

**BEFORE THE EPA
COASTAL RESOURCES LIMITED MARINE CONSENT APPLICATION**

IN THE MATTER of the Exclusive Economic Zone and Continental Shelf
(Environmental Effects) Act 2012

AND

IN THE MATTER of a decision-making committee appointed to consider a
marine consent application made by Coastal Resources
Limited to Dispose of Dredged Marine Sediment at the
Northern Disposal Area

**STATEMENT OF EXPERT EVIDENCE OF DAVID NEILSON HAY FOR
COASTAL RESOURCES LIMITED**

DATED 25 OCTOBER 2018

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MAY IT PLEASE THE COMMITTEE

EXECUTIVE SUMMARY

1. I have been engaged by Coastal Resources Ltd (**CRL**) to prepare this statement of evidence which provides an assessment of CRL's Marine Dumping Application (**Application**) from a planning perspective within the framework of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (**EEZ Act**).
2. CRL is applying for a marine dumping consent to continue offshore disposal of dredged marine sediment at the Northern Disposal Area (**NDA**) and increasing the annual disposal limit from 50,000 m³ to 250,000 m³ per annum (that is, the 12-month period from the date which the consent is given effect to).
3. CRL has engaged a number of witnesses (Mr West, Mr Andrews and Dr Childerhouse) to provide their expert opinion on the effects on the environment of the proposal and where relevant I have drawn on the evidence of these experts and also from the statement prepared by Mr Male for the applicant.
4. I have considered the matters which the Decision-Making Committee (**Committee**) of the Environmental Protection Authority (**EPA**) must consider in making a determination on these applications for consent under sections 10, 59, 60 and 62 of the EEZ Act. I have included as Attachment One an updated set of conditions for the Committee to consider in terms of section 63 of the EEZ Act.
5. I consider that the information available to the Committee is both adequate and sufficiently certain, so that the Committee is not required to favour caution and environmental protection.
6. CRL's witnesses have not identified any significant adverse effects on either the environment or existing interests from the proposed marine dumping apart from the mortality of benthic biota within the impact area. There will be a physical impact on the seafloor and impact on benthic organisms within the defined NDA as a direct result of the disposal and the creation of the spoil mound over time. However, the extent of this impact is very limited spatially and will not impact on any identified significant habitats or values and will not go beyond the boundaries of the NDA.
7. In my opinion and based on the evidence of CRL's other expert witnesses, the proposed continued disposal at the NDA site can be undertaken in a manner that appropriately avoids, remedies or mitigates potential significant adverse effects on the environment apart from the impact on benthic biota within the NDA. This is

achieved through the control of material which is disposed of at the site, the nature and rate of disposal, the location of the NDA and the very limited spatial extent in which disposal can occur.

8. At the current time, the continued use of the NDA for dredged sediment disposal remains the most efficient and effective disposal option for larger scale sediment disposal requirements although it is recognised that smaller volumes of sediment can be disposed of at appropriate landfills and reclamations and in some cases land-based disposal.
9. I conclude, based on the expert evidence and my assessment in terms of the decision-making criteria in Sections 59 and 60 of the EEZ Act, that there is no basis for the application to be declined in terms of s62(2). In my opinion granting the marine dumping consent, with the recommended conditions, would be consistent with the purpose (Section 10) of the EEZ Act.

INTRODUCTION

10. My full name is David Neilson Hay. I am a Planning Consultant/Director with Osborne Hay (North) Limited which is based in Warkworth, Auckland.
11. I hold the qualifications of a Master of Science Degree (with Honours) (1992) in Resource and Environmental Planning from the University of Waikato. I am a full member of the New Zealand Planning Institute.
12. I have practised in the field of environmental planning since October 1991, initially with Works Consultancy Services Ltd then from January 1996 with Manukau Consultants Limited which was purchased in January 2000 by GHD Limited, and since February 2007 in my own practice.
13. Since 1991 I have provided statutory and environmental planning advice to a range of clients for infrastructure and development projects. In particular, I have acted as the Planning Consultant for major subdivisions, quarry developments, educational facilities, religious facilities, roading projects, telecommunication and electrical infrastructure projects, waste-water and stormwater projects and marina related activities.
14. I was the Planning Consultant for CRL for the original dumping permit application to Maritime New Zealand (**MNZ**) in 2008 and have continued to provide planning advice to CRL since the granting of that permit (and subsequent amendments) (deemed marine dumping consent EEZ900012). I led the preparation of the current marine dumping consent application and supporting Impact Statement (**IA**).
15. In preparing this evidence I have reviewed:
 - (a) The Application and the supporting IA (which I was the lead author of and which forms part of my evidence);
 - (b) The EPA's Key Issues Report dated September 2018 (**Key Issues Report**);
 - (c) The EPA Report on the workability of the deemed consent conditions (October 2018);
 - (d) The responses from the Hauraki Gulf Harbour Forum, Department of Conservation (**DoC**), Biosecurity New Zealand, Auckland Council, Waikato District Council, Fisheries New Zealand (**FNZ**) and MNZ to

requests for advice from the Committee under s56 of the EEZ Act.

- (e) The submissions on the Application;
- (f) The further information request letter to CRL from the EPA; and
- (g) The evidence of Coastal Resources Ltd witnesses.

Code of conduct

16. Although this is not a hearing before the Environment Court, I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2014 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this evidence is entirely within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Scope of evidence

17. In this evidence I address the following:
- (a) Overview of the Planning Framework under the EEZ Act for the consideration of the application.
 - (b) My planning assessment of the application within the framework of the EEZ Act. This includes:
 - (i) Confirmation of the information required to be provided in the Application and supporting IA;
 - (ii) A summary of the conclusions in terms of potential effects drawn in the expert witness statements, the IA and advice provided to the Committee in support of the application;
 - (iii) An assessment of the Application against the matters set out in section 59 of the EEZ Act.
 - (c) Matters raised in submissions on the Applications that are within my area of expertise;
 - (d) The recommended conditions of consent; and
 - (e) Assessment against Section 10 (the Purpose) and Section 62 of the EEZ Act.

OVERVIEW OF THE PLANNING FRAMEWORK UNDER THE EEZ ACT

18. The proposal is for the disposal of dredged material within the Exclusive Economic Zone. The Exclusive Economic Zone is administered by the EPA under the EEZ Act.
19. Section 10 outlines the Purpose of the EEZ Act. This is:
 - (1) *The purpose of this Act is—*
 - (a) *to promote the sustainable management of the natural resources of the exclusive economic zone 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.*
 - (2) *In this Act, sustainable management means managing the use, development, and protection of natural resources in a way, or at a rate, that enables people to provide for their economic well-being while—*
 - (a) *sustaining the potential of natural resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
 - (b) *safeguarding the life-supporting capacity of the environment; and*
 - (c) *avoiding, remedying, or mitigating any adverse effects of activities on the environment.*
 - (3) *In order to achieve the purpose, decision-makers must—*
 - (a) *take into account decision-making criteria specified in relation to particular decisions; and*
 - (b) *apply the information principles to the development of regulations under section 27, 29A, 29B, or 29E and the consideration of applications for marine consent.*
20. Section 20G(3) of the EEZ Act provides for dumping at sea if authorised by a marine consent.
21. This proposal is defined as a discretionary activity under section 36 of the EEZ Act and Regulation 33(a) of the Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 as the dumping is not within an “authorised location”. Mr Male in his statement has outlined why none of the five authorised locations around New Zealand can be used for the disposal of the dredged sediment.
22. Sections 38 and 39 of the EEZ Act set out the matters to be covered in the application (including the IA). The Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 also covers other specific matters to be addressed.
23. Section 59 of the EEZ Act covers those matters the consent authority is to

consider when processing the application with section 60 outlining those matters to be considered in deciding the extent of adverse effects on existing interests. Section 62 then sets out the basis for the consent authority to make a decision on an application while s63 outlines the basis and scope on which conditions can be set on any granted consent.

24. As the current consent is not to expire shortly then the provisions of s74 do not apply.
25. My planning assessment steps through the key provisions in sections 38 and 39 then 59, 60 and 62 of the EEZ Act. The recommended conditions in Attachment A can be considered in terms of section 63 of the EEZ Act.

MATTERS TO BE COVERED IN THE APPLICATION

26. Sections 38 and 39 of the EEZ Act set out the matters to be covered in the application and IA. The Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 also covers other specific matters to be addressed.
27. The table in Section 2.1 of the Application and IA, outlines the requirements of Sections 38 and 39 and where this information has been provided. I have provided an updated table below (as it relates to s38 and 39 of the EEZ Act).

Table One: Matters to be Covered in the Application/IA

EEZ Section	Section Addressed in the Application/IA
38(2)(a) (Prescribed form)	Appendix Two
38(2)(B) (Describe the proposal)	3
38(2)(c) (Impact assessment & requirements under regulations)	7 and 7.6
39(1)(a) (Description on proposed activity)	3.5
39(1)(b) (Description of the area)	3.6, 4, 5 and 6
39(1)(c) (Existing interests)	10.1
39(1)(d) (Effects on environment and interests)	7.1
39(1)(e) (Effects on biological diversity)	7.1
39(1)(f) (Effects on rare species)	7.1
39(1)(g) (Consultation undertaken and outcomes)	10.2 and 10.3
39(1)(h) (Written consents)	No written consents were sought.
39(1)(j) (Measures taken to avoid, remedy or mitigate)	7.1, 8 and 9
39(i)(k) (Relevant regulations)	2.3
39(2)(b) (Effects on human health/re-use)	7.2
39(3) (Other matters)	7.5

28. The Committee has sought from the applicant further information on a number of matters. A full response to this request is to be submitted to the Committee by the 25th of October 2018 and this information is also covered in the evidence of the

relevant CRL experts. I have assisted in compiling this response. There were no specific planning questions raised.

29. The following significant new matters or clarification have been provided in either the statement of Mr Male or the evidence of Mr West, Mr Andrews or Dr Childerhouse:

- Proposal Description – Mr Male has provided further description of the disposal method and proposal and has also addressed the risk of unplanned events and provided descriptions of the two unplanned events that have occurred to date.
- Dr Childerhouse has undertaken a review of the application and IA as it relates to marine mammals and has considered and assessed the potential impacts on marine mammals. Dr Childerhouse has addressed this in his evidence.
- Beca has undertaken further modelling of the decent plume and prepared the report “Dredged Material Disposal Study” (October 2018) which has been provided to the Committee as part of the response to the request for information and Mr Andrews has also included this report and addressed it in his evidence.
- Mr West has addressed in his evidence the potential effects on bird life from the proposed activity.
- All experts, apart from Dr Childerhouse, and legal Counsel were involved in a detailed review of the recommended consent conditions which has resulted in changes to the recommended consent conditions with the revised set of conditions included in Attachment A and which I address later in this evidence. This review took account of the recommendations of Dr Childerhouse and outcomes of consultation with Sanford Limited, Cedenco Foods New Zealand Limited, Fisheries Inshore New Zealand and the Department of Conservation.

