

# Key Issues Report

**Coastal Resources Limited**

EEZ100015

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**Environmental  
Protection Authority**  
Te Mana Rauhi Taiao

New Zealand Government

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## Introduction

1. My name is Tone Carmona-Noklegaard. I am a Senior Advisor in the EEZ Applications team at the Environmental Protection Authority (EPA).
2. I hold a Bachelor's degree in Science Biology, and a Master's degree in Science Marine Biology and Limnology. Prior to joining the EPA in January 2017 I had over 10 years' experience, both within the public and private sector in Ireland and Norway, from monitoring and assessing effects of activity in the estuarine, coastal and offshore environments. A large part of my work has related to water quality, including a number of projects on the effects of sediment dispersal as related to the subsea placement of mine-tailing in coastal areas and offshore exploration drilling.
3. The documents listed in Appendix 1 have formed the basis for my report.

## Background

4. Coastal Resources Limited (CRL) is the holder of a deemed marine dumping consent, EEZ900012. Under this consent 50,000m<sup>3</sup> of dredged material, from marinas and proposed marinas, can be dumped per annum at the northern disposal area (NDA). The NDA is an existing dump site in the exclusive economic zone (EEZ) of New Zealand, approximately 25km east of Great Barrier Island.
5. On 5 June 2018 CRL applied for a replacement consent, EEZ100015, to dump up to 250,000m<sup>3</sup> of dredged material per annum at the NDA. The reason a higher volume is sought is to take account of future marine dredging work which CRL considers will be required in the Auckland and Waikato region over the next number of years.
6. Marine dredging is the process of removing marine sediment or substrate. Dredging in the coastal marine environment may be required for several reasons. The most relevant to CRL's application is in order to maintain required water depth of marine infrastructure such as ports, marinas and channels; and to remove material related to the development of marine infrastructure. These two broad categories of dredging activity are referred to as maintenance and capital dredging, respectively.
7. Marine areas adjacent to land masses, are susceptible to sedimentation. The level of sedimentation experienced depends on a number of elements. These include local geology; weather and climate; as well as land use, both in the coastal area as well as upstream. Together these determine how rapidly sediment is carried from land to the marine area. In addition, the level of sedimentation in an area also depends on marine sediment transport, by currents and wave action, both into and out of that area. Where the rate of sedimentation at a site is higher than the rate with which the current and waves carry sediment away, with time, marine infrastructure may become silted and too shallow to allow for safe navigation.
8. Due to population pressure, trade and other coastal activities, projects that use the coastal marine area may be permitted which require dredging work to take place. These may include the deepening of channels, to allow access to larger container ships, which ensure the efficient movement of goods, as

well as construction of infrastructure associated by the ferrying of passenger or the berthing for leisure crafts.

9. In section 3.7 of the application, CRL identifies a number of maintenance dredging and capital dredging works that is likely to be required in the Auckland and Waikato area over the next ten years. These works are estimated to total 2.5 million m<sup>3</sup> of dredged material. This material will need to be disposed of either at land or at sea, or be used for land reclamation. In recent years there has only been one consented large scale reclamation project in the Auckland area (i.e. the Ferguson Terminal). No further large scale reclamation work has been consented. CRL further notes in section 3.10 of the application that land reclamation is discouraged in the Auckland unitary plan, unless certain policy requirements are met. CRL further assert that land disposal of the estimated volumes of dredged material is not economically or environmentally the best option.
10. I note, however, that no timeline has been provided for the indicated required dredging works. It is unclear to which extent the estimated total volume (i.e. 2,500,000m<sup>3</sup> over 10 years) could be accommodated at the NDA, if the replacement consent was to be granted. Information to indicate that owners and operators of the relevant coastal infrastructures intend to use the NDA, if available for their future dredging work, has also not been provided.

## Purpose of the key issues report

11. This report identifies what I consider to be the key issues associated with application EEZ100015, that the Decision-making Committee (DMC) will need to consider as part of its decision making process. These issues are the:
  - a) degree to which dumped dredge material, including any contaminants, may move beyond the NDA boundary;
  - b) additional effects on the environment by the proposed activity, as compared to continued activity under EEZ900012;
  - c) effect of the activity on existing interests;
  - d) environmental management and monitoring; and
  - e) alternatives to marine dumping.
12. This report is intended to provide support to the DMC in terms of relevant considerations for the key issues, and guidance on where to find relevant information on these issues within the application documents. I have deliberately not provided a recommendation on whether the application should be granted or refused.
13. This report has been prepared before close of submission and the exchange of evidence by both the applicant and submitters. Additional information may therefore be provided in evidence, and during the hearing, which I have not considered in this report.

## The application – EEZ100015

### Scale and scope of the application

14. CRL is applying for a 35 year consent to dump up to 250,000m<sup>3</sup> per year of dredged material at the NDA, an existing dump site 25km east of Great Barrier Island. The application covers dredged material from both capital and maintenance dredging from the Auckland and Waikato region.
15. CRL is the holder of a deemed marine dumping consent EEZ900012, under which 50,000m<sup>3</sup> can be dumped at the NDA per year. The deemed consent was granted in December 2012 for a duration of 20 years, and thus expires in December 2032.
16. If application EEZ100015 is granted, CRL states in the application that it will surrender EEZ900012.

### Historical context

17. The NDA is an existing dump site in the EEZ. As of April 2018 about 200,000m<sup>3</sup> of dredged material from maintenance and capital dredging had been dumped at the site. A description, and discussion of, the historical context, of dredging in the Auckland area and the establishment of the NDA as a dump site, is provided in several parts of the application. The key sections are 1.1 and 1.2 of the application; 1.2 and 2 of appendix 4 to the application; 1.2 of appendix C of appendix 4 to the application; 1.1 of appendix 5 to the application; 2.1 of the 2008 environmental impact assessment (2008 EIA); and 1.2.3 and 1.2.4 of Flaim's 2012 PhD thesis (Flaim 2012). Both the 2008 EIA and Flaim 2012, were provided as part of the application.
18. In brief, as a result of public opposition to the dumping of dredged material in the coastal marine area (CMA) in the late 1980s and early 1990s, the Parliamentary Commissioner for the Environment established the Disposal Option Advisory Group (DOAG). This Group reviewed and made recommendations on the disposal of dredged material from the Ports of Auckland. The recommendations of the DOAG, which were released in 1994, included that:
  - (a) contaminated sediment be:
    - (i) used for land reclamation; or
    - (ii) disposed of in landfills, while
  - (b) capital dredging and minimally contaminated maintenance dredging be either:
    - (i) used for land reclamation; or
    - (ii) dumped north of Cuvier Island at a depth over 100m.
19. Following the DOAG recommendation, Maritime New Zealand (MNZ) granted a number of short term permits to dump dredged material at the Auckland Explosive Site (AES). The AES is located in the EEZ, at depth between 600m and 1200m, and has potentially been used by the New Zealand Defence Force (NZDF) to dispose of unexploded ordnances. As New Zealand is a signature the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, and the 1996 London Protocol to the Convention, MNZ was of the opinion that the AES did not fully meet the requirements of the London Protocol, in particular as pertaining to monitoring. MNZ therefore encouraged industry to identify

an alternative dump site in the EEZ, and CRL identified the NDA as a possible site in 2007. Desktop studies and field surveys were carried out over the following number of years to further assess the suitability of the site for dumping of dredged material. This culminated in CRL being granted by MNZ a 20 year permit in 2012 to dump dredged material at the site.

