

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

APPLICATION NO. APP-037197.01.01

STATEMENT OF EVIDENCE OF DAVID MARTIN

(REFINING NZ - PROJECT MANAGEMENT)

12 February 2018

INTRODUCTION

Qualifications and experience

1. My name is David Evan Martin. I am the Business Opportunities Manager at the New Zealand Refining Company Ltd (“Refining NZ”).
2. My formal qualifications include a New Zealand Certificate in Engineering (Automation and Control) and a Bachelor of Electrical Engineering (Hons) from the University of Auckland. I first joined Refining NZ in April 1981 and have held a number of positions over my past 37 years employment. These have included project engineering roles together with a number of senior managerial positions within the areas of engineering, information technology, projects, procurement and supply, energy and business strategy/planning/performance. I have project engineered, managed or overseen many internal projects over my years of service with Refining NZ.
3. I am intimately familiar with the refinery site, Whangarei Harbour, Bream Bay and the surrounding area. I have read the application material; submissions; the council officer’s section 42A Report; and the pre-circulated evidence.
4. I am authorised to present this evidence on behalf of Refining NZ.

Involvement with the Crude Shipping Project

5. I have been primarily responsible for the general project management of this application (the “Crude Shipping Project”, or “the Proposal”) since its inception in 2014. I have been involved with initial scoping, investigations and design, day to day management of the project, and as a conduit for strategic oversight of the project by the Refining NZ project steering committee. I am Refining NZ’s primary point of contact with the project’s expert team of consultants.
6. I have closely liaised with the Northland Regional Council and interested parties, including tangata whenua and Northport regarding the proposal. While Mr McNeill has had primary responsibility for managing public consultation, my role has included attending most, if not all, of the public consultation events (container ‘open days’, information events and expert workshops), meetings and hui with tangata whenua, and numerous meetings with other identified stakeholders and submitters. A comprehensive summary of the consultation undertaken by Refining NZ – and which I have been involved with – is detailed in the evidence of Mr McNeill.

SCOPE OF EVIDENCE

7. In my evidence, I:
 - (a) briefly summarise Refining NZ's operations in the context of this application;
 - (b) explain the need for the project;
 - (c) outline the approach taken to scoping the Proposal;
 - (d) summarise consideration of alternative methods and locations;
 - (e) summarise the key features of the Proposal;
 - (f) outline proposed enhancement, mitigation and monitoring activities;
 - (g) outline the key benefits of the Proposal;
 - (h) briefly comment on recent maintenance dredging at Refining NZ's jetty dolphins;
 - (i) address relevant issues raised in submissions; and
 - (j) comment on proposed conditions of consent.

THE REFINERY – BACKGROUND AND OPERATIONS

8. Refining NZ operates New Zealand's only refinery. Located at Marsden Point at the mouth of the Whangarei harbour (see location map in **Figure 1** below), the refinery was originally constructed in 1964. The refinery site was carefully selected for a number of key strategic reasons including: the low earthquake risk relative to the rest of New Zealand; existence of natural deep water harbour; proximity to, and transport links connecting with, Auckland (the country's primary fuel market); and availability of undeveloped land free of 'reverse sensitivity' type constraints. Since its construction, the Refinery has been extensively upgraded as new technologies have become available. These upgrades are summarised in the evidence of Mr Post. The Refinery to Auckland Pipeline ("RAP") was commissioned in 1985 to more efficiently transport a range of fuel products (petrol, diesel and A1 jet aviation fuel) to Auckland for use and/or distribution to the upper North Island.

Figure 1: Refinery site



9. The refinery relies on deliveries of crude oil by tanker predominantly from overseas terminals in the Middle East and Far East, with a small percentage received domestically from Taranaki. The crude oil is purchased and shipped to the refinery by Refining NZ's customers (BP, Mobil, Z Energy).
10. The crude oil origin is dependent on a range of factors including crude market pricing and availability, and ensuring the refinery configuration is feasible and fully loaded. Typically Far East ports (with the exception of Russian ESPO crude) cannot support fully laden Suezmax tankers due to load port constraints.
11. As described by Mr Post in his evidence, these deliveries are currently made via smaller Aframax vessels, and on larger Suezmax vessels – although current port constraints practically limit these Suezmax cargoes to around 900 kbbls making them less economically attractive.

12. Refined product is predominantly transported from the refinery to markets in and around Auckland via the RAP. Some refined product is transported by coastal tanker to other markets around New Zealand, including ports at Tauranga, Wellington, Dunedin and Lyttelton. These coastal tankers are of a relatively smaller size at 183m long compared to vessels bringing crude oil to the refinery.
13. Seaborne transport is therefore essential to the operation of the refinery – both to deliver crude product, and to transport finished refined product to regions around New Zealand. These essential coastal links are secured by a jetty facility solely used by (and under the control of) Refining NZ. The jetty has been carefully designed and constructed with three berths to facilitate loading and unloading of products. Adjacent to the jetty are a series of ‘dolphins’, coastal structures used to secure the fore and aft of vessels while berthing at the jetty.
14. While public access is available along the entire foreshore around the refinery site, Refining NZ restricts access to, and around, jetty structures for public safety and security reasons. This is enforced by fencing and signage on the landward side, and by a marked and charted prohibited area on the seaward side.
15. Marsden Point itself is dominated by industrial and manufacturing land uses including Northport and the Carter Holt LVL (laminated wood products) facility. The wider surrounding area is predominantly rural, although residential centres exist at Ruakaka, One Tree Point, and more recently the Marsden Cove marina development. To the north and east of the Refinery is the Whangarei Harbour and Whangarei Heads, and Bream Bay extends along the coast to the south.
16. As traversed by Mr Post in his evidence, Refining NZ is strongly committed to the environment in which it operates. Refining NZ and its employees recognise the values and characteristics of the environment within which we operate, and together with our neighbours and other stakeholders, focus as a priority on environmental stewardship. This is clearly set out in the company’s Environmental Policy Statement, which is appended to the evidence of Mr Post.

