change will be required to be submitted and certified prior to any works associated with the change to the CMP commencing.

19. The CMP and the management plans included under **Condition 18** shall include details of:

    a) Staff and contractors’ responsibilities,

    b) Training requirements for employees, contractors, any subcontractors and visitors,

    c) Environmental incident and emergency management,

    d) Environmental complaints management,

    e) Compliance monitoring,

    f) Corrective actions, if necessary in specified circumstances (including, where necessary, relating to wildlife management),

    g) Stakeholder and communication management,

    h) The final construction methodologies, and

    i) Shall contain sufficient information to ensure that the CMP achieves its purpose set out in **Condition 18**.

20. The CMP shall be consistent with, and as appropriate shall give effect to, measures within the Marine Wildlife Management Plan and the Little Blue Penguin (and other species) – Avian Management Plan.

21. The CMP shall be implemented and maintained throughout the entire construction period.

**Construction Noise Management Plan**

22. A Construction Noise Management Plan (CNMP) shall be provided as an appendix to the CMP, for the management of airborne construction noise and underwater noise. The CNMP shall be prepared by a suitability qualified and experienced person and shall be part of the documentation certified by the Council.

23. The CNMP shall identify practicable noise mitigation measures, provide for effective communication between contractors and Port neighbours, and shall seek to minimise potential adverse noise effects on marine mammals.

    For **airborne construction noise** the CNMP shall include, but not be limited to, the following:

    a) The performance standards that must, as far as practicable, be complied with,

    b) Predicted noise levels for relevant equipment and/or activities,

    c) Construction noise mitigation and management strategies to be employed where practicable,

    d) Monitoring,

    e) Complaints response procedures.

    For **underwater noise** the CNMP shall include, but not be limited to the following:

    a) Methods to minimise noise in the marine environment,

    b) Visual monitoring for marine mammals during pile-driving, and steps to take should any be identified (including species and distance from pile-driving area).

    The CNMP shall be consistent with relevant requirements of the Marine Wildlife Management Plan.

**Traffic Management Plan**

24. The consent holder shall prepare a Traffic Management Plan (TMP) to be provided as an appendix to the CMP. The TMP shall be prepared in consultation with Napier City Council and KiwiRail and shall be provided to the NZ Transport Agency (or the appropriate Network Operations Contractor), for comment and approval at least 10 working days prior to being finalised, and shall include but not be limited to the following:

    a) Management of traffic to and from the construction area,

    b) Access and parking for contractors,

    c) Specification of any additional measures necessary during periods of activities which involve high levels of construction traffic on nearby roads (including communication with any necessary physical management steps).

**Little Blue Penguin (and other species) – Avian Management Plan (AMP)**

25. In association with the Department of Conservation and mana whenua hapū, the consent holder shall prepare an Avian Management Plan. The purpose of the plan shall be to as far as practicable avoid, but otherwise mitigate or remedy, adverse effects on the populations of Little Blue Penguin and other species established in and nearby the existing revetment, during the construction period. The Avian Management Plan shall address the following:

    a) Measures to minimise adverse effects on bird populations (specifically the Little Blue Penguin) during construction,

    b) Required training of Port of Napier Staff and/or Contractors,

    c) Any additional steps that are necessary to achieve no net loss of the Little Blue Penguin population in the vicinity of the Port over a 10-year period following commencement of construction.

    d) Any additional steps that are necessary to mitigate effects on White-Fronted Terns, Shag species and any other avian species considered necessary (as advised by a suitably qualified person) in the vicinity of the Port over a 10-year period following commencement of construction.

    e) If required, management of the Little Blue Penguin population within the wider Hawke Bay area (for example, pest control, provision of nest boxes).

    **Advice Notes (relating to AMP):**
    Expert advice from a suitably qualified person shall be sought in developing the AMP.
    Environmental enhancements could include public education and signage to protect the Little Blue Penguin habitat/population near the Port.
    In achieving (c), where suitable Little Blue Penguin habitats cannot be achieved in the immediate vicinity of the Port, opportunities in the wider Hawke Bay area should be considered.

26. The consent holder shall submit the AMP to the Council for certification at least three months prior to any works commencing.

    The Council may seek external advice from a suitably qualified individual prior to certification of this plan. The consent holder would be invoiced for any costs (actual and reasonable) associated with this advice.

    Any changes to the plan in future shall be discussed in advance with the Council and the change is to be submitted and certified prior to any activity associated with the change commencing.

**Public Safety**

27. During the exercise of this consent, the consent holder shall take all practicable precautions to protect public safety at all times.

**Review of Consent**

The Council may review conditions of this consent pursuant to sections 128, 129, 130, 131 and 132 of the RMA. The actual and reasonable costs of any review undertaken will be charged to the consent holder, in accordance with section 36 of the RMA.

Times of service of notice of any review: During the months of February, May, August and November of any year.

Purposes of review:

To deal with any adverse effect on the environment that may arise from the exercise of this consent, which it is appropriate to deal with at that time or which became evident after the date of issue.

To require the adoption of the best practicable option to remove or reduce any effects on the environment.

To modify any monitoring and/or reporting programme (including requiring additional monitoring or decreasing the frequency of monitoring and/or reporting required) if there is evidence that current monitoring and/or reporting requirements are no longer appropriate.

To modify any monitoring programme, or to require additional monitoring if there is evidence that current monitoring requirements are inappropriate or inadequate.

**Conditions of Consent: CL180009E**

**Purpose:** to undertake Stage 1 capital dredging beneath the proposed new wharf, in the inner port area, swinging basin and part of the Deep Water Channel.

**CONSENT DURATION**

This consent is granted for a period of 35 years from the date of commencement of consent.

**LAPSING OF CONSENT**

This consent shall lapse in accordance with S125 of the RMA 10 years from the date of commencement if it is not exercised before that date.

**General Accordance and Certification**

1. The consent holder shall undertake all operations in accordance with any drawings, specifications, and statements of intent, proposed mitigation measures and other information supplied as part of the application for this resource consent. Except where modified in accordance with these conditions, the consent holder shall undertake all operations in accordance with the following documents and those provided in support of the application:

   (a) Proposed Wharf and Dredging Project, Resource Consent Applications and Description and Assessment of Effects on the Environment (Volumes 1, 2 and 3 and supporting documentation).

   (b) The Marine Cultural Health Programme (MCHP) certified under condition 11 of consent no. CL180008C, or any updated MCHP that is certified by the Council.

   (c) The Marine Wildlife Management Plan (MWMP) certified under condition 8 of consent no. CL180008C, or any updated MWMP that is certified by the Council.

   (d) The Avian Management Plan (AMP) certified under condition 26 of consent no. CL180008C, or any updated AMP that is certified by the Council.

   If a conflict arises between any conditions of this consent and information in the application documentation, the conditions of consent shall prevail.

2. Where any condition requires the consent holder to provide the Council with a plan or similar document "for certification" the following shall apply:

   (a) no less than two months in advance, the consent holder shall formally advise the Council of its intention to submit a management plan;

   (b) the consent holder shall provide the plan to the Council in accordance with the timeframe specified in the applicable condition;

(c) where a plan is required to be prepared in consultation with any third party, the plan shall outline the extent of the consultation that has been undertaken and demonstrate how the views of that party have been incorporated, and where they have not, the reasons why;

(d) the consent holder may commence the activities to which the plan relates in accordance with the submitted plan unless the Council advises the consent holder in writing within 20 working days of receipt of the plan that it refuses to certify it on the grounds that it fails to meet the requirements of the condition which requires such a plan to be provided, and the Council provides reasons why that view is held;

(e) should the Council refuse to certify the plan, the consent holder shall submit a revised plan to the Council for certification. The Council shall certify the plan as soon as is practicable. Clause (d) shall apply for any resubmitted plan;

(f) once certified, the plan may be varied by the consent holder. The certification process for any variation to the plan shall follow the process outlined in (a) to (e) above;

(g) the consent holder shall comply with the requirements of the certified plan.

