

Otago Regional Council

Section 42A Staff Recommending Report

Coastal Permit Application RM11.153.01 By Port Otago Limited

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18 April 2013



Executive Summary

Port Otago Limited has applied to replace expired Coastal Permit 2000.472 (or any substitution of Coastal Permit 2000.472), which authorised the discharge into the sea of dredging spoil at three disposal sites, with the following discharge volumes over a three year term:

Heyward Point 350,000 cubic metres per year
 Aramoana 50,000 cubic metres per year
 Shelley beach 50,000 cubic metres per year

The application was notified and 8 submissions were received. After assessing the actual and potential effects of the applications and submissions, the recommendation of this report is to grant the application subject to recommended consent conditions.

Administrative Details

File No: RM11.153 Application No: RM11.153.01

Report No: 2011/0875

Prepared for: Hearing Panel

Prepared by: Peter Christophers, Principal Resource Officer



Table of Contents

1	Purpose	5
2	Background	5
	2.1 Introduction	
	2.2 Dredging and disposal methodology	
	2.3 Deposition	
	2.4 Current Depositional Environment	
	2.5 Modelling	
	2.6 Proposed Consent Conditions Monitoring	
	2.7 Alternatives	
2		
3	Status of the Application	
	3.1 Maintenance dredge material disposal	
	3.2 Capital dredge material disposal	
4	Notification, Submissions and Pre-hearing Meeting	
	4.1 Submissions	
	4.1.1 Submissions in Opposition	
	4.1.2 Submissions that are neutral	23
	4.1.3 Submissions in support	24
	4.2 Pre-hearing Meeting	24
5	Assessment of Environmental Effects	
	5.1 Biological effects	
	5.1.1 Introduction	
	5.1.2 Heyward Point	
	5.1.3 Aramoana	
	5.1.4 Shelly Beach	
	5.1.5 Summary	
	· · · · · · · · · · · · · · · · · · ·	
	JJ	
	5.2.1 Surf Break	
	5.2.2 Other Recreational Effects	
	5.3 Physical Effects	
	5.3.1 Heyward Point	
	5.3.2 Aramoana	
	5.3.3 Shelly Beach	31
	5.3.4 Other Beaches	32
	5.4 Recommended Total Annual Sediment Deposition Volume	32
6	Statutory Considerations	
	6.1 Part 2 Matters	
	6.2 Section 104 Matters	
	6.2.1 Environmental Effects	
	6.2.2 New Zealand Coastal Policy Statement	
	6.2.3 Regional Policy Statement for Otago	
	6.2.4 Regional Plan: Coast for Otago	
	6.2.5 Kai Tahu Ki Otago Natural Resource Management Plan 2005	
~	6.3 Other Matters	
7	Conclusion	
8	Recommendation	
	8.1 Reasons for recommendation	
	8.2 Term	
9	Draft Conditions of Consent	49



10	References	50
App	pendix 1Coastal Permit 2000	55
Anr	pendix 2 Applicant's Proposed Consent Conditions	55



1 Purpose

1. To report and make recommendations on the determination of application RM11.153.01 under the notified provisions, Sections 95A(2)(a) and 95A(2)(c) of the Resource Management Act 1991 (the Act).

2 Background

2.1 Introduction

- 2. Port Otago Limited (the applicant) has applied to replace Coastal Permit 2000.472 which expired on 1 December 2011. Coastal Permit 2000.472 (Appendix 1) authorised the annual disposal of maintenance dredge spoil to three dredge spoil sites being:
 - Heyward Point 200,000 cubic metres (m³)
 - Aramoana 200,000 m³
 Shelly Beach 50,000 m³
- 3. Coastal Permit 2000.472 was also subject to a variation application (2000.472_V1). However though recommended to be granted, the decision was appealed and as the appeal was resolved after 2000.472_V1 expired, the variation was never issued.
- 4. The variation was to allow incremental capital dredge material, as well as the maintenance dredge material to be disposed of at each of the three dredge spoil sites. It is also noted that the variation was not to allow for increased volumes of material or a different type of material to be deposited.
- 5. It is also noted that effects of the dredging were addressed during the processing of Coastal Permit 2010.193 and will not be considered further.
- 6. Coastal Permit 2000.472 is a replacement of the original consent (3676) which was granted in 1991 with the establishment of the Act. Consent 3676 consented maintenance dredge material disposal at the three sites (Heyward Point, Aramoana and Shelly Beach) in the same volumes as this proposal.
- 7. The disposal sites are frequently referred to by several different names in the technical reports that accompany the application, previous staff section 42A recommending reports and decision documents. For the purposes of consistency and simplicity this report will refer to the Aramoana or Spit Beach disposal site as Aramoana. Shelly Beach or South Spit Beach disposal site will be referred to as Shelly Beach. The Heyward Point disposal site shall be referred to as Heyward Point.
- 8. Coastal Permit 2000.472 required the commissioning of three scientific studies to gather more information about the following:
 - Sediment transport paths between Taiaroa Head and Karitane Peninsula
 - The relationship between dredge disposal and accumulation of the beach at Shelly Beach
 - The effects of dredge material disposal on biota at or near the disposal sites.