30. Since the close of submissions, a Cultural Impact Assessment (**CIA**) has been provided by the Ngai Tai Ki Tamaki Trust which I have read. Mr Male has tabled this CIA in his statement. It is my understanding from this CIA that Ngai Tai Ki Tamaki Trust does not oppose the application but recommends that alternative methods to dispose or utilise the dredged material is continued to be investigated (including by the EPA).

31. In respect to section 39(1)(g), since the close of submissions meetings between

CRL and its experts and the following parties have been undertaken and which I attended:

- Sanford Limited, Cedenco Foods New Zealand Limited and Fisheries Inshore New Zealand at a combined meeting on the 3rd of October 2018. There has been further correspondence between the parties since that date on the fisheries data and analysis required, a possible industry liaison condition, biosecurity concerns and mitigation methods to avoid effects on the Black Petrel.
- The Department of Conservation on the 18th of October 2018. This meeting was attended by six Department of Conservation staff and covered a range of matters including possible consent conditions.

32. A meeting with representatives of the Auckland Conservation Board is planned for the 1st of November 2018.

33. Mr Male has also had further discussions with the representatives of Te Taumata Kaumaatua o Ngāti Rehua - Ngātiwai ki Aotea and the holders of the Ngāti Rehua - Ngātiwai ki Aotea Trust Marine Association Coastal Area and the Ngati Manuhiri Settlement Trust. Mr Male has addressed this further consultation in his statement.

34. The meeting with Sanford Limited/Cedenco Foods New Zealand Limited and Fisheries Inshore New Zealand Limited provided the opportunity for information sharing about both the operation of the NDA and fishery interests in this broader area. It also highlighted concerns held by the submitter in terms of biosecurity management generally. The key outcomes of that meeting were:

- CRL was to commission Trident Systems Ltd to define the actual extent of fisheries in the general area of the NDA;
- CRL and the biosecurity advisor to Sanford were to discuss the characterisation testing undertaken and to discuss if it could be further qualified in a consent condition;
- The submitter was to provide CRL the relevant Black Petrel Management Plans they implement on their fisheries fleet in order for CRL to consider if they were appropriate for vessels going to the NDA;
- The submitter was wanting further details from CRL on plume monitoring (and the dispersal of sediment); and
- CRL was to consider further the establishment of a Seafood Industry Group to liaise with.

35. The following actions have since been undertaken:

- Trident Systems Ltd were in the process of being commissioned to undertake the fisheries study when the FNZ response to the Committee request for advice was posted on the EPA website. This FNZ response provided much of the information required on the fisheries in this area. Fisheries Inshore New Zealand has sought some further assessment of the FNZ data and at the time of preparing this evidence this was being undertaken by Trident Systems Ltd.
 - An initial discussion was held between Mr West and the Sanford Biosecurity advisor. This discussion was not progressed further as Sanford were seeking that CRL commission the advisor to Sanford to provide independent expert advice to CRL.
 - Fisheries Inshore New Zealand provided information they use for the management of risk associated with sea birds.
 - Further modelling of the plume has been undertaken by Beca (as attached to Mr Andrew's evidence) and at the time of preparing this evidence this report was being finalised and will be provided to Sanford Limited/Cedenco Foods New Zealand Limited/Fisheries Inshore New Zealand.
 - A draft condition for a liaison group was provided to Sanford Limited/Cedenco Foods New Zealand Limited/Fisheries Inshore New Zealand and an amended version has been included in the recommended conditions in Attachment A.
36. The meeting with DoC staff provided an opportunity for sharing of information and clarification on a number of points relating to both the application and the DoC submission. A review of the recommended conditions was subsequently undertaken in light of a range of issues or clarification points raised by DoC. In particular, photographic recording for the benthic monitoring, a new condition relating to referencing all documentation which make up the application and clarification of the monitoring locations have been included in the revised recommended conditions.
37. In terms of section 39(1)(i), Mr Male in his evidence has provided further information of alternative options. I am unaware of any other alternative options which have been identified since the application was lodged apart from a small-scale reclamation at Westhaven Marina which is currently progressing through the resource consent process and the land-based disposal option being used for the very recently commenced dredging of the Mahurangi River.
38. I have read the various responses to the requests for advice from the Committee.

In particular the FNZ response provided detailed information about the potential effect on fisheries in the NDA. This response notes:

“The NDA is a relatively small area within a widespread and relatively low biodiversity benthic habitat. Due to this low biodiversity this habitat is only likely to support low densities of benthic or transient pelagic fish of interest to fisheries. These fish can generally avoid any dumping disturbance so any effect on fish is likely indirect through limiting available food, but is likely to be practically either scientifically undetectable or, if detectable, ecologically very small. The subsequent impact on fisheries is therefore likely to be even smaller and more difficult to detect.”

39. In respect to other responses, no additional information has been provided which is contrary to the information provided in the IA or which may materially change the findings in the IA.
40. The response from the Hauraki Gulf Forum includes a statement to an earlier resource consent hearing by Councillor Lee. I am aware of that statement from the earlier Pine Harbour Hearing in I was involved as the Planning Consultant for the applicant. This statement provides further detail on the history of dredged sediment disposal in Auckland and the desire to stop dredged spoil disposal within the territorial boundaries of the then Auckland Regional Council.
41. I am unaware of any actions taken since that time by either the former Auckland Regional Council or Auckland Council in identifying suitable alternative locations, including land-based disposal options, for sediment dredged within Auckland.
42. I have read the EPA Officers report on the Workability of the Deemed Consent Conditions. I have found this report useful in terms of better refining responsibilities and have addressed this further later in this evidence when I address recommended conditions.
43. The further advice received from FNZ and Biosecurity New Zealand in particular provide further detail which is helpful in terms of further assessing potential effects.
44. In terms of section 61(5), I consider that given the scale of the proposal and the potential effects the best available information has been provided. The information provided has identified the known and potential effects on the environment. To provide further analysis on, for example, the potential effects on marine mammals would take significant more monitoring and investigation (with a

corresponding cost) when the actual risk has been determined as very low or low. No significant effects beyond the NDA boundary have been identified which in my opinion warrant further detailed investigation.

45. I consider that the information available to the Committee is both adequate and sufficiently certain, so that the Committee is not required to favour caution and environmental protection.

46. In the event that the Committee considers that a precautionary approach needs to be taken then this does not over-ride the ability to grant consent. The EEZ Act provides for this proposal as a discretionary activity and provides for the ability for such activities to be controlled by conditions of consent. A range of conditions have been recommended that will in my opinion appropriately control and manage the actual and potential effects of the activity and will involve monitoring and reporting on the effects of that activity to ensure compliance.

SUMMARY OF CONCLUSIONS DRAWN IN EXPERT WITNESS STATEMENTS, THE IA AND FROM ADVICE RECEIVED TO COMMITTEE REQUESTS FOR ADVICE

47. The following table summarises the identified potential effects of the proposal.

Environmental Matter	Key Findings
Contamination Risk	<p>Chemical characterisation testing of spoil source sites is undertaken prior to the disposal at the NDA of that sediment. Mr West in his evidence has outlined this characterisation process. The characterisation results are provided to the EPA.</p> <p>All likely contaminants of concern have been identified, and exceedance of any Interim Sediment Quality Guideline – Low (“ISQG-L”) value in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 for any of those contaminants, at any of the NDA monitoring sites is not permitted.</p> <p>A condition on the requirement for chemical characterisation testing is included as a recommended condition of consent with the characterisation methodology included as a schedule to the recommended conditions of consent.</p>
Biosecurity Risk	<p>Biosecurity New Zealand has provided advice to the Committee on the biosecurity risk and Mr West has confirmed he is in agreement with that advice. Their common view is that there are limited non-indigenous species of concern, and the likelihood of those species establishing at the NDA, or dispersing from the NDA to the coastal zone, is negligible.</p> <p>Biosecurity characterisation testing is undertaken of spoil source sites and the results of this testing provided to MPI prior to the disposal of material. MPI in its regulatory role can take steps to manage the biosecurity risk if it considers there is a biosecurity threat. Mr West in his evidence has outlined this characterisation process.</p> <p>A condition on the requirement for biosecurity characterisation testing is included as a recommended condition of consent with the characterisation methodology included as a schedule</p>

	<p>to the recommended conditions of consent.</p> <p>The biosecurity risk from vessels visiting the site is no greater than other vessels traversing this area. Vessels using the NDA are expected to follow the MPI Clean-Hull requirements and this is now stipulated in a recommended consent condition.</p>
<p>Impacts on Benthic Ecology</p>	<p>Mr West in his evidence describes the current benthic biota at the NDA and notes that over 130 taxa have been identified in the 152 samples collected to date.</p> <p>Within the impact area in the NDA, biota living on the seabed will be impacted via burial or smothering. Significant mortality of individuals occurs at the disposal centre site as a result of this. Mr West has assessed that this high mortality zone was limited to less than 500m from the disposal centre following disposal of 150,000m³. His evidence is that there will be no material effect on benthic ecology beyond the NDA boundary. A condition requiring monitoring of benthic ecology at the NDA boundary is included in the recommended consent conditions.</p>
<p>Impacts on Fin Fish and Fisheries</p>	<p>Mr West in his evidence has identified that pelagic fish are expected to use the NDA area and concludes that the proposal is not expected to result in significant effects to fish within and beyond the NDA boundary.</p> <p>The issue of the impact on fisheries has been addressed in the FNZ response to the advice request from the Committee. This advice states:</p> <p><i>“The NDA is a relatively small area within a widespread and relatively low biodiversity benthic habitat. Due to this low biodiversity this habitat is only likely to support low densities of benthic or transient pelagic fish of interest to fisheries. These fish can generally avoid any dumping disturbance so any effect on fish is likely indirect through limiting available food, but is likely to be practically either scientifically undetectable or, if detectable, ecologically very small. The subsequent impact on fisheries is therefore likely to be even smaller and more difficult to detect.”</i></p>

<p>Impacts on Seabirds</p>	<p>Mr West in his evidence has outlined that the NDA is expected to be in the habitat range of some 34 species of seabird, the majority of which are only expected to interact with the top few meters of the water column. Mr West has concluded that the cumulative effects (ie general combined overall disruption) on coastal and pelagic birds and their habitats will be less than minor, especially in the context of existing conditions and activities, and the proposed mitigation.</p> <p>A specific light control conditions for vessels associated with the disposal activity is proposed to further minimise the risk of bird strike caused by boat lighting.</p>
<p>Impacts on Marine Mammals</p>	<p>Dr Childerhouse in his evidence considers that it is unlikely that the NDA represents an important area for any marine mammal species. Dr Childerhouse has considered potential effects from contamination, the sedimentation plum, disposal onto a mammal, noise and vessel strike and concludes that the proposal poses a very low or low risk to marine mammals.</p> <p>He supports the proposed conditions of consent on marine mammal detection and reporting as a proportionate response to the risk.</p>
<p>Hydrodynamics and Water Quality – Turbidity Effects</p>	<p>Upon being released from the barge, the marine sediment material behaves as a dense fluid like jet as it descends through the water column after release from the barge. This takes about 52 to 60 seconds and up to 180 seconds for this phase to be completed.</p> <p>During this process a proportion of the sediment is stripped whereby it comes detached from the descending volume and is then subject to transport by the tidal forcing at the time of disposal. This stripped material has the potential to be transported until it eventually is deposited on the seabed. Due to the low fall velocities the potential footprint can be large, albeit the resulting concentrations/deposition height is very low. This has been addressed in the evidence of Mr Andrews.</p> <p>Mr Andrews evidence is that on average 92-95% of the</p>