**General Duty**

3. The consent holder shall undertake all consented activities in a manner that applies all reasonable and practicable steps to avoid, remedy or mitigate actual and potential adverse effects on the environment.

4. The consent holder shall ensure that any contractors engaged to undertake work authorised by this consent abide by the conditions of this consent. The person responsible for the work on site shall be familiar with the consent conditions and management plans. A copy of this consent and management plans shall be present on site or vessel at all times while the work is being undertaken.

**Inadvertent Discharges**

5. Where, for any cause (accidental or otherwise), contaminants associated with the consent holder's operations escape to water other than in conformity with the consent, the consent holder shall:

(a) Immediately take all practicable steps to contain and then remove the contamination from the environment,

(b) Immediately notify the Council (Manager Compliance) of the escape,

(c) Report to the Council (Manager Compliance), in writing and within 7 days, describing the manner and cause of the escape and steps taken to manage it and prevent its reoccurrence.

**Complaints Received**

6. The consent holder shall notify the Council (Manager Compliance) of any complaints relating to the exercise of the consent within 7 days of being received by the consent holder.

**Dredging and Disposal Management Plan**

7. At least one month prior to commencing Stage 1 capital dredging the consent holder shall submit a Dredging and Disposal Management Plan (DDMP) to the Council for certification. Works shall not commence prior to certification. The objective of the DDMP is to ensure that all dredging and disposal activities are managed in a way that is in general accordance with the information referred to in Condition 1 of this consent and the detailed requirements of the DDMP.

   Any changes to a certified DDMP shall be discussed in advance with the Council and the change is to be submitted and certified prior to any activity associated with the change commencing.

8. The DDMP shall include details of:

   (a) A map and description of the area to be subject to capital dredging, the intended depth of dredging, and the estimated volume and nature of the dredged material.
   (b) A description of the number and types of dredges to be used, the intended start date and the duration and expected hours of operation for the stage.
   (c) A description of dredging methodology to be used.
   (d) A description of how the location and quantities of disposed dredged material are recorded.
   (e) A description of the maintenance of equipment and systems.
   (f) A description of any other measures to avoid or mitigate biofouling, management of waste, and refuelling procedures.
   (g) Staff and contractors' responsibilities.
   (h) Training requirements for employees, contractors, any subcontractors and visitors.
   (i) Environmental incident and emergency management.
   (j) Environmental complaints management.
   (k) Compliance monitoring.
   (l) Corrective actions, if necessary in specified circumstances (including, where necessary, relating to wildlife management).
   (m) Stakeholder and communication management.
   (n) The disposal strategy for dredged material (including the chosen location(s)).
   (o) Any biosecurity requirements arising from Condition 17 of this consent.

9. The DDMP shall be consistent with, and as appropriate shall give effect to, measures within the Marine Wildlife Management Plan and the Avian Management Plan.

**Water Quality Management Plan**

10 A Water Quality Management Plan (WQMP) for the integrated management of sediment plumes and turbidity, and monitoring of benthic ecological effects, shall be provided as an appendix to the DDMP. The WQMP shall be part of the documentation certified by the Council prior to this stage of the capital dredging commencing (Stage 1).

11. The WQMP shall include, but not be limited to:

(a) Establishment of appropriate environmental limits (specified as turbidity at specified locations) in the water column during and immediately following dredging and disposal activities.
(b) Specifying methods of measuring and determining turbidity levels at any time.
(c) Identification of sensitive localities, if any, at which longer-term ecological monitoring is required (other than at Pānia Reef (see (f) below).
(d) Linking of the specified environmental limits to pre-determined response steps through trigger levels and environmental response levels.
(e) Establishing reporting of trigger exceedances, including any response if the exceedance is determined to be due to dredging or disposal of dredged material.
(f) A detailed programme of dive surveys relating to Pānia Reef, to commence within six months of the commencement of consent, and to continue until completion of Stage 5 dredging.
(g) A detailed programme of benthic surveys in and around the disposal location prior to and following completion of Stage 1 dredging.
(h) Reporting requirements for the various components of the WQMP.
(i) Sediment contaminant monitoring for the material being taken from the inner port basin, and at the proposed disposal site. As a minimum, contaminants should include the heavy metals/metalloids arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc.
(j) Sediment texture analysis and monitoring at the disposal site.

Any changes to a certified WQMP shall be discussed in advance with the Council and the change is to be submitted and certified prior to any activity associated with the change commencing.

**Records**

12. The consent holder shall keep records detailing the timing, quantities and location of seabed material dredged, and also of the disposal to any disposal ground. These records shall be submitted to the Council (Manager Compliance) within one month of completion of a dredging stage or at any time upon request from the Council (Manager Compliance).

**Notice of Completion of Stage 1 Capital Dredging**

13. After completion of Stage 1, the consent holder shall advise Council (Manager Compliance) in writing of having finished the works. This notice shall be provided to the Council within five working days of the final bathymetric survey having been completed and certified by the Port.

**Bathymetric Surveys**

14. A bathymetric survey of the areas dredged in accordance with this consent shall be undertaken by the consent holder as soon as practicable after cessation of Stage 1 dredging and disposal activities.

15. The results of the survey required by Condition 13 (above) shall be submitted to the Council (Manager Compliance) within one month of the production of the survey chart. At this time the consent holder shall also provide to the Council a map, identifying where the dredging occurred, and shall confirm the volume of material excavated.

**Coastal Monitoring**

16. The consent holder shall, in consultation with the Council (Manager Compliance), develop and implement a monitoring programme for the beach to the east of Te Karaka (Perfume Point) and the adjacent nearshore area. The purpose of the monitoring programme is to identify any changes to and consistent trends in beach and foreshore volume east of the Ahuriri inlet.

17. The surveys required by Condition 15 (above) shall commence within six months of commencement of consent and shall be undertaken at least every six months until all consented capital dredging activities are complete, and then annually for five years. The results shall be reported annually to the Council, with an accompanying report identifying and consistent trends, prepared by a suitably qualified and experienced person.

**Biosecurity Management Plan (BMP)**

18. At least one month prior to the arrival of the dredge vessel in Napier, the consent holder shall provide a BMP to the Council for certification. The purpose of the BMP shall be to avoid the incursion and/or spread of unwanted organisms in the marine environment as a result of the construction or dredging activity. A copy of the BMP shall also be provided to mana whenua hapū. The matters covered by the BMP shall include but are not limited to:

    (a) How the risk of a biosecurity incursion from a dredge vessel is to be reduced to the greatest extent practicable;

    (b) The steps to be taken if dredging activities discover an unwanted organism;

    (c) A summary of existing biosecurity measures and initiatives already in place.

The BMP shall be part of the documentation certified by the Council prior to this stage of the capital dredging commencing (Stage 1).

Any changes to a certified BMP shall be discussed in advance with the Council and the change is to be submitted and certified prior to any activity associated with the change commencing.

**Archaeological or Cultural Finds**

19. In the event of an archaeological site, archaeological or cultural taonga find, or kōiwi being discovered or disturbed during the activities authorised by this consent, the consent holder shall immediately cease further work and inform:

    (a) Heritage New Zealand Pouhere Taonga (If necessary);
    (b) Appropriate representatives of mana whenua hapū, and
    (c) the Council (Manager Compliance).

    Further work at the site shall be suspended while mana whenua hapū carry out their procedures for removal of taonga. and/or any additional requirements (including obtaining any necessary archaeological authority) are met. The Council will advise the consent holder when work at the site may recommence.