THE PROPOSAL

17. The primary objective of the Crude Shipping Project is to enable larger parcels of crude thereby improving freight economics and Refining NZ’s overall competitive position. Freight costs are reflected in landed crude valuations and as such, have a direct impact on Refining NZ’s Gross Refining Margin and Processing Fee.

18. The project proposes to fully load Suezmax ships to a nominal 1 million barrel cargo size where supported by load ports, predominantly from the Middle East. In most cases (approximately 70% of the time) it is expected that ships will be able to be loaded to 1.05 Mbbls cargo size, being the nominal cargo size plus 5% loading tolerance. In some cases these full loads may consist of two separate crude oil parcel loadings from two separate load ports.
19. Enabling fully laden Suezmax ships is expected to reduce the overall number of ships visiting the refinery from around 59 to 48 in any given year, noting that the refinery is currently fully utilised so no additional crude volume is required.
20. The scope of the Crude Shipping Project includes the following elements:
 - Capital dredging of around 3.7 million cubic metres of sand from the channel entrance, approaches and jetty berthing area;
 - Periodic maintenance dredging with higher quantities expected in the earlier years as side slopes settle;
 - Channel realignment to improve navigational safety;
 - The potential addition of additional tankage to support larger cargoes. The need for any additional tankage is under review as part of a wider site tankage rationalisation study. This is a relatively complex exercise that will take some time to complete, given that it involves the consideration of a range of commercial and strategic factors. Should any additional tankage be required this would be the subject of a separate consent.
21. A significant amount of work has gone into assessing the effects of our proposal in preparation for a resource consent application.

NEED FOR THE PROJECT

22. New Zealand's demand for fuel is currently met by a combination of products refined at Marsden Point and refined product imported from overseas. As outlined in Mr Post's evidence, one of the key challenges facing Refining NZ is remaining competitive in the international market. Refining NZ seeks to be the 'first choice' supplier in the New Zealand oil products market now and into the future. This status is important to securing the refinery's continued presence, and the various positive benefits it brings to the Northland region and to New Zealand. To remain competitive with imported products, Refining NZ needs to continuously work towards achieving efficiencies in its operations.

23. This need for efficiency at the refinery and its operations is the key driver behind the project. Enabling Suezmax vessels to deliver full cargoes to the refinery will increase transport efficiency and reduce the cost of transport per unit of crude oil delivered. A strategic review of Refining NZ in 2013 highlighted crude shipping costs as a significant opportunity to support Refining NZ's ongoing profitability and competitiveness against international imports of refined product. Enabling more fully laden Suezmax ships will reduce the overall number of ships visiting the refinery; improve freight economics due to economies of scale; and provide additional customer value through enabling access to more standard crude parcel sizes with associated crude sourcing and trading benefits. The project is therefore an important part of Refining NZ's future business strategy and a key component in Refining NZ remaining competitive into the future.
24. Refining NZ's customers will capture direct benefits from the project in terms of lower actual freight costs. Refining NZ's customers have advised that having the ability to fully load Suezmax cargoes with standard one million barrel parcel sizes will deliver crude sourcing and trading benefits, further improving Refining NZ's overall competitive position.
25. Refining NZ will capture benefit through increased processing fees, with which it can fund the project and ongoing maintenance dredging and improve its overall profitability. This improved profitability will improve shareholder value, assist in buffering against low margin environments and offset increased pressure to reduce processing fees due to more cost effective imports from overseas export orientated "mega refineries".
26. It is also useful at this point to contextualise the need for the project within wider national trends relating to demand for oil/petroleum products. As outlined in the Application material¹ and in the evidence of Mr Peter Clough and Mr Post, while several factors may moderate future oil demand in New Zealand (for example alternative fuels and electric vehicles, government policy/legislation, and car ownership patterns), petroleum products are forecast to remain a crucial element in meeting New Zealand's energy needs into the foreseeable future. As New Zealand's only oil refinery, Refining NZ considers that it has an important role in continuing to meet such demand (as efficiently as possible).

APPROACH TO SCOPING THE PROJECT

27. Refining NZ has carefully selected and engaged a team of leading independent experts to assist with scoping, carefully designing, and assessing the environmental effects (both

¹ See for example section 2.3 of the NZIER Report at Annexure 2(o) of the AEE. See also the evidence of Mr Peter Clough.

positive and adverse) associated with the Proposal. In accordance with an ‘environment first’ approach, Refining NZ has actively sought expert input throughout the project’s extensive scoping, planning and refinement phases leading up to the application being lodged with Northland Regional Council. The expert team has undertaken extensive investigations and analysis to understand the existing environment, identify alternatives, develop and refine preferred options, and to comprehensively assess (and to appropriately avoid, remedy or mitigate) actual and potential effects associated with the Proposal.

28. The preferred channel alignment has evolved through the design process; taking into account navigational safety, ecologically sensitive areas (including Mair Bank, the rocky outcrops at Home Point, and the Motukaroro Island marine reserve), potential changes to the hydrodynamic system, and environmental and cultural considerations. The Marine 1 Management Areas set out by the Northland Regional Coastal Plan became a focus for this project in late 2014 and Refining NZ has worked hard, with its expert team, to design a proposal that would provide the navigational improvements and benefits needed, while avoiding those areas. Having achieved that, Refining NZ worked to ensure that the Crude Shipping Project will not indirectly impact on the values that are within these areas.
29. In addition to seeking extensive independent expert input, Refining NZ has widely consulted with the public, key stakeholders and interested parties to obtain their views, and to consider and, where appropriate, respond to issues raised. The consultation undertaken by Refining NZ is detailed in the evidence of Mr McNeill.

ALTERNATIVES CONSIDERED

30. To enable the delivery of larger loads of crude oil to the refinery, prior to advancing this resource consent application, Refining NZ (with the help of independent expert advisors) analysed alternatives to channel deepening. After determining channel deepening was the preferred approach, Refining NZ has also comprehensively considered a range of channel designs, dredge methodologies and disposal sites.² I outline each of these assessments below.

² See the report by Tonkin + Taylor: “Mid-point Multi-criteria Alternatives Assessment” (March 2017), including annexures.