	<p>discharge material will deposit inside the NDA, and the remaining 5-8% outside of the NDA. Near field modelling and site observations confirm that the majority of the material is deposited near the initial dump location within a 250m radius (500m width). Potential deposition depths at the NDA boundary from density driven currents and from deposition of stripped sediment will be up to 6-7mm per annum (based on the maximum deposition of 250,000m³). This is a conservative figure due to current direction variability at the NDA.</p> <p>The disposal will result in temporary increased turbidity via increased suspended solids at the disposal point and time. Water quality testing of the plumes was conducted by Flaim 2012 which showed visual plumes (i.e. concentrations <15 mg/l) of increased suspended solids at the surface did not cross the NDA boundary. The 2018 modelling undertaken by Beca and addressed by Mr Andrew's has confirmed this, however the modelling showed some subsurface plumes of elevated suspended solids may cross the NDA boundary.</p> <p>Mr West has confirmed the disposal of marine sediments at the NDA is not expected to have significant adverse effects on water quality beyond the NDA boundary, and only short term intermittent limited local effects within 800m of the disposal point.</p>
<p>Movement of the Disposal Mound</p>	<p>Monitoring to date has identified the mound being formed and confirmed that it is not migrating (i.e. there is no detectable re-suspension of deposited material). The footprint of the mound will continue to grow as disposal continues over the proposed grid pattern.</p> <p>Mr Andrew's in his evidence has confirmed that the mound height will be up to 5m after 35 years (based on the maximum disposal volume) and due to the retentive characteristics of the deep water site, the placed sediment will be retained in the NDA.</p> <p>The mound footprint is not expected to traverse the NDA</p>

	<p>boundary and a recommended condition now stipulates that traversing of the NDA boundary by the mound is not permitted. A condition requiring the monitoring of the extent of this mound is also proposed and this will provide confirmation of its location in relation to the NDA boundary.</p>
Visual and Landscape Effects	<p>The potential visual and landscape effects were addressed in the IA. Given the very low risk of such effects no expert evidence has been given on visual and landscape effects.</p> <p>The mound cannot be observed above the sea surface and it would be extremely unlikely that recreational diving would be occurring in this area.</p> <p>Owing to the distance from land, the actual disposal operation (including the plume from disposal) is not visible from Great Barrier or Cuvier Islands.</p> <p>The plume created during the disposal process is limited in size and is temporary in nature. It could only be observed by any boats in the immediate vicinity or by a low-flying plane crossing the site immediately after disposal. Given the location of the disposal site, the infrequent nature of disposal occurring, the lack of recreational activities occurring in this area and the temporary nature of the plume, the risk it would be observed by any other party is very low.</p>
Economic Impacts	<p>The continued use of the NDA is required as at the current time there is no practical alternative site for the disposal of large volumes of dredged sediment from Auckland in particular. Dredging of marine infrastructure such as ports and marinas is critical in order for that infrastructure to continue to operate effectively. Disposal of the dredged sediment is a necessary component of the dredging operation.</p> <p>An Economic Assessment was provided in the IA.</p> <p>Mr Male has confirmed in his statement that the continued disposal of dredged spoil and the operation of the NDA remains economic.</p>
Impact on	<p>No impacts on recreational uses have been identified. Owing</p>

Recreational Uses	<p>to the location of the site, the recreation potential of the immediate area is very limited although it is expected that recreational boaters would occasionally traverse the site. This activity is not affected by the proposal.</p> <p>Mr Andrew's has concluded that the risk of any impact on the surf breaks at Great Barrier Island is negligible.</p>
Impact on other Existing Users	<p>The NZDF occasionally use the general area. There is an established communication line with NZDF to ensure there is no conflict of use at this site. The timing of disposal at the NDA can be modified to avoid times when NZDF vessels are operating in the immediate area, and the recommended conditions include a condition to achieve this.</p> <p>The potential impact on fisheries has been considered above and is considered to be very low.</p> <p>CRL is a current user of the NDA but the existing marine dumping consent will be surrendered immediately upon the new marine dumping consent being given effect to and a condition of consent requiring this surrender has been recommended.</p>
Effects on Human Health	<p>The only potential for human health contact is by fish feeding on the seabed at the disposal site being caught and consumed. The low numbers of fish present and the remote location of the site combine to make the risk of human health contact almost zero.</p>
Site Capacity	<p>The NDA has sufficient volumetric capacity for the spoil at the maximum annual volume being sought.</p>
Risk of Unplanned Events	<p>Mr Male has addressed in his statement the risk from unplanned events. This risk is very low, with just two loads having to be disposed of to date on the trip to the NDA, with both cases being due to mechanical failures rather than weather or oceanographic conditions.</p>
Cumulative Effects	<p>An increased volume of disposal will result in a faster growth of the mound footprint, with the corresponding effect on benthic biota. However, the effects on benthic biota beyond the NDA boundary is considered to be negligible.</p>

	<p>The potential cumulative effect on water turbidity has been addressed through a recommended condition limiting disposal to two disposals per 24-hour period and a minimum of 1 hour between disposals. The current consent does not include such controls.</p> <p>The increase in vessel movements does increase the risk of marine mammal strike but this is still considered to be very low and this is addressed in the evidence of Dr Childerhouse.</p>
Cultural Values	<p>It is recognised that the disposal of sediment within the marine environment is generally not supported by iwi. As outlined in the CIA prepared by Ngai Tai Ki Tamaki Trust there is strong support for the investigation of an alternative solution in Auckland but Ngai Tai have concluded in their CIA that they do not oppose this current application.</p>

48. In summary, the on-going disposal in the NDA will cause significant mortality of benthic biota within the impact area as a result of smothering and/or burial. This effect cannot be avoided but is contained to within the NDA site. To date no effects at the NDA boundary on benthic biota from the disposal operation has been identified. The significance of this effect needs to be considered in the context of the very small area being affected and the area being affected has not been identified as having any special or significant ecological value.
49. Very short term and spatially limited turbidity effects arise immediately after the disposal and a small percentage of material remains suspended in the water and can be dispersed over a distance of up to approximately 15km.
50. Overall, beyond the NDA no potential significant adverse effects have been identified.

CONSIDERATION OF MATTERS IN SECTION 59 EEZ ACT

51. Section 59 of the EEZ Act outlines those matters which the Committee are to consider. I now address the various clauses of this section (provided in italics).

2(a) Any effects on the environment or existing interests of allowing the activity, including–

(i) cumulative effects; and

(ii) effects that may occur in New Zealand or in the waters above or beyond the continental shelf beyond the outer limits of the exclusive economic zone.

52. A range of potential effects are addressed in the IA and in the evidence of Mr West, Mr Andrews and Dr Childerhouse which I have summarised in the previous section of my evidence. It has been concluded that any potential effects on the environment will not be significant (apart from the effects on benthic biota within the NDA) and any such effects are limited spatially and/or temporal in nature.

53. In terms of cumulative effects, it is possible that up to two disposals from different vessels may occur within a 24-hour period but provided the time between disposals exceeds 1 hour (the time required for turbidity to return to background levels) it is not anticipated that there will be any short-term cumulative effects.

54. The NDA is likely to continue to be the main site for the disposal of dredged marine sediment from the Auckland Region including from a number of marinas and potentially the Ports of Auckland, and also possibly from marinas in the Waikato Region. Dredged marine sediment may also come from network utility projects within the coastal marine area. The maintenance dredging of most marinas in Auckland will continue to be required.

55. This dredging is a critical component of keeping established infrastructure operational. Such infrastructure is considered important for the social and economic well-being of the community. For dredging to be undertaken there has to be a legal, practical and efficient method and location for dredging spoil disposal, which NDA can continue to be.

56. Section 60 of the EEZ Act provides direction on considering the extent of adverse effects on existing interests. I consider these provisions appear to contemplate both the overlapping of uses in the exclusive economic zone by different interests, and also the need for exclusivity in carrying out activities in some circumstances. In this case, no exclusivity for the use of this area is being sought. This is different from a situation where a permanent structure is occupying part of the EEZ or for health and safety reasons there needs to be a permanent exclusion of parties from part of the area.

57. No existing interests which may be affected by allowing the activity were identified at the time of preparing the IA except the intermittent use of the area by the New Zealand Defence Force (**NZDF**). There is an existing process to advise the NZDF of when disposal operations are planned and NZDF can advise CRL if there are periods when the NDA cannot be used. To date there has only been one instance of a potential conflict of timing. I understand that CRL proposes to continue the current NZDF notification process regardless of whether it is a consent condition or not.
58. Sanford Limited, Cedenco Foods New Zealand Limited and Fisheries Inshore New Zealand Ltd identified that they or their members have an existing interest. I have outlined in the previous section of this evidence the outcomes of the meeting with these submitters and the subsequent information obtained to address their questions.
59. The FNZ response to the advice sought from the Committee outlines in detail the known fisheries in this area. This response has concluded that the impact on fish is likely to be either scientifically undetectable or, if detectable, ecologically very small, and *“The subsequent impact on fisheries is therefore likely to be even smaller and more difficult to detect.”*
60. Various iwi representatives in their submissions have stated that they have existing interests in this area.
61. It is not within my area of expertise to confirm which parties have a further interest in the area (ie as tangata or mana whenua) or are representatives of iwi who have an interest in the area. As outlined in the previous section, a CIA has since been obtained from Ngai Tai Ki Tamaki Trust and Mr Male is currently in direct discussions with the representatives of Te Taumata Kaumaatua o Ngāti Rehua - Ngātiwai ki Aotea and the holders of the Ngāti Rehua - Ngātiwai ki Aotea Trust Marine Association Coastal Area (MACA) and the Ngati Manuhiri Settlement Trust.
62. My understanding is that if iwi interests derive from Treaty settlements or recognition of proceedings under Marine and Coastal Area (Takutai Moana) Act 2011 then such interests might not constitute existing interests unless they are interests in an “existing activity” (though they may be taken into account under section 59(2)(m) if the Committee considers they are relevant and reasonably necessary to its decision).
63. The only lawfully established existing activities (apart from the currently consented disposal and the occasional use of the NDA by the NZDF) that have been identified in relation to the NDA are rights of navigation and fishing

(including customary, recreational and commercial fishing). The proposal does not result in restrictions on any party navigating or fishing through this area and nor does this activity appear to be having any effect on the NDA.

64. I also consider some care must be taken not to 'double count' effects by reference to a cultural dimension, given the purpose of the EEZ Act (unlike the Resource Management Act 1991) does not include cultural considerations.

2(b) *The effects on the environment or existing interests of other activities undertaken in the area covered by the application or in its vicinity, including*

(i) *the effects of activities that are not regulated under this Act; and*

(ii) *effects that may occur in New Zealand or in the waters above or beyond the continental shelf beyond the outer limits of the exclusive economic zone.*

65. There is very little known other activity undertaken in the NDA. Rights of navigation and fishing may be exercised, but there is little evidence of either, and no potential adverse effects on the NDA from other activities (apart from the existing consented disposal) have been identified.