- 9. These studies were to be completed within three years of the commencement of Coastal Permit 2000.477 (by 31 January 2005).
- 10. The application document contained four technical reports relating to the disposal of dredge material and the associated environmental effects from the disposal activities which have occurred over the previous 10 year consent term:
 - Physical Coastal Environment Single 2011a
 - Beach Morphology, Otago Harbour entrance to Karitane Single 2011b
 - Wave, current and Sediment transport model studies McComb et al 2011
 - Benthic Macrofaunal Assemblages near Maintenance dredge spoil disposal areas Paavo 2011
- 11. In summary, the application is to allow continued disposal of dredge material at the three inshore disposal sites for a further three years to allow monitoring of the effects of the discharge. The applicant then anticipates applying for a long term consent.

2.2 Dredging and disposal methodology

- 12. There are five main areas that require dredging in the Otago Harbour: the entrance channel; the lower harbour channel; the Port Chalmers Inner Basin and Berths; Victoria Channel and the Dunedin Basin and Berths.
- 13. The dredging is able to be carried out almost entirely with the trailer suction dredge *New Era*, which has been owned and operated by the applicant since 1986. This dredge has a large suction pump and trailing dredge pipe with a drag-head containing a rotating visor at its base. The operation is similar to that of a vacuum cleaner. The drag-head is lowered to the sea floor and dragged along the bed as the dredge moves forward. A mixture of sand, silt and sea water is pumped up through the dredge pipe and this mixture is deposited into the dredge hopper. In the hopper the solids quickly settle out, and the water and some of the finer material such as silt that remains in suspension flows back overboard through the discharge chute, into the harbour channel.
- 14. A full load of sand is firm enough to walk on in the hopper and is very close to the natural or in–situ density of undisturbed sand on the sea bed.
- 15. The applicant also uses a barge mounted grab dredge *Vulcan* to dredge less accessible areas and for materials which tend to be more difficult to remove, including clays and weathered rock. The *Vulcan* operation is supported by two dumb barges towed by a small workboat.
- 16. The time taken to dredge the various channel areas is generally proportional to the amount of silt and clay within the dredge material. A load of clean sand from the entrance area can be dredged in 1 hour whereas it may take up to three hours to obtain a full load from the Leith claim near the Dunedin basin, which has a higher silt content. The higher proportion of silt results in slower settlement of material in the hopper.
- 17. The vessel containing the dredge material is motored or towed to within the disposal ground boundaries and the vessel is then split in half using the onboard



- hydraulic system. As the vessel continues moving through the water, the dredged material falls from the hopper from a height of about 1–2 m below surface water level with any remaining material being washed from the hopper sides.
- 18. The trailer suction dredge has differential GPS to navigate to the disposal grounds, whereas the workboat that tows the barges works from shore based transit marks to ensure the discharge occurs in the correct location.
- 19. A discussion of the five main areas that require dredging in the Otago Harbour is provided below.

2.1.1 Entrance Channel

- 20. The entrance channel is bounded along its eastern edge by a large accumulation of sand forming a bar. The tidal currents on the ebb tide assist in maintaining the position of this channel.
- 21. However, once seaward past the outer end of the Mole, the ebb tide strength decreases and sand is constantly being deposited along the eastern channel toeline. This accretion or build up of sand is further exacerbated during easterly storms as the increased wave height and energy deposit large quantities of material over the bar.
- 22. The dredging of the entrance channel is a significant component of the dredging effort required to maintain the lower harbour with an estimated 60,000 m³ per annum removed in order to maintain a channel toe line design depth of 14.5 m. The material dredged from the entrance channel is generally clean fine to medium grained sand.

2.1.2 Lower Harbour Channel

- 23. The areas within the Lower Harbour Channel where deposition occurs and which particularly require regular maintenance are located along the inner edge of the bends. This is primarily due to the currents being considerably weaker in this region with the result that they are no longer able to transport the sediments either in suspension or as bed load.
- 24. The material dredged from the Lower Harbour Channel comprises predominantly fine grained sand, although some areas contain a component of shell. The proportion of silt contained within the dredged material increases with distance from the harbour entrance. Floating seaweed is at times collected by the dredge although this tends to be seasonal and is particularly prevalent following a period of strong winds. Sea tulips can become established in the areas that are less frequently dredged.
- 25. The areas within the channel that require dredging amounts to approximately 5% of the total area of the channel invert area, the remaining areas being deeper than the design depth of 13.0 m as a result of the natural scour of the tidal currents.



2.1.3 Port Chalmers Inner Basin and Berths

26. The material within the Port Chalmers inner basin and berths varies from clayey silt at the container berths to rock at the Beach Street berth on the eastern side of

the basin. The dredging of these areas is carried out using the grab dredge suspended off a barge mounted crane. The suction dredge is unable to dredge the silt, clay and rocky bed and has difficulty manoeuvring within the confined areas of the basin.

27. Deepening adjacent to the Beach Street berth was carried out in the early 1990's. This required drilling and blasting to fracture and dislodge the rock. Some isolated areas that were not taken down to the permitted design depth at that time continue to be worked on using the grab dredge progressively as the rock becomes more weathered.

2.1.4 Victoria Channel

28. The natural scour of the channel means that limited areas require dredging, particularly where sediment builds up on the bends of the channel.

2.1.5 Dunedin Basin and Berths

- 29. The sediment within the Dunedin Basin which extends to the end of Victoria Channel near the mouth of the Water of Leith is predominantly silt. The material has a low density and once mixed with water takes a long time to settle out. Its removal is not well suited to the use of a trailing suction dredge and the grab dredge is predominantly used to load the material into a dumb barge, which is then towed to sea for disposal.
- 30. Because of the distance to the disposal grounds from the upper harbour the trailing suction dredge *New Era* is at times used as a barge when grab dredging this area. This method of dredging is slow.
- 31. As in Port Chalmers, the currents within the basin and berth area are quite low and whilst the natural scour of the channel penetrates some distance into the basin, the siltation occurs over a wide area and requires exact positioning to dredge the correct spots.