Alternatives to dredging

31. Alternatives to channel dredging have been considered in detail by Refining NZ, and these are discussed in detail in the Poter & Partners report which is appended to the Tonkin+Taylor 'Mid-point Multi-criteria Alternatives Assessment'. The two principal options considered – in addition to deepening the access channel and berth area – were: installation of a Single Point Mooring (SPM) system in deep offshore water, connected to the Refinery by an underwater pipe; and using ship-to-ship (STS) transfer in deep water to transfer the crude oil from larger tankers to smaller tankers for final discharge at the Refinery. **Figure 2** illustrates an SPM System and a ship-to-ship transfer.

Figure 2: Alternatives to dredging



32. The assessment of alternatives considered a range of factors, including: environmental risk, operational considerations, discharge operations, capital investment, ongoing operational costs, customer coordination and weather dependency.
33. Against each of these factors except for the level of capital investment (where ship to ship transfer was seen as the most preferable, i.e. cheapest, for Refining NZ), dredging was seen as the preferred option. Environmental risk associated with use of an SPM off the coast, away from the protection of a harbour, together with the increased risk of a pipeline running over the seabed to connect to the refinery, was seen as less preferable. Likewise, and while it has a good safety record, the risk of incident during ship-to-ship transfer and the level of weather dependence, plus the need for Refining NZ to charter a suitable lightering vessel meant that option was less preferable also.
34. On an economic basis alone the higher capital costs of SPM or higher operational costs of an SPS solution would suggest the use of Very Large Crude Carriers (VLCC) to higher freight savings. The VLCC sized loads (two million barrels) would require significant additional tankage and are mis-matched to Refining NZ's operational throughput capacity.

35. Dredging was found to be the most preferable of the three alternatives on all other factors including with respect to environmental risk, operational considerations, and weather dependency. Dredging was found to be overall the most efficient option, as it enables the continued use of the existing refinery terminal, and ongoing operational costs will be the lowest of the three options. This means that upfront investment in dredging will be able to be recovered over a relatively short timeframe. Accordingly, Refining NZ decided to advance channel dredging as the preferred option.

Alternative channel designs, dredge methodologies and disposal sites

Channel design

36. As described in detail in the evidence of Mr Cross, the channel design process has drawn on a range of multi-disciplinary detailed investigations. These include:
- (a) identification of important or more sensitive areas (for example from an ecological or landscape character perspective), to be avoided where practicable;
 - (b) liaison with relevant stakeholders such as the Harbourmaster, Northport, and North Tugz to identify navigational and operational considerations;
 - (c) analysis with respect to international best practice guidelines for shipping channel design (the guidelines take into account a range of matters, including environmental issues and navigational safety etc); and
 - (d) several rounds of simulations to test channel design options under a range of operational conditions and scenarios.
37. Five broad channel design options – each capable of enabling fully loaded Suezmax vessels to visit the Refinery – have been considered in depth by Refining NZ. These are comprehensively described in the evidence of Mr Cross.
38. Following an intensive iterative process led by Royal Haskoning DHV, which included workshops with key stakeholders and several rounds of desktop simulations of the various channel designs, Option 4.2 (a variation of Option 4) was selected as the preferred design. Option 4.2 involves some dredging to deepen the channel, some re-alignment to straighten the approach to the Harbour, and some re-positioning/installation of navigational aids such as channel marker buoys. Option 4.2 was then appraised through a full bridge simulation study involving realistic simulation of a range of vessel operations and climatic and other conditions.

39. As described in Mr Cross's evidence, in comparison to the existing channel and/or other options considered, in summary key benefits of Channel Design Option 4.2 (as applied for) include:
- (a) simplification of the channel route, including through: reducing the channel to three main headings (i.e. reducing the number of bends that need to be navigated by vessels to two); increasing the distance between changes in channel alignment; and widening a bend;
 - (b) highest navigational safety, including improvements near the Home Point rock outcrop;
 - (c) best compliance with international best practice guidelines;
 - (d) avoidance of impacts on important ecological or landscape areas;
 - (e) reduction in dredging requirements adjacent to Mair Bank; and
 - (f) maximised use of the existing navigation aids.