20. After the introduction of the Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 (D&D Regulations) in 2015, CRL's MNZ permit became deemed marine dumping consent EEZ900012, under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act), and compliance with the consent monitored by the EPA.

## Proposed activity

21. Section 3.5 of the application notes that to date dredged material has been loaded onto a bottom-dump barge from source by a digger. Section 3.1 of appendix 4 to the application also notes that it is anticipated that future dredging will be undertaken by backhoe and placed directly, or transferred to, a split hull hopper. Although the application does not outline the exact future dredging approach, the proposed consent condition 8, as included in section 9 of the application, notes that the consent holder shall not source material that cannot be moved by mechanical means, or material which is a slurry.
22. Section 3.5 of the application describes the dumping operations. The barges which have been used to date have a load capacity ranging from around 350m<sup>3</sup> to 700m<sup>3</sup>. Once the dredged material has been loaded, the barge, which is either self-propelled or towed by tugs, is transported to the NDA dump site. A round trip from Auckland is estimated to take around 20–24 hours. At the NDA dump site the dredged material is dumped while the barge is in motion, typically travelling at speeds of 4-7knots. Once the hopper doors are opened the release of material into the water column is typically completed in under 1-2 minutes.
23. A high level description of the fate of the dredged material once the material has been released from the barge is included in section 3.5 of the application. A more detailed description is provided in section 4.4 of appendix 4 to the application, with further information also provided in section 2.2 of Flaim 2012. Once the dredge material is released to the water, its movement through the water column until it settles at the seabed is described as generally separated into three phases:
  - (a) first, the material falls through the water column as a dense fluid-like jet, where the speed of the descending material depends on its composition (e.g. a slurry would fall at a slower speed than material consisting of more solid lumps). 1-5% of the dumped material is expected to be dispersed in the upper water column in this phase;
  - (b) then, the descending plume either arrives at a level of neutral buoyancy, or encounters a boundary (e.g. a pycnocline, or the bottom). This phase is characterised by slowing descent and more horizontal spreading, where a density current may transport the material away from the dumping coordinates at a speed higher than the ambient current, due to residual energy when the material impact with the bottom, or layer; and
  - (c) finally, the material enters a passive transport-dispersion phase, where transport and spread of the material are determined by ambient currents and turbulence more than by the dumping operation.

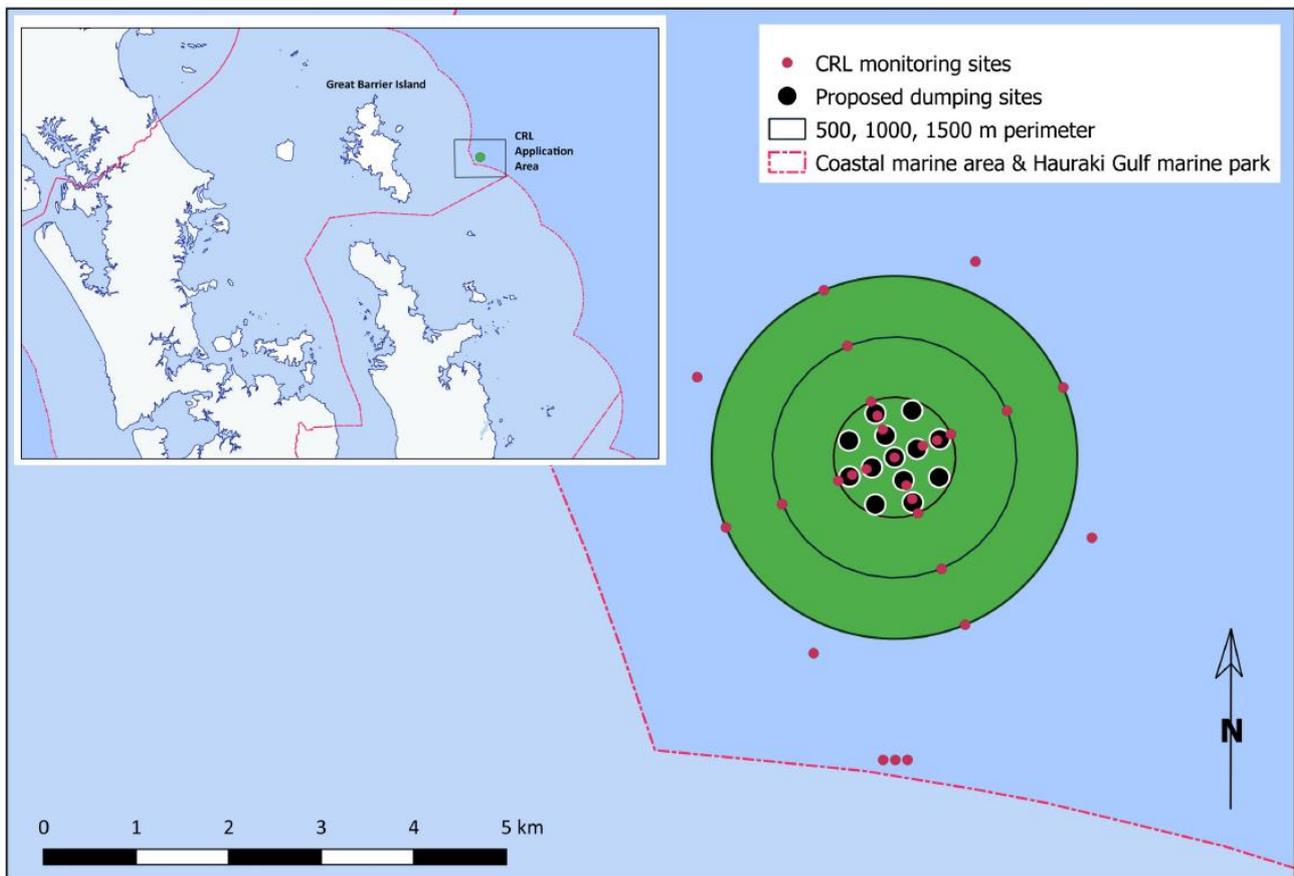
24. Based on the barge sizes, the applicant estimates that about 560 barge loads are required per year to dump 250,000m<sup>3</sup> of dredged material at the NDA site. The application does not specify a maximum number of loads that could be dumped per day, but in proposed consent condition 9, as provided in section 9 of the application, a minimum of one hour between barge unloadings at the NDA is proposed.

## Location

25. The NDA dump site is a 1,500m radius circle, centred on 36° 12.3403"S and 175° 48.002 "E (WGS84 datum), and covers an area of about 7km<sup>2</sup>. It is located on the mid-continental shelf approximately 25km east of Great Barrier Island and 22km north of Cuvier Island.

26. The water depth at the NDA is about 140m, slightly downwards sloping towards the east, and the seabed bathymetry is, in sections 3.6 and 4 of the application, described as generally flat with little to no distinguishable morphologic feature.

