BEFORE THE NORTHLAND REGIONAL COUNCIL

IN THE MATTER of the Resource Management Act 1991 (RMA)

AND

IN THE MATTER of a resource consent application by The New Zealand Refining Company Ltd under section 88 of the RMA to deepen and realign the Whangarei Harbour entrance and approaches

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STATEMENT OF EVIDENCE OF STEPHEN KENNETH BROWN ON BEHALF OF REFINING NEW ZEALAND

(12 February 2018)

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Brown NZ Ltd   January 2018
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INTRODUCTION & EXPERIENCE

1. My name is Stephen Kenneth Brown. I hold a Bachelor of Town Planning degree and a post-graduate Diploma of Landscape Architecture. I am a Fellow and past President of the New Zealand Institute of Landscape Architects, an Affiliate Member of the New Zealand Planning Institute, and have practised as a landscape architect for 36 years. During that period, the great majority of my professional practice has focussed on landscape assessment and planning. This has included evaluating the landscape, natural character and amenity effects associated with numerous projects, including:

**Waterview Connection Project** (2009-12): Assessment of landscape, amenity and natural character effects. Management of a design team within Brown NZ developing the concept design for open space around the motorway corridors, including rearrangement of sport fields and reserves, the provision of new walkways, the location of realigned streams and new stormwater ponds, and the design of planting and the noise barriers next to SH20 and the Great North Rd Interchange.

**Remarkables Station Gondola & Tourism Developments** (2017): provision of input on a proposed 10km gondola to the Remarkables Ski Field and associated tourism development; assessment of the landscape and amenity effects of the proposed gondola corridor together with a plan change designed to accommodate a tourist village, visitor accommodation and residential development near the Kawarau River on Remarkables Station – for Remarkables Station Ltd.

**East West Link Review** (2016/17 – for Auckland Council): completion of a detailed review of the urban design, landscape, natural character and amenity effects associated with the East West Link, including the preparation of evidence and supplementary evidence for the Board of Inquiry and participation in the NOR hearing – for Auckland Council.

**Westhaven Stage 1 Extension** (2015/16): development of the concepts for the Stage 1 Extension of Westhaven’s northern reclamation including: the closure of the western marina entry, replacement of pile moorings by two new berthing piers and reconfiguration of the existing A Pier, provision of 110 new car parks, development of a series of public open spaces culminating in a ‘forest’ of pouwhenua and an elevated ‘waka headland’ promontory projecting out over the Waitemata Harbour (developed in conjunction with the Panuku Development Auckland Mana Whenua Collective). Accompanied by a detailed assessment of the proposal’s landscape, natural character and amenity effects – for Panuku Auckland.

**Klondyke Water Storage Facility** (2015/16): assessment of the effects of the development and operation of a 53Mm³ water storage dam near the Rangitata River in South Canterbury, together with related modifications to the existing Rangitata Diversion Race canal system – for RDR Management Ltd.

**Hagley Park Cricket Oval Application** (2013): review of the landscape and amenity effects of a proposed cricket oval – including embankments, spectator pavilions and seating, light towers, security fencing and parking – within Hagley Park South for events up to the international level – for Christchurch City Council.


**Project Central Wind** (2009): evaluation of the landscape, natural character and amenity effects of a proposed 51 turbine wind farm proposed for the southern margins of the North Island’s Volcanic Plateau near Taihape and SH1, including a sub-regional assessment of alternative locations – for Meridian Energy Ltd.

**Moorabool Wind Farm** (2009/10): assessment of the landscape and amenity implications of a proposed 110 turbine wind farm east of Ballarat in the Moorabool Shire of Victoria – for WestWind Pty Ltd.

**Allandale Wind Farm** (2008): evaluation of the landscape and amenity effects of a proposed 50 turbine wind farm near Mt Gambier and Port MacDonnell in South Australia – for Acciona Ltd.

**Waitemata Harbour Crossing Options Assessment** (2002/3): Evaluation of the visual and amenity effects of 9 harbour crossing options, including bridges, tunnels, submerged tubes, reclamations, ventilation and service structures, trenches and motorway interchanges - for Opus International and Transit NZ.

**Marsden Point Port Impact Assessment** (1997 & 2002): responsible for assessment of the visual and amenity implications of a major new port facility covering some 37 ha and associated infrastructure development - including preparation of proposals for amelioration & enhancement around Blacksmith’s Creek, followed by assessment of the effects of additional berths in 2002 - for the Northland Port Corporation / Northport.

2. I have also undertaken a large number of strategic landscape and natural character assessments, including of: the Auckland Region (1984, 2008, and 2014), Whangarei District (2005), the Coromandel Peninsula (2008 and 2012), and the West Coast Region – together with the Grey, Buller and South Westland Districts (2012). In 2006 I was part of a team headed by Urbis Ltd that was awarded the UK Landscape Institute’s Strategic Planning Award for its ‘landscape values and sensitivity mapping’ of Hong Kong.
CODE OF CONDUCT

3. I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with it. I further confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person.

SCOPE OF EVIDENCE

4. My evidence is based on the AEE report that I prepared for Refining NZ Ltd in relation to the Crude Shipping Project, dated March 2017. Both that original report and my evidence address the proposed alterations to the shipping channel at Marsden Point – including:

- Realignment of the current Marsden Point / Home Point channel which provides shipping access to Marsden Point;
- Deepening of the channel to accommodate more heavily laden tankers than those currently able to unload at Marsden Point;
- Extraction of harbour floor material to accommodate this realignment and deepening of the main navigation channel;
- Disposal of that material within parts of Bream Bay;
- Reconfiguration of some channel buoys in the vicinity of Busby Head, Home Point and Taurikura Bay at the entrance to Whangarei Harbour;
- The addition of a new beacon and navigation lights within the outer harbour; and
- Installation of two new channel marker buoys.

5. I have evaluated these modifications and developments in terms of their visual, landscape, amenity and natural character effects, assessed in the context of both the existing environments of Whangarei Harbour and Bream Bay, and relevant statutory instruments – including sections 6 and 7 of the Resource Management Act, Policies 13
and 15 of the New Zealand Coastal Policy Statement and relevant provisions of both the Northland Regional Coastal Plan and the proposed Regional Plan for Northland. In addition, I address those public submissions to the Refining NZ application which raise concerns about the natural character, landscape and amenity effects of the proposal.

6. As a result, my evidence is structured as follows:
   - A brief overview of the Refining NZ proposals that are relevant to my assessment;
   - Analysis of the landscape context for the current applications – focusing on the outer Whangarei Harbour and the northern half of Bream Bay;
   - A description of key environmental areas near Marsden Point identified in relevant statutory documents and relevant provisions – focusing on natural character, landscape and amenity;
   - Analysis of the key effects associated with:
     - Dredging and channel realignment;
     - Sand disposal;
     - New lead lights proposed in the vicinity of Taurikura Bay;
     - A new lateral maker proposed off Home Point;¹
     - The sand plumes associated with dredging and sand disposal; and
     - The actual sand dredging and sand disposal operations.
   - A summary of key findings and assessment of cumulative effects;
   - Evaluation of the proposal against key statutory provisions and instruments;
   - Public submissions; and
   - My conclusions.

7. All of the matters listed above, apart from public submissions, are covered at length in my AEE report. Consequently, rather than repeat that report in a verbatim fashion, I

¹ I also address the relocation and reconfiguration of some existing buoys or the addition of two new channel entry buoys in paragraph 15 below.
have attempted to distil my previous assessment down to a series of summaries that address my original analyses and key findings.

**EXECUTIVE SUMMARY**

8. As indicated above, my statement focuses on the effects associated with the following components of the Crude Shipping Project:

- Formation of a new navigation channel to and from Marsden Point;
- Disposal of the material extracted from the new channel in Bream Bay;
- The location of new Lead Lights off Taurikura Bay;
- The location of a new navaid marker next to Home Point;
- Dredging and disposal plumes in the harbour and Bream Bay; and
- The proposed dredging and disposal activities.

9. Those effects are evaluated in the context of the existing natural character, landscape and amenity characteristics associated with Whangarei Harbour, Whangarei heads and Bream Bay. They are also assessed with reference to the identified Outstanding Natural Landscapes (ONLs) and areas of High or Outstanding Natural Character (HNC and ONC Areas) identified around the harbour and within Bream Bay, as well as other areas of elevated environmental sensitivity. Relevant statutory instruments, primarily at the regional level, are also considered.

10. Much of my assessment pertaining to the underwater, natural character effects of the application relies on analysis by other experts, as outlined in the statements of Dr Beamsley (MetOcean Solutions Ltd), Mr Reinen-Hamill (Tonkin & Taylor Ltd) and Mr Graham Don (Bioresearches Ltd). However, I have also undertaken site visits to examine the ‘above sea surface’ effects of the current proposals. On the basis of that assessment, I have determined that the application would generate a range of natural character, landscape and amenity effects that are, both individually and cumulatively, of a small scale. Moreover, they are, for the most part, spatially discreet – spread between underwater and above water environments and different parts of both the harbour and Bream Bay – while the temporary nature of the capital dredging and sand
disposal operations would further assist to limit the long term change anticipated within both Whangarei Harbour and Bream Bay. Overall, I have therefore concluded that any permanent effects would typically be of a Low to Very Low order. I have further concluded that the proposals are consistent with relevant statutory instruments and therefore appropriate from my standpoint.