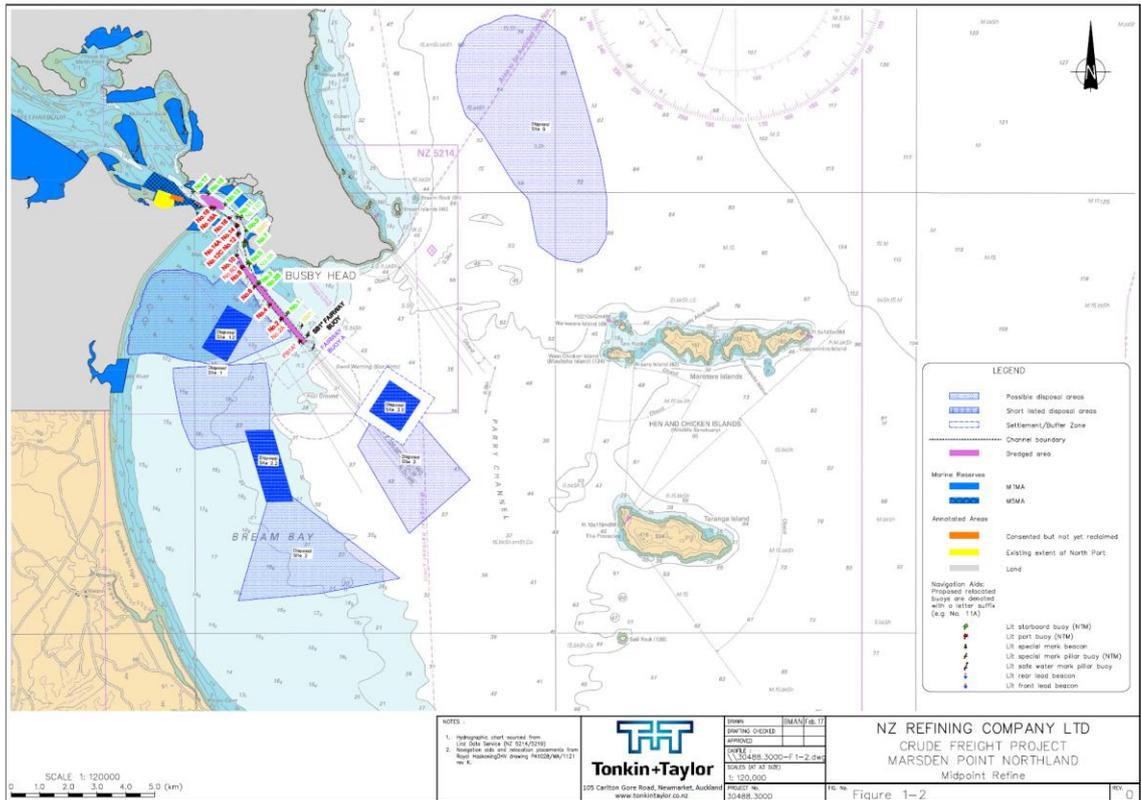
Dredge methodology

40. Refining NZ has commissioned in-depth assessment of several potential dredging methodologies, including Trailing Suction Hopper Dredgers ("TSHD"), Cutter Suction Dredgers ("CSD") and Backhoe Dredgers ("BHD") (also see the evidence of Mr Cross). The full range of factors were considered, including natural (e.g. effects on ecology and geomorphology); social (e.g. noise and visual effects, and effects on fishing and water activities); cultural (e.g. effects on kaimoana and taonga species); and economic. Following comprehensive analysis, Refining NZ anticipates that most dredging will be undertaken by a TSHD.

Disposal sites

41. Refining NZ has also commissioned in depth assessment of a range of alternative disposal sites, including distant deep-water disposal sites (greater than 60m water depth), intermediate water depth sites (30m to 60 m), and shallower water depth areas, in addition to land-based disposal options. Several of the disposal sites considered are shown in **Figure 3**. The full range of factors were considered (including natural, social, cultural and economic).

Figure 3: potential disposal sites considered



42. Following comprehensive analysis, as outlined below the preferred disposal areas are Areas 1.2 and 3.2 (see also the evidence of Mr Reinen-Hamill).

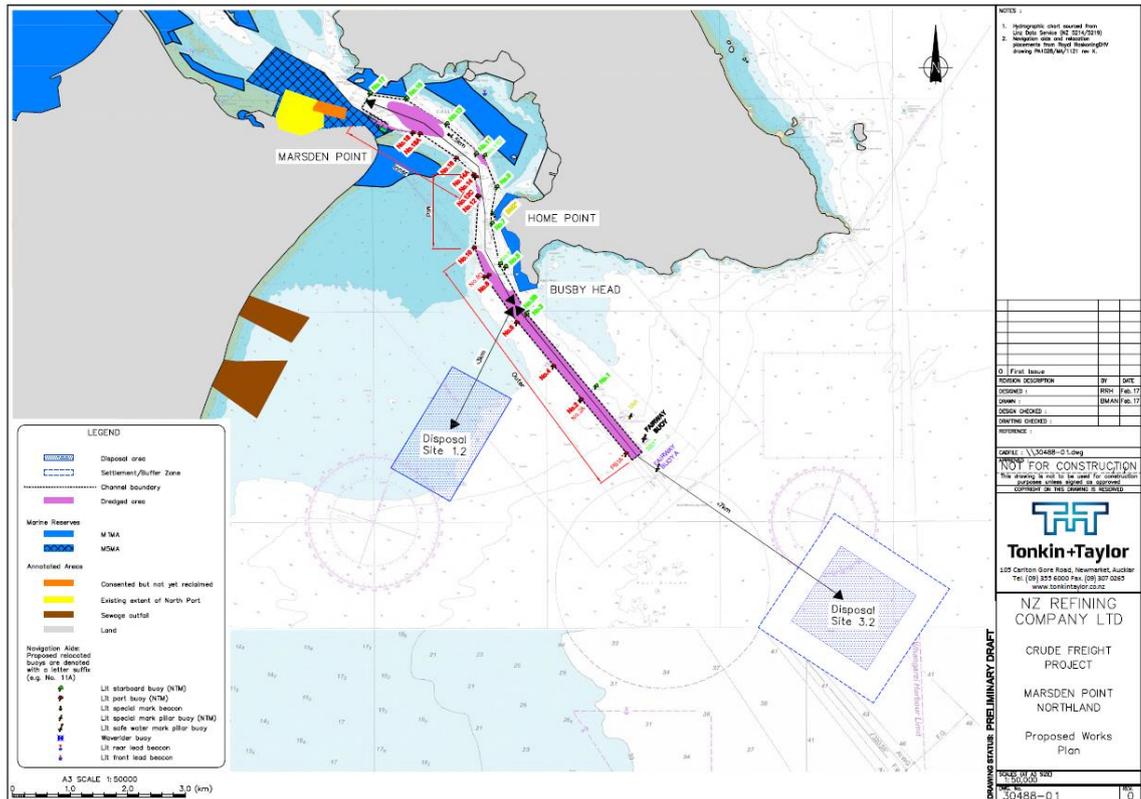
CRUDE SHIPPING PROJECT: SUMMARY OF PROPOSAL

43. Refining NZ is proposing to undertake targeted dredging of parts of the entrance channel to the Whangarei Harbour to enable Suezmax ships – which currently visit the refinery partially loaded – to visit the refinery fully loaded. To enable fully laden Suezmax tankers unrestricted access the Refinery except in extreme wave climate or swell events, capital dredging is required to establish a channel to support a 16.6m draft Suezmax tanker.
44. In addition to deepening the channel, Refining NZ asked its expert advisers review the existing channel alignment, to minimise environmental impacts and determine whether navigation safety could be improved upon. Following an extensive, iterative evaluative process, including a series of expert workshops and simulations involving representatives from NorthTugz, Northport and the Harbourmaster, channel design option 4.2 was selected as the preferred channel design from a navigational perspective (as described above).
45. It is worth mentioning at this stage that the Proposal is solely intended to facilitate access to the refinery by fully loaded Suezmax tankers. Internationally, there are two types of

tanker larger than Suezmax (Very Large Crude Carriers, or VLCC and Ultra Large Crude Carriers, or ULCC), but Refining NZ has no intention to bring these types of vessels to the refinery at this time. Besides the practical constraints of enabling access by those vessels, our refining systems and crude storage capacity are not configured to store and process the volumes which are transported on those types of vessel. The optimal efficiency gains are through deliveries of crude product on fully laden Suezmax vessels.