    **Advice Note:** In the event that human remains are found the police should be contacted immediately and all works shall cease until advice is given that works can continue.

**Public Safety**

20. During the exercise of this consent, the consent holder shall take all practicable precautions to protect public safety at all times.

**Review of Consent**

The Council may review conditions of this consent pursuant to sections 128, 129, 130, 131 and 132 of the RMA. The actual and reasonable costs of any review undertaken will be charged to the consent holder, in accordance with section 36 of the RMA.

| | |
|---|---|
| Times of service of notice of any review: | During the months of February, May, August and November of any year. |
| Purposes of review: | |

To deal with any adverse effect on the environment that may arise from the exercise of this consent, which it is appropriate to deal with at that time or which became evident after the date of issue.

- To require the adoption of the best practicable option to remove or reduce any effects on the environment.
- To modify any monitoring and/or reporting programme (including requiring additional monitoring or decreasing the frequency of monitoring and/or reporting required) if there is evidence that current monitoring and/or reporting requirements are no longer appropriate.
- To modify any monitoring programme, or to require additional monitoring if there is evidence that current monitoring requirements are inappropriate or inadequate.

**Conditions of Consent: CL180010E**

**Purpose:** to undertake Stages 2 to 5 capital dredging within the inner port area, swinging basin, in and near the existing three channels and to form a new channel.

**CONSENT DURATION**

This consent is granted for a period of 35 years from the date of commencement of consent.

**LAPSING OF CONSENT**

This consent shall lapse in accordance with S125 of the RMA 10 years from the date of commencement if it is not exercised before that date. Once exercised, this consent shall not lapse due to the passage of time between stages of dredging.

**Advice Note**: The consent will be "exercised" upon the commencement of Stage 2 dredging. Depending on the demand to deepen the channel through subsequent dredging stages (3, 4 and 5), there may be more than 5 years between these subsequent stages. However, this passage of time will not cause this consent to lapse.

**General Accordance and Certification**

1. The consent holder shall undertake all operations in accordance with any drawings, specifications, and statements of intent, proposed mitigation measures and other information supplied as part of the application for this resource consent. Except where modified in accordance with these conditions, the consent holder shall undertake all operations in accordance with the following documents and those provided in support of the application:

   (a) Proposed Wharf and Dredging Project, Resource Consent Applications and Description and Assessment of Effects on the Environment (Volumes 1, 2 and 3 and supporting documentation).

   (b) The Marine Cultural Health Programme (MCHP) certified under condition 11 of consent no. CL180008C, or any updated MCHP that is certified by the Council.

   (c) The Marine Wildlife Management Plan (MWMP) certified under condition 8 of consent no. CL180008C, or any updated MWMP that is certified by the Council (as relevant).

   (d) The Biosecurity Management Plan (BMP) certified under condition 17 of consent no. CL180009E, or any updated BMP that is certified by the Council.

   (e) The Avian Management Plan (AMP) certified under condition 26 of consent no. CL180008C, or any updated AMP that is certified by the Council (as relevant).

   If a conflict arises between any conditions of this consent and information in the application documentation, the conditions of consent shall prevail.

2. Where any condition requires the consent holder to provide the Council with a plan or similar document "for certification" the following shall apply:

(a) No less than two months in advance, the consent holder shall formally advise the Council of its intention to submit a management plan.

(b) the consent holder shall provide the plan to the Council in accordance with the timeframe specified in the applicable condition;

(c) where a plan is required to be prepared in consultation with any third party, the plan shall outline the extent of the consultation that has been undertaken and demonstrate how the views of that party have been incorporated, and where they have not, the reasons why;

(d) the consent holder may commence the activities to which the plan relates in accordance with the submitted plan unless the Council advises the consent holder in writing within 20 working days of receipt of the plan that it refuses to certify it on the grounds that it fails to meet the requirements of the condition which requires such a plan to be provided, and the Council provides reasons why that view is held;

(e) should the Council refuse to certify the plan, the consent holder shall submit a revised plan to the Council for certification. The Council shall certify the plan as soon as is practicable. Clause (d) shall apply for any resubmitted plan;

(f) once certified, the plan may be varied by the consent holder. The certification process for any variation to the plan shall follow the process outlined in (a) to (e) above.

(h) The consent holder shall comply with the requirements of the certified plan.

**General Duty**

3. The consent holder shall undertake all consented activities in a manner that applies all reasonable and practicable steps to avoid, remedy or mitigate actual and potential adverse effects on the environment.

4. The consent holder shall ensure that any contractors engaged to undertake work authorised by this consent abide by the conditions of this consent. The person responsible for the work on site shall be familiar with the consent conditions and management plans. A copy of this consent and management plans shall be present on site or vessel at all times while the work is being undertaken.

**Inadvertent Discharges**

5. Where, for any cause (accidental or otherwise), contaminants associated with the consent holder's operations escape to water other than in conformity with the consent, the consent holder shall:

(a) Immediately take all practicable steps to contain and then remove the contamination from the environment,

(b) Immediately notify the Council (Manager Compliance) of the escape,

(c) Report to the Council (Manager Compliance), in writing and within 7 days, describing the manner and cause of the escape and steps taken to manage it and prevent its reoccurrence.

**Complaints Received**

6. The consent holder shall notify the Council (Manager Compliance) of any complaints relating to the exercise of the consent within 7 days of being received by the consent holder.

**Dredging and Disposal Management Plan (DDMP)**

7. At least one month prior to commencing any dredging the consent holder shall submit a Dredging and Disposal Management Plan (DDMP) to the Council (Manager Compliance) for certification. Works shall not commence until the plan is certified. The objective of the DDMP is to ensure that all dredging and disposal activities are managed in a way that is in general accordance with the information referred to in Condition 1 and the detailed requirements of the DDMP.

   Any changes to a certified DDMP shall be discussed in advance with the Council and the change to be submitted and certified prior to any activity associated with the change commencing.

8. The DDMP shall include details of:

   (a) A map and description of the area to be subject to capital dredging, the intended depth of dredging, and the estimated volume and nature of the dredged material,

   (b) A description of the number and types of dredges to be used, the intended start date and the duration and expected hours of operation,

   (c) A description of dredging and disposal methodology to be used,

   (d) A description of how the location and quantities of disposed dredged material are recorded,

   (e) A description of the maintenance of equipment and systems,

   (f) A description of any other measures to avoid or mitigate biofouling, management of waste, and refuelling procedures,

   (g) Staff and contractors' responsibilities,

   (h) Training requirements for employees, contractors, any subcontractors and visitors,

   (i) Environmental incident and emergency management,

   (j) Environmental complaints management,

(k) Compliance monitoring,

(l) Corrective actions, if necessary in specified circumstances (including, where necessary, relating to wildlife management),

(m) Stakeholder and communication management,

(n) The disposal strategy for dredged material (including the chosen location(s)),

(o) Any biosecurity requirements arising from Condition 17 of CL180009E.

9. The DDMP shall be implemented during maintenance dredging campaigns, when campaigns are undertaken consecutively with capital dredging.

**Water Quality Management Plan**

10. An updated Water Quality Management Plan (WQMP) for the integrated management of sediment plumes and turbidity, and monitoring of benthic ecological effects, shall be provided as an appendix to the DDMP. The WQMP shall be part of the documentation certified by Council prior to each dredging campaign.

11. The updated WQMP shall include, but not be limited to:

(a) Establishment of appropriate environmental limits (specified as turbidity at specified locations) in the water column during and immediately following dredging and disposal activities,

(b) Specifying methods of measuring and determining turbidity levels at any one time,

(c) Identification of sensitive localities, if any, at which longer-term ecological monitoring is required (other than Pānia Reef (see (f) below)),

(d) Linking of the specified environmental limits to pre-determined response steps through trigger levels and environmental response levels,

(e) Establishing reporting of trigger exceedances, including any response if the exceedances is determined to be due to dredging or disposal of dredged material,

(f) A detailed programme of dive surveys relating to Pānia Reef, to commence within six months of the commencement of consent, and to continue until completion of Stage 5 dredging,

(g) A detailed programme of benthic surveys in and around the disposal location,

(h) Reporting requirements for the various components of the WQMP,

(i) Sediment contaminant monitoring for any material being taken from inner port basin, and at the proposed disposal site.