27. In section 7.1 of the application the NDA is described as non-dispersive, that is, that it is able to retain the material which is dumped there. This is based on the current, wave and wind environment at the site, and results of monitoring required under EEZ900012. In general, however, site measurements have been temporally limited, and only partly cover seasonal variations.



## Statutory framework

### The EEZ Act 2012

#### Purpose

28. The purpose of the EEZ Act as set out in section 10 of the Act is:

- (a) *to promote the sustainable management of the natural resources of the EEZ and the continental shelf; and*
- (b) *in relation to the exclusive economic zone, the continental shelf, and the waters above the continental shelf beyond the outer limits of the exclusive economic zone, to protect the environment from pollution by regulating or prohibiting the discharge of harmful substances and the dumping or incineration of waste or other matter.*

#### Section 20G restriction

29. Section 4 of the EEZ Act defines dumping to mean:

- (i) *any deliberate disposal into the sea of waste or other matter from ships, aircraft, and structures at sea.*

30. Section 20G of the EEZ Act sets out that no person may dump waste, or other matter, into the sea or onto the seabed of the EEZ, unless the dumping is authorised by a marine consent; an emergency dumping consent; or the dumping is in accordance with section 248 or 249 of the Maritime Transport Act.

### The D&D Regulations 2015

31. CRL is proposing to dump dredged material in the EEZ. This activity is regulated under the D&D Regulations, with provisions relating to dumping set out in part 5 of the Regulations.

32. CRL is proposing to use the existing NDA site located in the EEZ. Although the dump site is established, it is not one of the five authorised locations set out in regulation 3.

33. Under regulation 33(a), the dumping of dredged material is classified as a discretionary activity under the Act, unless regulation 32 applies (i.e. dumping dredged material at an authorised location). As CRL is proposing to dump dredged material at a site other than an authorised location, application EEZ100015 is fully notified.

#### Decision making function

34. The EEZ Act prescribes the decision making function of the EPA. For this application, decision-making has been delegated to the DMC by the EPA Board.

35. In order to best discharge its responsibilities for assessing, hearing and deciding CRL's application, the DMC must take into account or have regard to the decision-making criteria in sections 59 and 60, apply the information principles outlined in section 61, and make the decision under section 62.

36. The decision-making criteria in section 59 apply to any application for a marine consent. For a marine dumping consent, however, section 59(2B)(a) directs the DMC to specifically exclude the matters described in section 59(2)(c),(f),(g), and (i) from its considerations, which relates to the:

- effects on human health that may arise from the activities effects on the environment;

- the economic benefit to New Zealand of allowing the application;
- the efficient use and development of natural resources; and
- best practice in relation to an industry or activity.

37. Section 59(2B)(b), (c) and (d) instead directs the DMC to take into account:

- the effects on human health of the dumping, if consent is granted;
- any alternative methods of disposal of the waste; and
- whether there are practical opportunities to reuse, recycle or treat the waste.

38. Section 61(1)(b) requires the DMC to base its decisions on the best available information. Section 61(5) defines that for the purposes of section 61, best available information means the best available information that, in the particular circumstances, is available without unreasonable cost, effort, or time.

39. Under section 62 the DMC must refuse an application for a marine dumping consent if:

(a) it considers that the waste may be reused, recycled, or treated without:

- (i) more than minor adverse effects on human health or the environment; or
- (ii) imposing costs on the applicant that are unreasonable in the circumstances; or

(b) the waste is identified in such a way that it is not possible to assess the potential effects of dumping it on human health or the environment; or

(c) the DMC considers that dumping the waste is not the best approach to its disposal in the circumstances.

40. Under section 54 the DMC may request that the applicant provide further information relating to an application, and under section 56 it may:

- (a) commission an independent review of the applicants impact assessment;
- (b) seek advice or information from any person on any aspects of the application or proposed activity; and
- (c) commission any person to provide a report on any aspects of the application or the proposed activity.

41. Under section 61(2), if the information available is uncertain or inadequate, the DMC must favour caution and environmental protection. As CRL's application is for a marine dumping consent, section 61(4)(a)(i), provides that if the information available is uncertain or inadequate, the DMC is not able to consider whether taking an adaptive management approach would allow the activity to be undertaken.

## Conditions of consent

42. Section 59(2)(j) of the EEZ Act requires the DMC to take into account the extent to which imposing conditions under section 63 might avoid, remedy, or mitigate the adverse effects of the activity. Under section 63(1) the DMC may grant a marine consent on any condition that it considers appropriate to deal with adverse effects of the activity authorised by the consent on the environment or existing interests. Section 63(2) gives examples of the types of condition which may be imposed, and sections 65 to 67

(bonds, monitoring, observers) give further detail regarding the type of conditions outlined in section 63(2).

43. Under section 64(1AA)(b), section 64 (adaptive management approach) does not apply to a marine dumping consent. Conditions under 63(2)(b), which together amount or contribute to an adaptive management approach can therefore not be imposed, if consent was to be granted.
44. Sections 63(3) and 63(4) give further detail of conditions which cannot be imposed on consents. These include:
  - a) conditions which are inconsistent with the EEZ Act or any regulations, or
  - b) conditions to deal with an effect, if the condition would conflict with a measure required in relation to the activity by another marine management regime (MMR) or the Health and Safety at Work Act 2015.
45. In addition to the conditions which the DMC may impose, if consent was to be granted, other conditions volunteered by CRL, including those that may be outside those that the DMC may impose under the Act, may also be imposed and become enforceable by the EPA. Such conditions are often referred to as 'Augier' conditions. The prohibitions in section 63(3) and 63(4), however, still apply.
46. CRL has included proposed consent conditions in section 9 of the application. In addition further potential commitments, which pertain to the involvement of iwi in the continued monitoring of the site, if consent was to be granted, are outlined in section 10 of the application. CRL notes that these can also be offered as conditions.

## Key Issues

### Introduction

47. After reviewing the documents, as listed in appendix 1 of this report, and considering the scale and scope of the application, I consider that the key issues associated with the application that the DMC will need to consider as part of its decision-making process under sections 59-62 of the EEZ Act are the:
  - (a) degree to which dumped dredge material, including any contaminants, may move beyond the NDA boundary;
  - (b) additional effects on the environment by the proposed activity, as compared to continued activity under EEZ900012;
  - (c) effect on existing interests;
  - (d) environmental management and monitoring; and
  - (e) alternatives to marine dumping of the dredged material.

## The degree to which dumped dredge material, including any contaminants, may move beyond the NDA boundary

### Introduction

48. The extent to which dredged material dumped at the NDA, including any contaminants, will remain within its boundaries is likely to be determined by the:
- (a) operational approach to dredging and dumping (e.g. by mechanical dredger vs by cutter-head suction; dumping method and speed; and the forming mound);
  - (b) the characteristics of the dredged material (e.g. the grain size distribution; cohesiveness; water content of the material; and contaminants); and
  - (c) the physical environment at the dump site (e.g. depth and topography; ambient current velocity; the presence of vertical or horizontal density boundaries; turbulence; and wave action).