66. I am unaware of any effects on the NDA and wider area from the occasional use by NZDF.

2(d) *The importance of protecting the biological diversity and integrity of marine species, ecosystems, and processes.*

67. The ecology of the NDA has been addressed in detail in the IA and the evidence of Mr West and the following is a summary of that description.

68. The NDA sits within the continental shelf, which extends out to 60 km east from Great Barrier Island. Sea floor relief of the shelf is relatively uniform, except for small areas of basement outcrop and isolated rock pinnacles, which occur 16 km south and 20 km north west of the disposal area according to the marina chart. The Northern Disposal Area ranges in depth from approximately 130 m to 140 m and is characterised by sandy muddy sediments. Within the NDA, the seabed contains biota (benthic biota) that live within and on the surface of the sediment. In the water column above, there are likely to be fish and marine mammals that are transient, i.e. not present all the time and able to move in and out of the disposal area. In addition, seabirds may interact with the surface waters of the Northern Disposal Area.

69. In terms of benthic biota there have been over 130 taxa recorded from monitoring to date including foraminifera, polychaete worms, nemertean, platyhelminthes, sipunculid worms, molluscs, amphipods, isopods, decapods, cumaceans, mysids, ostracods, tanaids, anthozoa, ophiuroids, echinoids, sponges and ascidians. The biota is generally numerically dominated by foraminifera.

70. In terms of marine mammals, the continental shelf in region east of Great Barrier Island is used by a number of whale species including Bryde's whale, Humpback whale, Fin whale and Blue whale. Of these species only the Bryde's whale is present year-round. The other species are only seasonal as they pass through the area on migration to and from breeding grounds. The evidence of Mr Childerhouse provides more details on the species likely to be occasionally present.
71. Despite the lack of specific data on the composition and abundance of fishes present in the disposal area, pelagic fish are expected to use the area.
72. The NDA has been identified in the habitat range of some 34 species of seabird (which Mr West lists in his evidence). The majority of these birds only interact with the top few metres of the water column. Penguins are the only species capable of diving to depths greater than 30m.
73. On the continental shelf in this region, it has been reported that Scleractinia (solitary stony coral) may be present. Scleractinia corals are typically found in water depths greater than 200 m, often associated more with elevated features such as seamounts or ridges. Scleractinia either alive or dead have not been recorded in the study area as part of either the predisposal studies (2009 to 2010) or the post disposal monitoring studies (2013 to 2018) and this is addressed further in the evidence of Mr West.
74. The disposal area is typical of large areas of the continental shelf in this region of New Zealand. Studies to date have shown that the disposal area does not contain any known vulnerable ecosystems or habitats of threatened benthic species. Despite some species such as seabirds, whales and dolphins being classed as threatened, they are not considered to be affected by the disposition of material on the seabed, but are likely to avoid the disposal activity for the very short periods of the disposal events. The area is not known to be used for breeding activity by marine mammals.
75. As outlined in the evidence of Mr West, biodiversity within and beyond the disposal area has not been impacted by the disposal activity to date. No sensitive species or ecosystems have been encountered in the disposal area nor are expected to occur in the nearby environment.
- 2(e) *The importance of protection rare and vulnerable ecosystems and the habitats of threatened species.*
76. As I have outlined above studies to date have shown that the disposal area does not contain any known vulnerable ecosystems or habitats of threatened benthic species. Despite some species such as seabirds, whales and dolphins being

classed as threatened, they are not considered to be affected by the disposition of material on the seabed, but are likely to avoid the disposal activity for the very short periods of the disposal events.

77. The area is not known to be used for breeding activity by marine mammals. In terms of marine mammals, Dr Childerhouse has confirmed in his evidence:

“Based on my review of the Application, associated Appendices and other material, I consider that the proposed operation poses a very low or low risk to marine mammals from the impacts identified. The proposed mitigation and Conditions are appropriate to the level of risk proposed by the operation although I have made some suggestions for increased reporting.”

2(h) *The nature and effect of other marine management regimes.*

78. Section 7 of the EEZ lists the range of marine management regimes which require consideration and I now address these.

Biosecurity Act 1993

79. Biosecurity risks are addressed above under paragraph 46. Neither MPI nor Mr West consider there is a biosecurity risk at the NDA.
80. I understand biosecurity risks are within the jurisdiction of MPI, and under the Biosecurity Act MPI’s jurisdiction covers both the territorial waters and the EEZ. MPI considers there are limited biosecurity risks, of which the most significant is the potential to spread invasive pests through biofouling. The condition I have recommended to require vessel operators to comply with MPI ‘clean hull’ standards will mitigate those risks. It is also a recommended condition that CRL provide to MPI biosecurity characterisation of every source site before material dredged from that site is disposed of at the NDA. This will enable MPI to consider whether any additional steps to manage biosecurity issues may be warranted.

Continental Shelf Act 1964

81. This is not relevant as the application is not for exploration or exploitation.

Crown Minerals Act 1991

82. This is not relevant as the proposal is not for the mining or take of mineral resources.

Defence Act 1990

83. The site is within an extensive submarine exercise area. The NZDF is consulted prior to disposal periods to seek confirmation that there are no operations in

progress which may be affected by the dumping operation. It is intended that this consultation will continue and this is a recommended condition of consent.

Fiordland (Te Moana o Atawhenua) Marine Management Act 2005

84. Not relevant.

Fisheries Act 1996

85. This area is used on occasions for fishing but the rate of fishing is low and any effects on fisheries is considered to be negligible.

Hauraki Gulf Marine Park Act 2000

86. The NDA is located outside the Hauraki Gulf Marine Park Act. It is possible that on occasions some suspended sediment enters the Marine Park but based on the evidence of Mr Andrew's the volumes are so low that any potential effects are negligible.

Kaikōura (Te Tai o Marokura) Marine Management Act 2014

87. This is not relevant as the NDA is not located in this location.

Marine and Coastal Area (Takutai Moana) Act 2011

88. The NDA is outside the territorial sea (ie beyond 12 nautical miles from shore) and therefore this Act does not apply.

Marine Mammals Protection Act 1978

89. It is considered that the proposal is not contrary to nor in contravention of the Marine Mammals Protection Act 1978. Dr Childerhouse has addressed marine mammals in his evidence.

Marine Reserves Act 1971

90. This is not relevant as the NDA is not within or located in close locality to any Marine Reserves.

Maritime Transport Act 1994

91. All vessels used for the disposal operation are regulated under the Maritime Transport Act 1994. The management and regulation of vessels using the disposal area does not require to be further regulated in terms of the consent and this is addressed further by Mr Male.

Resource Management Act 1991

92. This Act is not relevant as the NDA is outside that territorial area covered by this Act. It is possible that on occasions some suspended sediment enters the

Auckland region territorial waters but based on the evidence of Mr Andrew's the volumes are so low that any potential effects are negligible.

Submarine Cables and Pipelines Protection Act 1996

93. This Act is not relevant as there are no cables or pipelines within or close to the NDA.

Wildlife Act 1953

94. The Wildlife Act 1953 deals with the protection and control of wild animals and birds and the management of game. This has been addressed in the evidence of Mr West

95. In summary, I have not identified any significant issues arising in respect to the relevant provisions in the 'other marine management regimes' identified.

2(j) The extent to which imposing conditions under section 63 might avoid, remedy, or mitigate the adverse effects of the activity;

96. The application included a number of recommended consent conditions and having taken into account both the EPA report on the workability of the existing deemed consent conditions and outcomes of consultation an updated set of conditions is included in Attachment A.

97. Of particular importance is proposed recommended condition 5 which outlines the environmental parameters at the NDA which are not to be exceeded so that adverse environmental effects are limited to within the NDA.

2(k) Relevant regulations (other than EEZ Policy Statements)

98. The Exclusive Economic Zone and Continental Shelf (Environmental Effects—Discharge and Dumping) Regulations 2015 and in particular Regulation 36 is to be considered. These matters are also covered by s59 and I have addressed them in my assessment under s59 later in this evidence.

2(l) Any other applicable law (other than EEZ Policy Statements)

99. The operation of vessels to and from the disposal area in terms of the Health and Safety at Work Act 2015 will be the responsibility of the vessel operator.

100. All vessels used for the disposal operation are regulated under the Maritime Transport Act 1994. This has been addressed in the statement of Mr Male.

2(m) Any other matter the marine consent authority considers relevant and reasonably necessary to determine the application.

101. On the 1st of October 2018 a request for further information under section 54 of the EEZ Act was received. Those questions have been answered, where

possible, in the statement of Mr Male and the evidence of Mr West, Mr Andrews and Dr Childerhouse. There were no specific planning related questions which I need to respond to in this evidence.

102. On the present information available from iwi submitters about cultural interests, I consider this provision is the appropriate heading under which cultural interests could be taken into account. As I have outlined earlier, a CIA has been prepared by Ngai Tai Ki Tamaki Trust and is attached to the evidence of Mr Male.

Section 59 Matters for the Marine Consent Authority's Consideration.

103. I have already considered those matters requiring consideration under s59(2B)(a) above. I now address the residual matters requiring consideration by the Committee under (b), (c) and (d).

S59(2B)(b) The effects on human health of the dumping of waste or other matter, or the abandonment of the pipeline if consent is granted.

104. The site is approximately 25 km from Great Barrier Island and 22 km from Cuvier Island and has minimal if any recreational use. During site surveys or disposal periods, no commercial or recreational fishing boats have been identified either in the NDA or in the immediate area, although it can be expected that boats (including recreational fishing boats) will traverse through the area from time to time. DoC in their response to an advice request from the Committee did not identify any marine mammal watching licences specific to this area.

105. The environmental effects observed to date (and expected in the future) do not present a risk to human health. Adverse environmental effects have been minimal and there is little or no linkage between the disposal site seabed and human health contact. The only potential for human health contact could be by fish feeding on the seabed at the disposal site being caught and consumed. The low numbers of fish present and the remote location of the site combine to make the risk of human health contact almost zero.

Section 59(2B)(c) Any alternative methods of disposal of the waste, other matter, or pipeline that could be used.

106. Section 2 of the Beca Assessment (Appendix Four to the IA) provides a summary of the historical context of the disposal of dredged material in Auckland. The requirement for a new deep-sea disposal site for Auckland was identified as long ago as 1993 in the findings of the Disposal Options Advisory Group (“DOAG”). In 2007, CRL in conjunction with the University of Waikato identified then investigated a possible new disposal site with CRL obtaining consent for marine dumping in the NDA in 2013.

107. DOAG identified a number of disposal options. Apart from reclamation and

marine disposal in water deeper than 100m, no other options were considered applicable. The other options considered were beach nourishment, habitat enhancement or creation, disposal to sanitary landfill, commercial and industrial applications, solid landfill, disposal to Lake Pupuke and forestry applications.