(j) Sediment texture analysis and monitoring at the disposal site.

**Records**

12. The consent holder shall keep records detailing the timing, quantities and location of seabed material dredged, and also of the disposal location. These records shall be submitted to Council (Manager Compliance) within one month of completion of a dredging stage or at any time upon request from the Council.

**Notice of Completion of Stages**

13. After completion of each dredging campaign, the consent holder shall advise the Council (Manager Compliance) in writing of having finished the works. This notice shall be provided to the Council within five working days of the final bathymetric survey having been completed and certified by the Port.

**Bathymetric Surveys**

14. A bathymetric survey of the areas dredged in accordance with this consent shall be undertaken by the consent holder as soon as practicable after each dredging campaign has been completed.

15. The results of the survey required by **Condition 14 (above)** shall be submitted to the Council (Manager Compliance) within one month of the production of the survey chart. At this time the consent holder shall also provide to the Council a map, identifying where the dredging occurred, and shall confirm the volume of material excavated.

**Coastal Monitoring**

16. The consent holder shall, in consultation with the Council, develop a monitoring programme for the beach to the east of Te Karaka (Perfume Point) and the adjacent nearshore area. The purpose of the monitoring programme is to identify any changes to and consistent trends in beach and foreshore volume east of the Ahuriri inlet. Measurements shall be by aerial and bathymetric survey.

17. The surveys shall commence within six months of commencement of consent, and shall be undertaken at least every six months until consented capital dredging activities are complete, and then annually for five years to monitor the effects of maintenance dredging authorised by this consent. The results shall be reported annually to the Council (Manager Compliance), with an accompanying report identifying and consistent trends, prepared by a suitably qualified and experienced person.

**Public Safety**

18. During the exercise of this consent, the consent holder shall take all practicable precautions to protect public safety at all times.

**Archaeological or Cultural Finds**

19. In the event of an archaeological site, archaeological or cultural taonga find, or kōiwi being discovered or disturbed during the activities authorised by this consent, the consent holder shall immediately cease further work and inform:

    (a) Heritage New Zealand Pouhere Taonga (If necessary);
    (b) Appropriate representatives of mana whenua hapū, and
    (c) the Council (Manager Compliance).

    Further work at the site shall be suspended while mana whenua hapū carry out their procedures for removal of taonga. and/or any additional requirements (including obtaining any necessary archaeological authority) are met. The Council will advise the consent holder when work at the site may recommence.

    **Advice Note:** In the event that human remains are found the police should be contacted immediately and all works shall cease until advice is given that works can continue.

**Review of Consent**

The Council may review conditions of this consent pursuant to sections 128, 129, 130, 131 and 132 of the RMA. The actual and reasonable costs of any review undertaken will be charged to the consent holder, in accordance with section 36 of the RMA.

Times of service of notice of any review: During the months of February, May, August and November of any year.

Purposes of review:

To deal with any adverse effect on the environment that may arise from the exercise of this consent, which it is appropriate to deal with at that time or which became evident after the date of issue.

- To require the adoption of the best practicable option to remove or reduce any effects on the environment.
- To modify any monitoring and/or reporting programme (including requiring additional monitoring or decreasing the frequency of monitoring and/or reporting required) if there is evidence that current monitoring and/or reporting requirements are no longer appropriate.
- To modify any monitoring programme, or to require additional monitoring if there is evidence that current monitoring requirements are inappropriate or inadequate.

**Conditions of Consent: CL180011E**

**Purpose:** to undertake maintenance dredging within the areas for which capital dredging permits are sought (Stages 1 to 5).

**CONSENT DURATION**

This consent is granted for a period of 35 years from the date of commencement of consent.

**LAPSING OF CONSENT**

This consent shall lapse in accordance with S125 of the RMA 10 years from the date of commencement if it is not exercised before that date. Once exercised, this consent shall not lapse due to the passage of time between stages of dredging.

**Advice Note**: The consent will be considered "exercised" upon the commencement of the first disposal of dredged material. Depending on the requirement to undertake maintenance dredging campaigns, there may be more than 5 years between these subsequent campaigns. However, this passage of time will not cause this consent to lapse.

**General Accordance and Certification**

1. The consent holder shall undertake all operations in accordance with any drawings, specifications, and statements of intent, proposed mitigation measures and other information supplied as part of the application for this resource consent. Except where modified in accordance with these conditions, the consent holder shall undertake all operations in accordance with the following documents and those provided in support of the application:

   (a) Proposed Wharf and Dredging Project, Resource Consent Applications and Description and Assessment of Effects on the Environment (Volumes 1, 2 and 3 and supporting documentation).

   (b) The Marine Cultural Health Programme (MCHP) certified under condition 11 of consent no. CL180008C, or any updated MCHP that is certified by the Council.

   (c) The Marine Wildlife Management Plan (MWMP) certified under condition 8 of consent no. CL180008C, or any updated MWMP that is certified by the Council (as relevant).

   (d) The Biosecurity Management Plan (BMP) certified under condition 17 of consent no. CL180009E, or any updated BMP that is certified by the Council.

   (e) The Avian Management Plan (AMP) certified under condition 26 of consent no. CL180008C, or any updated AMP that is certified by the Council (as relevant).

   If a conflict arises between any conditions of this consent and information in the application documentation, the conditions of consent shall prevail.

2. Where any condition requires the consent holder to provide the Council with a plan or similar document "for certification" the following shall apply:

   (a) no less than two months in advance, the consent holder shall formally advise the Council of its intention to submit a management plan.

   (b) the consent holder shall provide the plan to the Council in accordance with the timeframe specified in the applicable condition;

   (c) where a plan is required to be prepared in consultation with any third party, the plan shall outline the extent of the consultation that has been undertaken and demonstrate how the views of that party have been incorporated, and where they have not, the reasons why;

   (d) the consent holder may commence the activities to which the plan relates in accordance with the submitted plan unless the Council advises the consent holder in writing within 20 working days of receipt of the plan that it refuses to certify it on the grounds that it fails to meet the requirements of the condition which requires such a plan to be provided, and the Council provides reasons why that view is held;

   (e) should the Council refuse to certify the plan, the consent holder shall submit a revised plan to the Council for certification. The Council shall certify the plan as soon as is practicable. Clause (d) shall apply for any resubmitted plan;

   (f) once certified, the plan may be varied by the consent holder. The certification process for any variation to the plan shall follow the process outlined in (a) to (e) above;

   (g) the consent holder shall comply with the requirements of the certified plan.

**General Duty**

3. The consent holder shall undertake all consented activities in a manner that applies all reasonable and practicable steps to avoid, remedy or mitigate actual and potential adverse effects on the environment.

4. The consent holder shall ensure that any contractors engaged to undertake work authorised by this consent abide by the conditions of this consent. The person responsible for the work on site shall be familiar with the consent conditions and management plans. A copy of this consent and management plans shall be present on site or vessel at all times while the work is being undertaken.

**Inadvertent Discharges**

5. Where, for any cause (accidental or otherwise), contaminants associated with the consent holder's operations escape to water other than in conformity with the consent, the consent holder shall:

(a) immediately take all practicable steps to contain and then remove the contamination from the environment,

(b) immediately notify the Council (Manager Compliance) of the escape,

(c) report to the Council (Manager Compliance), in writing and within 7 days, describing the manner and cause of the escape and steps taken to manage it and prevent its reoccurrence.