### *Dredging and dumping operations*

49. Section 3.5 of the application provides a high level overview of the dredging and dumping methodologies used under deemed marine dumping consent EEZ900012. The application does not specify whether these methodologies will exclusively be used in the future.
50. With regards to dredging methodology, proposed consent condition 8, as included in section 9 of the application, requires that the consent holder shall not source material that cannot be moved by mechanical means, nor source material which is a slurry. This would indicate that the water content and cohesiveness of the material, given similar sediment type, could be similar to what has been dumped at the NDA to date.
51. Section 3.5 further notes that when dumping the dredged material at the NDA, the split hull barge is opened, releasing the load. The dumping operation is noted as completed in 1-2 minutes. In general a shorter dumping time is associated with reduced entrainment and dispersion in the upper water column. I note that in sections 3.1 of appendix A to appendix 4 to the application, and 4.4.3 of Flaim 2012, the observed time to complete dumping was reported as several seconds and less than 5 seconds, respectively. The estimate of 1-2 minutes may therefore be conservative, in terms of time required for the bulk of the material to enter the water column.

### *The physical and chemical characteristics of the dredged material*

52. The grain size distribution of the dredged material is determined by the geology of the source sites and its catchment, while contaminants present in the dredged material may reflect past or present activity at the site and wider area.
53. Comment on the sediment characteristics of dredged material dumped at the NDA under EEZ900012 is provided in sections 2.2, 2.4, and 2.5 of appendix 5 to the application. Sediment characteristics varied between the source sites (e.g. between marinas) and also within the same source site (e.g. within the same marina). The average grain size distribution of material that has been dumped at the NDA is described as gravelly mud with approximately 6% gravel, 39% sand, and 55% silt and clay. Contaminant levels at the source sites have on occasion breached the ANZECC ISQG- Low (ISQG-Low) threshold.

Section 3.6 of the application notes that contaminants in the sediment at the NDA were below the ISQG-low at the 2016 environmental monitoring (the last reported monitoring event at time of lodgement). Potential future source sites for dredged material are listed in section 3.7 of the application. The list includes sites from which dredged material has previously been dumped at the NDA, as well as sites from which it has not. The latter includes Ports of Auckland, and a number of unspecified sites for capital and maintenance dredging.

54. Section 2.2.2 of appendix 5 to the application, notes that past elutriate tests have shown that dredged material may release some contaminants to surrounding seawater. The levels observed were not noted in the application. To date, analysis of water quality has not been carried out at the NDA.

### ***The physical environment***

55. The physical environment at the NDA is described in sections 3.6 and 4 of the application, with further detail provided in the appendices and documents accompanying the application. In general the description of the physical environment is based on a number of studies and site surveys carried out in the period 2008-2012, and which in part sought to determine the dispersive nature of the NDA. In addition, data from national and international databases and published articles have been used for both qualitative and numerical assessments. Results from environmental monitoring, carried out under EEZ900012, are also referenced.
56. Section 7.1 of the application, and section 5.5 of appendix 4 to the application, describes the NDA as non-dispersive, referencing previous studies and environmental monitoring. In particular the 2008 EIA; the 2011 post –monitoring report; Flaim 2012; and 2016 environmental monitoring results. In general, the conclusions of the listed works are based on short duration surveys with limited seasonal coverage and relatively few sampling points. Additional regional models and datasets have been used in assessing the site, but it is not clear how well these represent the physical conditions at the NDA. Density profiles and current measurements have been obtained from the NDA, but these were limited in temporal scale, which makes it difficult to draw conclusions about the current regime throughout the year or the extent of seasonal stratification.
57. In 2011, MNZ commissioned NIWA to review the work and assessment that had been carried out for the NDA in 2010 and presented in the 2011 post-monitoring report, which described both the monitoring approach and the results. The 2011 NIWA review was critical to a number of the methodologies used for site and plume monitoring. In section 4.2, however, the NIWA review concurred with the 2011 post-monitoring report's findings, that it was highly likely that the material was localised within about 600m from where it was dumped at the NDA.

### **Considerations**

58. While most of the dredged material is expected to settle at the NDA dump site in relative close proximity to the dump location (i.e. close to where the load is dumped into the water column) a proportion may be dispersed further by:
- (a) entrainment in the water column and transport by ambient currents; or

- (b) remobilisation from the bottom over time, through sediment transport away from the site where material originally settled.

### ***Entrainment in the water column***

59. Section 3.5 of the application notes that immediately after dumping a small proportion of the finer components, like silt, will be lost to passive dispersion in the water column. The application estimates this proportion to be 1-5 % of the dumped volume. This is also the estimated range given in section 4.4 of appendix 4 to the application; and section 7.1 of the 2008 EIA. For a load of 500m<sup>3</sup> this would indicate that the equivalent of 25m<sup>3</sup> could disperse some distance away from the dumping location (although the dry weight volume would be less, dependent on the water content of the dredged material). How far this volume could be dispersed will depend on factors like the grain size, cohesiveness of the material, flocculation, and ambient currents.
60. Section 3.5 of the application further notes that field studies carried out at the NDA in 2010 indicate that increased turbidity, as arising from dispersed fines, is only significant within approximately 500-600m of the dump location. As the observed turbidity increases were not quantified, it is unclear how the significance of the increase was determined. Table 4.16 in section 4.10.2 of Flaim 2012, lists observed changes in turbidity above background levels (with distance and time from the dump location) during four 2010 surveys. These indicate that elevated turbidity levels were observed beyond 600m.
61. Reporting on the 2010 surveys, the 2011 post-monitoring report in its summary of findings section, notes that after one hour, suspended sediment levels throughout the water column had decreased to an undetectable level through dispersion, dilution, and settling processes, and that the plume had not been detected beyond the boundary of the NDA on any of the four 2010 monitoring occasions. The report further concluded that the dumped material had likely settled wholly within the NDA. For the survey, an Acoustic Doppler Current Profiler (ADCP) was used to assess turbidity in the water column (measuring backscatter intensity). However, the data was not calibrated against measurements of suspended sediment concentration (SSC) or turbidity profiles on the day. As noted in section 3.2.6 of the 2011 post-monitoring report, the particle size distribution that is best represented by the backscatter intensity data is approximately 15µm–1.5mm (i.e. medium sized silt to very coarse sand). The ADCP methodology is less robust when applied to particles outside this range. Table 4.1 in section 4.4.1 of Flaim 2012, lists the grain size distribution of the dredged material from Pine Harbour which was dumped during the 2010 surveys. The proportion represented by fine silt and clay ranged from about 56% to 83%. This indicates that, although much of the sediment could have kept its cohesive nature, and/or settled as larger flocks, part of the dispersed material, is likely to have been outside the optimal measurement range for the ADCP methodology.
62. The application further notes in section 3.6 that monitoring carried out in 2016 at the NDA for EEZ900012 did not identify dredged material beyond 375m from the geographical centre of the NDA. Prior to that monitoring event, however, only 150,000m<sup>3</sup> had been dumped at the site. Depending on the extent to which material was dispersed, but considering the relatively small volume (i.e. 150,000m<sup>3</sup>), and the sampling methodology which analysed a mixed sample from the top 5cm, it may be questioned to what degree robust conclusions can be drawn on this basis, regarding the dispersal of fines within and beyond the site.