108. Mr Male in his statement has addressed the issue of alternative options and I now expand on this in respect to the use of dredged spoil in reclamations.
109. The approach to disposal of dredged spoil in Auckland has been somewhat different to other parts of New Zealand given the environmental, social and cultural sensitivity of the Hauraki Gulf. An option which has been raised in the past and which a number of submitters identify is the use of the dredged spoil in reclamations. The use of dredged spoil in reclamations could be considered either as a re-use or recycling of the material. Any such use of the dredged spoil in a reclamation is likely to be in the form of mudcrete.
110. The Auckland Unitary Plan Operative in Part (AUPOP) provides strong direction in respect to coastal reclamation. The Regional Policy Statement Policy B8.3.2(9) states:
 - (9) *Avoid reclamation of land in the coastal marine area unless all of the following apply:*
 - (a) *land outside the coastal marine area is not available for the proposed activity;*
 - (b) *the activity which requires reclamation can only occur in or adjacent to the coastal marine area;*
 - (c) *there are no practicable alternative methods of providing for the activity; and*
 - (d) *the reclamation will provide significant regional or national benefit.*
111. This is then supported in the Regional Coastal Plan (which forms part of the AUPOP) by Objectives F2.2.2.1 and F2.2.2.2 which states:

Objective F2.2.2.

 - (1) *The adverse environmental effects of reclamation, drainage or declamation on the coastal marine area are avoided, remedied, or mitigated.*
 - (2) *The natural character, ecological values and natural coastal processes of the coastal marine area are not adversely affected by inappropriate reclamation, drainage or declamation.*
112. Although the construction of reclamations is not prohibited in Auckland and can be consented, the tests set in the RPS policy and supporting Objective F2.2.2 are high. In particular, the requirement to prove there is no practicable alternative and that the reclamation will provide significant regional or national benefits. Disposal at sea will be one practicable alternative which would require consideration.
113. These objectives (and their supporting policies) have been specifically included

in the AUPOP to reflect that reclamations in Auckland are now generally not acceptable in terms of potential effects on the coastal marine area and environment.

114. This is not a new approach within Auckland and reflects the contentious history of reclamations in Auckland. The investigation for a new deep-sea disposal site by CRL commencing in 2007 reflected that there was a significant risk in Auckland that future disposal of dredged spoil by its use in reclamations or in near shore disposal sites would likely cease or be significantly reduced in the near future and the Auckland Explosives Dumping Group would not be an option and this has since eventuated.
115. In my opinion (and taking account of the DOAG findings, the statement of Mr Male and the assessment of alternatives undertaken in the IA), the disposal of larger volumes of dredged marine sediment at the NDA remains the best industry practice in Auckland if consented reclamations cannot be used and there is not an immediately adjoining land-based disposal area such as farmland. The increasing demand for disposal of dredged marine sediment at the NDA reflects that the use of the NDA is considered a practical and efficient option in Auckland. This is further reinforced by the observation that no other parties have sought consents (either under the Resource Management Act 1991 or the EEZ Act) for alternative disposal sites to service Auckland in recent years as an alternative to the use of the NDA.
116. I am aware of a single larger reclamation proposal in Auckland (Westhaven Marina) which will be about 70,000m³ in volume. This reclamation is currently proceeding through the resource consent process.
117. I am also aware that the recently commenced dredging of the Mahurangi River will dispose of approximately 120,000m³ of dredged material over a number of years (funding dependant) on adjoining farm land. Although I do not know the economics of this project, it is likely that in this case where there was suitable immediately adjoining farm land that the disposal of the dredged material directly onto adjoining land was both consentable and more economic than disposal at the NDA and therefore why it has been pursued.
118. I recognise that reclamation within the Waikato Region may be an option for dredged spoil from the Waikato. However, in the event that such an opportunity arose then it an economic question arises for the party undertaking the dredging whether to dispose of at the consented reclamation or at the NDA. It is reasonable to expect that if the cost for disposal at the consented reclamation was cheaper then that is the option which would be pursued.

Section 59(2B)(d) Whether there are practical opportunities to re-use, recycle, or treat the waste, other matter, or pipeline

119. No practical opportunities for the re-use of the marine sediment have been identified. With the cessation of reclamation at the Ports of Auckland and with no other large-scale reclamation projects currently planned in Auckland, there are no current opportunities to use larger volumes of marine sediment as mudcrete in reclamation projects. I am unaware of any large-scale reclamation projects in the Waikato Region which could be suitable for a long-term alternative to the NDA.

120. The dredged material is not suitable for beach re-nourishment projects in Auckland.

121. The dredged material is not suitable for site development fill material in Auckland.

Section 59(3) Matters

122. Under s59(3) the consent authority must also have regard to:

(aa) EEZ Policy Statements

(a) Any submissions made and evidence given in relation to the application

(b) any advice, reports, or information sought under this part and received in relation to the application

(c) Any advice received from the Maori Advisory Committee.

123. There are no specific EEZ policy statements requiring consideration.

124. I consider the matters covered in submissions in the following section of this evidence.

125. I have considered the advice received from various parties as a response to requests for advice from the Committee and have addressed this advice, where appropriate, throughout my evidence.

126. At the time of writing this evidence I had not seen any advice received by the Committee from the Maori Advisory Committee.

MATTERS RAISED IN SUBMISSIONS

127. In this section I cover those matters raised in submissions which are relevant to my areas of expertise.

Use in Reclamations

128. As I have outlined in this evidence there are currently no large-scale reclamation projects in the Auckland or Waikato Regions which provide an alternative to the NDA. In my opinion, the construction of new large-scale reclamations in Auckland is now unlikely in terms of the Regional Policy Statement and the Regional Coastal Plan.

Disposal at Landfill/Cleanfills/Buried on Land

129. As outlined in the IA and in the statement of Mr Male, the disposal of significant volumes of dredged material to landfill or cleanfill is not practical for a range of reasons including the need for it to be dried to a spadeable form. I would also consider whether the disposal of dredged sediment within a landfill or cleanfill is an efficient use of the landfill or cleanfill resource, given the demand on landfills and cleanfills in Auckland at the current time. I recognise that in some instances, such as the current dredging of the Mahurangi River, land-based disposal onto adjoining farmland is a practical option but for the majority of maintenance dredging projects within Auckland this is not a feasible option due to the lack of suitable adjoining land.

Resource Management Act 1991

130. Consideration of the Resource Management Act 1991 (including Sections 6, 7 and 8) is not required as the application is under the EEZ Act rather than the Resource Management Act. Likewise, the site is outside the Hauraki Gulf Marine Park Act and this Act and the Hauraki Gulf Marine Spatial Plan (May 2017) do not apply. Further, any effects from suspended sediment entering the Hauraki Gulf Marine Park will be negligible.

New Disposal Site Further out to Sea

131. The key issue with a site further out to sea (and in deeper water) is the inability to adequately monitor the site. The NDA was specifically chosen as it was outside the territorial boundaries of Auckland and the Hauraki Marine Gulf Park but was at a depth where re-suspension of the deposited spoil was unlikely and where monitoring (surveys and coring) could be practically undertaken.

Lack of Consultation with Fishing Industry

132. Unlike the earlier application to MNZ, a number of fishing industry parties identified they had an interest and raised concerns about not being consulted. Sanford Limited and Cedenco Foods New Zealand Limited were not on the list of parties which the consultation package was sent to. Consultation has since been undertaken with Sanford Limited, Cedenco Foods New Zealand Limited and Inshore Fisheries New Zealand and I have addressed the outcomes of that consultation elsewhere in my evidence.

Lack of Iwi Consultation

133. Although iwi consultation was undertaken with some parties who were known to have a direct interest in the area, a number of other parties have identified their interest through the submission process. Since the close of submissions, a Cultural Impact Assessment has been received from Ngai Tai Ki Tamaki Trust and tabled by Mr Male. Mr Male has also further consulted with the representatives of Te Taumata Kaumaatua o Ngāti Rehua - Ngātiwai ki Aotea and the holders of the Ngāti Rehua - Ngātiwai ki Aotea Trust Marine Association Coastal Area and the Ngati Manuhiri Settlement Trust. Mr Male has addressed this further consultation in his statement.

Necessity for a Disposal Site and Certainty of Monitoring

134. A number of submitters (including various marina operators and the New Zealand Marina Operators Association) have identified the need for the NDA and certainty around the monitoring requirements. In my opinion this certainty around availability of a dumping site for dredged marina sediment and likely cost for disposal is important in terms of planning for and maintaining both new and established infrastructure (including marinas and ports). It is my experience from marina projects, including the current Half Moon Bay marina extension resource consenting project, that Council when processing applications for such projects prefer certainty around the disposal location for dredged sediment and likewise the cost of dredging (and associated disposal) is a major determinant in the costing of projects (and I would assume their overall feasibility).

Industry Liaison Group

135. Sanford Limited and Cedenco Foods New Zealand Limited have sought in their submission a "Seafood Liaison Group". The establishment of a liaison group is now included in the recommended conditions. I currently coordinate a Community Liaison Group for Brookby Quarry and have found the operation of this liaison Group very helpful in terms of information exchange, identifying issues arising and addressing issues before they arise.

RECOMMENDED CONDITIONS OF CONSENT

136. Section 63 of the EEZ Act allows for the EPA to 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.
137. In the Application/IA, a list of recommended conditions was provided in s9. These were largely based on the existing consent with modifications to reflect changes to the activity and learnings from the implementation of the existing consent since 2012.
138. Taking into account the EPA report on the workability of the existing deemed consent conditions, legal guidance on what adaptive management means in terms of consent conditions and feedback from Sanford Limited, Cedenco Foods New Zealand Limited, Fisheries Inshore New Zealand and the Department of Conservation a detailed review of the recommended consent conditions has been undertaken. This has resulted in changes to the recommended conditions and I have included the updated set of recommended conditions in Attachment A.
139. The key changes are:
- (i) In the proposed definitions “ISQG” is defined to also include amendments that may occur from time to time which allows for future amendments/updated standards to be considered when relevant at that time. I have slightly modified the definition by removing the word “low” so the definition is more generic and covers all times which ANZECC ISQG is referred to in conditions. A number of definitions have now been added or earlier definitions deleted to reflect the key terminology used in the revised set of recommended conditions.
 - (ii) Condition 1 is “borrowed” from resource consents granted under the Resource Management Act 1991 and details the information which forms part of the overall resource consent.
 - (iii) Condition 2 sets the consent period while Conditions 3 outlines the time period when the consent will lapse if not given effect to.
 - (iv) Condition 4 requires that the existing deemed marine dumping consent is to be surrendered immediately upon the new marine dumping consent being given effect to. This avoids a perceived risk that the consent holder may

continue to use both consents.