**PROJECT DESCRIPTION**

11. The proposed deepening and realignment of the harbour channel to and from the Marsden Point Refinery is designed to accommodate more efficient use of the terminal and, in particular, the greater use of more fully laden, Suezmax type vessels carrying crude oil. The realignment option ultimately selected by Refining NZ [Option 4.2 (Rev. M)] extends for 8km between the centre of Bream Bay and Marsden Point (see the map 1) and requires the removal of some 3.7 million m\(^3\) of sand from the sea floor at Whangarei Harbour’s entrance. It would result in a channel that varies in depth between 19.0 m below Chart Datum (CD) at the entrance to the channel, to 16.5 m below CD at the berth area and 17.9m below CD within the berth pocket. The new channel would disturb some 1.44km\(^2\) of the harbour floor (see Figure 1 below).

![Figure 1: Proposed Option 4.2 Rev, M Navigation Channel & Locations For Sediment Disposal](image-url)
12. In addition to this ‘capital dredging’, periodic maintenance dredging would be required mainly in the proposed berth pocket and at the outer edge of the new channel. Over the duration of the proposed consent (35 years), this would result in the dredging of between 1,960,000 and 3,660,000 m\(^3\) of sea bed material – mostly sand – representing approximately 1.2 to 2.5% of the current ebb tide delta volume. Maintenance dredging would probably need to occur every 2 to 5 years in the berth pocket area, as well as at localised areas along the channel’s margins.

13. Disposal of the dredged material is proposed at Nearshore Disposal Area 1.2, some 3.5km offshore off Ruakaka’s foreshore (see Map 1 above), while a second disposal site – Area 3.2 – is located some 10.9km from the same beachfront. Both dredging and sand disposal have the potential to generate plumes of material that would, in turn, affect the more general water turbidity within Whangarei’s harbour mouth and Bream Bay. The boats/ ships undertaking these activities would also generate noise and lighting that could add to these effects.

14. Other key components of the Refining NZ proposal include the relocation and / or addition of navigation lights and buoys – including:
   - Relocation of the existing Fairway Buoy A at the entrance to the navigation channel by some 20m;
   - Replacement of the other existing Fairway Buoy by a new Starboard Buoy;
   - The relocation of existing Buoys 2, 3, 5, 8, 11, 12 and 14 to accommodate the revised, “S” footprint of the proposed navigation channel, together with the addition of two new buoys near the outer reaches of the channel within Bream Bay and reconfiguration of some existing buoys;
   - Location of a new ‘lateral marker’ off Home Point to mark a rock outcrop next to that feature;
   - Provision of new ‘Front Lead’ light on the southern edge of Calliope Bank, offshore of McKenzie Bay; and
   - Location of a new ‘Rear Lead’ light on the northern side of Calliope Bank, offshore of the main beach at Taurikura, though still some 740m from it.
15. It should be noted that my statement does not address the relocation and reconfiguration of some existing buoys or the addition of two new channel entry buoys. Having reviewed these proposals, it is my opinion that these modifications and additions would have such a limited effect – especially within the broad expanse of Bream Bay – that few boaties or visitors to the Home Point Reserve would be aware of any changes to the current channel marker configuration. Indeed, having taken a series of panoramic photos from Busby Head to try and address this issue, it proved almost impossible to clearly identify the existing channel buoys. As a result, I determined that the proposed changes to the channel alignment would be imperceptible from most public vantage points. Viewed close-up, the changed configuration of some buoys would be more apparent, but they would remain – as now – typical of buoy lane markers. Again, any perceived change in this regard would be negligible.

**LANDSCAPE CONTEXT**

16. The approaches to Whangarei Harbour are framed by the expansive coastal plain around Ruakaka to the south and the volcanic peaks of Home Point, Mt Lion, Bream Head, then Taurikura, Mt Manaia and Mt Aubrey, to the north. A sequence of bays – from Little Munroe to Urquharts – frames the northern side of the outer harbour and looks across its entry channel to the oil refinery and deep water port at Marsden Point. West of the oil refinery, Marsden Bay and One Tree Point enclose the shoreline stretching inland, at the edge of the coastal plain that extends southwards to Ruakaka and Waipu Cove. However, the catchment more directly associated with Marsden Point’s navigation channel is effectively framed by the adjoining deep-water port and, across the harbour, by Darch Point – at the western edge of Reotahi (below Mt Aubrey). Home Point and Busby Head define the outer limits of the main channel, while its outer reaches – extending into Bream Bay – are more loosely framed by Bream Head and the dune corridor around Ruakaka.

17. The Ruakaka coastline also reveals the remains of the old Marsden B Power Station and substation, various industrial premises, the Ruakaka Sewerage Plant and scattered pockets of residential development. Further north, the Marsden Point Refinery is clearly identifiable, with its complex array of storage tanks, pipe work, buildings and
infrastructure dominating the headland that marks the interface between Ruakaka Beach and Whangarei Harbour. Two unloading wharves and gantries are outliers to the main refinery, projecting out into the enclosed harbour, with tankers often moored alongside these wharves and their ‘dolphins’. Northport’s adjacent deep water berths are constantly in motion, with logs being loaded onto freighters, while trucks re-supply the large timber and timber chip stockpiles behind the main wharves.

18. This industrial node is framed by Blacksmiths Creek, but immediately west of it, a sequence of residential development expands the harbour frontage subject to active occupation and use – including the enclosed waterways of the Marsden Cove development. Although views from this quarter capture the margins of the Northport facility and the oil refinery with its twin berths, the main outlook from Marsden Bay and One Tree Point is directly across the harbour, towards Mt Aubrey, Taurikura and the wider sequence of sharply serrated, volcanic peaks that are fundamental to the outer harbour’s signature (see Photo 1, below). Bush, and pockets of pasture extend down from the sharply etched profile of these old volcanoes to wrap around pockets of residential occupation and activity. At the very end of this ‘chain’, Mt Lion and Home Point decisively mark the outer limits of the harbour, while a broad phalanx of bush extending from Home Point to Busby Head, then out from Smugglers Bay to Bream Head, helps to further reinforce the more natural qualities of this ‘bookend’.

![Photo 1: Looking from One Tree Point towards Mt Aubrey, Taurikura, Mt Lion & the Marsden Point Oil Refinery](image)

19. Most of the settlements between Reotahi and Urquharts Bay lie within the visual catchment of the existing refinery and its navigation channel. As a result, the refinery acts as the visual centrepiece of most views to, and across, the harbour entrance. However, this is not always the case: descending towards McGregors Bay and Taurikura Bay on Whangarei Heads Rd, the volcanic relief of the surrounding hills, and their interplay with the waters of the northern harbour reaches, is a defining feature of many
views. In particular, the distinctive profile and visual presence of Mt Lion and Home Point – joint sentinels at the harbour mouth – is a key facet of the Whangarei Heads landscape (see Photo 2, below).

![Photo 2: Looking from Whangarei Heads Road near Mt Manaia towards Mt Lion and Home Point](image)

20. Outside the relatively sheltered waters and Whangarei Harbour, the waters off Smugglers Bay and Bream Head mark the junction with Bream Bay and a much more open and exposed body of sea – with just the distant Hen and Chicken Islands (Taranga Island and the Marotere Islands), on the far side of the Parry Channel, providing any degree of protection and containment from the Pacific Ocean’s swells. As a result, the waters facing the northern edge of Bream Bay are frequently wind-tossed and flecked with spray. The often wild, but also enduringly scenic, qualities of this coastal landscape are therefore often matched by the turmoil of its sea surface. Although lying close to the string of coastal settlements described above, it has a much more remote, elemental, quality and, unlike the other parts of the Marsden Point’s landscape setting, there is little sense of contact with the oil refinery or other areas of more obvious human activity – apart from the ships lined up offshore, waiting to berth.

**IDENTIFIED VALUES**

21. The Northland Regional Policy Statement and proposed Regional Plan for Northland identify a number of regionally significant, Outstanding Natural Landscapes (ONLs) near Marsden Point, together with areas of High and Outstanding Natural Character. In addition, Map 16 of the Operative Whangarei District Plan (see overleaf) identifies additional district level ONLs within Bream Bay and around Whangarei Heads. Of most relevance to the current proposal, the Regional Policy Statement identifies:
• Areas of High Natural Character within the harbour either side of the current navigation channel in and out of Marsden Point, including High Natural Character (HNC) areas covering Calliope Bank and part of Mair bank either side of the proposed navigation channel.

• A strip of Notable Landscape (district plan) and ONL (Regional Policy Statement) running along Bream Bay’s beachfront and dune corridor, south of the oil terminal boundary.

• ONLs (District Plan and RPS) covering the coastal hills and ridges that frame the northern side of Whangarei Harbour, including Taurikura, Mt Lion, Busby Head, and the coastal ridges extending from Smugglers Bay to Bream Head.

• Areas of High Natural Character flanking Home Point and the series of coastal ridges and promontories in its vicinity that culminate in Busby Head.

• An area of Outstanding Natural Character covering the seaward slopes and bluffs from Smugglers Bay through to Bream Head.