63. Under EEZ900012 dredged material can be dumped within 100m of the geographical centre of the NDA. CRL's proposed activity provides that material could instead be dumped up to 500m from the geographical centre of the site (i.e. up to 1,000m from the NDA boundary). Section 5.10.2 of Flaim 2012, in considering sediment dispersion at the NDA, recommends that the dumping location should be;

*“at or within ~200 m of the centre of the site so that the distance from the boundary is kept relatively constant at 1500 m because during certain environmental conditions, a decreased distance may result in dispersion beyond the boundary.”*

64. Further recommendations are also made in the same section 5.10.2, including that:

- (a) release of material from the hopper should be undertaken in the shortest amount of time possible, to minimise dispersion in the upper water column;
- (b) if wind conditions of 20 knots or more are consistent (in direction and speed) for two or more days, immediately before a planned dumping event, dumping should be avoided when the tidal current coincides with the wind direction; and
- (c) dumping of material which consists predominantly of fine, but mostly non-cohesive components, should not be undertaken unless further investigation to cover these types of dumping events have been carried out. This is because this type of material would be more susceptible to dispersion than the material that was dumped during field observations in the 2010 study.

65. I note that point c) above may to some extent be addressed by the proffered consent condition 8 as provided in section 9 to the application.

66. The application does not address what proportion of the dispersed material may settle beyond the boundaries of the NDA, nor how any proposed, or future, changes to operational practices, or sediment composition, may influence this. Noting that for the monitoring surveys carried out in 2010, all dredged material was sourced from one marina using the same dredging methodology, and that dumping was by slip hull barge (sections 4.4 and 4.4.1, and appendix II of Flaim 2012). Different operational practises, or dumping of dredged material significantly different to that dumped during the 2010 monitoring, may therefore result in a different level of dispersal to what was observed then.

### **Contaminants**

67. Contaminants may be present in the dredged material. During the dumping process these contaminants may be released into the water column. The degree to which this may take place will depend on the:

- (a) type of contaminant present;
- (b) degree of disturbance to the dredged material and the contaminant's affinity for the material;
- (c) reactions in the receiving environment (e.g. oxygenation of anoxic material); and
- (d) pore water pressure of the developing mound.

68. Elutriate testing may indicate the degree to which contaminants present in the dredged material are released into the water column upon dumping. As per the proposed sediment characterisation, provided in section 2.1 of appendix 5 to the application, elutriate testing is only carried out where analysis of the sediment indicates that contamination exceed the ISQG-Low in the sediment. It is not given, however,

that disturbance of the same sediment will not result in breach of ISQG-low for water quality, also for contaminants present in the sediment at levels below the ISQG-low. I note that due to the intermittent nature of release and further dilution of the contaminants in the environment, any adverse effect may be limited in temporal and spatial scale. Potential adverse effect posed by the release of contaminants can be further minimised by robust testing of sediment before dumping and by limiting the disposal of contaminated dredged material.

69. Another route for contaminants to the water column is through leaching from the forming mound. Section 4.1 of appendix 5 to the application states that for significant leaching to occur a distinctive pressure gradient is normally required, which is only established when the mound is very large and solid. The same section states that the continued use of the NDA as proposed will not result in a significantly higher mound, and concludes that the proposed dumping is not expected to result in a mound large enough for the pore water pressure to increase sufficiently for leaching to occur. The application does not discuss at what point (i.e. mound size and shape) leaching may be expected, or the scale of any associated effect.
70. In section 6.2 of appendix 4 to the application, a number of simplified calculations are given to estimate the potential mound size that would result from annual dumping of 250,000m<sup>3</sup> for 35 years. The estimate is given as a cone shaped mound spreading from the geographical centre to the boundary of the NDA. It is unclear whether the conclusion in section 4.1 of appendix 5 to the application (noted above), is based on this estimate (i.e. a cone shaped mound with radius of 1,500m and height of 3.75m). Noting also that in light of section 6.1.2 of appendix 4 to the application concluding that the proposed activity at the NDA is not expected to have a significant effect on the potential for resuspension, the proposed dumping approach (i.e. to dump material only within 500m of the geographical centre) would result in a different shape mound, where the bulk volume is spread over a much smaller area thus resulting in a higher mound than the simplified estimate of appendix 4.

### ***Resuspension and mobilisation***

71. In order for sediment which has settled on the seabed to be remobilised and transported away from the site, the current at the seabed needs to be such that the applied bed shear stress is sufficient to move the particle. Different size particles require different shear stress in order to be re-mobilised. The level to which material is consolidated will also influence the shear stress required for remobilisation.
72. Section 6.3 of appendix 4 to the application describes it as unlikely that deposited material will become re-suspended and mobilised after placement. This is due to the cohesive nature of the material being dumped and the relatively low bed current velocities at the site. I note that appendix 4 does not discuss the grain size distribution of material dumped at the site, and to what degree varying levels of cohesiveness may affect the conclusion regarding potential for re-suspension and mobilisation. The application also does not make comment on required shear stress to mobilise unconsolidated sediment, or how remobilisation of unconsolidated (e.g. recently dumped) material may be influenced by the subsequent dumping of further loads at the same location within a short timeframe.

### **Conclusion**

73. Based on past monitoring at the NDA it seems likely that the bulk of the dredged material dumped there will remain within a relatively short distance of the dump location, and within the boundary of the NDA. It

is less clear what volume may be dispersed, and settle beyond the boundaries of the NDA, and the level of contaminants which may be released into the water column by the activity. The application also does not discuss how operational changes (e.g. to dump within 500m from the geographical centre of the NDA, as opposed to 100m) or an increased dumping frequency may influence this. These are matters which the DMC may wish to have clarified.

## Additional effects on the environment by the proposed activity, as compared to continued activity under EEZ900012

### Introduction

74. CRL's deemed marine dumping consent EEZ900012 was granted in 2012 for a 20 year period. An accumulated total volume of 1,000,000m<sup>3</sup> of dredged material could be dumped at the NDA during the lifetime of this consent, assuming the maximum volume allowed by the consent is dumped each year for the duration of the consent.
75. The present application EEZ100015 proposes to increase the annual maximum volume that can be dumped at the NDA, from the current 50,000m<sup>3</sup> per year (under EEZ900012) to 250,000m<sup>3</sup> per year. The application also seeks a duration of 35 years.
76. If consent for the proposed activity was granted, this would enable an additional accumulated volume of approximately 8,000,000m<sup>3</sup> of dredged material to be dumped at the NDA over the 35 years of the consent, (assuming the maximum proposed annual volume is dumped each year), compared to what may be dumped under EEZ900012, over its full term. This in turn would:
  - (a) lead to an increase in total hours of increased turbidity at the NDA caused by dumping;
  - (b) increase any potential accumulated volume of dredged material settling beyond the boundary of the NDA; and
  - (c) result in 15,000 -17,000 additional barge return trips.
77. Given the existing consent (EEZ900012) gives rise to certain effects, the focus of my assessment of effects for the proposed new activity (EEZ100015) is on the additional effects of that proposed activity. In some respects the extent of additional activity may mean different effects arise.

### Considerations

#### *Turbidity*

78. Section 7.1 of the application, and section 6.1.1 of appendix 4 to the application, estimates that the proposed activity will result in elevated turbidity at the NDA going from an estimated 200 hours per year, associated with dumping under EEZ900012, to 1,000 hours per year if application EEZ100015 was to be granted. These estimates are based on the findings of the field surveys in 2010, of four loads of between 570m<sup>3</sup> and 720m<sup>3</sup> dumped at the NDA, which concludes that the effects in the water column were no more than minor, and that a limited area is affected. Based on the surveys, section 6.1.1 of appendix 4 to the application further assesses the effect of increased turbidity for an additional 800 hours per year, to be less than minor. No further analysis of the previous collected data appears to have been carried out.