46. I set out below a summary of the proposal – although I note that the evidence of Mr Reinen-Hamill, Mr Cross, and Mr Bermingham sets out the technical detail of the channel design, depth and dredge methodology in considerably more detail.
47. The Proposal involves the following key components, which I address below and which are illustrated in **Figure 4**:
 - (a) **Capital dredging**: Dredging of the approaches to the Whangarei Harbour to deepen and realign the channel, and dredging of Refining NZ’s jetty “pocket”, to enable the navigation and berthing of fully loaded Suezmax vessels.
 - (b) **Maintenance dredging**: Ongoing dredging of the channel and jetty pocket to maintain water depth.
 - (c) **Disposal of dredged material**: The disposal of dredged material (both capital and maintenance dredging) at two locations in Bream Bay, being Marine Disposal Site 1.2 and Disposal Site 3.2. Refining NZ also recognises that there is the potential for land-based disposal of dredged material, subject to the obtaining of any additional necessary authorisations.
 - (d) **Changes to navigational aids**: Changes to aids to navigation (channel marker buoys, lead lights, and cardinal beacon to identify Home Point reef) to facilitate the safe passage of vessels through the new channel.

Figure 4: Proposal summary



Capital dredging

48. To enable fully laden Suezmax vessels to access the Refinery, Royal HaskoningDHV has calculated – taking into account a range of factors – that a target stepped channel depth ranging from 19.0 m below Chart Datum (CD) at the entrance to the channel, to 16.5 m below CD at the berth area with -17.9 m CD at the berth pocket is required.³ For the preferred channel alignment, this requires the dredging of approximately 3.7 million cubic metres of sediment from an area of approximately 1.44km² within the Whangarei Harbour channel. It is important to note that dredging is not uniform throughout the entire channel. Instead, it is targeted to those areas where the channel seabed is higher. As shown in **Figure 4**, the main areas where capital dredging is required are the outer channel and the berth pocket area near the Refinery. A more detailed breakdown of dredge volumes shown by location is provided in Mr Cross’s evidence.
49. While I understand that each application under the RMA is required to be considered on its merits, and that the facts and circumstances vary, it may be of interest to compare the proposed dredge volume here to some other recent NZ examples. I understand that the following applications have either been consented, or are proposed:

³ See the evidence of Mr Cross.

- (a) Port of Tauranga: resource consents have been granted to dredge 15 million cubic metres of material of which approximately six million cubic metres was dredged in 2016.
 - (b) Centreport (Wellington): has applied for resource consents to dredge 6.3 million cubic metres of material. That application has been suspended, pending recovery from the November 2016 Kaikoura earthquake.
 - (c) Lyttelton Port of Christchurch: resource consents have been granted for 18 million cubic metres of material. The consents are currently subject to appeal to the Environment Court.
 - (d) Port Otago: resource consents have been granted for 450,000 cubic metres of material per year over the 25-year term of consent. This enables a total of slightly more than 11 million cubic metres of material.
50. Accordingly, the overall volume of dredged material proposed at Whangarei is relatively low when compared to other ports nationally. The reasons for this are primarily twofold: the Whangarei Harbour channel is naturally a deep water system that, due to relatively high tidal water velocities, naturally flushes sediment from the channel; and the design approach developed by Refining NZ has followed a 'targeted dredging' methodology in order to minimise the volumes dredged, and therefore minimise the environmental effects associated. This has included developing a 'channel within a channel' system for the outer channel reaches.⁴
51. At this stage Refining NZ has not made any selection of dredging company, and therefore dredging methodology/equipment. This will be considered at a later stage, during the tendering phase of the project. In the meantime, Tonkin+Taylor has calculated the likely duration of the capital dredging campaign, based on the types of dredge likely to be utilised. Taking into account the range of likely possible dredge types, physical characteristics of the dredge area, location of the disposal areas, meteorological and sea-state conditions and operational allowance, Tonkin+Taylor calculate the capital dredge programme will take up to six months dependent on the size of dredge equipment employed.
52. As is normal practice in tendering, Refining NZ would seek to to make compliance with the applicable Regional Council Harbour Bylaws a condition of contract for the successful tender.

⁴ See the evidence of Mr Cross and Mr Bermingham.

Maintenance dredging

53. Following capital dredging, ongoing maintenance dredging will be required to maintain the channel depth, because of sedimentation. Annual sedimentation within the channel (and therefore annual maintenance dredging requirements) is expected to be between 56,000m³ and 122,000m³ per annum and is expected to be dredged on a campaign basis as sedimentation allowances are anticipated to be reached. Although precise maintenance dredging requirements will be determined by bathymetric surveys, generally maintenance dredging is estimated to be required once every two to five years for the first six years following capital dredging, and every three to ten years for the following six to twenty years.

Disposal of dredged material

54. The Proposal seeks resource consents for the disposal of capital and maintenance dredging material within the coastal marine area at marine disposal sites 1.2 and 3.2 (see **Figure 4** above). Each of the disposal sites is 2.5km² in area, although site 3.2 includes an outer boundary buffer zone where placed sediment may settle over time. The maximum area of site 3.2 including this outer boundary is 5.75km².
55. The reason two disposal sites have been identified and investigated is to enable for some dredged material to be placed at an inshore location, facilitating the transport (via natural coastal processes) of that material into the ebb tidal delta system. This approach was recommended to Refining NZ by its independent coastal process expert advisors.
56. The primary disposal site 3.2 is located approximately 7km from Busby Point, in around 45m water depth. Refining NZ proposes to place up to 97.5% of capital dredge material within Disposal Site 3.2 (or up to 3,607,500m³). If the material is uniformly distributed within area 3.2, the average height of the placed material during capital dredging will be 1.5m.
57. Disposal site 1.2 is approximately 3.5km offshore, being located at the southern end of the ebb tide delta in water depth of between 7m and 15m. I am advised that area 1.2 is designed to enable placed sediment to be slowly transported by natural coastal processes landward during higher energy wave events to maintain sediment volumes on the ebb delta. Between 2.5-5% of capital dredge material is to be placed within Disposal Site 1.2 (up to 185,000 m³). Maintenance dredge material is proposed to be placed at either site 1.2 or 3.2 (or on land, subject to required authorisations). Therefore, site 1.2 has been sized to enable different locations to be targeted for the placement of maintenance dredging. If the dredged sediment is placed uniformly in this area, the

average depth would be around 0.06m. However, I am told that it is more likely that there will be smaller areas targeted within this larger area during each dredge campaign, with average placement depths of around 0.6m, covering an area of around 10% of the total disposal site.