**Complaints Received**

6. The consent holder shall notify the Council (Manager Compliance) of any complaints relating to the exercise of the consent within 7 days of being received by the consent holder.

**Dredging and Disposal Management Plan (DDMP)**

7. This condition shall apply only when maintenance dredging is being undertaken as a separate activity[30]. At least one month prior to commencing any maintenance dredging the consent holder shall submit a Dredging and Disposal Management Plan (DDMP) to the Council (Manager Compliance) for certification. The objective of the DDMP is to ensure that all dredging and disposal activities are managed in a way that is in general accordance with the information referred to in Condition 1 and the detailed requirements of the DDMP.

   Any changes to a certified DDMP shall be discussed in advance with the Council and the change to be submitted and certified prior to any activity associated with the change commencing.

8. The DDMP shall include details of:

   (a) A map and description of the area to be subject to dredging, the intended depth of dredging, and the estimated volume and nature of the dredged material,

   (b) A description of the number and types of dredges to be used, the intended start date and the duration and expected hours of operation,

   (c) A description of dredging and disposal methodology to be used,

   (d) A description of how the location and quantities of disposed dredged material are recorded,

   (e) A description of the maintenance of equipment and systems,

   (f) A description of any other measures to avoid or mitigate biofouling, management of waste, and refuelling procedures,

[30] Where capital dredging is being undertaken in association with any maintenance dredging, this condition shall not apply to the maintenance dredging component.

(g) Staff and contractors' responsibilities,

(h) Training requirements for employees, contractors, any subcontractors and visitors,

(i) Environmental incident and emergency management,

(j) Environmental complaints management,

(k) Compliance monitoring,

(l) Corrective actions, if necessary in specified circumstances (including, where necessary, relating to wildlife management).

(m) Stakeholder and communication management.

(n) The disposal strategy for dredged material (including the chosen location(s)).

**Water Quality Management Plan**

9. An updated Water Quality Management Plan (WQMP) for the integrated management of sediment plumes and turbidity, and monitoring of benthic ecological effects, shall be provided as an appendix to the DDMP. The WQMP shall be part of the documentation certified by Council prior to each maintenance dredging campaign.

10. The updated WQMP shall include, but not be limited to:

(a) Establishment of appropriate environmental limits (specified as turbidity at specified locations) in the water column during and immediately following dredging and disposal activities,

(b) Specifying methods of measuring and determining turbidity levels at any one time,

(c) Identification of sensitive localities, if any, at which longer-term ecological monitoring is required (if necessary) (other than Pānia Reef (see (f) below)),

(d) Linking of the specified environmental limits to pre-determined response steps through trigger levels and environmental response levels.

(e) Establishing reporting of trigger exceedances, including any response if the exceedances is determined to be due to dredging or disposal of dredged material,

(f) A detailed programme of dive surveys relating to Pānia Reef (if necessary),

(g) A detailed programme of benthic surveys, and methods, around the disposal location (if necessary),

(h) Reporting requirements for the various components of the WQMP,

(i) Sediment texture analysis and monitoring at the disposal site.

**Records**

11. The consent holder shall keep records detailing the timing, quantities and location of seabed material dredged, and also of the disposal location. These records shall be submitted to Council (Manager Compliance) within one month of completion of a dredging stage or at any time upon request from the Council.

**Notice of Completion of Campaigns**

12. After completion of each separate maintenance dredging campaign, the consent holder shall advise the Council (Manager Compliance) in writing of having finished the works. This notice shall be provided to the Council within five working days of the final bathymetric survey having been completed and certified by the Port.

**Bathymetric Surveys**

13. A bathymetric survey of the areas dredged in accordance with this consent shall be undertaken by the consent holder as soon as practicable after each separate maintenance dredging campaign has been completed.

14. The results of the survey required by Condition 13 (above) shall be submitted to the Council (Manager Compliance) within one month of the production of the survey chart. At this time the consent holder shall also provide to the Council a map, identifying where the dredging occurred, and shall confirm the volume of material excavated.

**Public Safety**

15. During the exercise of this consent, the consent holder shall take all practicable precautions to protect public safety at all times.

**Archaeological or Cultural Finds**

16. In the event of an archaeological site, archaeological or cultural taonga find, or kōiwi being discovered or disturbed during the activities authorised by this consent, the consent holder shall immediately cease further work and inform:

    (a) Heritage New Zealand Pouhere Taonga;
    (b) Appropriate representatives of mana whenua hapū, and
    (c) the Council (Manager Compliance).

    Further work at the site shall be suspended while mana whenua hapū carry out their procedures for removal of taonga. The Council will advise the consent holder when work at the site may recommence.

    **Advice Note:** In the event that human remains are found the police should be contacted immediately and all works shall cease until advice is given that works can continue.

**Review of Consent**

The Council may review conditions of this consent pursuant to sections 128, 129, 130, 131 and 132 of the RMA. The actual and reasonable costs of any review undertaken will be charged to the consent holder, in accordance with section 36 of the RMA.

Times of service of notice of any review: During the months of February, May, August and November of any year.

Purposes of review:

To deal with any adverse effect on the environment that may arise from the exercise of this consent, which it is appropriate to deal with at that time or which became evident after the date of issue.

- To require the adoption of the best practicable option to remove or reduce any effects on the environment.
- To modify any monitoring and/or reporting programme (including requiring additional monitoring or decreasing the frequency of monitoring and/or reporting required) if there is evidence that current monitoring and/or reporting requirements are no longer appropriate.
- To modify any monitoring programme, or to require additional monitoring if there is evidence that current monitoring requirements are inappropriate or inadequate.

**Conditions of Consent: CD180012W**

**Purpose:** to dispose of dredged material from capital and maintenance dredging within an offshore area shown in the application.

**CONSENT DURATION**

This consent is granted for a period of 35 years from the date of commencement of consent.

**LAPSING OF CONSENT**

This consent shall lapse in accordance with S125 of the RMA 10 years from the date of commencement if it is not exercised before that date. Once exercised, this consent shall not lapse due to the passage of time between stages of dredging.

**Advice Note**: The consent will be considered "exercised" upon the commencement of the first disposal of dredged material. Depending on the demand to deepen the channel through subsequent dredging stages (1, 2, 3, 4 and 5) and/or maintenance dredging campaigns, there may be more than 5 years between these stages/campaigns. However, this passage of time will not cause this consent to lapse.

**General Accordance and Certification**

1. The consent holder shall undertake all operations in accordance with any drawings, specifications, and statements of intent, proposed mitigation measures and other information supplied as part of the application for this resource consent. Except where modified in accordance with these conditions, the consent holder shall undertake all operations in accordance with the following documents and those provided in support of the application:

    (a) Proposed Wharf and Dredging Project, Resource Consent Applications and Description and Assessment of Effects on the Environment (Volumes 1, 2 and 3 and supporting documentation).

    (b) The Marine Cultural Health Programme (MCHP) certified under condition 11 of consent no. CL180008C, or any updated MCHP that is certified by the Council.

    (c) The Marine Wildlife Management Plan (MWMP) certified under condition 8 of consent no. CL180008C, or any updated MWMP that is certified by the Council (as relevant).

    (d) The current Dredging and Disposal Management Plan (DDMP) provided to Council prior to the commencement of the respective dredging campaign to which the deposition relates (the required WQMP is an Appendix to the DDMP).

    (e) The Biosecurity Management Plan (BMP) certified under condition 17 of consent no. CL180009E, or any updated BMP that is certified by the Council.

If a conflict arises between any conditions of this consent and information in the application documentation, the conditions of consent shall prevail.