79. I note that the data provided in table 3.8 of appendix A to appendix 4 to the application, seems to indicate that turbidity, as measured from water samples during the 2010 field survey, was increased above background levels at 5m and 10m depth an hour after dumping on some occasions. In the figures and tables provided in section 3.3.5 of appendix A to appendix 4 to the application, turbidity, as measured by ADCP, also appears to show levels elevated above background levels over one hour after dumping, and also noting here the potential limitations of the ADCP methodology used to detect dispersed fines, as discussed above. Furthermore, the turbulence in the water column can influence the extent of dispersal. Weather and sea state did vary between the four 2010 surveys (e.g. sea state ranging from 0.5m -1m and wind speed from 5-15 knots), but it did not cover the range over which operations may take place, (section 3.1 of the 2011 post-monitoring report).
80. CRL, in proposed consent condition 9, as provided in section 9 of the application, proposes a minimum of one hour between dumping events at the NDA. This is to prevent plumes from more than one event from overlapping, which could temporarily result in turbidity levels elevated above that associated with a single dumping event. Depending on the sea state and water column conditions at the time of dumping (e.g. stratification, and turbulence), however, elevated turbidity levels may persist at the site beyond one hour after dumping. I note, however, that although levels of turbidity may persist for a time after dumping, the plumes are still likely to be transient, and although elevated above background levels may not be above a level harmful to marine life.

#### ***Volume of dredged material settling beyond the NDA***

81. As outlined above, CRL is proposing to dump dredged material within 500m of the geographical centre of the NDA (i.e. 1,000m from the NDA boundary), as opposed to the current practice (under EEZ900012) of up to 100m from the geographical centre. Flaim 2012, in section 5.10.2, recommended that dredged material be dumped at or within ~200m of the geographical centre, as she considered dumping closer to the NDA boundary to potentially result in dispersion beyond the NDA boundary.
82. Dumping at locations closer to the NDA site boundary may result in a higher accumulated volume of dispersed sediment settling outside the NDA. The potential rate or volume of dispersal beyond the NDA is not discussed in the application. I note, however, that sediment which is dispersed beyond the NDA and settle there, depending on rate and presence of contaminants in the material, may not have a detectable adverse effect.

#### ***Increased vessel activity***

83. If consent was to be granted, vessel movement associated with the dumping activity may increase from about 100-140 trips per year to an estimated 560 trips per year. Increased vessel activity is associated with the increased potential for other events, such as:
- (a) unplanned events; and
  - (b) transport of invasive species.

### ***Unplanned events***

84. Where unplanned events occur (e.g. engine problems or a sudden worsening sea state or weather conditions) the operator of the vessel may decide, due to safety concerns, to dump the load at a location other than the NDA.
85. With an estimated 400-560% increase in the annual number of barge trips, the number of unplanned events can also be assumed to increase, as measured by the number of unplanned event per hours of activity. This could potentially result in the possible dumping of an unknown amount of dredged material outside of the NDA.
86. The application does not discuss the frequency with which unplanned events may be expected, based on industry statistics and CRL's own experience.

### ***Invasive species***

87. The activity has the potential to spread invasive species, both by organisms attached to the hull of vessels and barges used, and from the material dumped at the NDA. The application describes a number of invasive species relevant to the operations. In response to request for advice under section 56 of the EEZ Act, MPI has confirmed the current relevant invasive species of concern for the Auckland region (see appendix 1).
88. In general, adult individuals of the species of concern are expected to either be destroyed during the dredging operations, or if they survive, not be able to establish themselves at the site. The most likely potential for spread is therefore considered to be the release of larvae or propagules. The relevant invasive species have varying number of days that their larvae can survive in the open water column before settling, ranging from less than one day, to several weeks. Appendix D to appendix 4 to the application contains a MetOcean Solutions modelling of the potential spread and beaching of larvae released at the dump site. The results showed that there is, in general, a relatively low probability of beaching, were invasive species were to be released at the site. The application does not, however, discuss the potential for transferring invasive species between source sites, or measures that may mitigate this (e.g. hull cleaning).

### **Conclusion**

89. An increase in the level of activity, as proposed in the application, may also lead to an increase in the frequency of unplanned events, and additional effects, associated with the activity.
90. Depending on dumping operations, the sea state, and water column conditions at the time of dumping, the proposed activity could potentially result in a significant increase in hours with elevated turbidity at the NDA, and that over the lifetime of the consent, if it was to be granted, a larger volume of dispersed sediment could settle beyond the boundary of the NDA. I note, however, that although levels of turbidity may persist for a time after dumping, the plumes are still likely to be transient, and although elevated above background levels may not be above a level harmful to marine life. Furthermore, sediment which is dispersed beyond the NDA and settle there, depending on rate and presence of contaminants in the material, may not have a detectable adverse effect.

91. With increased activity, the number of unplanned events may also be expected to rise. Unplanned events are not directly addressed in the application. The DMC may consider whether to request further information from the applicant, regarding any potential effects unplanned events may have in the environment and/or on existing interests.

## Effects on existing interests

### Introduction

92. The NZDF, has an exercise area which, I understand, in part overlaps with the NDA. Under EEZ900012 CRL informs NZDF of its planned dumping activity, to avoid potential conflicting activity at the NDA. CRL proposes the same approach for this application EEZ100015.
93. Aside from NZDF, CRL has not identified other existing interests which may be affected by the proposed activity. CRL further considers that no parties, during its consultation process, identified existing interests, or activities which require consideration (aside from NZDF).
94. In section 7.3 of the application, the only other lawfully established existing activities in the area are identified as the rights of navigation, and fishing (including customary, recreational and commercial fishing).
95. The application states in section 1.2, that the NDA was initially identified as a potentially suitable dump site due to there, amongst other things listed, being no obvious sites of cultural significance. CRL further notes that it is not aware of circumstances which impact on that original assessment and has not considered this further specifically. Through consultation, however, both for CRL's original MNZ permit 568 (now EEZ900012) and the current application (EEZ100015), a number of iwi were identified as having a strong interest in the area.

### Considerations

96. Consultation carried out by CRL is summarised in section 10 of the application. Consulted iwi, in their responses to CRL, note the significance of the wider area to iwi. Appendix 10 to the application contains the consultation documents and responses received by CRL. These include feedback from the following iwi:
- (a) Ngati Rehua trust, who informs CRL that it is Mana whenua of Aotea;
  - (b) Ngati Maru, who notes that it is currently not opposed to the proposal, but requests a copy of the most recent environmental effect report for the NDA;
  - (c) Manuhiri Kaitiaki Charitable trust, who confirms that it is interested in this consent, and have serious concerns regarding the proposal;
  - (d) Ngai Tai Ki Tamaki, who:
    - (i) confirms that it has interests in the area, and
    - (ii) wants to discuss the activity, its effects, and the monitoring thereof.