58. The disposal sites have been carefully selected to minimise adverse effects on the environment, including with respect to ecology and coastal processes. Both marine disposal areas comprise sand of a similar composition to the channel area to be dredged: this is key to the 'like for like' disposal approach. I understand this minimises the disruption to flora and fauna in the disposal areas. The disposal sites were both extensively sampled by independent ecological experts, and the disposal sites refined in order to minimise disruption of areas of greater productivity and/or diversity. Further, disposal site 1.2 was selected so that material deposited in this location will over time (and by natural coastal processes) replenish the nearshore sediment budget; and will improve the resilience of the dynamic nearshore sediment system, including with respect to sea level rise and any changes resulting from the Proposal.
59. While Refining NZ has no firm proposal for land based disposal, it seeks to retain the flexibility to enable some disposal of dredged material to land. The application therefore seeks to enable that to occur, for example for beach replenishment or reclamation purposes, but acknowledges that any necessary resource consents or other approvals for such land-based disposal would need to be separately obtained – and that disposal would need to adhere to the conditions of any such consents or approvals. To be clear, a minimum of 2.5% of the capital dredge will be deposited to disposal area 1.2 irrespective of where the remainder of the capital dredge material is deposited. Also a quantum of maintenance dredging (likely at least a similar volume to that placed during capital) will also be deposited in Area 1-2, assessed as part of ongoing monitoring of Mair Bank, the upper portion of the ebb tide shoal and disposal Area 1-2.

Dredging methodology

60. Potential dredge methods are discussed in detail in the evidence of Mr Cross. Although final determinations regarding dredge methodology and equipment will be made at the project commissioning stage, Refining NZ anticipates that most dredging will be undertaken by a small to medium sized Trailing Suction Hopper Dredger ("TSHD"). Some dredging in shallower and more inaccessible water, for example around Refining NZ's jetties, will likely be undertaken by a Barge Mounted Backhoe Dredger ("BHD"). A Cutter Suction Dredger ("CSD") may be used for localised dredging. **Figure 5** illustrates examples of each method:

Figure 5: Potential dredging methods



61. Several support vessels will be needed to support the main dredge vessel(s), including hydrographic survey vessels; crew boats; and a tugboat for towing barges (if used).

Aids to navigation

62. The new channel alignment associated with the Crude Shipping Project will require several changes to the existing navigational aids. These are discussed in more detail in the evidence of Mr Cross and Mr Bermingham, but in summary the changes are:
- (a) moving eight of the existing channel buoys to reflect the realigned channel;
 - (b) adding two additional channel marker buoys at the entrance to the channel;
 - (c) moving the existing fairway buoy further out and aligned with the starboard channel markers;
 - (d) installation of a “West Cardinal Beacon” to demarcate a rocky reef outcrop near Home Point;
 - (e) improvements to the existing ‘Port Entry (forward) Lead Light’;
 - (f) upgrading the existing Port Entry (rear) lead light, which marks the offshore approach channel; and
 - (g) installation of a set of new lead lights in Taurikura Bay to define the centreline of the proposed channel to assist with night-time navigation of arriving Suezmax tankers and other vessels.
63. These proposed changes to navigational aids have been discussed with key stakeholders, including Northport (who own and maintain commercial shipping nav aids in Whangarei Harbour, in accordance with Maritime NZ guidelines), and the Harbourmaster. The Harbourmaster has provided his written approval to the proposed changes to navigational aids, and a copy of that letter is attached to the AEE.⁵ Northport

⁵ Annexure 13 to the AEE.

have advised that they will maintain the new Aids to Navigation as part of the existing Northport annual maintenance programme/agreement.

64. Refining NZ acknowledges that subsequent to obtaining the necessary resource consents for the Proposal, but before any changes to navigational aids are undertaken, it is required to make application to Maritime New Zealand for approval under the Maritime Transport Act 1994 and subordinate regulations and/or standards. I understand that a resource consent condition to this effect is proposed in the draft conditions attached to Mr Kemble's evidence.

ENHANCEMENT, MITIGATION AND MONITORING ACTIVITIES

65. A range of environmental enhancement/mitigation initiatives are proposed by Refining NZ as a result of recommendations from its independent expert team. Refining NZ is committed to pursuing such initiatives as part of its commitment to the environment. A comprehensive environmental monitoring programme, with appropriate triggers and responses, will also be implemented through the proposed conditions which are attached to the evidence of Mr Kemble.

66. Environmental enhancement initiatives proposed by Refining NZ include the following:

- (a) **Coastal processes:**⁶ A proportion of dredged material will be placed in Disposal Site 1.2 to replenish the nearshore sediment budget. This will enhance the resilience of coastal features (for example the tidal delta and beaches) to sea level rise and any effects of the Proposal.
- (b) **Marine ecology:**⁷ In consultation with the Regional Council, tangata whenua, and other interested parties, Refining NZ will provide financial support to enhance marine ecology and improve the health of the Whangarei Harbour, for example through initiatives relating to water quality and/or the enhancement of seagrass communities.
- (c) **Avifauna:**⁸ In consultation with the Department of Conservation ("DoC")/the Bream Head Conservation Trust, little penguin and grey faced petrel breeding will be enhanced through the provision of nesting boxes and predator control within the Harbour.