2.3 Deposition

- 32. When dredging first occurred in Otago in 1865, much of the material was used to form reclamations around the foreshore of Dunedin. As reclamations were completed, the only other economical option for disposal of dredged material was to take it out to sea to deposit it back to where much of the material had come from. This practice has been carried out since at least 1882 when attempts were first made to deepen the sand bar at the entrance to the harbour.
- 33. The applicant currently discharges dredge material at three locations: Heyward Point, Aramoana and Shelly Beach. These areas are shown in Figure 1.



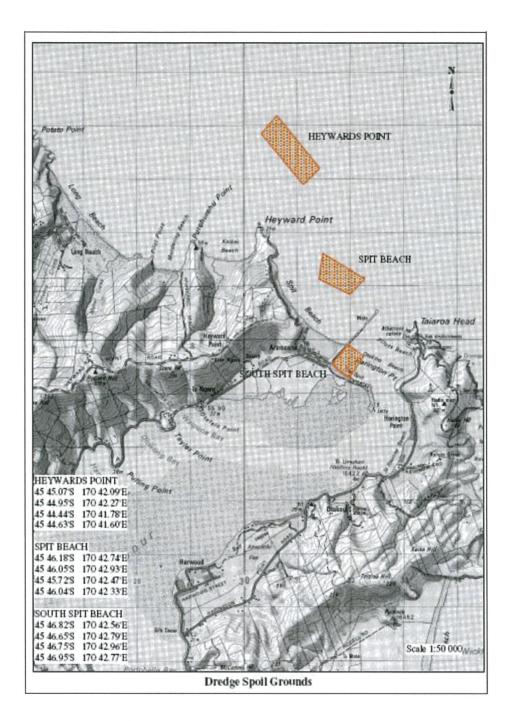


Figure 1: Schedule 5 from the Otago Regional Council Coastal Plan showing the existing consented disposal grounds.

34. The three spoil disposal grounds are specified by latitude and longitude coordinates, being of areas:

Heyward Point -38.2 ha approximately. Aramoana -28.3 ha approximately. Shelly Beach -14.5 ha approximately.

35. Prior to 1985 all dredged material was placed at the Heyward Point site. This included material derived from both development and maintenance dredging. In 1985, the Aramoana disposal site was first used and this has become the preferred location in recent years because it is closer, resulting in the dredge



- spending less time going to and from the disposal site. Though the applicant still prefers to use the Heyward Point site in rough weather, as it can often be calmer than the Aramoana site due to the greater depth of water available.
- 36. Shelly Beach was added as a further option in 1987. Sediment was placed here to assist in re-nourishing the beach which was suffering from erosion. The site has a limitation in that only sand from claims seaward of and including Tayler Bend is able to be disposed of to ensure that material moving onto the beach is of similar composition to the sand that already exists there. There is also a limit to the quantity of sand that is able to be disposed of at this site in any one year. The applicant also notes that Shelly Beach is a useful location when the weather is too rough to take the suction dredge out to sea.
- 37. On 17 June 2010 a panel of commissioners appointed by the Council and the Minister of Conservation granted applications by the applicant to ready itself for the next generational shift in shipping services, specifically the use of larger (6,000 to 8,000 Twenty-foot Equivalent Unit (TEU)) container vessels and/or increase in number, frequency and duration of all vessels using the Port Chalmers wharves due to growth in international trade.
- 38. In particular, this generational shift necessitates the existing lower harbour channel, Port Chalmers berths, and swing area being both deepened and widened to accommodate the larger shipping vessels and the existing multipurpose wharf needing to be extended.
- 39. The upgrading of the channel, berths and swinging area involves both the deepening and widening of these areas to a maximum depth of up to 17.5 m (not including over dredge allowance) and will result in up to 7,200,000 million m³ of material being removed from the lower harbour and entrance channel.
- 40. However the decision was subsequently appealed, but on 10 January 2013 the Environment Court granted RM10.193 to create a new disposal site (A0). This new disposal site is in approximately 27 m of water (below Chart Datum) at an offshore location on the "Peninsula Spit" sand feature, centred at or about Latitude 45.735 S, Longitude 170.80 E, or about 6.3 km to the northeast of Taiaroa Head as shown in Figure 2.