(e) Ngaati Whanaunga, who

- (i) considers that CRL fails to recognise that the land below the water is the same as the land above the water and kaitiakitanga is viewed in its entirety for Papatuanuku, and that the NDA is in an area that is culturally significant;
- (ii) considers that use of the NDA to dump dredged material has created a Waahi Tapu and that the NDA therefore needs to be treated as such;
- (iii) believes that more rigorous guidelines and practices in dealing with contaminants are needed; and
- (iv) believes that more needs to be done to reduce or cease the practice of ocean dumping.

97. The term 'existing interest' for the purposes of the EEZ Act, is defined in section 4 of the Act. While there are many interests that fall into the various parts of this definition, there are four main parts of this definition where Māori can have an existing interest. These are by way of:

- (a) a lawfully established existing activity, whether or not authorised by or under an Act or regulations, including rights of access, navigation and fishing, which includes customary fishing;
- (b) settlement of a historical claim under the Treaty of Waitangi Act 1975;
- (c) settlement of a contemporary claim under the Treaty of Waitangi as provided for in an Act, including the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992; and
- (d) a protected customary right or customary marine title recognised under the Marine and Coastal Area (Takutai Moana) Act 2011.

98. The NDA is not located the coastal marine area (CMA); it is in the EEZ. To date, no historic or contemporary Treaty claims settlements overlap with the NDA. Nor have any gazetted rohe moana under the Fisheries (Kaimoana Customary Fishing) Regulations 1998, customary rights or customary marine titles been recognised at the location of the NDA.

99. The application does recognise the existence of customary fishing in the area, but considered this to not be adversely affected, as:

- (a) there are no restrictions on other parties to fish in the area (section 7.3 of the application);
- (b) no parties identified specific fishing right concerns during consultation (section 2.2 of the application);
- (c) fishing boats have not been identified at the NDA or in the immediate area during any past surveys or dumping operations (section 7.4 of the application); and
- (d) lack of habitat conducive to feeding suggest that bottom feeding fin fish are unlikely to inhabit the muddy bottom at the NDA (section 3.6 of the application).

100. The cultural effects of the activity on iwi identified as having an interest in the area has not been assessed by CRL, though a small amount of information is provided in appendix 10 of the application. Without a cultural impact assessment, it may be difficult to determine the extent to which the existing interests of relevant hapū and iwi will be affected. However, I note that a cultural impact assessment is not a statutory requirement under the Act.

101. The views of iwi/Māori may become better known through submissions and this may assist the DMC to better understand this element of existing interests. The DMC may also request advice from the Māori Advisory Committee, under section 56(1)(b), on any matter related to the application.

## Conclusion

102. Where dumped dredged material remains within the boundaries of the NDA, it does not appear to conflict with existing interests as defined in the EEZ Act, beyond that which is highlighted by the applicant. I note, however, that in order to dump at the NDA, in accordance with the proposed activity, an increased frequency of unplanned events may result (e.g. emergency dumping in the CMA) due to the increased level of overall activity. If the DMC is minded to grant consent, it may consider how additional mitigation measures may be imposed to minimise such effects including on existing interests; and the value of requesting further advice on the effects of the application on Māori existing interests.

## Environmental management and monitoring

### Introduction

103. If the DMC is minded to grant consent, conditions of consent should, among other things, provide controls over:

- (a) environmental effects of the activity;
- (b) monitoring and reporting responsibilities for the applicant; and
- (c) unanticipated adverse effects.

104. With respect to the environmental monitoring, it is important that:

- (a) methodologies adapted are able to answer the hypothesis posed (e.g. the assumptions made regarding the effects of the activity);
- (b) samples are of sufficiently size and target the relevant substance and substrates (e.g. analysis on layers that are small enough to appropriately assess unexpected impact early);
- (c) spatial distribution of monitoring sites adequately captures the extent of the effects of the activity;
- (d) the frequencies of monitoring events are appropriate as relates to the scale of the activity; and
- (e) that seasonal variabilities are appropriately considered when setting out the above.

### Considerations

105. Section 8 of the application outlines CRL's proposed environmental management and monitoring for the NDA dump site. This is to a large extent based on the requirements of EEZ900012.

106. CRL's MNZ permit 568, granted under the Maritime Transport Act 1994 (MTA), became deemed marine dumping consent EEZ900012 with the commencement of the D&D regulations in 2015. The permit, and its environmental management and monitoring plan, was therefore granted under a different MMR, not the EEZ Act. That regime also included guidance, referenced in various sections of the now revoked Part 180 under the MTA, which detailed a number of requirements regarding assessment of

dredged material and monitoring of effects, as relating to marine dumping. This guidance was not included in the D&D Regulations, under the EEZ Act.

## Conclusion

107. CRL's proposed environmental management and monitoring approach is to a large extent based on its existing plan, under EEZ900012. This plan, however, was drafted under a different MMR. The DMC, if it is minded to grant consent, needs to consider which matters are required through conditions to adequately monitor the effects of the activity on the environment and existing interests, and to confirm that these are appropriate under the EEZ Act.

## Alternatives to marine dumping of the dredged material

### Introduction

108. In accordance with section 62(1A)(a) of the EEZ Act, the DMC must refuse consent if it considers that the dredged material may be reused, recycled, or treated without causing unreasonable cost, or more than minor adverse effects on human health, or the environment. Under section 62(1A)(c) the DMC must also refuse consent if it considers dumping the dredged material is not the best approach to its disposal in the circumstances.

109. Section 3.10 of the application addresses alternative disposal options for the dredged material, with further details set out in section 5 of appendix 6 to the application. The alternatives to marine dumping addressed in the application, are the disposal in:

- (a) existing and new reclamation projects; and
- (b) landfill, as either waste or cover material.

### Consideration

110. In section 7.2 of the application, CRL notes that no practical opportunities have been identified to re-use, recycle or treat the dredged material. It notes, however, that in the event that future reclamation projects were progressed in Auckland there may be an opportunity for dredged material to be used for such reclamation. At the time of lodgement, CRL was unaware of any consented and planned reclamation works in Auckland that can utilise this dredged material. The application, in section 5 of appendix 6, notes that New Zealand Coastal Policy Statement 2010 states to avoid reclamation in the CMA unless the reclamation provide significant regional or national benefit. The application also notes in section 3.10 that further reclamation is strongly discouraged under the Auckland Unitary Plan. Major reclamation work in the area may therefore be unlikely to progress within the immediate future. I note, however, that no comment is made on the potential for reclamation works outside of Auckland.

111. The potential use of dredged material as cover material, would be a consideration for the DMC under section 62(1A)(a) of the EEZ Act. The DMC also needs to consider, under subsection (c), if dumping of the dredged material is the best approach to its disposal. Consultation carried out as part of the application process for EEZ900012, as summarised in section 3 of appendix C to appendix 4 to the application, indicates that other dredging operations have disposed of dredged material in landfills (section 3.2.4 of the same appendix). The volume disposed of in this manner, however, is not recorded. CRL notes, in section 3.10 of the application, that in order for the landfill to accept dredged material it

has to be dewatered and delivered in a “spadable” form. CRL does not consider landfill disposal a viable option, and a number of technical limitations are listed in section 3.10. These include the need for land area (for drying), and additional discharge consent(s) (including for runoff).