67. Key proposed monitoring programmes and/or mitigation initiatives include the following:

⁶ See the evidence of Richard Reinen-Hamill.

⁷ See the evidence of Brian Coffey and Brian Stewart.

⁸ See the evidence of Graham Don.

- (a) **Coastal processes:**⁹ A comprehensive programme of monitoring of coastal processes is proposed, including with respect to the bathymetry of Mair bank, the tidal delta, Disposal Area 1.2 and the dredged channel.
- (b) **Marine ecology:**¹⁰ A range of monitoring and response measures is proposed with respect to marine ecology, including: pre-dredging/disposal monitoring of nearby seagrass and shellfish communities; during dredging/disposal monitoring of turbidity through a network of fixed and mobile turbidity meters (with the implementation of appropriate thresholds and response mechanisms); and seabed ecological monitoring after capital dredging and disposal activities, including with respect to pest and weed species within the dredge and disposal areas. This monitoring will occur in relation to the capital dredging campaign maintenance dredging campaigns. Should pest and weed species be found to be dominating the recolonization of the dredged areas, Refining NZ will collaborate with the Crown agencies in its response. I note that this approach is aligned with the recommendations of Dr Coffey and Dr Stewart.
- (c) **Marine mammals:**¹¹ A comprehensive mitigation and monitoring plan is proposed to be implemented in relation to marine mammals, including through a Marine Mammal Management Plan. In particular: visual and periodic underwater acoustic monitoring for marine mammals will be undertaken before and during capital dredging; a marine mammal observer will be present on the dredge vessel(s) during daylight hours to record any mammal sightings and reduce any potential risk of interaction with marine mammals. Similar measures are proposed for maintenance dredging.
- (d) **Avifauna:**¹² Coastal bird monitoring is proposed following capital dredging to establish “before” and “after” records. A lighting audit of all vessels used for the project will be undertaken to minimise the risk of bird strike.
- (e) **Noise:**¹³ A comprehensive noise monitoring programme and appropriate restrictions on noise are proposed to be implemented (including through a Noise Management Plan) on both the capital dredging campaign, and the subsequent maintenance dredging campaigns, to ensure noise effects of dredging and disposal activities – as experienced from nearby residences – are appropriate.

⁹ See the evidence of Richard Reinen-Hamill.

¹⁰ See the evidence of Brian Coffey and Brian Stewart.

¹¹ See the evidence of Deana Clement.

¹² See the evidence of Graham Don.

¹³ See the evidence of Jon Styles.

- (f) **Archaeology:**¹⁴ An Accidental Discovery Protocol will be implemented in the capital dredging campaign in the unlikely event that unrecorded archaeological sites are encountered during dredging.

BENEFITS OF THE PROPOSAL

68. The Crude Shipping Project will have a range of significant positive effects/benefits, as outlined below.

- (a) **Economic benefits:**¹⁵ The Proposal will have major economic benefits for the region:

- (i) The economy of scale advantages/savings achieved by enabling larger crude deliveries to the Refinery – and other strategic advantages offered by the Proposal – will improve the profitability and competitive position of the Refinery with respect to foreign supplies; and will support the efficient operation of the Refinery into the future. This will enable the continuation of the Refinery’s key contribution to the local and regional economy. This is a key benefit, because the closure of the Refinery would constitute a major economic loss to the region, including through lost employment and business expenditure. The Refinery employs approximately 500 employees and contractors, 94% of whom live in Northland. These are highly skilled and highly paid job opportunities, with the average wage higher than that in Northland generally. Staff and contractors are currently paid \$68 million annually.
- (ii) The capital investment and regular maintenance projects associated with the Proposal will drive periods of increased local spending and employment, as well as stimulating local businesses. A proportion of this spending will be local, which will support incomes in the region.

- (b) **Ecological enhancement:**¹⁶ As outlined above, the Proposal will result in ecological enhancements, including with respect to avifauna and marine ecology. Breeding of little penguin and grey faced petrel will be enhanced through the provision of nesting boxes and predator control within the Harbour. Support will also be provided to improve Harbour health, for example through water quality initiatives and/or the enhancement of seagrass communities.

¹⁴ See the evidence of Rod Clough.

¹⁵ See the evidence of Peter Clough.

¹⁶ See the evidence of Graham Don (avifauna); and Brian Coffey (marine ecology).

- (c) **Increased navigational safety:**¹⁷ The proposed realigned shipping channel (including changes to navigational aids) will enable improved navigational safety for all vessels transiting through the channel.
- (d) **Reduced environmental spill risk:** Because the Proposal will result in fewer deliveries of crude oil to the Refinery through enabling the delivery of larger loads, the very slim likelihood of an environmental incident (i.e. an oil spill) will be reduced.¹⁸
- (e) **Increased geomorphological resilience:**¹⁹ As noted above, the deposition of dredged sediment at Disposal Site 1.2 will replenish the supply of sand to nearshore features, including the tidal delta and the adjacent shoreline, enhancing the resilience of those features.
- (f) **Reduced greenhouse gases:** Because of fewer tanker visits (carrying larger loads), the Proposal will reduce greenhouse gas emissions from transportation per unit of delivered crude oil.²⁰

MAINTENANCE DREDGING AT REFINING NZ JETTY DOLPHINS

69. During the planning and development of this project, Refining NZ became aware of the need to undertake targeted maintenance dredging around its jetty mooring dolphins.²¹ As this dredging was required urgently to allow sufficient safe clearance around the dolphins, the necessary resource consents were obtained from Northland Regional Council (consent references AUT.038275.01.01 to AUT.038275.07.01), and the works were carried out in accordance with those resource consents in late 2017.
70. While the dredging work authorised pursuant to those consents is separate to the current application, given the location of the dredging proximate to the Whangarei harbour channel, drone video footage was taken of the dredging using an unmanned aerial vehicle. That footage was taken during dredging operations, and illustrates the very confined visible sediment plume resulting. A copy of the video will be made available in electronic form as Attachment 1 to my evidence. While the dredging equipment seen in the footage is of a smaller scale than that likely to be used in the capital dredging the

¹⁷ See the evidence of Geraint Bermingham.