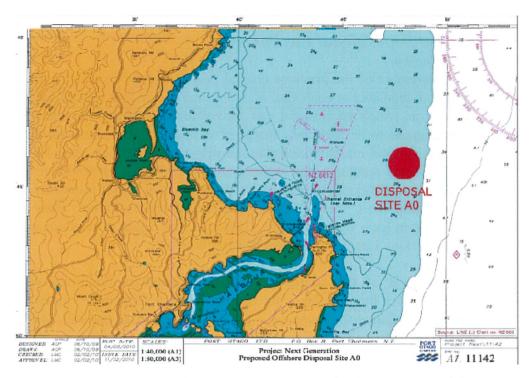


Figure 2: Location of Disposal Site A0

- 41. However, disposal from authorised dredging (capital and maintenance) will continue to be discharged to the existing inshore disposal sites up to the volumes permitted under the existing consent, including managing the disposal to ensure that 90% of the capital dredging material disposed over any 12 month period is sand.
- 42. As discussed, the total volume of material to the existing sites will be within the previous volume of 450,000 m³ per annum. The only difference between the proposed disposal and that currently undertaken will be that material will be taken from slightly different depths or geographical locations (due to the deepening and widening of the channel, swinging area and berths) than is allowed under the previous consent.
- 43. The balance of the disposal from dredging is to go to Disposal Site A0, which will be used as follows:
 - (a) Until a large contract dredge is used on the project, dredging spoil (other than rock from Acheron Head and Rocky Point) will be divided between the existing disposal grounds and the site A0. There could be up to 1,000,000 m³ a year disposed of to the new site, but generally the disposal is likely to be less than 500,000 m³ a year.
 - (b) When the large contract dredge is used then the balance of the total volume of 7,2000,000 M m³ will be disposed of to this site in a period of less than 6-8 months with the actual volume depending on the progress that has been made by the *New Era* at the time of arrival of the large contract dredge.
- 44. Disposal site A0 would not be used for the disposal of spoil from maintenance dredging once the capital work on the channel is completed as its distance from shore both restricts access by the New Era when seas are rough and also increases the cost of disposal.



2.4 Current Depositional Environment

2.4.1 Introduction

- 45. A requirement of the previous coastal permit was for records of the quantity of material deposited at each site, including the nature and type of material and the areas from which the material was derived and the state of the tide when material was dumped to be material. Supplied with the application were the records of the total annual quantities of material disposed of at each site. No information was provided relating to the nature and type of material or the areas of derivation or the state of the tide at the time of disposal. Nor was it requested, as the latter information was more for compliance purposes rather than to provide information for a future consent. However, the origin of material was restricted by conditions 1 and 2 of Coastal Permit 2000.472.
- 46. Appendix B of the application document contains the itemised records of disposal over the past 26 years of maintenance dredging. Figures 3-5 of this report summarise the disposal at each of the disposal grounds, whilst Figure 6 shows the total volume of material deposited.

2.4.2 Proposed Amendment

- 47. After notification of the application, the applicant reviewed the volumes of material proposed to be deposited at the three locations and concluded that the 200,000 m³ proposed to be deposited at Aramoana may potentially cause depositional effects to the local beach system. Consequently the applicant is now proposing that no more than 400,000 m³ of material shall be deposited on an annual basis across the Heyward Point and Aramoana Spit sites provided that there is no more than 50,000 m³ disposed of at Aramoana Spit on an annual basis, unless a greater volume is required to study the effects on the Aramoana surf break or to maintain surf quality.
- 48. Furthermore, any volume of material in excess of 200,000 m³ annually deposited at the Heyward Point site, shall be deposited within water greater than 18 m below chart datum.

2.4.3 Heyward Point

- 49. Heyward Point is the northern most disposal site. The site lies in waters varying from 9 m to 23 m deep off the cliffs and rocky reefs of the Heyward Point headland. Approximately 437,484 m³ of material has been deposited at Heyward Point between 2000 and 2010, with 1,500,000 m³ in total having been deposited there between 1985 and 2010 (Figure 3).
- 50. As discussed, the Heyward Point disposal site covers an area of approximately 38.2 ha. The applicant was initially proposing to deposit up to 200,000 m³ of sediment annually at this site. If spread evenly over the disposal area, this would equate to a depth of 524 mm.
- 51. The annual volumes of material disposed of at the Heyward Point site between the years 1985 and 2010 is shown in Figure 3. The trend line shows the actual dredge material disposal at Heyward Point has, on average, decreased since disposal began. Furthermore the proposed maximum annual volume of 350,000 m³ of dredge material has never previously been disposed at this site.



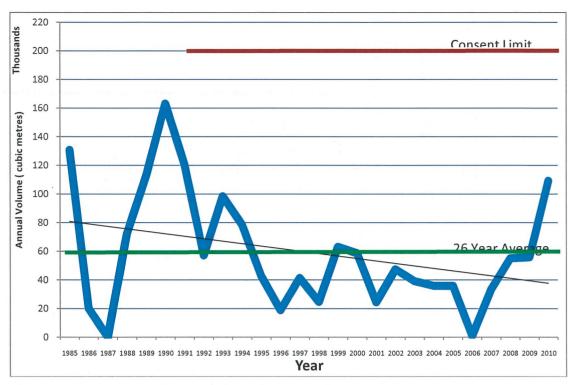


Figure 3 Heyward Point annual dredge disposal volumes 1985 - 2010 including the 26 year average annual volume, trend line and the previous consent limit of $200,000 \text{ m}^3$.

2.4.4 Aramoana

- 52. The Aramoana disposal site lies in waters varying from 6 m to 12 m in depth and is seaward of the Aramoana beach and "The Spit" surf break. "The Spit" is a nationally recognised surf break in the New Zealand Coastal Policy Statement 2010.
- 53. As discussed, the Aramoana disposal site covers an area of approximately 28.3 ha. The applicant was initially proposing to deposit up to 200,000 m³ of sediment annually at this site. If spread evenly over the disposal area, this would equate to a depth of 707 mm.
- 54. The annual volumes of material disposed of at Aramoana between the years 1985 and 2010 are shown in Figure 4.



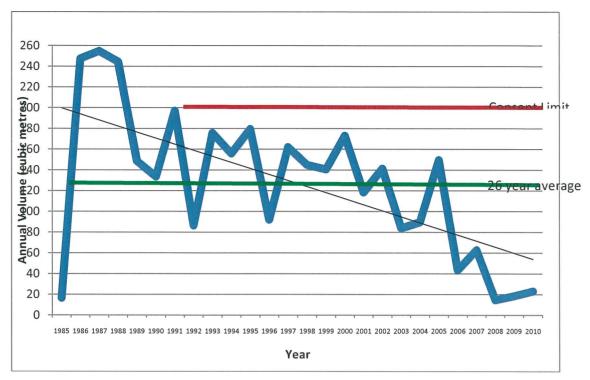


Figure 4 Aramoana annual dredge disposal volumes 1985 - 2010, including the 26 year average annual volume, trend line and the previous consent limit.