- (v) Condition 5 sets out various controls which the NDA must not exceed. A schedule has now been included identifying the NDA monitoring sites. This condition now clearly sets out the environmental parameters which the operation of the NDA must work within.
- (vi) Conditions 6 and 7 set out the requirements for the sediment and biosecurity characterisation testing (with more specific details on the requirements of the characterisation testing set out in proposed Schedules 3 and 4). In my opinion this addresses the concerns raised by Sanford Limited for example about a lack of detail on the approved characterisation testing which is to be undertaken.
- (vii) Condition 8 details the monitoring to be undertaken at the NDA and the timing for this monitoring.
- (viii) Conditions 10 to 13 sets the requirements of what and how the dredged marine sediment is to be disposed of and where. Condition 12 sets a maximum disposal rate of two disposals over a 24-hour period with a minimum of 1 hour between disposal events.
- (ix) Condition 14 has been clarified and there is now a requirement for written records of the mammal monitoring to be kept. This re-wording addresses a number of points raised by Dr Childerhouse and concerns from some submitters about the current recording of mammal monitoring.
- (x) Condition 24 addresses lighting and clean-hull requirements for vessels associated with the disposal of dredged material at the NDA. This addresses concerns raised by some submitters including Sanford Limited and the DoC about potential effects on bird strike due to boat lighting and the risk posed by biofouling of the hulls of vessels.
- (xi) Condition 25 introduces the requirement for a NDA Liaison Group. This addresses a request by Sanford Limited, Cedenco Foods New Zealand Limited and Fisheries Inshore New Zealand for an industry liaison group.

140. I am not in agreement with the EPA Officer that Condition 17 which requires the notification of the NZDF is not within the scope of the EEZ Act. The condition

reflects that there is another user of this area who may be adversely affected by the disposal operation if there is a conflict in timing. This condition provides the process to follow to avoid this potential effect. If the Committee deems that this condition is outside the scope of the EEZ Act then the consent holder can still contact the NZDF outside the consent requirements and I understand that is the intent of CRL.

141. I am in agreement with the findings in the EPA report that the following earlier recommended conditions in the Application/IA are outside the scope of the EEZ Act and they have not been included in the updated set of recommended conditions.

- *The Consent Holder must ensure any disposal vessel has an active Automatic Identification System fitted and operational throughout the duration of each voyage.*
- *The Consent Holder must lodge a passage plan with the Auckland Harbourmaster's office at least 12 hours in advance of planned departure if the proposed passage to be used has not previously been subject to a passage plan submitted to the Auckland Harbourmasters office*
- *The Consent Holder must notify, via email, telephone or radio (VHF Channel 12 or 16), the Auckland Harbourmaster's office for every disposal voyage:*
 - a) *The disposal vessel's time of departure from the Marina before such departure, and*
 - b) *The disposal vessel's time of arrival at the Disposal Area, and*
 - c) *The disposal vessel's time of return to the Auckland port precincts.*

Scope of Consent to Cover Physical Monitoring

142. An issue which has arisen under the current deemed consent since administration was transferred to the EPA is the additional paperwork/iwi notification required (and the associated time delays and costs) each time physical monitoring of the site (which involves the disturbance of the seabed) is required. The following process is generally required to be followed:

- CRL must submit a pre-activity notice at least 40 working days before the start of the monitoring activity.
- If the EPA determines that the activity affects relevant Maori groups with existing interests the EPA provides a list of iwi to be notified. In recent times this has been over 90 iwi groups.
- At least 25 working days before undertaking the activity CRL must notify

every group the EPA has identified as having an interest in the activity.

- At least 5 working days before the start of the activity CRL must submit Form 2 and 3 (pre-activity notification of relevant Maori groups with existing interest and environmental assessment and sensitive environments contingency plan).
- CRL must notify the EPA within 24 hours of commencing the activity.
- CRL must complete logbooks for the duration of the activity and send to the EPA weekly.
- CRL must notify the EPA within 24 hours of completing the activity.
- CRL must provide a post-activity report within 60 working days of stopping the activity to the EPA.

143. It is therefore important for this proposed dumping consent (which will in effect replace and surpass the existing deemed consent) that all physical monitoring requirements are clearly stipulated in the consent conditions and provided for by the consent. This avoids the further and on-going requirement to obtain EPA approval every time that the required monitoring is to be undertaken.

144. It is therefore important that if physical monitoring requirements are to be continued that all physical monitoring is clearly stipulated in the consent conditions and provided for by the consent. This avoids the further and on-going requirement to obtain EPA approval as stipulated every time that the required monitoring is to be undertaken.

145. The consent therefore needs to be clear that it also covers the physical monitoring required under the conditions of consent. From my experience with resource consents under the Resource Management Act 1991, it would be very unusual to have to obtain further consents to undertake the monitoring required by that consent.

146. To address this concern the purpose or the scope of the consent could be clarified to read:

To authorise the disposal of up to 250,000 m³ per annum at the NDA of accumulated sediment and capital dredging sediment by marine dumping and to undertake any associated physical monitoring at the NDA.

SECTION 10 (PURPOSE) AND SECTION 62 OF THE EEZ ACT AND CONCLUSION

147. I have earlier set out section 10 of the EEZ Act (the Purpose).
148. I am unaware of any natural resources which will be adversely affected to such a degree that this will impact on the on-going sustainable management of the natural resources of the exclusive economic zone and the continental shelf. I recognise from the evidence of Mr West that there will be a localised effect on benthic species within the NDA but such effects are limited to a very small extent. From the evidence of Mr West and Dr Childerhouse I understand there will be no or a negligible risk of adverse effects on marine mammals, fish and bird-life.
149. Although the disposal operation over-time will continue to result in a mound being formed, the spatial extent of this is relatively small and defined. Likewise any effects arising from the dispersion of sediment during the disposal operation will be both limited spatially and will be very temporary in nature and will not result in a wider impact on the sustainable management of natural resources.
150. In particular, granting the consent and the continued operation of the NDA site will not:
- Affect the sustainable management of natural resources within the EEZ to meet the reasonably foreseeable needs of future generations; and
 - Impact on the life-supporting capacity of the environment.
151. In terms of section 10(1)(b), the environment is to be protected by imposing on the consent a number of conditions, including conditions to comply with established international standards for potential contaminants in dredged material, and conditions to ensure the impact of the dredged material on benthic ecology is limited to the NDA.
152. The granting of this consent with appropriate conditions will ensure that the continued disposal of dredged sediment at this site will not result in adverse environmental effects as a result of pollution. The EEZ Act specifically provides for a process to apply for and to consent such dumping operations within the EEZ.
153. In my opinion and based on the evidence of CRL expert witnesses, the proposed continued disposal at the NDA site can be undertaken in a manner that appropriately avoids, remedies or mitigates potential adverse effects on the environment. This is achieved through the control of material which is disposed of at the site, the nature and rate of disposal, the location of the disposal and the very

limited spatial extent in which disposal can occur.

154. At the current time, the use of the NDA for dredged sediment disposal remains the most efficient and effective disposal option for larger scale sediment disposal requirements although it is recognised that smaller volumes of contaminated sediment can be disposed of at appropriate landfills. I also recognise that in some instances, disposal to reclamations may be more appropriate but there are insufficient reclamation projects at present to accommodate all dredged sediment and this situation is highly unlikely to change.
155. Therefore in my opinion the consent can be granted in terms of section 62 of the EEZ Act. In my opinion and in terms of section 62(2) the application does not need to be refused as:
- (1) There is no identified practical or efficient re-use or re-cycling option. Consent is being sought for the continued operation of the NDA site. If more practical and cost-efficient options for re-use or recycling of dredged sediment arise in the future then it is likely for economic reasons that the party seeking to dispose of dredged sediment will use those methods rather than paying for the disposal at the NDA site.
 - (2) The potential effects of the disposal are known and have been assessed. Since the original marine dumping permit application was made a step by step process has been followed in terms of identifying and assessing effects. This commenced with the initial site assessment studies, followed by a trial disposal period and then the granting of the permit for 50,000m³ and subsequent monitoring. The current application is now for a larger maximum annual volume to provide for the likely maximum annual volumes requiring to be disposed in the future.
 - (3) In my opinion adequate information has been received for the Committee to make a decision.
 - (4) I am unaware of any circumstances which have now arisen which results in disposal at the NDA site not being the best approach for dredged sediment disposal (when the party requiring the dredged sediment disposal has not secured an alternative disposal method).
156. In concluding, my opinion is that consent can be granted, with the recommended conditions, and granting consent would not be contrary to the purpose of the EEZ Act.



Dated this 25th day of October 2018

ATTACHMENT ONE: PROPOSED CONDITIONS OF CONSENT

Definitions:

Consent Holder means Coastal Resources Limited.

Disposal Point means the point where the spoil is disposed at.

EEZ Act means the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012.

EPA means the Environmental Protection Authority.

ISQG means the Interim Sediment Quality Guidelines in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000) or any subsequent variation thereof, and references to **L-Value** or **H-Value** mean, respectively, the low or high values referred to in those Guidelines.

MPI means the Ministry for Primary Industries.

NDA means Northern Disposal Area, which is a 1500 metre radius circle centred on 36° 12.3403'S and 175° 48.002"E.

NDA Centre means 36° 12.3403'S and 175° 48.002"E.

Sampling Site means any location from which samples are collected for the purposes of the consent conditions.

Source Site means a site from which dredged material is intended to be sourced for disposal.

Submarine Exercise Area means that area by the same name identified on chart NZ531 and the associated New Zealand Notices to Mariners.

1. Subject to compliance with these consent conditions, the activities authorised by this consent shall be undertaken in general accordance with the application and supporting documents, the further information provided by the Consent Holder to the EPA and the evidence given for the Consent Holder at the hearing. Where information contained in these documents is contrary to the conditions of this consent then the conditions will prevail.
2. This consent is for a term of thirty-five (35) years.

3. The lapse date for this consent for the purpose of section 85 of the EEZ Act, shall be ten (10) years after the date of commencement of this consent.
4. Immediately upon giving effect to this consent the Consent Holder shall surrender the existing deemed Marine Dumping Consent (EEZ900012).
5. The activities authorised by this consent shall not result in:
 - a) Exceedance of any ISQG-L values for any of the metals or compounds specified in Schedule 2 of any of the Sampling Sites specified in Schedule 1.
 - b) Sediment size class at any of the Sampling Sites specified in Schedule 1 changing by more than 50% by volume between consecutive monitoring events.
 - c) A change, at any of the sampling sites on the NDA boundary, in:
 - i Overall abundance of macrofauna by more than 50% of the long-term average; or
 - ii Overall abundance in number of taxa of macrofauna by more than 50% of the long-term average.