2. Where any condition requires the consent holder to provide the Council with a plan or similar document "for certification" the following shall apply:

   (a) No less than two months in advance, the consent holder shall formally advise the Council of its intention to submit a management plan.

   (b) the consent holder shall provide the plan to the Council in accordance with the timeframe specified in the applicable condition;

   (c) where a plan is required to be prepared in consultation with any third party, the plan shall outline the extent of the consultation that has been undertaken and demonstrate how the views of that party have been incorporated, and where they have not, the reasons why;

   (d) the consent holder may commence the activities to which the plan relates in accordance with the submitted plan unless the Council advises the consent holder in writing within 20 working days of receipt of the plan that it refuses to certify it on the grounds that it fails to meet the requirements of the condition which requires such a plan to be provided, and the Council provides reasons why that view is held;

   (e) should the Council refuse to certify the plan, the consent holder shall submit a revised plan to the Council for certification. The Council shall certify the plan as soon as is practicable. Clause (d) shall apply for any resubmitted plan;

   (f) once certified, the plan may be varied by the consent holder. The certification process for any variation to the plan shall follow the process outlined in (a) to (e) above.

   (g) the consent holder shall comply with the requirements of the certified plan.

**General Duty**

3. The consent holder shall undertake all consented activities in a manner that applies all reasonable and practicable steps to avoid, remedy or mitigate actual and potential adverse effects on the environment.

4. The consent holder shall ensure that any contractors engaged to undertake work authorised by this consent abide by the conditions of this consent. The person responsible for the work on site shall be familiar with the consent conditions and management plans. A copy of this consent and management plans shall be present on site or vessel at all times while the work is being undertaken.

**Inadvertent Discharges**

5. That where, for any cause (accidental or otherwise), contaminants associated with the consent holder's operations escape to water other than in conformity with the consent, the consent holder shall:

   (a) immediately take all practicable steps to contain and then remove the contamination from the environment,

   (b) immediately notify the Council (Manager Compliance) of the escape,

   (c) report to the Council (Manager Compliance), in writing and within 7 days, describing the manner and cause of the escape and steps taken to manage it and prevent its reoccurrence.

**Complaints Received**

6. The consent holder shall notify the Council (Manager Compliance) of any complaints relating to the exercise of the consent within 7 days of being received by the consent holder.

**Disposal of Dredged Material**

7. Dredged material deposited under this consent shall only be sourced from capital dredging (Stages 1 to 5) and maintenance dredging (within the areas where Stages 1 to 5 capital dredging has been undertaken).

8. The consent holder shall ensure that dredge spoil is only deposited within the "Offshore Disposal Area" attached as Figure 1.

9. Prior to the first deposition of dredged material under this consent, the consent holder shall provide the Council (Manager Compliance) with the co-ordinates representing each corner of the Offshore Disposal Area.

10. The consent holder shall ensure that the dredge spoil is spread as evenly as practicable over the Offshore Disposal Area by utilising so far as is practicable all of the site contained within this disposal area.

**Benthic Baseline Survey and Monitoring**

11. Within six months of the commencement of consent and within three to six months prior to the start of the Stage 1 dredging activity, the consent holder shall undertake a benthic baseline survey of the offshore disposal area. The purpose of the baseline survey is to:

   (a) characterise the composition and distribution of infaunal and epifaunal communities, and sediment characteristics within survey sites.
   (b) Identify and establish the spatial distribution of any high value habitats and/or features (such as extensive biogenic structures) in the disposal area;
   (c) Inform the design of a post-disposal monitoring programme specified under Condition 11.

12. Post-disposal monitoring shall be carried out at approximately six and 12 months after the completion of the first two stages of capital dredging (including if two stages are carried out together) and approximately 12 months after any subsequent stages. The purpose of post-disposal monitoring is to:

    (a) Identify changes occurring in and near to the disposal area since the baseline surveys. This shall include changes to benthic communities and sediment characteristics in areas where deposition occurred during the previous capital dredging stage, and in any areas containing high value habitats or communities identified in the baseline survey.
    (b) Assess whether deposited material has caused effects on surrounding benthic communities and/or sediment characteristics.

    **Advice note:** Due to the weather and sea state dependent nature of monitoring surveys, timings specified in this consent represent targets only. Exact timing will depend upon suitable conditions.

13. The benthic baseline and post-disposal surveys shall:

    (a) include adequate within-site and between-site sampling to characterise benthic communities and their spatial distributions and provide for appropriate analyses to identify changes over time. At a minimum, this shall include sampling of:
        i. the disposal area;
        ii. replicated sites potentially affected by the re-dispersal of material deposited in the disposal site; and,
        iii. at least two remote reference sites unlikely to be affected by disposal.
    (b) be designed, undertaken and reported by a suitably qualified and experienced expert in marine ecology.

14. The methods to be used for the benthic baseline and post-disposal surveys shall be specified in the Water Quality Management Plans (WQMP) required under Consents CL180009E, CL180010E and CL180011E.

15. Within a month of the results from the baseline and post-disposal surveys becoming available from
    sample analysis, the Consent Holder shall provide the survey data to the Council (Manager Compliance). Data from the baseline and one-year surveys from each stage shall be accompanied by a report describing the findings of the surveys. This shall include comparisons with previous survey findings and interpretation of the results in relation to the purposes specified in Conditions 11 and 12.

16. This information shall be provided to all parties involved in the MCHP (required under condition 9 of Consent CL 180008C), provided to hapū information networks (in accordance with condition 13 of Consent CL 180008C), and made available to the Fisheries Liaison Group (FLG) (conditions 18 to 23 below).

**Avoidance of High Value Habitats and Communities**

17. Disposal shall not occur within 50 metres of areas containing high value habitats and/or communities identified through the baseline survey, carried out in accordance with Condition 11.

**Fisheries Liaison Group**

18. Within two months of the commencement of the consent, the consent holder shall invite the Area 2 Committee of Fisheries Inshore New Zealand and the local recreational fishing community to each nominate three representatives to participate in a Fisheries Liaison Group (FLG). The consent holder shall be entitled to appoint up to three representatives to the FLG. This representation may include technical experts on behalf of any of the three groups. Before the first meeting, the group will agree on an additional person as the independent chair. If no agreement is reached, Council (Manager Compliance) shall nominate the chair.

19. The purpose of the FLG shall be to:

    (a) share information relating to the consented activities;
    (b) discuss the monitoring required by this consent in relation to any effects on fishing, including but not limited to the development of, and any modifications to the DDMP, the WQMP and the BMP; and
    (c) review monitoring results and associated analyses relating to those plans.

20. The consent holder shall ensure that the FLG is given an opportunity to provide input into the management plans in condition 19 during their preparation. Any written recommendations from the FLG shall be provided to the Council (Manager Compliance) at the same time the plan is lodged with an explanation as to how the recommendations (from the FLG) have been included in the plan, and if they have not, the reasons why.

21. The FLG shall meet within three months of the commencement of the consent, at least two months before finalising any of the management plans identified in condition 19 to be provided to the Council for certification, three weeks into the first dredging activity and annually thereafter, unless the FLG agrees by majority in advance that a meeting is not necessary.

22. The consent holder shall provide administrative services and shall meet the reasonable cost of meetings, and shall ensure that, within one week of each meeting, a record of that meeting is reported to the Council (Manager Compliance) and available to the public on the Port's website.

23. The consent holder shall advise members of the FLG two weeks in advance of the commencement of any stage of dredging/dredge material disposal, and during the activity when a trigger is breached for longer than three consecutive days or more than two times in a 30 day period.

**Advice Note:** The FLG may also recommend commissioning additional research or monitoring to address any knowledge gaps identified in the exercise of the consent. Funding, resourcing, implementation and information sharing of any such programmes shall be agreed between the parties that members of the FLG represent, and in consultation with Council (Manager Compliance).