22. Figures 2 and 3 identify these areas of high landscape and environmental value.
23. Further west, most of Mt Aubrey and part of its apron of CMA either side of Lort Point is also identified as an ONC area, while Mounts Manaia, Aubrey and Taurikura – facing Whangarei Harbour and Marsden Point – are each subject to an ONL overlay.

24. The Northland RPS identifies the criteria employed to identify the various ONLs, HNC areas and ONC Areas found around Marsden Point and Whangarei Heads – which are aligned, in my opinion, with the criteria for such assessment set out in Polices 13 and 15 of the NZ Coastal Policy Statement.

25. However, the RPS fails to describe or detail the key attributes associated with each of the regional ONLs. This is also the case in relation to the Notable and Outstanding Landscape Areas identified in the Whangarei District Plan. On the other hand, the Northland RPS does provide an annotated list of the key habitats and fauna found within the areas of High and Outstanding Natural Character. Close to Marsden Point these include the following HNC Areas:
Coastal Area Covered: North of Uretiti to north of Marsden power station site, including Ruakaka estuary

Dominant Coastal Criteria Used:
- Ridgeline/land contour: Yes
- Presence and extent of dunefields: Yes
- Presence and extent of coastal lakes, lagoons, tidal estuaries, saltmarshes, or coastal wetlands:
  - Ruakaka River estuary, Ruakaka Racecourse Dune Lake

Other Relevant Factors:
- Defined areas of coastal hazard risk: Bream Bay/Ruakaka Beach
  - Presence and extent of coastal vegetation:
    - See Q07/128 Ruakaka Dunelands; and
    - Q07/130 Ruakaka River Estuary
    - Natural Areas of Waipu Ecological District 2007
  - Presence and extent of habitats of indigenous coastal species including migratory birds:
    - See Q07/128 Ruakaka Dunelands
    - Q07/129 Ruakaka Racecourse Dune Lake; and
    - Q07/130 Ruakaka River Estuary

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Coastal Area Covered: Whangarei Harbour – Darch Point to Home Point Open Coast – Home Point to Ocean Beach including Bream Head

Dominant Coastal Criteria Used:
- Ridgeline/land contour: Yes
- Presence and extent of dunefields: Ocean Beach
- Presence and extent of coastal lakes, lagoons, tidal estuaries, saltmarshes, or coastal wetlands: N/A

Other Relevant Factors:
- Defined areas of coastal hazard risk: Ocean Beach
  - Presence and extent of coastal vegetation:
    - See Q07/069 Manaia Ridge Scenic Reserve and Surrounds
    - Q07/070 Mount Aubrey Coastal Forest and Shrubland
    - Q07/073 Taurikura Ridge Bush
    - Q07/074 Bream Head Scenic Reserve and Surrounds; and
    - Q07/075 Ocean Beach Recreation Reserve and Surrounds in
    - Natural Areas of Manaia Ecological District 2010
  - Presence and extent of habitats of indigenous coastal species including migratory birds: N/A

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Coastal Area Covered: Bream Bay – north of Marsden power station site to Marsden Point
  - South Whangarei Harbour – Marsden Point to Takahiwai
North Whangarei Harbour – Mount Aubrey

**Dominant Coastal Criteria Used:**

Ridgeline/land contour: Yes

Presence and extent of dunefields:

*North end of Bream Bay beach*

Presence and extent of coastal lakes, lagoons, tidal estuaries, saltmarshes, or coastal wetlands:

*Blacksmith’s Creek, Takahiwai Creek*

**Other Relevant Factors:**

Defined areas of coastal hazard risk:

*Bream Bay Beach, Marsden Cove, One Tree Point*

Presence and extent of coastal vegetation:

*See Q07/128 Ruakaka Dunelands, Q07/144 Blacksmith’s Creek Estuary, Q07/143 Takahiwai Creek Estuary; and Q07/167 Takahiwai Saltmarsh and Shrubland in Natural Areas of Waipu Ecological District 2007*

*And Q07/058 Whangarei Harbour in Natural Areas of Whangarei Ecological District 2001 And Q07/070 Mount Aubrey Coastal Forest and Shrubland in Natural Areas of Manaia Ecological District 2010*

Presence and extent of habitats of indigenous coastal species including migratory birds:

*See Q07/128 Ruakaka Dunelands, Q07/144 Blacksmith’s Creek Estuary, Q07/143 Takahiwai Creek Estuary; and Q07/167 Takahiwai Saltmarsh and Shrubland in Natural Areas of Waipu Ecological District 2007*

*And Q07/058 Whangarei Harbour in Natural Areas of Whangarei Ecological District 2001*

26. Unfortunately, these descriptions are sparse, to the point of having little meaning to most lay people. What remains apparent, however, is the proliferation of areas subject to landscape and natural character overlays around Marsden Point and Whangarei Heads, together with the environmental dichotomy that is evident both sides of Whangarei’s outer harbour. To the north, its waters are physically enclosed, and overlooked, by a sequence of forested, and spectacularly volcanic, terrain, within which pockets of settlement also engage with the harbour’s margins. This culminates in the peaks and promontories of Home Point, Busby Head, Mt Lion and Bream Head.

27. By contrast, around Marsden Point and Cove a series of coastal dunes and flats contain an increasingly solid matrix of industrial development, port related activities and housing. Further south again, the Bream Bay coastline retains vestiges of natural
character and an area of high public appeal around Uretiti; yet most of the coastal frontage around Ruakaka is still dominated by a complex matrix of housing development, the local race course, industrial premises lining Marsden Point Rd and even the local sewage treatment works. This creates a landscape of markedly contrasting character and appeal.

28. Of the proposed Crude Shipping project components, nearly all would avoid physically encroaching on the various ONLs, HNC areas and ONC areas that I have identified near Marsden Point. However, the two lead lights proposed for Calliope Bank off Taurikura are located within part of the HNC area that extends from Reotahi and Mt Aubrey to Home Point on the northern side of the entry channel (which is recorded as having High Natural Character values in both the Regional Policy Statement and the proposed Regional Plan for Northland), while my AEE assessment has also addressed potential effects that might ‘spill over’ into the various ONLs, HNC and ONC Areas described above.

EFFECTS – NATURAL CHARACTER, LANDSCAPE & AMENITY

29. Effects on natural character, landscape and amenity natural character values typically arise from changes to the character of the existing environment that, in turn, modify and diminish the values of that environment / landscape. Consequently, this section of my statement addresses the degree of landscape / environmental change associated with the Crude Shipping Project and the extent to which those alterations would reduce the appeal and values of the area(s) affected by the project. Most projects focus on a single development and site. In this instance, however, the Crude Shipping Project involves multiple sites and a range of developments – from channel realignment (including widening and deepening) to the erection of new navigation markers and lights, and the processes of both dredging and disposal. As a result, my assessment addresses the project in terms of its key components – as set out in my Paragraph 11.

30. Again, I need to reiterate that I have not addressed the relocation of a number of existing navigation buoys, together with the addition of two new buoys to the channel margins and the reconfiguration of others. As indicated, at my paragraph 15 (above),
this is because the existing channel buoys are very minor components of the current outer harbour and northern Bream Bay: they would simply shift within the closer confines of Whangarei Harbour and the two additional buoys proposed near the channel entry would be located some 3-4km off Busby Head – rendering them all but invisible from most vantage points not close to the entry channel. They would be largely ‘lost’ amid the broad expanse of sea and fetch typically experienced within central and outer Bream Bay. As a result, it is my opinion that any effects associated with such changes would be ‘de minimis’.

31. Notwithstanding this, all other project components have been assessed in detail, with regard to both the perceptual and biophysical aspects of landscape and natural character, especially.

32. I also need to point out that in my AEE report, I identified the individual receiving environments and audiences potentially exposed to all of the project components described above. However, there is considerable overlap between the different catchments and audiences potentially affected by the different components. In order to be as efficient as possible, I have therefore grouped the main receiving environments and audiences that experience the Crude Shipping project, in a consolidated list, below. Indeed, while many locals and visitors might well see just one or two components of the proposal from a single, static vantage point, they would often see much more of the overall ‘site’ area when travelling down the harbour, or along its margins – by boat or motor vehicle.

Key Receiving Environments:

- the shoreline around Marsden Point and the oil refinery, extending down the Ruakaka coastline & past the Northport facilities towards One Tree Point;
- the margins and elevated vantage points of the DoC Reserve stretching from Bream Head to Home Point;
- the settlements of Reotahi, Little Munroe Bay, McGregor’s Bay, Taurikura Bay, McKenzie Bay and Urquharts Bay;
- associated public beaches;
- parts of Whangarei Heads Rd;
the public tracks to and around Mt Lion, Taurikura, Mt Aubrey and Mt Manaia; and
the water areas of outer Whangarei Harbour and the northern half of Bream Bay

**Key Audiences:**
- Boaties using the outer harbour and/or the northern half of Bream Bay;
- Recreational users of Home Point, Busby Head and Smugglers Bay – within the DoC reserve extending across Mt Lion to Bream Head;
- Residents within, and visitors to, the settlements of Reotahi, Little Munroe Bay, McGregor’s Bay, Taurikura Bay, McKenzie Bay, Urquhart’s Bay and parts of Ruakaka;
- Those using the associated public beaches;
- Those using the public tracks to and around Mt Lion, Taurikura, Mt Aubrey and Mt Manaia; and
- Those working at the Marsden Point Oil Refinery.