¹⁸ In terms of overall risk, Mr Oldham considers that this will outweigh the increased impact of any such spill as a result of the larger crude loads enabled by the project. See the evidence of Kevin Oldham.

¹⁹ See the evidence of Richard Reinen-Hamill.

²⁰ All things being equal. See the evidence of Peter Clough.

²¹ These refer to the fixed (concrete) structures installed in the CMA to assist ships berthing at the Refining NZ jetty to remain in a fixed (stable) position when loading/unloading.

subject of this resource consent application, the footage does provide a visual representation of the location, and the minimal visible discoloration.

RESPONSE TO SUBMISSIONS

71. I have read and considered the submissions on the Proposal. Eighteen of the fifty submissions support the Crude Shipping Project, and highlight a range of benefits associated with the Proposal. Refining NZ is encouraged by the number and range of submissions in support of the project, which I consider is a reflection of the extent and quality of community consultation and stakeholder engagement undertaken by the company, as outlined in the evidence of Mr McNeill.
72. The vast majority of issues raised in submissions have appropriately been addressed by the relevant experts engaged by Refining NZ, or by Mr McNeill. There are, however, several issues which I consider it is appropriate for me to briefly address on behalf of Refining NZ.

The Proposal will not involve larger vessels

73. The submissions of several community members (for example, Reg Lawson, Barry Pyle, and Margaret Hicks) appear to evidence a misconception that the Proposal will involve larger vessels visiting the Refinery. For the avoidance of doubt, the Proposal is for vessels up to Suezmax size to visit the Refinery. Suezmax vessels currently visit the Refinery, but draft restrictions mean that they presently cannot be fully laden with crude oil. The dredging associated with the Proposal will mean that fully laden Suezmax vessels can visit the Refinery, but the Proposal will not involve larger ships visiting the Refinery.

Alternatives have been comprehensively considered

74. The Northland Scallop Enhancement Co. Ltd asserts that Refining NZ has not adequately considered alternatives with respect to several matters. I have outlined above the range of alternatives that Refining NZ has comprehensively considered for all aspects of the Proposal; including alternatives to dredging, alternative channel designs, alternative dredge methodologies, and alternative disposal sites. Refining NZ's consideration of alternatives has been genuine (open-minded) and robust.

Land-based disposal remains a possibility (subject to obtaining authorisations)

75. The Northland Scallop Enhancement Co. Ltd seeks that all dredged material be disposed on land. Fisheries Inshore New Zealand Ltd also seek that further consideration be given

to land-based disposal. Refining NZ remains open to the possibility of land-based disposal for some of the material dredged during the project, if suitable land-based uses can be identified. Such uses may have environmental benefits, for example the use of dredged material for onshore beach nourishment. For this reason, as explained above, these resource consent applications and proposed conditions are framed such that they do not preclude Refining NZ disposing of dredged material to land, subject to any necessary authorisations being obtained for such disposal. It is also worth noting that:

- It is highly unlikely that a large enough land based area could be identified for the entire capital dredge volume, especially given the capital dredge window timeframes involved.
- The additional costs to store all of the capital dredge volume ashore for future use would make the project uneconomic and result in an extremely large stockpile, which itself would have a range of actual and potential environmental effects.
- Any reliance on other parties to accept dredged material would involve separate authorisations/approvals and as such remain uncertain and outside of Refining NZ's direct control.

The Refinery has an important role in meeting future energy demands

76. Several submissions raise the theme of the Refinery being part of a “sunset” fossil fuel industry (Reg Lawson and the Bream Bay Coastal Care Trust); or suggest that road transport will be predominantly electrified within the Project's lifetime (Mark Modrich). As outlined in NZIER's report accompanying the application²² and in the evidence of Mr Peter Clough, the reality is that for the foreseeable future, hydrocarbon fuels will continue to meet the vast majority of New Zealand's road, aviation and marine transport energy demand. In addition Refining NZ currently only supplies around 63% of New Zealand's current petrol demand and so has a large buffer in imported fuel reduction before any impact on its own operation, provided it can remain competitive. Refining NZ considers that it has an important role to play in meeting that future demand, and that the Crude Shipping Project is important for the Refinery to continue to do so efficiently. The company also considers that there are several key regional and national benefits associated with the Marsden Point refinery continuing to supply national demand (and continuing to increase its efficiencies in meeting such demand), as opposed to overseas-refined products supplying the market. Such benefits are outlined above.

²²

See for example section 2.3 of the NZIER AEE Report at Annexure 2(o) of the AEE.

PROPOSED CONDITIONS

77. Refining NZ supports the proposed conditions attached to the evidence of Mr Kemble. The company considers that the conditions are comprehensive; and that the extensive monitoring, mitigation and enhancement requirements included in the conditions are appropriate, in the context of the company's strong commitment to the environment. I do wish to briefly comment on one aspect however, which is the lapse period.
78. Refining NZ supports the Council approach to the lapse period in condition 5. In my view, a suitable lapse period is necessary for the Proposal, primarily to recognise and provide for the scale, complexity and importance of the Project and the practicalities involved in its execution. Relevant factors include, for example: securing dredging contractors; allowing time for the necessary pre-dredging monitoring/reports to be undertaken, as required by the proposed conditions; and the commercial practicalities associated with the necessary timeframes to fund/commit to an investment of this scale.

CONCLUSION

79. The Crude Shipping Project represents the culmination of years of effort by Refining NZ and its consultant team. Refining NZ considers that the project will have a range of significant benefits, including through supporting the continuation of the competitive efficiency of the Refinery, which is a key asset to the region. Refining NZ has gone to considerable lengths to thoroughly and conservatively assess the effects as a result of the proposal and ensure that any potential adverse effects will be appropriately managed. In addition, Refining NZ has put in significant effort consulting with stakeholders, and genuinely seeking to address their concerns.
80. Overall, Refining NZ considers that the Crude Shipping Project represents an exciting opportunity for the Northland region; one that will generate important positive effects on a local, regional and national scale.

David Martin
Business Opportunities Manager
The New Zealand Refining Company Ltd

12 February 2018