Where the long-term average is compiled from all prior monitoring results obtained under this consent and the former deemed Marine Dumping Consent EEZ900012 at each of the relevant Sampling Sites.
 - d) The disposal mound traversing the NDA site boundary.
6. The Consent Holder shall provide to the EPA sediment characterisation of each Source Site, undertaken in accordance with Schedule 3, prior to the disposal of dredged material from that Site. Any Sampling Results previously approved by the EPA in relation to a Source Site under deemed Marine Dumping Consent EEZ900012 shall be deemed to satisfy this condition until 3 years have passed since that approval.
7. The Consent Holder shall provide to the EPA and MPI biosecurity characterisation of each Source Site, undertaken in accordance with Schedule 4, prior to the disposal of dredged material from that Site. Any Sampling Results previously approved by the EPA in relation to a Source Site under deemed Marine Dumping Consent EEZ900012 shall be deemed to satisfy this condition until 3 years have passed since that approval.
8. The Consent Holder shall undertake the following monitoring in the first spring (September, October or November) after the cumulative total disposal of 125,000 cubic metres of dredged material under this consent, and in each spring after every cumulative total disposal of a further 125,000 cubic metres of dredged material under this consent:

- a) Core sample monitoring to determine the disposal mound foot print. A single core sample from each site described below will be collected, photographed and measured, including the depth of any disposal material visible in the sample.
 - i Samples will be collected at 100m intervals along axes from the NDA Centre.
 - ii Axes will be aligned in onshore (W) offshore (E) and along shore (N, S) directions.
 - iii Beyond 500m from the NDA Centre an additional axis will be added midway between the axes described above (i.e. NE, SE, SW and NW directions).
 - iv Once no disposal sediment is observed along an axis, core sample monitoring will be conducted at intervals of 500m from the NDA Centre, at sites listed in Schedule 1.
- b) Contaminant analysis of sediments from at least the 17 Sampling Sites listed in Schedule 1. Such analysis will:
 - i Be undertaken on the top five centimetres of sediment in each core using standardised methods and compared to the ISQG-L values.
 - ii Be conducted by a suitably accredited laboratory.
- c) Sediment grain size analysis from at least the 17 sampling sites listed in Schedule 1, using accepted standardised methods to establish proportion by volume.
- d) Benthic faunal monitoring from at least the 8 NDA boundary monitoring sites, using from each of those sites.
 - (i) a minimum of three replicates consisting of at least two 100mm diameter cores, and
 - (ii) a photographic record of the seabed macrofauna.

Advice Notes:

- (1) *For the purposes of these conditions and their schedules, N, S, E and W do not represent true bearings, but are a simplification in which the N-S axis is generally parallel to the shoreline of Great Barrier Island (i.e. the alongshore axis), and the E-W axis is perpendicular (i.e. the onshore-offshore axis).*
- (2) *Disposal at the NDA can continue during the period when monitoring is required then undertaken.*

9. The Consent Holder shall provide all monitoring results to the EPA within four months of the completion of monitoring. Results for monitoring under Conditions 8(b), (c) and (d) shall include statistical analysis and/or a comparison of the results to relevant ISQG-L.
10. The Consent Holder shall only dispose of dredged marine sediment which has been dredged by excavation only (excluding suction dredging).
11. The Consent Holder shall only dispose of material by 'bottom dump' barge.
12. There is to be a maximum of two disposals over a 24-hour period with a minimum of 1 hour between disposal events.
13. The location of the disposal point will vary following disposal of up to 250,000 ± 1,000 cubic metres. The Consent Holder must ensure that the barge operator releases all loads of sediment within 100 metres of the operational disposal points as follows (with disposal commencing again at (a) once disposal is completed at (m)):
 - a) 0 – 250,000 ± 1,000 cubic metres, operational disposal point (DS), being 36° 12.3403' S, 175° 48.002' E (WGS 84)
 - b) 250,000 – 500,000 ± 1,000 cubic metres, operational disposal point (W200), being 36° 12.388' S, 175° 47.880' E (WGS 84)
 - c) 500,000 – 750,000 ± 1,000 cubic metres, operational disposal point (N200), being 36° 12.244' S, 175° 47.945' E (WGS 84)
 - d) 750,000 – 1,000,000 ± 1,000 cubic metres, operational disposal point (E200), being 36° 12.299' S, 175° 48.123' E (WGS 84)
 - e) 1,000,000 – 1,250,000 ± 1,000 cubic metres, operational disposal point (S200), being 36° 12.441' S, 175° 48.055' E (WGS 84)
 - f) 1,250,000 – 1,500,000 ± 1,000 cubic metres, operational disposal point (W400), being 36° 12.432' S, 175° 47.759' E (WGS 84)
 - g) 1,500,000 – 1,750,000 ± 1,000 cubic metres, operational disposal point (NW400), being 36° 12.271' S, 175° 47.750' E (WGS 84)
 - h) 1,750,000 – 2,000,000 ± 1,000 cubic metres, operational disposal point (N400), being 36° 12.146' S, 175° 47.890' E (WGS 84)
 - i) 2,000,000 – 2,250,000 ± 1,000 cubic metres, operational disposal point (NE400), being 36° 12.148' S, 175° 48.091' E (WGS 84)

- j) 2,250,000 – 2,500,000 ± 1,000 cubic metres, operational disposal point (E400), being 36° 12.253' S, 175° 48.246' E (WGS 84)
 - k) 2,500,000 – 2,750,000 ± 1,000 cubic metres, operational disposal point (SE400), being 36° 12.423' S, 175° 48.249' E (WGS 84)
 - l) 2,750,000 – 3,000,000 ± 1,000 cubic metres, operational disposal point (S400), being 36° 12.539' S, 175° 48.109' E (WGS 84)
 - m) 3,000,000 – 3,250,000 ± 1,000 cubic metres, operational disposal point (SW400), being 36° 12.553' S, 175° 47.904' E (WGS 84)
14. Visual and acoustic detection for marine mammals is to be undertaken (by an appropriately trained crew-member) for at least 30 minutes immediately prior to any disposal activity. A written record of the period in which the detection was undertaken, marine mammals detected, method of detection, personnel undertaking detection, confirmation that the personnel has the required training, and general weather conditions shall be prepared and along with any acoustic recordings undertaken shall be made available to the EPA upon request. Marine mammal data will be summarised in the monitoring report required under Condition 9.
15. Dumping activity may only occur provided there is no detection of marine mammals within the NDA during the detection period required under Condition 14.
16. Upon the EPA's request, the Consent Holder shall allow the EPA (or their representative or delegate) to attend in an observer status during the Consent Holder's monitoring surveys. The Consent Holder shall bear the reasonable costs of the EPA's attendance.
17. At least ten days prior to any scheduled disposal periods, the Consent Holder must notify the New Zealand Defence Force of the scheduled disposal periods to ensure there is no conflict with military use of the Submarine Exercise Area. Should any such conflict arise, the New Zealand Defence Force's current or intended military use of the Submarine Exercise Area shall take precedence.
18. The Consent Holder shall supply to the EPA, on request, proof in writing that the requirements of Condition 17 have been met.
19. The Consent Holder must maintain written records of the following matters, and provide them to the EPA each calendar month in a Form of Acknowledgement, for each individual load of dredged material:
- a) The Source Site,

- b) The actual amount disposed,
 - c) The exact location of disposal determined by GPS,
 - d) The date, time and duration of any disposal, and
 - e) Any detections of marine mammals present in the NDA.
20. At the time of providing the EPA with the Form of Acknowledgment, the Consent Holder must also provide the EPA with GPS evidence supporting the information required in Condition 17(c) and (d).
21. If no disposal at the NDA occurs during a calendar month, the Consent Holder must provide to the EPA a Form of Acknowledgement stating the same.
22. The Form of Acknowledgement, referred to in Conditions 19, 20 and 21, must be provided to the EPA by the 15th day of the following month.
23. In the event that disposal intended to occur in the NDA occurs outside the NDA for any reason, emergency or otherwise, the Consent Holder must notify the EPA within 24 hours. Such notification must include the quantity disposed, the exact location and the date and time the disposal occurred, and an explanation of the reasons for the disposal.
24. For all vessels associated with the disposal of dredging material at the NDA:
- (i) Lighting is to be inward facing and minimised as far as practicable while still complying with any relevant regulations; and
 - (ii) The 'Clean Hull' for 'long-stay vessels' requirement specified in the Craft Risk Management Standard: Biofouling on Vessels Arriving to New Zealand (MPI, 15 May 2014), or any subsequent variation thereof is to be followed.
25. The Consent Holder is to establish and run a "NDA Liaison Group" to consider and discuss the operations and effect of the disposal at the NDA, subject to the invitees' willingness to participate. This Group shall comprise the representatives of the parties listed below ("the invitees") and any subsequent parties invited by the Group. The Group shall be convened at least annually (from the date the consent is given effect to) by the Consent Holder, who shall meet the administrative meeting costs only. The purpose of the Group shall be to disseminate information (including monitoring results), to hear concerns of invitees and to discuss ways of addressing any concerns or risks arising. The consent holder shall keep the minutes of all meetings. At least 15 working days prior to each meeting the following information shall be distributed to all invitees:

- A copy of the last meeting minutes,
- Summary of source and volume of disposed material for the last 12-month period,
- Summary of any NDA site monitoring results from the last 12-month period, and
- Summary of known disposal volumes, sources and periods for the next 12-month period.

Invitees:

- A representative of Sanford Limited,
- A representative of Cedenco Foods New Zealand Limited,
- A representative of Inshore Fisheries New Zealand Limited, and
- Representatives of Coastal Resources Limited (including any specialist consultants involved in the administration and monitoring of the NDA).

Schedule One: Northern Disposal Area Monitoring Sites

Site Name	Latitude (WGS 84)	Longitude (WGS 84)
Disposal Centre	36 12.34030 S	175 48.00200 E
North 500	36 12.09404 S	175 47.86445 E
East 500	36 12.22881 S	175 48.30585 E
South 500	36 12.58656 S	175 48.13957 E
West 500	36 12.45178 S	175 47.69813 E
North 1000	36 11.84778 S	175 47.72691 E
East 1000	36 12.11731 S	175 48.60968 E
South 1000	36 12.83281 S	175 48.27715 E
West 1000	36 12.56324 S	175 47.39425 E
North 1500	36 11.60151 S	175 47.58939 E
North East 1500	36 11.58770 S	175 48.35138 E
East 1500	36 12.00580 S	175 48.91351 E
South East 1500	36 12.63229 S	175 48.93734 E
South 1500	36 13.07906 S	175 48.41475 E
South West 1500	36 13.10263 S	175 47.65465 E
West 1500	36 12.67469 S	175 47.09036 E
North West 1500	36 12.05748 S	175 47.06402 E

Schedule Two: Metals, metalloids, organometallic and organic compounds to be Tested

Parameter	Units
Dry Matter	g/100g
Total Organic Carbon	g/100g dry wt
Total Recoverable Arsenic	mg/kg dry wt
Total Recoverable Cadmium	mg/kg dry wt
Total Recoverable Chromium	mg/kg dry wt
Total Recoverable Copper	mg/kg dry wt
Total Recoverable Lead	mg/kg dry wt
Total Recoverable Mercury	mg/kg dry wt
Total Recoverable Nickel	mg/kg dry wt
Total Recoverable Zinc	mg/kg dry wt
Tributyltin	µg/kg dry wt
Total Petroleum hydrocarbons (C7 - C36)	mg/kg dry wt

Schedule Three: Chemical Characterisation Methodology

This methodology sets out a procedure to characterise the concentration of the substances specified in Schedule 2 (“the Primary Contaminants”) in any material to be dredged for disposal at the NDA. Dredged material will only be acceptable for disposal at the NDA if the average concentration of each of the Primary Contaminants is below the ISQG-L Value.

In addition, this methodology requires the material to be dredged to be characterised in relation to potential contaminants other than the Primary Contaminants (“Other Contaminants”) in accordance with international best practice.

The methodology is tailored to material to be dredged from shallow seabed locations either as capital or maintenance operations.

Characterisation of each source site must be undertaken at intervals of not greater than 3 years, and must be undertaken if events occur at a source site that are likely to change contaminant concentrations present at that site.

The characterisation methodology follows a three-level procedure:

A **level 1** investigation reviews the existing information on the material to be dredged.