33. Taking these catchments and audiences into account, together with my analysis of the existing natural character and landscape conditions experienced from different locations around Whangarei Harbour and Bream Bay, I have therefore reached a number of conclusions in relation to the effects of the project components. These culminate in impact ratings for each Crude Shipping Project component that reflect the following rating scale:

**Very Low:** The proposal would have very little or no impact on the character and values of Whangarei Harbour and/or Bream Bay (as applicable).

**Low:** The proposal would be discernible, but would remain a minor, to very minor, component of the local coastal environment and landscape.

**Low / Moderate:** The proposal would be reasonably apparent, without adversely affecting the overall character and values of the outer harbour and/or Bream Bay.
**Moderate:** The proposal would affect the character of one or both water bodies (Whangarei Harbour and/or Bream Bay), but it would have a limited impact on their biophysical and perceived values.

**Moderate / High:** The proposal would be readily apparent, adversely affecting both the character and values of the coastal environs of Whangarei Harbour and/or Bream Bay.

**High:** The proposal would become a dominant feature within the outer harbour and/or Bream Bay, adversely affecting the character and values of one or both water bodies (and their margins) to a significant degree.

**Very High:** The proposal would be so dominant that it fundamentally changes the nature of the local coastal environment and landscape.

### Channel Formation

35. The process of channel formation would involve the removal of a mixture fine, medium and coarse sands, together with shell debris, making up the majority of the total 3,700,000 m$^3$ to be extracted in the course of capital dredging, then maintenance dredging in the range of 56,000 to 122,000 m$^3$ per annum. Silts and clays would also be removed, but these would only make up approximately 2.0% of excavated material in the Outer Channel (Bream Bay), rising to approximately 6.0% in the Inner Channel (outside the berth pocket).

36. This part of the project would be framed by a maritime and terrestrial landscape that is notable for its array of natural headlands, volcanic peaks and forested areas counterbalanced by the existing oil refinery, deep water port, pockets of settlement and existing shipping lanes and berths – as described in my section addressing the proposal’s landscape context. Underwater, analysis of the sea bed around the proposed
navigation channel\(^2\) has revealed a seabed that largely comprises broad layers of sand interposed with patches of gravels and sea shells. Most of this environment has a sparse, undifferentiated, character. It is relatively homogeneous, without a great deal of diversity and biotic content.

37. On the other hand, Bioresearches’ assessment of the current harbour floor also identified an important ‘rocky reef and sponge garden habitat’ (one of only three such sub-tidal habitats in Whangarei Harbour) northeast of Home Point. The deeper, sponge garden is important in terms of both its sponge colony and the high concentration of schooling fish within it.

38. Turning to the effects of the new channel, the rearrangement of buoys within both the outer harbour and Bream Bay would make little, if any, difference to the current delineation of the navigation channel. For all intents and purposes, once dredged and re-marked, the channel would appear identical to that which exists at present. In a similar vein, it is considered that the proposed channel would have no appreciable impact on the amenity values of Whangarei Harbour or Bream Bay.

39. Underwater the sea floor around the northern to eastern edge of Mair Bank and along the southern edge of Calliope Bank would be subject to significant modification, as is outlined by Richard Reinen-Hamill (Tonkin & Taylor). The natural tidal channel would be reconfigured, with parts of the current, natural channel extended laterally, deepened and ‘squared off’ – although the resulting side batters would develop a reasonably natural angle of repose given time to settle. These changes would be more pronounced at the entry to the channel within Bream bay through to near Home Point and on the final approach to the current ‘dolphins’ and unloading facilities. MetOcean’s modelling, as explained in Dr Beamsley’s evidence, also indicates that once the configuration of the seabed is modified, it is expected to naturally stabilise, although maintenance dredging will have to respond to constant in-filling of Marden Point’s berthing area and channel by sands – around the toe of Mair Bank and off Busby Head,

\(^2\) Existing Environment Assessment: Ecology Of The Dredge Area – Whangarei Heads; Bioresearches Ltd; September 2016.
in particular. This would result in changes to the morphology of Mair and Calliope Banks.

40. Related research by Metocean Solutions confirms that most of the sea floor is dominated by medium-grain sands, and Dr Beamsley indicates in his statement that any changes to the sediment particle sizes near the proposed channel would amount to no more than a 5% change – to slightly coarser, heavier sands. The heavier weight of these sands would also help to limit the spread of colloidal material away from the area of dredging and thus the potential smothering of local marine habitats by dredging plumes. Other biophysical, underwater effects would be limited by the sand-dominated, relatively depauperate, conditions within and around most of the channel corridor. Their on-site assessment also confirms that the significant ‘sponge garden’ and ‘rocky reef’ habitats would stay outside the footprint of area subject to dredging and channel formation. In addition, Refining NZ has agreed to manage the turbidity of the waters around the ‘rocky reef and sponge garden’ to ensure that neither is affected by the dredging operations. Consequently, the proposed channel formation would have no appreciable effect in relation to these highly sensitive habitats from an underwater natural character, landscape and amenity perspective.

41. Overall, therefore, it is my opinion that the effects generated by channel formation would typically be of a Very Low to Low order, although in a precautionary vein I have indicated that they could rise to a Low / Moderate level in relation to changes to the sea bed’s morphology in closer proximity to the new channel.

Sand Disposal

42. The coastline closest to both proposed disposal sites is notable for its highly modified state, including pockets of residential development, the oil refinery, the site of the former Marsden B Power Station site, the Ruakaka Race Course, an industrial park, the local sewerage treatment plant and ponds, two camping grounds and even the Waipu Cove Golf Club. Even so, the dunes and beachfront directly facing, and physically abutting, Bream Bay have been identified as a Notable Landscape Area in the Whangarei District Plan, anchored by the narrow dune corridor behind the beach and lagoons at the mouth of the Ruakaka and Waipu Rivers. The dune system provides a buffer between the beachfront and its developed hinterland, with both the seaward
edge of the dunes and the beachfront ‘in front of it’ offering panoramic views out over Bream Bay towards the Hen and Chicken Islands, as well as to the spectacular sequence of volcanic peaks clustered around Mt Lion and Bream Head.

43. Disposal of the dredged material within this landscape would have very few ‘above water’ effects – in relation to this ONL or other parts of the Ruakaka coastline. In fact, these would largely be confined to the presence of a vessel within the broad expanse of Bream Bay, with the actual disposal operations remaining essentially invisible from the shoreline and beyond. Viewed from other vessels traversing Bream Bay, the dredging vessel and disposal operations would be more obvious, but both would still largely merge with other ship movements and maritime operations associated with both the oil refinery and Northport. To a certain extent, the dredging vessel would also become a known and accepted part of the local sea environment, without greatly altering or disturbing the more important characteristics and values associated with Bream Bay. As a result, it is anticipated that the dredging vessel and sand disposal would have a very limited impact on Bream Bay’s landscape values. It would have no appreciable impact on the Bay’s identity, sense of place and amenity values.

44. Underwater, both proposed disposal sites are part of an extensive sea floor that is dominated by existing layers of sand together with some shell fragments. Most of the sands found within both disposal sites are generally similar in their composition and grain size to those found around the proposed shipping channel. Consequently, disposal would create layers and mounds of transplanted material that rapidly merges with a sand floor within Bream Bay that is – like that closer to Marsden Point – also sparse and relative undifferentiated. Wave and tidal action would help to both settle and spread the mounds so that they physically coalesce with that existing sea floor. As a result, any effects on the structure and form of the sea floor would rapidly dissipate, especially so when the period of capital dredging is complete; limiting any potential underwater landscape, natural character and amenity effects.

45. On the basis of this analysis, it is therefore my view that the proposed sand disposal would have a Low level of effect.
Lead Lights Off Taurikura

Two lead lights are proposed off Taurikura Beach. The Front Lead would be similar to the other 39 lead lights already in use within Whangarei Harbour, with its 600mm diameter pole, painted ‘rescue orange’ rising 8.7m above Chart Datum (see Photo 3, below). The Rear Lead would be taller, rising to 15.7m above Chart Datum with an 850mm pole (see Photo 4, showing a 19m high lead light, below). Again, this structure would be painted ‘rescue orange’.

Photo 3: A Front Lead as proposed for Taurikura at the outer edge of Calliope Bank 1450m from Taurikura Bay

Photo 4: “Skips Rocket” off Limestone Island – as proposed for the inner side of Calliope Bank some 740m offshore of Taurikura Bay
Both proposed Leads would be located on the northern side of the proposed navigation channel. They would sit within a large area of High Natural Character identified within both the operative NRPS and the proposed Regional Plan for Northland that extends across Calliope Bank to the northern harbour shoreline (see Figure 2). The Front Lead would be sited 1450m from Taurikura Bay on the southern edge of Calliope Bank, and the Rear Lead some 740m from Taurikura’s beachfront. Both lights would oriented towards the navigation channel, with their lights facing southwards, away from Little Munroe Bay, McGregors Bay, Taurikura Bay and McKenzie Bay. They would each have a slender, vertical profile, while the actual light heads and reflectors would be largely absorbed by the pole structure and ladders attached to the Rear Lead, in particular.