**Update of Marine Charts**

24. The consent holder shall in consultation with Council's Harbourmaster and Maritime New Zealand, develop a proposal for how the disposal area is to be identified on the marine charts. This should include but not be limited to any safety markers required on the charts and the need for any prior notice to mariners. The proposal shall be submitted to Council for certification prior to any material being deposited within the offshore disposal area.

**Public Safety**

25. During the exercise of this consent, the consent holder shall take all practicable precautions to protect public safety at all times.

**Notice of Completion of Campaigns**

26. After completion of each maintenance dredging campaign, the consent holder shall advise the Council (Manager Compliance) in writing of having completed the campaign. This notice shall be provided to the Council within five working days of the campaign having been completed.

**Review of Consent**

The Council may review conditions of this consent pursuant to sections 128, 129, 130, 131 and 132 of the RMA. The actual and reasonable costs of any review undertaken will be charged to the consent holder, in accordance with section 36 of the RMA.

| | |
|---|---|
| Times of service of notice of any review: | During the months of February, May, August and November of any year. |
| Purposes of review: | |

To deal with any adverse effect on the environment that may arise from the exercise of this consent, which it is appropriate to deal with at that time or which became evident after the date of issue.

- To require the adoption of the best practicable option to remove or reduce any effects on the environment.
- To modify any monitoring and/or reporting programme (including requiring additional monitoring or decreasing the frequency of monitoring and/or reporting required) if there is evidence that current monitoring and/or reporting requirements are no longer appropriate.
- To modify any monitoring programme, or to require additional monitoring if there is evidence that current monitoring requirements are inappropriate or inadequate.

**Figure 1: Location of Offshore Disposal Area**

**Conditions of Consent: CL180013O**

**Purpose:** to occupy the common marine and coastal area shown in the plan attached to the application to manage and operate Port activities.

**CONSENT DURATION**

This consent is granted for a period of 35 years from the date of commencement of consent.

**General Accordance**

1. The consent holder shall undertake all operations in accordance with any drawings, specifications, and statements of intent, proposed mitigation measures and other information supplied as part of the application for this resource consent. Except where modified in accordance with these conditions, the consent holder shall undertake all operations in accordance with the following documents and those provided in support of the application:

    (a) Proposed Wharf and Dredging Project, Resource Consent Applications and Description and Assessment of Effects on the Environment (Volumes 1, 2 and 3 and supporting documentation).

If a conflict arises between any conditions of this consent and information in the application documentation, the conditions of consent shall prevail.

2. All works and structures relating to this resource consent shall be designed and constructed to conform to the best engineering practices and at all times maintained to a safe and serviceable standard.

3. The area to which this occupation permit relates is shown by the illustration attached as Figure 1.

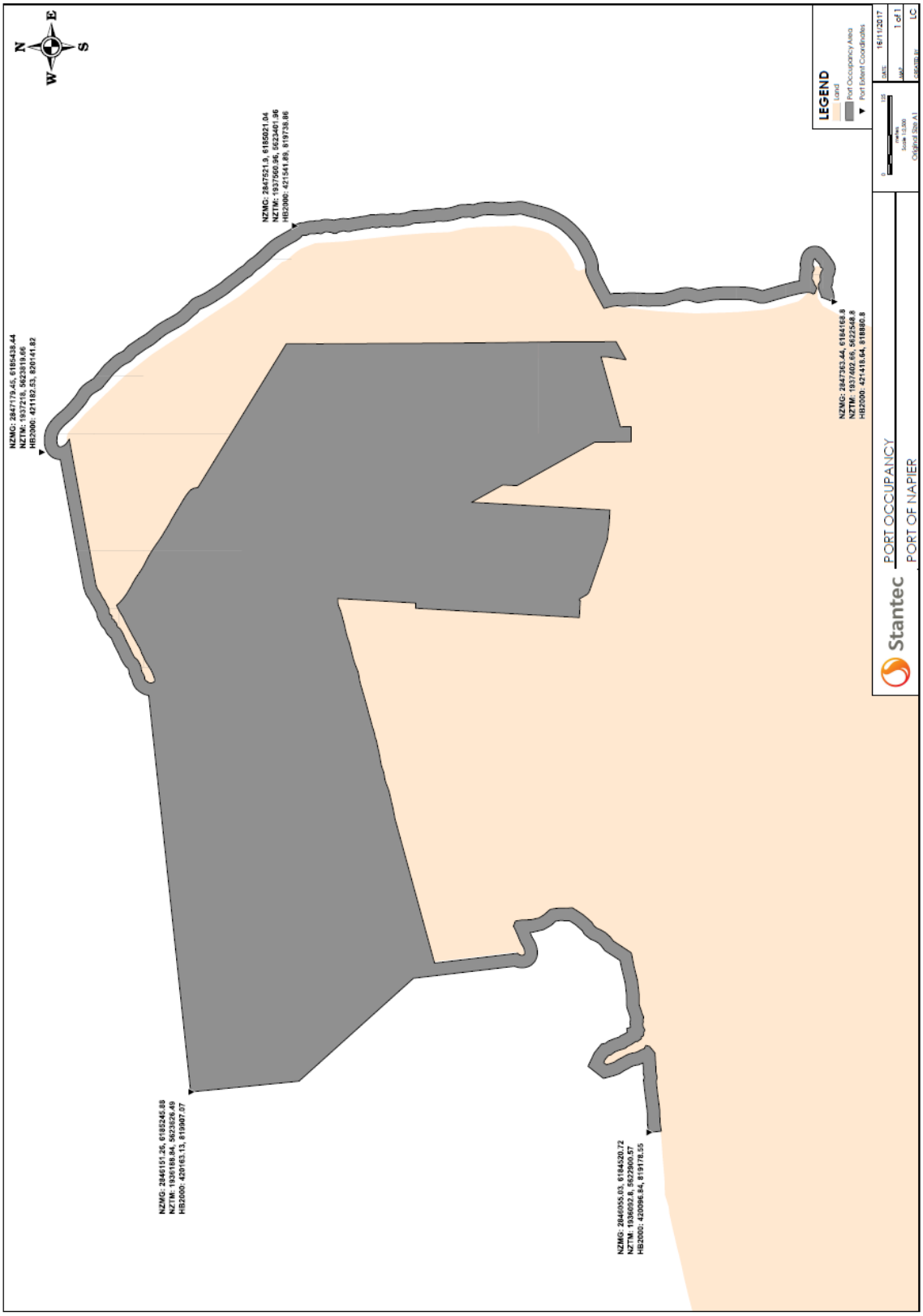
**Update of Marine Charts**

4. The consent holder shall in consultation with Council's Harbourmaster and Maritime New Zealand, develop a proposal for how the total area occupied by the Port is to be identified on the marine charts. This should include but not be limited to any safety markers required on the charts and the need for any prior notice to mariners. The proposal shall be submitted to Council for certification prior to works commencing on Wharf 6.

**Public Safety**

5. During the exercise of this consent, the consent holder shall take all practicable precautions to protect public safety at all times.