- 55. Approximately 745,369 m³ of material has been deposited at Aramoana between 2000 and 2010, with nearly 3,300,000 m³ in total having been deposited here between 1985 and 2010.
- 56. As the trend line shows the actual dredge material disposal at Aramoana has, on average, decreased significantly since disposal began. Initially more dredge material than what is currently being proposed was disposed of at the site. Most notably between 2005 and 2010 there has been a significant decrease in the volume of disposal at Aramoana. The proposed reduction to 50,000 m³ is more consistent with the volumes recently deposited at this site.

2.4.5 Shelly Beach

- 57. Shelly Beach site is the inner most disposal site in Otago Harbour. It is a shallow disposal site in around 3–8 m of water.
- 58. A number of sand beaches in the Dunedin area, including Shelly Beach, are subject to either long term or short term natural erosion of sediment. At present the applicant places dredged material in the nearshore off Shelly Beach to offset losses of sediment from its narrow dune system.
- 59. As discussed, the Aramoana disposal site covers an area of approximately 14.5 ha. The applicant is proposing to deposit up to 50,000 m³ of sediment annually at this site. If spread evenly over the disposal area, this would equate to a depth of 349 mm.
- 60. The annual volumes of material disposed of at the Shelly Beach site between the years 1985 and 2010 is shown in Figure 5.



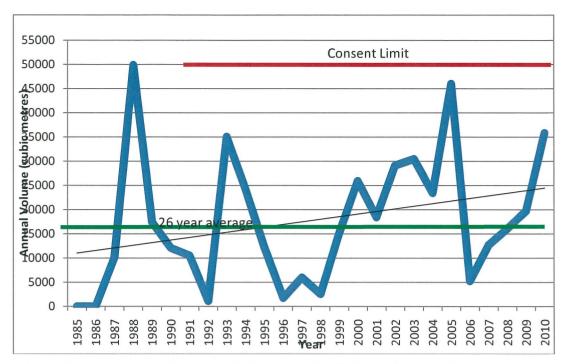


Figure 5 Shelly Beach annual dredge disposal volumes 1985-2010, including the 26 year average annual volume, trend line and the applied for consent limit.

- 61. Actual dredge material disposal at Shelly Beach has fluctuated with an increase in disposal since 2006. A notable trend at Shelly Beach is that after a large volume of material is disposed of, there is a significant decline in disposal over the following 4-5 years. This decline is in some cases immediate and in others a gradual decline. The applied for volume of material has only been disposed of once (49,896 m³ in 1988) at this disposal ground.
- 62. The quantity of sand placed off Shelly Beach is resulting in gradual shoaling of the nearshore, maintenance of a small foredune and some growth of the dune system. The work to date is fulfilling the desired purpose of mitigating erosion that was prevalent during the 1980s and early 1990s. Between 2000 and 2010 approximately 237,092 m³ of dredged material has been deposited at Shelly Beach

2.4.6 Total Inshore Deposition Volumes

63. The annual volumes of material disposed of at the three inshore beach sites between the years 1985 and 2010 are shown in Figure 6.



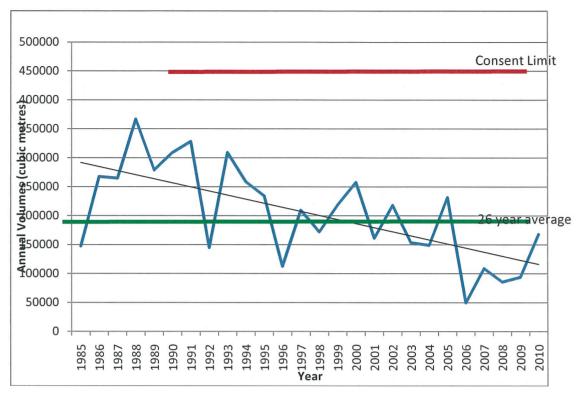


Figure 6 Total Annual Inshore dredge disposal volumes 1985 - 2010, including the 26 year average annual volume, trend line and the applied for consent limit.

- 64. There has been a steady decrease in the volumes of material disposed between 1985 and 2006. Since 2006 there has been an increase in the volumes being deposited. Disposal peaked over this period in 1988 when 367,116 m³ was deposited and was at a minimum during 2006 when a volume of 49,572 m³ was deposited. In total 5,300,148 m³ was disposed during this period.
- 65. The total consent limit sought is 450,000 m³, which is significantly more than the previous maximum volume of material deposited in 1988 (367,116 m³) and approximately 220% of the average annual volume of material deposited at these locations between 1985 and 2010 (203,852 m³).
- 66. In summary, this application to dispose dredge material in accordance with the original consented volumes (450,000 m³) will result in the total deposition volumes increasing to a level which has never previously been experienced.