A **level 2** investigation is concerned with the physical and chemical characterisation of the material.

In relation to the Primary Contaminants levels 1 and 2 are mandatory and will establish whether the average concentration of any of the Primary Contaminants is below the relevant ISQG-L Value.

If the level 1 investigation identifies potential Other Contaminants that may be present in the material to be dredged, then those contaminants will also be subject to a level 2 investigation.

A **level 3** investigation involves elutriation testing of any Other Contaminants identified in a level 2 investigation at concentrations between the ISQG-L and ISQG-H Values.

Level 1 investigation

The review needs to determine:

- i) what the contaminants of concern are based on the site history review and pre-existing data on the sediments, if any; and
- ii) whether or not the geometric mean levels of the identified contaminants of concern in the waste are below the ISQG-L Values.

The review should include information on the volume, location and depths of sediment to be dredged. The historical uses of the excavation site and catchment should be evaluated with

particular attention to any usage that could have resulted in contamination, such as horticulture, farming, mining, industrial and residential uses, and should pay particular attention to potential point sources of pollution adjacent or upstream, the location of effluent or stormwater discharges etc., and previous dredging, dumping, or landfilling. The sediments in major ports and established marinas are very likely to have been studied previously.

The review of existing information should identify all potential contaminants particularly those with ISQG guideline values. In addition to chemical contaminants in the marine sediments an assessment of particle sizes and a detailed review of their potential to release floating material or contaminants should be investigated.

Level 2 investigation

A level 2 investigation requires a comprehensive physical and chemical characterisation based on samples of the material to be dredged. Sampling will be representative of the geographic extent of the area to be dredged and the entire depth of sediment to be dredged.

The number of samples or cores required is dependent on the variability of the sediments and their pollutant content, which may depend on a large number of factors. Table 1 contains a guide to the number of cores to be collected based on volume dredged. Within marinas it is expected that 1 sample per 10,000m² is sufficient. Whichever number of cores (based on volume or area) is greater should be adopted, and additional cores should be added to target known point source locations.

Table 1 Guide to Number of Core Samples Required by Volume Dredged

Volume to be Dredged (cubic metres)	Number of Cores
0–5,000	3
5,000–15,000	4
15,000–100,000	10
Each additional 100,000	3 additional

The USEPA approach of stratifying the site into arbitrarily sized blocks and randomly sampling in each block is to be adopted. The size of blocks can be varied, but should not be greater than 10,000m². For large or complex sites the use of an initial pilot sampling programme should be considered.

The level of contamination is expected to decrease with increased depth of sediment. The thinnest layer that can be reliably dredged and selectively handled is between 30 and 50 cm

so sampling at smaller intervals is of no value. Cores are to be sampled as follows:

- The top 50 cm of the core (or to the depth of dredging if less than 50 cm) is to be composited as a single sample for analysis.
- A second sample is to be taken from the 50–100 cm interval.
- Below 1 m, cores should be composited in 1 m lengths for analysis.

Sample handling techniques must ensure that changes in the composition of the samples as a result of chemical, physical or biological action are minimised, that cross contamination of samples does not occur during sub-sampling and subsequent handling, and that samples are not lost or mixed up between sampling and arrival at the analysing laboratories. Sampling should occur in a manner that avoids or minimises contamination and effective use of field and equipment blanks should be utilised. Appropriate decontamination procedures must be followed when sub-sampling from cores and between sites to avoid cross-contamination of samples.

Samples for chemical analysis should be frozen, the sample container should be filled to two thirds of its volume and immediately chilled; the sample should be frozen as soon as possible after sampling. Samples for grain size analysis should be chilled but not frozen. Waterproof labels and ink should be used, preferably pre-printed. The labels should be placed outside the sample bag inside a second bag facing out clearly visible. The label information should include site, date, depth, analysis, and handling required.

The approximate mass of material necessary for particular analyses is set out in Table 2 below.

Table 2 Amount of sediment required for various analyses

Analytical Parameter	Amount required (g, wet weight)
Organic compounds	100–250
Metals	10–100
Miscellaneous analyses	50–100
Grainsize	50–200
Total organic carbon	10–50
Moisture content	10–50

All field procedures must be documented using the standard procedures routinely used in New Zealand in contaminated site investigations as follows:

- Written standard operating procedures (SOPs) are to be included in the sampling and analysis plan and variations from SOPs, and the reasons for such variations, noted.
- Field conditions (weather, tides, currents), station locations, sampling methods and handling and storage methods, field numbers, date, time, identity of sampler should be noted in ink in the field log and field descriptions of sediments recorded as collected.
- A sample inventory log and a sample tracking log must be maintained.
- Chain-of-custody forms that list all sample numbers and locations and the analyses and detection limits required of each sample are to accompany each sample to the laboratory. At each stage of handling, the samples are to be checked against the chain-of-custody forms and after receipt by the laboratory, a checked form sent back to the sampling organisation.
- Laboratories must be accredited with a recognised laboratory accreditation organisation and must be experienced in the analysis of marine sediments and solid wastes.

For all core samples and depth subsamples the basic physical characteristics to be determined are volume, basic sediment grain size (by volume), and moisture content data. The proportion of litter and other anthropogenic items in the waste should also be assessed.

In respect of the Primary Contaminants the following sampling program should be applied:

- The top 50 cm of each core should be analysed for Sediment grain size, Moisture content, Heavy metals (cadmium, chromium, copper, lead, mercury, nickel, zinc), metalloid (arsenic), total organic carbon, total petroleum hydrocarbons, polynuclear aromatic hydrocarbons and tributyl tin.
- 50 – 100cm interval of each core, should be analysed for Sediment grain size, Moisture content, Heavy metals (cadmium, chromium, copper, lead, mercury, nickel, zinc), metalloid (arsenic).
- A composite sample of equal volumes from each 50 – 100cm interval of each core should be analysed for total organic carbon, total petroleum hydrocarbons, polynuclear aromatic hydrocarbons and tributyl tin.
- Each further 1m interval of each core, should be analysed for Sediment grain size, Moisture content, Heavy metals (cadmium, chromium, copper, lead, mercury, nickel, zinc), metalloid (arsenic).
- A composite sample of equal volumes from each 1m interval of the same depth, of each core should be analysed for total organic carbon, total petroleum hydrocarbons, and tributyl tin.

If the level 1 investigation has identified the potential for site-specific Other Contaminants (examples could include polynuclear aromatic hydrocarbons, organochlorine pesticides, polychlorinated biphenyls and pentachlorophenol), the sampling program shall include appropriate provision for those Contaminants.

Detection limits should be sufficient to allow comparison with the ISQG-L Values.

If the mean concentrations by volume for each Primary Contaminant detected is at levels above ISQG-L, then the material is unsuitable for disposal at the NDA.

If the level 2 investigation reports any detections of arsenic, cadmium, chromium, copper, lead, mercury, nickel or zinc in one or more samples above ISQG-L then a level 3 investigation is required in relation to those contaminants.

Level 3 investigation

Elutriate testing determines whether contaminants present in the dredge material are mobile and will transfer to the water once dredged or dumped. The results of elutriate testing are to be compared to the ANZECC marine water quality criteria (for cadmium, chromium, copper, lead, mercury, nickel or zinc) or USEPA criteria (for arsenic) after the application of an appropriate dilution factor. If the elutriate test results exceed the relevant criteria after initial dilution (initial mixing is defined as that which occurs within four hours after dumping), then the material is unsuitable for disposal at the NDA.

Schedule Four: Biosecurity Characterisation Methodology

In addition to the characterisation of quality of dredge material as outlined in Schedule 3, a characterisation of marine biosecurity risks associated with a dredging area is required.

Because different non-indigenous species (NIS) have different habitat preferences, sampling methodologies are required to assess the different habitats that NIS are likely to occur in. The number and type of samples required to assess a dredge area will vary from area to area. The area to be dredged will consist of soft marine sediments, which support infaunal biota and larger epifaunal biota. Where the dredge area is adjacent to vertical structures, such as wharf piles, or shoreline that could lead to NIS being entrained in the dredge material, then these areas should also be assessed.

The number of samples required is determined from the area to be dredged, its complexity and history. At sites where there is a history of NIS, a stratified approach of dividing the site into arbitrarily sized blocks, with the average size no greater than 10,000m² and randomly sampling in each block is to be adopted. Within each block different sampling techniques should be used depending on the habitats present within and adjacent. The size of blocks can be varied so that the sampling density is greater in locations where the probability of NIS being present is greatest. At sites where there is a history of no NIS and no reasons to believe otherwise, then the number of samples required can be reduced. However a stratified random, sample approach should still be used.

Biota present within the sea floor soft sediment to be dredged should be sampled either by diver operated core sampler or by surface operated grab sampler. While it is preferable to collect quantitative samples this is not always possible and qualitative samples will still provide a presence or absence of NIS. Each sample should be a minimum of 2L volume and be washed through a 1.0mm (or smaller) mesh sieve and animals retained on the sieve collected, preserved and returned to the field laboratory for sorting and identification. Sieving and samples preservation should occur within 6 hours of sample collection. A suitably qualified and experienced person should conduct sample species identification.

Larger benthic organisms are likely to be under represented in grab samples therefore these should be sampled using an Ocklemann sled or similar device. The sled should be towed for a standard distance, typically 100 m, along the seabed such that the mouth of the sled partially digs into the sediment and collects organisms in the surface layers to a depth of a few centimetres, before being retrieved. The mesh size used in the sled should be sufficiently small as to retain species of interest, typically in the order of 10mm square mesh. The entire contents should be sorted and either identified in the field or bagged, labelled and persevered for later identification. A suitably qualified and experienced person should conduct sample species identification.

Some epibenthos species such as benthic scavengers and fishes are more mobile and thus require different sampling methods. The use of baited Opera house fish traps, Fukui-designed box traps, Starfish traps and Shrimp traps should be considered, if mobile NIS are identified as being present within the dredge area and potentially able to be included in the dredge material.

While dredging is of soft sediment from the sea floor, adjacent habitats could be disturbed by the dredge or barges, during dredging, thus the wharf piles and step rocky break waters are also required to be assessed. The outer face of wharf piles are to be assessed at different depths from low tide to seabed. Sampling can include continuous video recording of the wharf pile face, high resolution still images of selected depths and diver collected scraping samples from a quadrat at selected depths. The piles assessed should have been present within the marina for at least 12 months. Rocky breakwater walls adjacent to dredging operation will be sampled at low tide in areas. Samples can include still images of quadrats and or hand sorted, enumerated counts of species present within quadrats.

All samples should be clearly labelled with site number, sampling method, time and date. Field conditions (weather, tides, currents), station locations, sampling methods and handling and storage methods, field numbers, date, time, identity of sampler should be noted in ink in the field log and field descriptions of sediments recorded as collected. A sample inventory log and a sample tracking log must be maintained.

The regional distribution of the NIS recorded should be discussed with particular attention to the potential for survival at the Northern Disposal Area and spread of the NIS beyond their known geographic distributions. For any NIS arriving and establishing in the Auckland and Waikato regions after the date of consent, an assessment of the potential from spread from the Northern Disposal Area should be conducted.