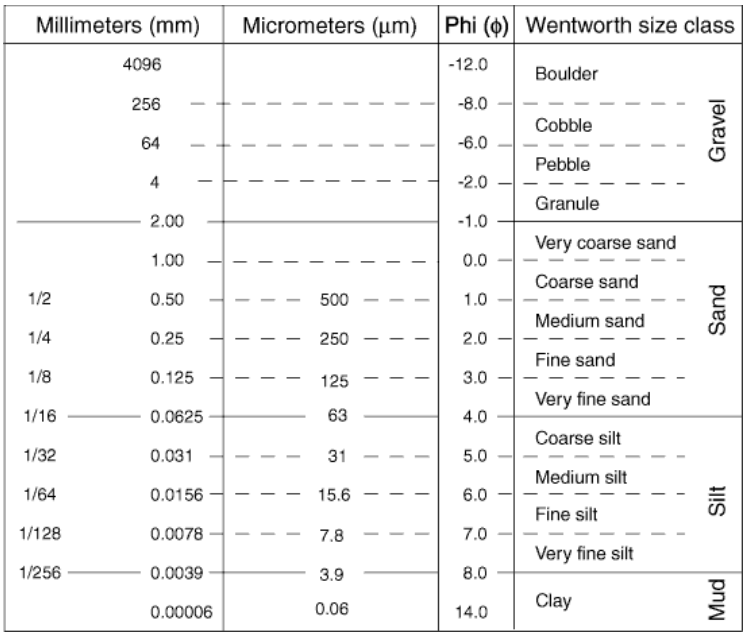
**Figure 1: Area for which the Coastal Occupation Permit applies:**



# NB: THIS APPENDIX IS NOT PART OF ANY CONDITIONS OF CONSENT BUT RELATES TO DISCUSSION CONTAINED IN THE DECISION

## APPENDIX 1: WENTWORTH SEDIMENT GRAINSIZE SCALE

The Wentworth scale classifies "very fine sand" as granular sediment with particle grainsize in the range 63–125 microns31, and "fine sand" as 125–250 microns. "Silt" is 4–63 microns, and "clay" is smaller than 4 microns. The term "mud" is used loosely; typically, it refers to silt and mud combined (which is not what is shown in the figure). The term "sand" encompasses very fine sand, fine sand, and coarser material up to 2000 microns. Coarser than "sand" is "gravel". This nomenclature was used loosely on many occasions in evidence and during questioning. We will clarify what we understand to have been the intended meaning where we can.




[Image from http://www.planetary.org/multimedia/space-images/charts/wentworth-1922-grain-size.html]

[31] A micron is one thousandth of a millimetre.

# NB: THIS APPENDIX IS NOT PART OF ANY CONDITIONS OF CONSENT BUT RELATES TO DISCUSSION CONTAINED IN THE DECISION

## APPENDIX 2: MODELS USED BY ADVISIAN

Dr Williams and Mr Adamantidis variously used a suite of numerical computer models to investigate alternative ways of achieving the Applicant's goals, optimise some features and specifications of the design, and assess potential effects of the Project on the environment. For reference, we list here the models.

**Delft3D-FLOW**: simulates wind-, tide- and density-driven currents.

**SWAN**: phase-averaged wave model – simulates wave generation, refraction, shoaling, dissipation, breaking, wave–wave interactions.

**Transport of noncohesive[32] (sand) sediments** as bedload and as suspended load by combined waves and currents is treated using the equations of van Rijn (2007, 2017)[33]. As implemented in the numerical model TRANSPOR2004, the equations are valid both inside the surfzone (that is, under breaking waves) and outside the surfzone. The equations were also used to calculate sediment transport from actual current data (as opposed to within the numerical model TRANSPOR2004, which calculates transport from predicted currents). This so-called "analytical assessment" of sediment transport is valid only outside of the surfzone. Our understanding is that the analytical assessment treats sediment transport as current-advection of sediments that are suspended by combined wave–current bed shear stress, as well as just some of the "simpler" aspects of the "direct" wave transport of sediment, including wave asymmetry and the effects of waves and currents interacting at angles. This amounts to a somewhat less comprehensive treatment compared to that in TRANSPOR2004.

**Transport of cohesive (silt and finer) sediment** based on the equations of Parthenaides (1965)[34] and Parchure and Mehta (1985)[35]. These use an excess critical bed shear stress formulation for deposition and erosion. Material travels in suspension; specifically, sediments suspended by the combined wave–current bed shear stress are advected by

[32] "Noncohesive" refers to granular sediments that do not "stick together", whereas "cohesive" sediments do "stick together". Clays are cohesive and sediments coarser than silt are noncohesive. The boundary between noncohesive and cohesive sediments lies somewhere within the silt range of particle sizes, more towards the clay end.

[33] van Rijn, L.C., (2007). Unified view of sediment transport by currents and waves, I: Initiation of motion, bed roughness, and bed-load transport. Journal of Hydraulic Engineering, 133(6), p 649667. van Rijn, L.C. (2017). Simple General Formulae for Sand Transport in Rivers, Estuaries and Coastal Waters. Technical Note. www.leovanrijn-sediment.com

[34] Parthenaides E, 1965, Erosion and deposition of cohesive soils, Proceedings of the American Society of Civil Engineers (ASCE), Volume 91 (HY1), pp105-139.

[35] Parchure, T.M. and Mehta, A.J., 1985. Erosion of soft cohesive sediment deposits. Journal of Hydraulic Engineering ASCE 111 910), 1308-1326.

the current. Our understanding is that the cohesive-sediment transport equations are also implemented in TRANSPOR2004 together with the noncohesive equations, and the appropriate set of equations is selected by reference to sediment grainsize.

**MIKE21BW**: Boussinesq (phase-resolving) wave model.

**D-WAQ PART**: 3D random-walk particle tracking and cohesive-sediment settling and resuspension. Fines released in water column (in this case representing fines released from dredging by digging and disposal) are tracked; they can settle on the seabed and be resuspended as the simulation proceeds. Settling and resuspension are by the cohesive-transport formulation.

The models may be coupled in various ways. For instance:

Couple SWAN and FLOW: pass wave parameters from SWAN back to FLOW to generate wave-induced currents (setup and set-down, undertow, near-bed orbitals) and wave and wave–current bed shear stresses.

Couple FLOW to a transport model: pass bed shear stresses and currents (currents and/or waves, as required) to appropriate transport model to generate sediment transport.

Beach-profile data along Westshore Beach and North Beach (December 2015 to January 2016), topographic survey data at Port Beach and along Hardinge Road (March 2016), high-resolution single-beam submarine survey data (2011 to 2016), and bathymetry from NZ hydrographic survey charts were used to construct model bathymetric grids.

The calibration and validation of the models are described in Appendices D, E and F of the Applicant's AEE.

FLOW was calibrated against near-surface and near-bed currents measured over a 10-day period in winter at Pilot Buoy[36] (10 m water depth, located west of the navigation channel). FLOW was validated using data from a 6-week period in autumn/winter. These periods were chosen because they encompassed clearly identifiable storm events and "relatively high" current velocities, each with different wind and current directions. FLOW was also validated against data collected at Beacons (6 m water depth, west of the navigation channel and adjacent to Westshore Beach) over the same period.

SWAN was calibrated against wave height measured at three inshore locations (RBR pressure sensors, 6 m depth, at Beacons, East Pier, Hardinge Road) during two separate

[36] Sometimes called "Channel Approaches".

storm events chosen from data that spanned the period April to September 2016. Simultaneous wave measurements at Pilot Buoy (Tri-Axis wave buoy, 10 m depth) were used as the offshore wave boundary condition. Predictions of wave height, period and direction were validated against a further three storm events (occurring between May and July 2016) at the same three inshore locations.

The Boussinesq wave model MIKE21BW was not calibrated.

The sediment-transport models incorporated seabed sediment grainsize data from various sources, including grab samples collected by the Applicant. No sediment-transport model was calibrated. The inherent uncertainties in the transport models, which are large, were acknowledged and it was emphasised that the models were used to predict "potential" – as opposed to actual – sediment transport, and that the model predictions are most appropriately used to compare different scenarios, for example, existing environment and post-dredging, rather than to determine actual sediment transport rates. Furthermore, "conservative" values for various parameters in the sediment-transport models were chosen[37]. The predictions were "reality checked" by comparing predicted sediment movement at the edge of the navigation channel with historical dredge records kept by the Applicant.

[37] Response to s92 further information request, 19 March 2018.