112. Appendix 6 to the application indicates the current cost of disposing material at landfill. No comparison of this cost to the cost of marine dumping is provided. The number of truck trips required for landfill disposal is quoted in section 5.3 of appendix 6, as up to 3,900 truck trips per annum. This would equate to 136,500 trips over a 35 year consent. The application estimates one truck trip to take 3 hours, or 409,500 hours over 35 years to move the total maximum proposed for dumping at the NDA over the 35 year period (i.e. 8,000,000m<sup>3</sup>). It is understood that any required movement of the material to and from confined areas (e.g. for drying) is additional to this, implying that a higher number of truck hours may be required. For comparison, dumping at the NDA, would require between 392,000 hours - 470,400 hours of vessel time (i.e. 560 trips of 20-24hours/ x 35 year). What implications dumping at sea, compared to landfill disposal, would have on emissions of pollutants to air, or on any conventional cost/benefit parameters, are not discussed.

## Conclusion

113. It is unclear what the comparative cost and benefits of alternative disposal of dredged material may be, as compared to the proposed marine dumping. These are matters which the DMC may wish to have clarified in order to establish if sea-based dumping as proposed is the best approach to its disposal in the circumstances.

## Conclusion

114. I have considered CRL’s application, impact assessment, appendices, documents accompanying the application, and MPI’s response to request for advice under section 56 of the EEZ Act. I consider that the key issues associated with the proposed activities are those outlined in this report.
115. If the DMC is minded to seek further information on any of the matters set out in this report, it may:
- (a) direct questions to relevant expert witnesses at any hearing;
  - (b) direct expert conferencing on relevant topics including inviting experts to consider and respond to questions specified by the DMC; and
  - (c) request information under sections 54 and 56 of the EEZ Act being mindful on restrictions as to timing issues for when such information can be requested.

END

## Appendix 1 Documents reviewed for the key issues report

Documents reviewed for the key issues report.

Date	Document Name	Author/ Organisation	Document description
<b>Application documents</b>			
August 2008	Proposal for dredged sediment disposal on the continental shelf in the EEZ: environmental impact assessment	University of Waikato	Environmental Impact assessment, which accompanied the application lodged with MNZ in 2008.
2009	Tidal components of flow at a proposed dredged material disposal site on the continental shelf, northeast New Zealand	University of Waikato	Conference paper, on the tidal flow at the NDA.
2010	Establishment of a Dredged Material Disposal Site in the Exclusive Economic Zone: New Zealand	University of Waikato	Research paper, on establishing the NDA.
30 April 2010	Coastal Resources Limited Request for Information 16th April 2010	Maritime New Zealand	Letter, replying to CRL's request for information, regarding alternative options for dredge material.
23 July 2010	Assessment of alternative options	David Hay	Letter, responding to MNZ's reply of 30 April 2010.
2011	Monitoring a dredged material disposal site on the continental shelf using the dynamic penetrometer Nimrod.	University of Waikato	Conference paper, on the use of dynamic penetrometers to profile small vertical changes in seafloor sediment properties.
February 2011	Post-Disposal Monitoring of the Auckland Marine Disposal Ground	University of Waikato	A collection of reports, on monitoring related to the 2010 test dumping. <b>Note-</b> Report 3 is also included as appendix A to appendix 5 of the application.
July 2011	Review of post-disposal monitoring of the Auckland Marine disposal ground	NIWA	Independent review, of the reports on monitoring related to the 2010 test dumping.
19 October 2011	Application for Dumping Permit – Disposal of Dredge Spoil	Maritime New Zealand	Draft assessment, of CRL's application (lodged in 2008).
2012	Sediment Dispersion at the New Auckland Marine Disposal Ground, Northeast New Zealand	University of Waikato	PhD thesis, by Flaim, on the work done to identify the NDA and test the assumptions associated with the site (e.g. non-dispersive).
1 May 2017	Feedback on proposed methodology for marine dumping consent	EPA	Letter, giving feedback on CRL's methodology.
5 September 2017	Coastal Resources Limited: Consultation for a Replacement Marine Consent	CRL	Documents, for consultation on application EEZ100015.
5 September 2017	Re: Coastal Resources Consultation Document for Disposal Consent	Ngati Rehu Trust	Response, to CRL's draft application consultation.
11 September 2017	Re: Coastal Resources Consultation Document for Disposal Consent	Ngai Tai Ki Tamaki Tribal Trust	Response, to CRL's draft application consultation.
13 September 2017	FW: Coastal Resources Consultation Document for Disposal Consent	Manuhiri Kaitiaki Charitable Trust	Response, to CRL's draft application consultation.
14 September 2017	Re: Coastal Resources Consultation Document for Disposal Consent	Ngati Maru Runanga	Response, to CRL's draft application consultation.

16 September 2017	Re: Coastal Resources Consultation Document for Disposal Consent	Ngati Manuhiri Settlement Trust	Response, to CRL's draft application consultation, including e-mail chain.
29 September 2017	Feedback on the consultation document for the replacement marine consent for the disposal of spoil material.	Auckland Council	Memo, feedback from Auckland Council to CRL on draft application.
20 November 2017	Coastal Resources Limited: Consultation for a Replacement Marine Consent - MPI would like to provide some comments related to biosecurity	Ministry for Primary Industries (MPI)	Response, to CRL's draft application, regarding biosecurity, including e-mail chain.
20 November 2017	Review of Coastal Resources Limited draft marine dumping consent application	EPA	Feedback, on CRL's draft application.
February 2018	Review and Recommendations on the Consultation Document for the replacement Marine Consent for the Disposal of Spoil Material	Ngaati Whanaunga Incorporated Society	Response, to CRL's draft application, including recommendations.
April 2018	Invasive species trajectory modelling	MetOcean Solutions	Trajectory modelling, of invasive species in the Hauraki Gulf.
April 2018	Northern Disposal Area - Physical Oceanography Assessment, Dredged Material Disposal Options and International Deep Water Disposal Sites	Beca	Report, on the physical oceanography at the site. Also include site capacity, disposal options, and reference to international sites.
April 2018	Economic assessment of deep sea dredging disposal in Auckland	Property Economics	Assessment of the potential economic costs and benefits of the proposed activity.
18 May 2018	Northern disposal area – assessment of source material, ecological and sediment quality effects assessment of disposal	Bioresearches	Assessment, including information on the historical context, source site and how material is characterised, site description, and evaluation of potential impact. The appendices of the report include some collected data from the site.
May 2018	Marine Consent to dump application and supporting impact assessment	osbornehay Resource Management Practice	CRL's application. <b>Note</b> - most of the appendices and documents accompanying CRL's application are also listed above.

**Further information received by the EPA**

24 July 2018	Request for advice under section 56 of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 regarding the Coastal Resources Limited Application - EEZ100015	MPI	Assessment of risk of invasive species establishing populations offshore or in coastal areas identified in Appendix 5 of Coastal Resources Limited's application.
6 August 2018	Request for advice under section 56 of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 regarding the Coastal Resources Limited Application - EEZ100015	MPI	Assessment of the significance of invasive species establishing populations in coastal areas identified in Appendix 5 of Coastal Resource's Limited's application.



**Environmental  
Protection Authority**  
Te Mana Rauhi Taiao