The Rear Lead would sit more directly offshore of Taurikura Bay – framed by the headlands at each end of the Bay, together with High Island, to the west, and Home Point to the east. Viewed over 740m from the local beachfront, the Lead’s profile would be akin to that of a distant yacht’s mast, albeit considerably shorter than those on most of the yachts moored directly off Taurikura Bay. Its slender profile would typically be viewed against either the harbour entrance and the distant backdrop of the Brynderwyn Hills beyond or against the much more complex and industrial, matrix of the Marsden Point Oil Refinery. In either case, it would have very limited visual presence and effect on the character and values of Taurikura Bay. The Front Lead, smaller in its own right and much more remote – both physically and visually – would have even less effect.

In more dynamic views from vessels passing Calliope Bank, the Front Lead (especially) would be more obvious, but it would comprise one of a series of navigation structures that mark the lanes to and from the Port of Whangarei and the Town Basin. The outer harbour is also flanked by Northport’s wharves, the oil refinery and its dolphins, and the sequence of residential development at both One Tree Point / Marsden Bay and strung along the northern reaches of the harbour. Consequently, the Leads would be visible, but are unlikely to be particularly prominent. Even at night-time, their reflectors would focus on the shipping channel, away from Taurikura Bay and the other settled beaches lining the northern side of the harbour.
50. As a result, both Leads would have a Very Low impact on the natural character, landscape and amenity values of the harbour and its settled margins. Indeed, I was asked by Justin Cross (as referred to in his evidence) to provide comment on three other possible alternatives, but determined that the current proposal would best serve to minimise the Leads’ visual and amenity effects.

**New Lateral Marker Off Home Point**

51. The proposed lateral marker to be located on an exposed rock outcrop directly west of Home Point – on the edge of the area of High Natural Character (NRPS and pRPN) described above, as well as the ONL that covers Home Point and Busby Head. It would, however, be substantially smaller than both Leads (as shown in Photo 5, overleaf), comprising a 250mm diameter tubular steel, pole that is elevated 4.5m above Chart Datum, approximately 1.8m above MHWS. A triangular marker would be attached to the top of the pole, together with a small light.

![Photo 5. – typical lateral marker of the kind proposed off Home Point](image)

52. Although located close to the historic WWII gun battery on Home Point, the proposed lateral marker would sit well below the main viewshafts that project out over the harbour from that reserve and, in particular, the elevated tracks and area around the gun emplacements. It would only become visible if and when those visiting Home Point
clamber down the steep escarpment at the coastal edge or glimpse it through bush and mature pohutukawas along the cliff-line near the old bunkers and observation point. Its thin profile and small overall size, together with its close association with the rising promontory of Home Point, would also render it all but invisible from Urquharts Bay and other nearby settlements.

53. On the other hand, it would be visible in more dynamic views from passing vessels, especially from those straying closer to the rock outcrops fringing the DoC reserve. Yet, as with the Leads, it comprises one of the 40 or more navigation markers that line the shipping lanes between Bream Bay and the Port of Whangarei and nearby Town Basin. Further contextualised by the oil refinery and the sequence of residential development strung along the northern reaches of the harbour, it is most unlikely, in my opinion, that the marker would have any real prominence or impact on the landscape and amenity values of the northern harbour coastline and Home Point. In absolute terms, the proposed marker might very slightly reduce the natural character content of the coastline in the immediate vicinity of Home Point by incrementally adding to the array of structures both within and next to the harbour’s water area. Yet, this change would be so slight that it is doubtful that it would have any appreciable impact on the wider values of the outer harbour and its margins, or those of Bream Bay.

54. As a result, it is my assessment that the proposed navigation marker would have no appreciable effect on Home Point’s HNC area and the wider landscape and amenity values of the surrounding harbour margins.

**Dredging & Disposal Plumes**

55. The processes of dredging and disposal would result in some spillage of extracted material, resulting in the creation of colloidal plumes around the vessel(s) undertaking dredging and deposition. MetOcean Solutions Ltd modelled a range of types of plume associated with different forms of dredging, and as is explained in Dr Beamsley’s statement, it has been determined that:

- Most dredging plumes would remain concentrated near the harbour floor (within the lower water column), producing very limited effects close to the sea surface and on it;
Such plumes would tend to be carried down the line of the tidal channel and dispersed largely within it;

- Plumes are likely to decrease in extent and effect as the channel deepens; and
- No plume would reach nearby beaches, sand banks, Marine Management Areas or Marine Reserves.

56. In relation to disposal plumes, the same modelling determined that surface plumes would be ‘insignificant’ while those at the middle of the water column might spread as far as 100m in conjunction with use of the largest vessel being looked at by Refining NZ.

57. These modelled findings appeared to be borne out in the course of maintenance dredging off Marsden Point in January 2017 (see Photo 6, overleaf).

58. As a result, it is anticipated that the discolouration of water around dredging operations would be quite physically confined and this would be further assisted by the natural flushing of the outer harbour and the faster rates of settlement associated the medium sands that dominate the sea floor around the proposed channel (finer sands and silt

Photo 6: view of current maintenance dredging (under a separate resource consent) from Mt Aubrey: 80mm telephoto lens – January 2017
would be more likely to exacerbate the suspension of material in the water column and would slow down settlement). Both the MetOcean modelling and examination of dredging in practice appears to confirm that most plumes would remain well away from the harbour margins, including the sensitive receiving environments down the northern side of the harbour – between Reotahi and Home Point – as well as within Marsden Bay.

59. In addition, the dredging plumes would primarily be generated during the initial 5 to 6 months of capital dredging. Maintenance dredging would be more infrequent and targeted – particularly around the berth pocket on the Marsden Point side of the harbour. Although the proposed capital dredging still has the potential to create the perception of the outer harbour’s waters being muddied and ‘tainted’ it strikes pockets of silt and finer grained sand, any such effects would be of a short duration and would not have a significant impact on the longer term appeal of Whangarei Harbour from an aesthetic standpoint.

60. At both sediment disposal sites, it is anticipated that the associated plumes would be even smaller and more physically / visually isolated than those around the new navigation channel. The dredge material placed at both Bream Bay sites would either settle and merge with the existing sea floor, or be rapidly diluted by wave action and tidal flows. Moreover, looking across the broader expanse of Bream Bay, disposal plumes would be effectively screened and ‘masked’ by wave fetch, reflections and the sheer scale of the surrounding maritime environment.

61. On the basis of this analysis, it is considered that the plumes associated with both dredging and sand disposal would have a Low level of effect on the natural character, landscape and amenity values of both Whangarei Harbour and Bream Bay.

**Dredging & Sand Disposal Operations**

62. A dredging vessel has yet to be specified for the Crude Shipping Project. However, it is my understanding that Refining NZ are likely to use a Trailing Suction Hopper Dredge (TSHD) for most of the proposed channel and a Backhoe Dredger (BD) for the berth
pocket (see overleaf). A TSHD would use a dredging head that maintains contact with
the sea floor, thus limiting the spill of material during operations, while a Backhoe
Dredge – effectively an excavator mounted on a dredging pontoon – would result in
more spillage, but only within a confined part of the proposed channel near the existing
dolphins at Marsden Point (see Figures 4A and 4B, below and overleaf).

63. Any such vessel would share much the same level of visibility and public exposure as
other vessels operating at and near Marsden Point, and within Bream Bay at present,
although it would be significantly smaller than most freighters (timber) and tankers.
Indeed, tankers are frequently anchored off Marsden Point waiting to unload oil and
petroleum products, while a regular parade of vessels either docks at, or passes, both
the oil refinery and Northport facility.

![Figure 7: Trailing Suction Hopper Dredge (TSHD) (Source: IHC (Artists impression))](image)

*Figure 4A: a Trailing Suction Hoper Dredge*
Dredging would differ from the more conventional activities associated with the loading and unloading of vessels at Northport and the terminal dolphins. It would also become an additional source of lighting at night-time and noise while operational. However, noise effects and their attenuation would be subject to the NZ Noise Standard and related conditions, while the dredge’s illuminated profile would be little different from that of other anchored vessels when sitting either next to the oil refinery or within the open expanse of Bream Bay. In addition, it would be effectively screened from One Tree Point and Marsden Bay by the current port wharves and berthed ships, both during the day and at night.

I also note that in his evidence, Dr Graham Don (Bioresarches Ltd) indicates that measures should be adopted to minimise lighting related effects on sea birds. These could include reducing all unnecessary deck and cabin lighting, orientating all deck lights so that they shine only downwards and shielding them to prevent upwards or horizontal light projection. Such measures are addressed by proposed conditions. They would also appreciably reduce the visual signature of the dredge at night-time for local residents, further minimising the true potential for ‘nuisance’ effects derived from the dredging operations.

The industrial backdrop to such activities afforded by the Marsden Point Refinery and Northport would further restrict such potential, while the relatively small scale of the
vessel involved in dredging and disposal activities would limit its perceived incursion or encroachment into the wider environs of the outer harbour and Bream Bay. Finally, most of the proposed dredging and disposal process would occur during an initial 6 month period, then become more intermittent after that – occurring again every 2 to 5 years. Consequently, the level of effect would diminish very rapidly after the initial period of capital dredging.