2.5 Modelling of the Wave Environment and Sediment Transport

- 67. Met Ocean Solutions Ltd (Met Ocean), on behalf of the applicant, undertook a preliminary modelling study of the wave and sediment dynamics at the Otago harbour entrance. The purpose of the work was to provide improved understanding of this environment, with particular focus on the physical oceanographic and sedimentary process that characterise this area.
- 68. The wave climate was hindcast over a 12-year period; providing an hour-by-hour re-creation of the historical conditions from 1998-2009. From these data and climate statistics, maps of the wave regime have been produced and analysed. On average, the entrance region has a relatively moderate energy wave climate, with a mean annual significant wave height of only 0.89 m.



- 69. The location of the Otago Harbour entrance on the north side of the Otago Peninsula provides a large degree of topographical sheltering from the predominant waves from the south and southeast. However, this coast is also exposed to seas and swells that approach from the north, northeast and easterly quarters. Large wave events do occur throughout the year the 2.5 m significant wave height level is exceeded for approximately 1% of the time on an annual basis. These larger events typically approach from the east northeast or south–easterly octants, usually with peak spectral periods in the range 10–14 seconds. The ebb tide delta and the entrance bar cause significant modification of the incident wave climate. Combined with sheltering effects, the net result is wave height focussing at locations along Aramoana Beach and the coast toward Heyward Point.
- 70. Sediment transport has also been modelled by Met Ocean over a one year period during 2008 and their qualitative interpretation of the results is as follows:
 - (i) The modelling system produces similar morphological changes to the seabed and disposal mounds as those observed between successive seabed surveys at the Aramoana and Heyward disposal grounds.
 - (ii) At both locations, there is a net migration of the mound in the direction of wave advance, inferring that i) wave—velocity asymmetry is an important process and ii) bed load sediment transport predominates.
 - (iii) During energetic storm events, sediments are mobilised throughout the ebb tide delta region, and active bypassing of the harbour entrance and shipping channel is evident.
 - (iv) Characteristic patterns of wave-driven circulation and associated sediment transport pathways in the region west of the entrance are clearly evident. Near Heyward Point there is a strong transport vector directed north-northwest toward the point and then west beyond the point. Further south there is an opposing flow directed toward Aramoana Beach, which veers offshore as a rip current near the western end of the beach. Flows are much lower along Aramoana Beach, with a net transport vector directed southeast. East of the harbour entrance, there is a well-defined westward flow adjacent to the coast.
 - (v) The sediment model results do not identify a direct transport pathway from the Aramoana disposal ground and Aramoana Beach system to the coast west of Heyward Point. It is highly probable that placed sediments at the Aramoana disposal ground will experience long residence times within this system and historical disposal here has led to general accretion.
 - (vi) The shallow parts of the Heyward disposal ground are mobilised during storms, and net transport to the west is indicated. The deeper parts of the ground appear to be retentive and do not show significant movement

2.6 Proposed Monitoring Conditions

- 71. The applicant is seeking a 3 year extension to its existing consent. After this time, it is intended that a 35-year disposal consent will be sought. After the pre hearing meeting the applicant submitted its proposed consent conditions (Appendix 2).
- 72. At each of the disposal site locations the applicant proposes monitoring the volumes of material deposited, annual bathymetric surveys of the seabed.



- 73. At the Heyward Point and Aramoana Spit disposal sites the applicant also proposes a undertaking a biological study, by a suitably qualified person or organisation, which considers the findings of the biological monitoring work undertaken as a condition of the former maintenance disposal consent (2000.472) and provides recommendations as to suitable biological monitoring indicator species that could be adopted for the long term adaptive management of disposal activities disposal sites.
- 74. A hydrodynamic and sediment dynamics study, by a suitably qualified person or organisation will also be undertaken. The study will involve numerical modelling and empirical analysis of the coastal and sediment dynamics, including the transport pathways, for the coastal region between Taiaroa Head and the Karitane Peninsula.
- 75. A working party will also be formed and an annual work plan submitted to the Consent Authority which shall incorporate any mitigation recommendations provided in the most recent Annual Monitoring Report
- 76. In summary, the applicant seeks that any monitoring required for the 3-year consent sought under this application, be either a continuation of existing monitoring (as required by the existing consent) or contributing to information required to formulate a long term monitoring programme for the applicant's future dredging disposal activity.

2.7 Alternatives

- 77. The applicant considered the dredge material being used as aggregate for construction purposes; land reclamation or beach renourishment as alternatives to ocean disposal.
- 78. However, the applicant deems the use of aggregate for construction to be inappropriate due to the comparatively small amount of material required within the region, relative to that which would be produced by the capital dredging programme. The applicant also notes that recovery, unloading and transport costs would make the supply of sand or aggregate to areas outside Dunedin economically unviable.
- 79. The applicant is also unaware of any commercial, community or private plans for major reclamation works in the vicinity of Port Chalmers or along the margins of Otago Harbour that would benefit from the receipt of significant portions of dredged sand material. Though there has previously been interest expressed for additional community land resources along the margin of the harbour in Careys Bay and Deborah Bay, the immediate requirement for reclamation fill is limited. Although such small reclamations may result in additional community resources, they would also result in associated environmental and economic costs, and disposal of the remaining majority of the dredged material by another means would still be required. Consequently, the use of dredged material from the proposed dredging for reclamation purposes is not a viable option.
- 80. A number of sand beaches in the Dunedin area are subject to either long-term or short term erosion. At present the applicant places maintenance dredging material in the near shore off Shelley Beach to offset losses of sediment from the narrow dune system of the South Spit.