67. Consequently, much as a dredge would add to the man-made content of the outer harbour and associated activity, it would not alter the fundamental balance and interplay between natural and man-made components of this environment: the dredge would remain within that part of the harbour already strongly influenced by the existing oil terminal and port facilities. As such, it is more likely to reinforce perceptions of a maritime working environment at Marsden Point, without appreciably encroaching on, or degrading, those more natural features and patterns found down the northern side of Whangarei Harbour.

68. Accordingly, it is my assessment that the movement and operation of dredge within Whangarei Harbour and Bream Bay would have a Low level of effect overall.

**KEY FINDINGS**

69. In my assessments above, I have described the various factors that have contributed to my assessment of effects for each project component. The following table tabulates the impact ratings for each project component and also shows the ratings for various factors that have contributed to these final ‘scores’ (overleaf):
70. Given the physical extent and footprint of the Crude Shipping Project, it is perhaps surprising that both the individual effects ratings and overall impact of the proposal are not higher. However, I am of the opinion that four factors limit the overall scale of landscape, natural character and amenity effects:

- The proposed channel and disposal sites would have a very limited visual ‘signature’ above sea level, mainly limited to the relocation of buoys, positioning of new buoys near the channel entrance and the addition of lights and markers of the kind that are already common near Marsden Point and other parts of Whangarei Harbour. For the most part, these would be dwarfed by the combination of dramatic landforms, existing oil terminal and port facilities, and the open expanse of Bream Bay.

- Underwater, the areas subject to dredging and disposal comprise largely undifferentiated, even depauperate, sand environments. For the most part, the margins of Mair and Calliope Banks comprise relatively bare, ‘deserts’ that are dominated by medium grained sand, albeit with patches of shell, silt and gravels. A very similar situation is found within and near Disposal Sites 3.2 and 1.2. Although the ‘sponge garden’ and ‘rocky reef’ identified by Biosearches near Home Point deviate from this norm, they comprise relatively small components of the undersea environment overall and management of water turbidity would preclude any adverse effects on those more sensitive habitats.
- Much of the dredging activity and relocation of buoys, leads, etc would either be concentrated near the current oil refinery and port, or near the existing shipping lanes that are already quite heavily trafficked by a wide range of seagoing vessels – from Suezmax tankers to leisure craft and yachts. Even the Front and Rear Leads off Taurikura and new Lateral Marker off Home Point would be viewed in the context of a landscape that contains both significant development and a scattering of moored vessels. These would help to absorb and integrate the finer grained structures proposed for closer to the northern harbour shoreline.

- The expansive scale and openness of Bream Bay, together with viewing distances to the proposed channel and disposal sites, would help to isolate activity focused on these locations.

71. It is anticipated that the dredging vessel – of whichever kind is finally chosen – would provide much of the focus for attention while dredging is underway. However, it would still integrate, to a considerable extent, with the existing shipping activity and movements near Marsden Point, as well as in and out of Whangarei Harbour. This, together with the physical isolation of the dredge within Bream Bay (more so once the capital works programme is completed) should ensure that any effects associated with its presence and activities are limited and essentially incremental. In particular, Mr Don’s recommendations in relation to lighting (to avoid bird strike) and Jon Styles’ conclusions and operational recommendations in relation to noise directly address such effects.

72. On the basis of the preceding analysis – taking into account the existing environments of Whangarei Harbour and Bream Bay, the catchments and audiences exposed to the project’s various ‘sites’, and the range of landscape / natural character / amenity changes identified – I am of the opinion that the effects for the individual components of the Crude Shipping Project would all be ‘less than minor’. Importantly, the Project would not, in my opinion, adversely affect any of the ONLs or ONCs, or have a discernible impact on the HNCs. This analysis is not complete, insofar as I have yet to address relevant statutory instruments, but it does recognise potential effects on the
key areas of environmental value and vulnerability (ONLs, HNC and ONC Areas) that are found in close proximity to Marsden Point.

73. I also note that the proposed conditions of consent require a number of mitigation/compensation measures pertaining to the habitat values of the outer harbour and Blacksmiths Creek. These include nesting boxes and targeted predator control programmes to enhance the breeding success of coastal birds; a lighting audit of dredge vessels in order to minimise effects on pelagic birds; and a Harbour Restoration Fund to establish a water quality monitoring programme at Blacksmiths Creek. Such measures would subtly enhance the biotic values of the harbour and creek, and therefore their natural character values overall.

**CUMULATIVE EFFECTS**

74. The Crude Shipping Project would give rise to multiple small scale, effects, both above sea level and underwater, that pertain to specific locations within Whangarei Harbour. Moreover, the combination of dredging, sand disposal, buoy relocation, provision of new lights and markers, and even dredging plumes, could give rise to cumulative effects that affect a combination of catchments and receiving environments around Marsden Point. In particular, there would be some aggregation of underwater effects within and around the footprint of the new shipping channel, especially so near Marsden Point itself and Home Point.

75. Yet, the proposed activities and structures would be largely separated from one another both spatially and temporally, and the greater bulk of such effects would be concentrated at locations almost literally in the ‘shadow’ of the existing oil refinery and Northport facilities, or within the outer reaches of Whangarei Harbour and the more open expanse of Bream Bay, well away from most sensitive receiving environments and audiences. Importantly, the effects identified would have a low to very low level of effect in relation to the areas of High Natural Character covering Calliope Bank, Mair Bank and the Home Point coastline, as well as the ONL that extends from Home Point to Ocean Beach. They would not affect any of the other environmental ‘hot spots’ around Whangarei heads and the harbour entrance.
76. Returning to the project’s individual components, the proposed channel formation would give rise to effects that are Low / Moderate (at worst), primarily in the area around, and close to Home Point. Yet, the Very Low to Low levels of effect associated with actual dredging operations, both Lead lights near Taurikura and the new marker off Home Point itself are not considered sufficient to elevate the overall level of effect within this part of the outer harbour to a Moderate level. In my opinion, the overall level of effect arising from these different operations and structures would still remain at or below a Low/Moderate effect level – even within that part of Whangarei Harbour where they would be more concentrated. Within Bream Bay, such effects would remain at a combined Low to Very Low level.

77. Consequently, it is my assessment that the cumulative effects of the project as a whole would remain at a ‘less than minor’ level. As such, I am not concerned about the potential for the Crude Shipping Project to adversely affect these sensitive environments in an accumulative fashion.

**STATUTORY CONSIDERATIONS**

78. The Crude Shipping Project would occupy part of the Coastal Marine Area that is subject to regional provisions under the aegis of sections 6(a), 6(b), &c) and 7(f) of the Resource Management Act, together with the NZ Coastal Policy Statement 2010 – specifically, Policies 13 and 15 in relation to landscape and natural character matters. As a result, the proposal is subject to assessment against relevant objectives and policies in the Northland Regional Coastal Plan (2004), the Northland Regional Policy Statement (2016), and the Proposed Regional Plan for Northland (2017).

79. The **Northland Regional Coastal Plan** directly addresses structures, reclamation, dredging and other activities within the CMA. In relation to that operative document, the proposed channel formation and dredging proposed by Refining NZ would fall within the following Coastal Plan ‘zones’:

- Marine 2 (Conservation) Management Area (or ‘M2MA’); and
Marine 5 (Port Facilities) Management Area (or ‘M5MA’).

80. The proposed disposal of dredged material would occur in two areas – Disposal Areas 1.2 and 3.2 – both of which are also zoned M2MA. Importantly, however, none of the proposed works encroach into any area of the CMA that is zoned Marine 1 (Protection) Management Area (or ‘M1MA’). Nor have I identified any specific effects on that zone, as Mr Kemble affirms in his evidence.

81. Even so, a range of objectives and policies within the operative NRCP are directly pertinent to the current proposals and assessment of them as Discretionary Activities – including the following:

7.3 OBJECTIVE

The preservation of the natural character of Northland’s coastal marine area, and the protection of it from inappropriate subdivision, use and development.

7.4 POLICIES

1. In assessing the actual and potential effects of an activity to recognise that all parts of Northland’s coastal marine area have some degree of natural character which requires protection from inappropriate subdivision, use and development.

2. As far as reasonably practicable to avoid the adverse environmental effects including cumulative effects of subdivision, use and development on those qualities which collectively make up the natural character of the coastal marine area including:

(a) natural water and sediment movement patterns;
(b) landscapes and associated natural features;
(c) indigenous vegetation and the habitats of indigenous fauna;
(d) water quality;
(e) cultural heritage values, including historic places and sites of special significance to Maori; ...........

and where avoidance is not practicable, to mitigate adverse effects and provide for remediating those effects to the extent practicable.

3. Within Marine 1 and Marine 2 Management Areas and the rules that apply to each of those, identify what subdivision, uses and developments may be appropriate taking into consideration the actual or potential effects on natural character as required by, amongst others, Policy 1.1.1 of the New Zealand Coastal Policy Statement.

4. Subject to Policies 1 and 2 above, through the use of rules in this Plan, to provide for appropriate subdivision, use and development in areas where natural character has already been compromised, including within Marine 3, Marine 4, Marine 5, and Marine 6 Management Areas. ......
7. To promote, where appropriate, the restoration and rehabilitation of the natural character of the coastal marine area where it has been significantly degraded.

82. In my opinion, the Crude Shipping Project would either avoid having an adverse environmental effect on the key biophysical characteristics of Whangarei Harbour and Bream Bay, or it would minimise those effects and concentrate them within part of both water bodies that has already been subject to significant modification. Moreover, the installation of predator traps, tracking tunnels and breeding nests on Motukaroro Island (as required by proposed conditions) would help to enhance the habitat values of a specific part of the harbour.

83. The NRCP’s Appendix 3 also identifies the following Outstanding Geological Features and Landforms’ that are listed as being of international, national or regional significance in the NZ Geopreservation Inventory within and around Marsden Point:

- Reserve Point nepheline flow, garnet andesite and sedimentary rock;
- McLeod Bay unconformity;
- Taurikura natural jetty;
- Port Whangarei fossil beds;
- One Tree Point dunes; and
- Bream Head stratovolcano

84. The assessments undertaken by Dr Beamsley (MetOcean Solutions) and Richard Reinen-Hamill (of Tonkin & Taylor) provide no indication that these features and landforms listed in Appendix 3 would be adversely affected by the proposed channel dredging. As a consequence, I am of the opinion that the proposal is aligned with the approach that the NRCP sets in relation to these features.

85. Turning to the Northland Regional Policy Statement, which became operative on 9th May 2016, Policy 4.5.2 addresses the location of particular parts of the coastal environment (including the CMA) and landscapes that are particularly sensitive to new development – stating as follows:

*The Regional Policy Statement Maps of high and outstanding natural character and outstanding natural features and outstanding natural landscapes identify areas that are sensitive to subdivision,*
use and development. The maps of these areas identify where caution is required to ensure activities are appropriate.

86. In my opinion those parts of the coastal environment around Marsden Point and Whangarei Heads appear to accord with the requirement [under sections 6(a) and (b) of the Resource Management Act] to identify and preserve / protect such areas from inappropriate subdivision, use and development. I have identified the Crude Shipping Project’s effects on those areas accordingly. In a related vein, the following landscape and natural character provisions are relevant to the current proposals:

3.14 Natural character, outstanding natural features, outstanding natural landscapes and historic heritage

Identify and protect from inappropriate subdivision, use and development;

(a) The qualities and characteristics that make up the natural character of the coastal environment, and the natural character of freshwater bodies and their margins;

(b) The qualities and characteristics that make up the outstanding natural features and outstanding natural landscapes; ....

4.6.1 Policy – Managing effects on the characteristics and qualities natural character, natural features and landscapes

(1) In the coastal environment:

a) Avoid adverse effects of subdivision use, and development on the characteristics and qualities which make up the outstanding values of areas of outstanding natural character, outstanding natural features and outstanding natural landscapes.

b) Where (a) does not apply, avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of subdivision, use and development on natural character, natural features and natural landscapes. Methods which may achieve this include:

(i) Ensuring the location, intensity, scale and form of subdivision and built development is appropriate having regard to natural elements, landforms and processes, including vegetation patterns, ridgelines, headlands, peninsulas, dune systems, reefs and freshwater bodies and their margins; and

(ii) In areas of high natural character, minimising to the extent practicable indigenous vegetation clearance and modification (including earthworks / disturbance, structures, discharges and extraction of water) to natural wetlands, the beds of lakes, rivers and the coastal marine area and their margins; and

(iii) Encouraging any new subdivision and built development to consolidate within and around existing settlements or where natural character and landscape has already been compromised.

(2) Outside the coastal environment avoid significant adverse effects and avoid, remedy or mitigate other adverse effects (including cumulative adverse effects) of subdivision, use and
development on the characteristics and qualities of outstanding natural features and outstanding natural landscapes and the natural character of freshwater bodies. Methods which may achieve this include:

a) In outstanding natural landscapes, requiring that the location and intensity of subdivision, use and built development is appropriate having regard to, natural elements, landforms and processes, including vegetation patterns, ridgelines and freshwater bodies and their margins;

b) In outstanding natural features, requiring that the scale and intensity of earthworks and built development is appropriate taking into account the scale, form and vulnerability to modification of the feature;

c) Minimising, indigenous vegetation clearance and modification (including earthworks / disturbance and structures) to natural wetlands, the beds of lakes, rivers and their margins.

(3) When considering whether there are any adverse effects on the characteristics and qualities of the natural character, natural features and landscape values in terms of (1)(a), whether there are any significant adverse effects and the scale of any adverse effects in terms of (1)(b) and (2), and in determining the character, intensity and scale of the adverse effects:

a) Recognise that a minor or transitory effect may not be an adverse effect;

b) Recognise that many areas contain ongoing use and development that:

   (i) Were present when the area was identified as high or outstanding or have subsequently been lawfully established

   (ii) May be dynamic, diverse or seasonal;

c) Recognise that there may be more than minor cumulative adverse effects from minor or transitory adverse effects; and

d) Have regard to any restoration and enhancement on the characteristics and qualities of that area of natural character, natural features and/or natural landscape.

87. I also note that the Proposed Regional Plan of Northland was notified in September. It contains the following policy (overleaf), which introduces the additional issue of protecting ‘nationally recognised surf breaks’:

D.5.27

Managing effects on surf breaks

Have regard to the following effects on mapped surf breaks (refer I 'Maps');

1. Effects on the quality or consistency of the surf break by considering the extent to which the activity may:

   a) change or interrupt coastal sediment dynamics, and

   b) change or interrupt swell within the swell corridor including through reflection, refraction or diffraction of wave energy, and
c) change the morphology of the foreshore or seabed, and

2. effects on:
   a) amenity values, and
   b) the feeling of wilderness or isolation.

88. The last two matters listed are of particular relevance to my assessment. However, the closest Nationally Recognised Surf Breaks depicted in the Proposed Regional Plan are at Ocean Beach and Ruakaka. Ocean Beach is completely isolated from the Crude Shipping Project sites, both physically and visually, while the Ruakaka Surf Break is associated with part of the coastline that contains the sizeable areas of residential development, the Ruakaka Race Course and an industrial area. It is not remote or subject to any feeling of ‘wildness’, except when being battered by exceptionally stormy / cyclonic conditions, and the area’s amenity values are decidedly mixed. In addition, the surf break lies 2.5km or more from the proposed sand disposal sites and further from the proposed shipping channel.

89. Although the beach’s sand dunes and a buffer strip of reserve land help to enhance the amenity experienced along the beachfront and in shallower waters, views back from the sea clearly capture the patina of development that spreads both sides of the surf break – towards Marsden Point to the north and past the Ruakaka town centre and motor camp to the south. In my assessment, periodic views of a dredging or disposal vessel, seaward of the surf break, would make little appreciable difference to either the character of the local seascape or the amenity experienced by those surfing at Ruakaka. Such exposure would have even less impact on any residual feelings of wildness and isolation that might be associated with the coastline. Consequently, I regard the current proposal as being consistent with Policy D.5.27 of the PRPN.

90. The NRPS, NRPN, PRPN and Whangarei District Plan are jointly responsible for management of the district and regional ONLs, and areas of high or outstanding natural character, while the two Crude Shipping proposals of most direct relevance to these statutory documents are:

   ▪ The location of a new navigation marker next to Home Point, within part of the coastline identified as being an HNC area; and
The removal of dredged material from the sea floor between Mair and Calliope Banks, both of which are identified as being areas of Outstanding Natural Character.

91. The positioning of a new marker next to Home Point is considered likely to have a very low level of effect. It would sit, almost literally, in the shadow of Home Point itself, enclosed and backed by the rising mantle of rocks shelves, coastal scarp and pohutukawa lined slopes that flank the harbour mouth. As a result, it would be difficult to distinguish the marker from its Home Point backdrop – except when viewed from the harbour – and it would have no effect in relation to nearby settlements, public beaches or the Home Point reserve itself. In relation to views from the harbour’s waters, it would become one of a chain of navigation aids that already line the harbour entrance and shipping route. As a result, I do not believe that it would erode or otherwise affect the qualities of Home Point and adjoining reserve land.

92. Within the adjoining harbour, the dredging of material from the channel footprint would alter the topographic profile of the sea floor and erode material – mostly medium grained sands and shell – from the harbour corridor between Mair Bank and Calliope Bank. Physically, this would change the profile of the sea floor near both banks, but would not significantly alter the composition of the material found on it. The new channel would have a more linear, geometric, profile than the natural harbour channel, but would not significantly affect the habitat values of the sea floor, its food gathering value or its materiality. The changes proposed would also occur within part of the coastal environment that is highly dynamic and subject to on-going, natural change. Taking these various factors into account, it is considered that any effects in relation to the harbour floor would be of a low order, and any effects in relation to the Mair Bank and Calliope Bank HNC areas (and their natural character values) would be of a very low order overall.

93. In relation to local habitat values, I have already discussed the proximity of the ‘rocky reef and sponge garden’ habitats off Home Point to the proposed navigation channel, which is relevant to assessment of the proposal against District Plan Policies 10.3.2, 10.4.1 and 10.6, together with RPS Policy 4.6.1 (1)(b)(i). However, any potential effects on those habitats are to be managed by Refining NZ. As such, it is my opinion that the
proposal is consistent with the management and protection of marine habitats in line with those policies.