- 81. Commencing in July 2007, the Dunedin City Council also used sand from the maintenance dredging to nourish Middle Beach after a prolonged period of storm wave induced erosion of the Ocean Beach foreshore and dune system. Previously a number of small bays within Otago Harbour have also been replenished with sand to restore and protect local recreational resources and some property. More recently, the Te Rauone Beach community, in conjunction with the applicant and other agencies, was investigating the potential to nourish Te Rauone Beach as part of the management of its foreshore and dunes.
- 82. However, beach renourishment requires sand of an appropriate size, texture, colour and cleanliness to be effective and acceptable to beach users. In assessing the potential use of the dredging material for beach renourishment, these factors have been considered and areas of suitable sand identified by the applicant. In addition, the total volume required for possible beach renourishment projects has been estimated. The applicant concluded that the results of these investigations show that the volumes of material that would require disposal during the proposed capital dredging activities would be substantially larger than that required for beach renourishment projects.
- 83. The applicant has also considered other disposal sites, but stated that the Shelly Beach site has been chosen in order to provide nourishment to the adjoining beach and dunes. In addition, disposal at this location also benefits the Aramoana saltmarsh that the spit shelters. Other locations and methods would not provide these ecological and amenity benefits.
- 84. The applicant states that the Heywards Point and Aramoana sites which have been used for many years, have been selected for their naturally moving sandy bottoms and they are of sufficient area to ensure that the applied for disposition is absorbed into the natural coastal movement of material

3 Status of the Application

85. This application can be separated into two distinct parts – maintenance dredge material and capital dredge material. These two aspects fall under the umbrella of two separate rules in the Regional Plan: Coast for Otago (RPC). They are as follows:

3.1 Maintenance dredge material disposal

- 86. This is a discretionary activity under rule 9.5.4.1 which states:
- 87. 9.5.4.1 The deposition of sand shell shingle or other natural material from a maintenance dredging operation in any 12 month period is a discretionary activity if:
 - (a) The sand, shell, shingle or other natural material is deposited at the sites shown in Schedule 5 and described below:

Heywards Point

45°45.07'S 170°42.09'E 45°44.95'S 170°42.27'E 45°44.44'S 170°41.78'E 45°44.63'S 170°41.60'E

Spit Beach (Aramoana)



45°45.18'S 170°42.74'E 45°46.05'S 170°42.93'E 45°45.72'S 170°42.47'E 45°46.04S 170°42.47'E South Spit Beach (Shelly Beach) 45°46.82'S 170°42.56'E 45°46.65'S 170°42.79'E 45°46.75'S 170°42.79'E 45°46.95'S 170°42.77'E

3.2 Capital dredge material disposal

- 88. This is a discretionary and restricted coastal activity under rule 9.5.4.2 of the RPC. The rule is as follows:
- 89. 9.5.4.2 Except as provided for by Rule 9.5.4.1, any activity involving the deposition of any sand, shell, shingle or other natural material on the foreshore or seabed in quantities greater than 50,000 cubic metres in any 12 month period is a discretionary activity and a restricted coastal activity.
- 90. The application does not specify what volume of material will be sourced from maintenance and capital dredging, but as in the last 10 years an average of 142,000 m³ of maintenance dredging material has been deposited at the inshore sites per year, and the applicant is proposing to deposit up to 450,000 m³ of material per year, the volume of capital dredging material will significantly exceed 50,000 m³
- 91. Policy 29 of the New Zealand Coastal Policy Statement 2010 (NZCPS) has removed the requirement for an activity to be specified as a restricted coastal activity. It also requires local authorities to amend documents as necessary to give effect to this policy. However, as the removal of the Restricted Coastal Activities from the Regional Plan: Coast was not completed prior to the notification of this application, then this activity remains a restricted coastal activity.

4 Notification, Submissions and Pre-hearing Meeting

- 92. A decision to publicly notify this application was made on the basis that the effects have the potential to be more than minor over the three year term and that there are special circumstances and considerable public concern over the activity.
- 93. The special circumstances relate to the fact that though the applicant has been disposing dredge material from maintenance dredging at the three disposal sites since 1985. Over that time deposition volumes from the three sites have varied but on average have been for a total of 203,852 m³ and in the last 10 years an average of 142,000 m³. This application is to dispose dredge material in accordance with the original consented volumes (450, 000 m³) which will result in the actual deposition volumes increasing to a level which has never been experienced.
- 94. Special circumstances also exist for this application due to Policy 16 of the NZCPS, which acts to protect surf breaks of national significance. The



- Aramoana surf break (known as the Spit) is listed in Schedule 1 of the NZCPS as a surf break of National Significance.
- 95. In the processing of Port Otago application 2010.193 there were a significant number of submissions specifically relating to the deposition of dredge material at the three disposal sites, most particularly Aramoana.
- 96. It is also noted that S.117 of the Act requires restricted coastal activities to be publicly notified.

4.1 Submissions

97. The application was publicly notified on 13 August 2011 and by the close of the submission period eight submissions had been received in the following categories (refer table 1)

Table 1 Submitter Category and number

Submitter Category	Request to be Heard	Request not to heard	Total
Support	1	-	1
Support with conditions	_	-	_
Neutral		2	2
Oppose	4	1	5
Total	5	3	8