94. These findings are also relevant to assessment of the project against Northland Regional Coastal Plan Policy 7.4 and its various sub-clauses, even though these have their genesis in the now superseded 2004 NZCPS. In particular, the greater bulk of proposed activities and modification would occur within that part of Whangarei Harbour and Bream Bay that is already subject to the regular movement of shipping, the positioning of channel buoys and other navigation markers, and activities associated with current refinery and Northport facilities — with reference to Policy 7.4(4). In my assessment, the crude shipping project is consistent with Policy 7.4.

95. In my opinion, these conclusions also mean that the Crude Shipping Project is consistent with Policies 13 and 15 of the NZ Coastal Policy Statement focusing on the effects of development on natural character values and outstanding landscape values. Overall, it is my assessment that the various proposals that fall under the umbrella of the Crude Shipping Project and related applications are consistent with the relevant statutory instruments at the national, regional and district level. For the sake of completeness, I further note that Gavin Kemble has addressed these findings in relation to natural character, landscape and amenity effects in his evidence. I agree with his summaries of my findings in his evidence, with particular regard to sections 6(a), 6(b) and 7(c) of the Resource Management Act.

SUBMISSIONS

96. I have reviewed the public submissions to the Crude Shipping Project application. Two are particularly relevant to the matters that I have covered in my AEE report and this statement. The first of those (Submission No.9) is from The Bream Bay Coastal Care Trust (represented by Robyn Hembry), which raises concerns about ‘lighting pollution potentially affecting the circadium rhythm of local residents, birds and marine life if dredging occurs at night-time’. The second submission that I wish to respond to (No.40) is from the Patuharakeke Te Iwi Trust Board, represented by Jared Pitman, which raises wide ranging concerns in relation to the Crude Shipping project. These include the following statements at paragraphs 57 and 76 of the Trust Board’s submission:
57. Mr Brown has identified the areas of outstanding landscape and natural character in and around the application proposal area. These landscape components are all part of our cultural landscape and seascape. We acknowledge, to a point, that the refinery, port areas and associated shipping movements are now a part of that landscape, albeit modified, and the dredge’s movements associated with the proposal are deemed temporary by the applicant. However, the potential ongoing effects raised in relation to coastal processes and geomorphology as described above link to indirect effects on cultural sites and markers. These include Mair Bank which is just one component of the interrelated network of sites and markers that make up the cultural landscape as a whole (pp.13 and 14).

**Regional Coastal Plan and Proposed Regional Plan**

76. Because of the effects outlined in the CEA and this submission, we do not believe the proposal is consistent with provisions of the Regional Coastal Plan, such as the Marine 2 Management Area. These are areas to be managed to conserve ecological, cultural, and amenity values. Similarly the proposal does not align with policies of the recently notified Proposed Regional Plan.

97. Focusing firstly on the issue of lighting raised by the Bream Bay Coastal Care Trust, it is important to appreciate that most dredging and sand disposal activities would take place over 950m or more from the nearest residential properties: with Urquharts Bay the closest settlement to any part of the proposed navigation channel. Within Bream Bay, however, that distance would increase to over 3.0kms. In addition, those looking towards the dredge from the northern side of Whangarei Harbour – from Reotahi through to Urquharts Bay – would view that vessel against the backdrop of the industrial profile and lighting of the existing oil refinery and the Northport facility. Ships tied up at both the refinery and adjoining port are also lit up at night-time. In my opinion, a dredge would make little appreciable different to the night-time environment within this part of Whangarei Harbour. Offshore of Ruakaka, it would appear even more remote, although it would be set against a darker sea and sky.

98. However, as mentioned at my paragraph 65 (above), Mr Don has already made a number of suggestions designed to mitigate the effects of such lighting in relation primarily to sea birds. I believe those measures would also help to address any amenity
effects on local communities, to the point where lighting of a dredge and/or disposal vessel has very little or no real effect.

99. Turning to the broader range of issues raised by the Patuharakeke Te Iwi Trust Board, I have addressed the landscape and environmental context for the Crude Shipping project, together with the values attributed to specific features and locations, in both my AEE report and this statement. This segues into my assessment of effects, which necessarily relies on specialist scientific input to a significant degree – especially so in relation to geomorphological and ecological effects in relation to Mair Bank and the coastline from Home Point through to Reotahi.

100. I consider that I have identified those core natural character and landscape characteristics relevant to assessment of the current application, without transgressing into the area of associated cultural values. Those have been addressed in two reports:

- **“Cultural Values Assessment Report: Refining NZ Ltd – Crude Freight Proposal”** (January 2015) prepared by the Patuharakeke Te Iwi Trust Board Inc, working with Julian Chetham and reviewed by Clive Stone, Marina Fletcher, Mira Norris and Hineamaru Lyndon. This report addresses such matters as (for example) “Cultural Landscapes and Seascapes, Waahi Tapu”, then “Mahinga Kai” and “Contemporary Cultural Relationships” at Sections 5.2.2 to 5.2.24.

- **“Refining NZ Crude Freight Proposal – Tangata Whenua o Whangarei Te Rerenga Paroa DRAFT Cultural Effects Assessment”** (31 August 2017) prepared again by the Patuharakeke Te Iwi Trust Board Inc on behalf of Ngati Wai Trust Board, Te Kahu o Torongahe hapu, Patuharakeke, and Te Parawhau – as is explained by Antoine Coffin in his evidence.

101. In the context of the concerns raised by the Trust and the matters that I have addressed, it is important to recognise that both Mair Bank and Calliope Bank are dynamic features that are continually shaped and reconfigured by tidal flows in and out of Whangarei Harbour and storm events. Both banks are capped by a mixture of medium to fine grained sands, gravels and shell fragments, and their physical equilibrium relies on a constant cycle of deposition and erosion. The proposed channel formation would affect
the outer margins of both banks near the berth pocket, in particular. However, it would leave the main body of both banks intact, and the fundamental composition, character and extent of the banks would be unchanged from at present.

102. Although the proposed channel would extend to within 100m of the rocky margins of Home Point, it would not directly affect or modify that feature. I have described the effects of the proposed lateral navigation marker off Home Point in detail at Section 4.3 of my AEE report, and consider that the proposal would have a negligible effect (if any at all) on that key landmark. The proposed channel and its navigation markers would be much further separated from Busby Head and would have no impact on that feature or nearby Smugglers Bay.

103. Consequently, I remain of the opinion, that the proposed channel and its navigation markers would have a very low level of effect to no effect at all in relation to all of the coastal features and landmarks that line the Whangarei Heads coastline. Once the new channel is formed, it would be very difficult for those living around, or visiting, that coastline to identify any appreciable differences between Whangarei Harbour’s ‘pre-channel’ and ‘post channel’ landscapes and coastline. The only new structure of any significance would be a new Rear Lead off Taurikura, but its physical isolation and profile would minimise any effects associated with that structure.

104. As a result, I have determined that the proposed channel and its navigation system would have no appreciable effect on the ONLs and areas of high to outstanding natural character that extend out from Mair Bank and Calliope Bank to Home Point and Busby Head, then along the dramatic volcanic coastline framed by Taurikura and Bream Head.

**NORTHLAND REGIONAL COUNCIL STAFF REPORT**

105. At Section 5.8 of the Officers Report, my AEE report and its assessment of natural character, landscape and amenity effects is reviewed by Glenn Mortimer on behalf of the Northland Regional Council. He concludes that review as follows:

474. *The report anticipates that the dredging vessel will provide most of the focus for attention when dredging is occurring. However, it is considered*
the vessel would integrate with the existing shipping activity and movements near Marsden Point, as well as in and out of Whangarei Harbour. This, together with the physical isolation of the dredge within the wider expanse of Bream Bay, is considered likely to ensure that any effects associated with the vessels presence and activities are limited and essentially incremental.

475. In relation to potential cumulative effects of the Crude Shipping Project, the risk is ranked as low as the proposed activities and structures (navaids) will be largely separated from one another both spatially and temporally, and most of the effects will be concentrated either near Marsden Point – adjacent to the existing oil refinery and Northport facilities – or within the outer reaches of Whangarei Harbour and the more open expanse of Bream Bay, well away from most sensitive receiving environments and audiences.

476. Importantly, the effects identified are considered likely to have only a low to very low level of effect in relation to the HNC areas which cover Calliope Bank, Mair Bank and the Home Point coastline, as well as the ONL that extends from Home Point to Ocean Beach.

477. These conclusions are accepted by the writer of this s42A report.

CONCLUSIONS

106. On the basis of my AEE assessment, including evaluation of the proposal against relevant statutory provisions, it is my opinion that the Crude Shipping Project would have a typically low level of effect on the landscape, natural character and amenity values of Whangarei Harbour, Whangarei Heads and Bream Bay.

107. In effect, the current proposal would adhere to the maxim of concentrating new development and related effects within parts of the CMA and Coastal Environment that are already significantly modified. Consequently, the proposal would effectively avoid having an adverse effect on those parts of Whangarei Heads, Marsden Point and Bream Bay that are identified as having outstanding landscape or natural character values. It would also avoid having a significant effect in relation to the rest of the coastal environment and surrounding landscapes. Most components and activities associated
with the project would have a quite limited impact on perceptions of the area’s character, identity or sense of place. In my opinion, it is therefore appropriate in respect of the natural character, landscape and amenity considerations and effects that I have addressed.

Stephen Brown
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