4.1.1 Submissions in Opposition

- 98. *K Westfall*. Ms Westfall, Environmental & Program Director, Save The Waves Coalition requested to be heard in support of her submission.
- 99. She noted that the coalition are primarily concerned with the spoil mounds at Aramoana/Spit and Heywards Point, as once the spoil grounds reach a level where the waves break continuously over the spoil mound, only degenerative effects will be observed in the inshore surf conditions.
- 100. She noted that at this location the waves are both national and international treasures, and any damage to them would represent a tremendous detrimental effect to New Zealand's economy and coastal heritage. She added that for these reasons, careful consideration needs to be taken when considering this project.
- 101. Surfbreak Protection Society Inc. The society request that the Council places the application on hold for the provision of further information that assesses the use and enjoyment of the surf breaks. The society requested to be heard in support of its submission.
- 102. In particular, the society noted that the local nationally recognised surf breaks are world class and rated very highly as surfing destinations.
- 103. The society understands that the surf breaks cannot be mitigated for and submits that relying on feedback of local surfers is not industry best practice. The society submits that proper independent numerical wave modelling at the potentially



- affected surf breaks must be conducted in conjunction with mapping of the terrain by appropriate independent experts before any changes are considered to the seabed. This would enable the applicant and the consent authority to determine the level of effects on the natural features, as opposed to an online survey that may well be conducted by unqualified individuals.
- 104. The society noted that while Aramoana is a pre-existing dump site, much smaller amounts of sediment have actually been dumped than what has been consented. Though approximately 50,000 m³ in total has been dumped at Aramoana over the last 5 years, the applicant is now looking at dumping up to 600,000 m³ over the next 3 years and the impacts of this massive amount of spoil has not been scientifically assessed to provide, among other things, a firm and agreeable outcome of no adverse effects on the surf break.
- 105. The society also quotes an unpublished University of Otago, Department of Surveying research dissertation by David Kilpatrick 2005 titled "Determining Surfing Break Components at Aramoana Beach, Dunedin" that stated that: "The fact that waves have been observed to break on spoil ground suggests that the spoil ground may in fact be reaching its maximum size if it is to continue to enhance surf conditions at Aramoana. Once the spoil grounds reach a level where the waves break continuously on the spoil mound, only degenerative effects will be observed in the inshore surf conditions."
- 106. The Aramoana disposal site already contains a significant amount of the spoil dumped historically, and the society is concerned that excessive loading within a short timeframe will increase the size of the mound and dissipate much of the incoming swells' energy, along with other possible adverse effects and cumulative effects.
- 107. The society also identified that the Council notified the application as a discretionary activity, but as the Council had not given effect to Policy 29 of the New Zealand Coastal Policy Statement, the proposed activity remains a restricted coastal activity.
- 108. The society has also sought its own expert advice from Dr Shaw Mead from coastal and marine consulting firm ASR Limited. Dr Mead noted that the large deficiencies in assessing the environmental impacts of continued inshore dumping at this site and lack of monitoring regime on which to base the proposed adaptive management are very concerning since there are a number of current issues that could lead to negative impacts.
- 109. Dr Mead recommends that a thorough baseline investigation is undertaken, an adequate assessment of environmental effects of the impacts of continued nearshore disposal on the surfing wave quality is undertaken, and should these studies indicate that there will be insignificant to minor impacts, a monitoring programme be developed and undertaken to ensure that deterioration in wave quality is prevented should the study's conclusions be wrong
- 110. Dr Mead added that there are a range of surf quality monitoring programmes being applied world-wide that could be utilised, should the assessment of environmental effects indicate that these impacts will be less than minor.



- 111. *M Gunson*. Mr Gunson is opposed to dumping of spoil in the coastal marine environment adjacent to world renowned surf breaks and seeks that the surf breaks are protected. Mr Gunson states as that the NZCPS stipulates that the surf breaks must be protected, minimising or mitigating is not an option under the NZCPS. He added that the RPC must give effect to the NZCPS. Mr Gunson requested to be heard in support of his submission.
- 112. *N J Reeves*. Ms Reeves is opposed to any further dumping of dredged spoil as the applicant and Council will not be taking a precautionary approach in relation to the effects of dumping on surfable wave quality.
- 113. In particular, Ms Reeves notes that the impact of this massive amount of spoil has not been scientifically assessed to provide a firm and agreeable outcome of no adverse effect on the surf breaks. She also identified that even the applicant's own consultants (Single and McComb 2011) state the both positive and adverse effects may occur. She added that this shows that a known outcome of no effect, or the claim that increased spoil at the Aramoana site will improve surfing conditions at Aramoana surf break are not scientifically proved. Ms Reeves requested to be heard in support of her submission.
- 114. DC Picot. Mr Picot did not request to be heard in support of his submission.
- 115. He noted that the applicant was not taking a precautionary approach, particularly on the effects on the surfable wave quality. He added that monitoring the effects on the Aramoana and Murdering Bay surf breaks after dumping occurs does nothing as suggested by the applicant, and is not a precautionary approach.
- 116. He identified concerns that adverse effects to the wave quality have not been adequately assessed, and the applicant has not engaged the correct science to ascertain these adverse effects in its assessment of environmental effects report.
- 117. Mr Picot notes that while Aramoana is a pre-existing dumpsite, the volumes being deposited are much smaller amounts than the currently consented volumes. In particular, the applicant is now seeking to dump up to 600,000 m³ of spoil over the next 3 years. The impacts of this massive amount of spoil have not been scientifically assessed to provide a firm and agreeable outcome of no adverse effect on the surf breaks.
- 118. The Aramoana site already retains a significant amount of the spoil dumped there historically, and Mr Picot is concerned that excessive loading within a short timeframe will increase the size of the mound and dissipate much of the incoming swells' energy, along with other possible adverse effects.

4.1.2 Submissions that are neutral

- 119. *South Coast Board Riders Assoc Inc.* The association did not request to be heard in support of its submission.
- 120. The association does not know the effects of the dumping, particularly regarding the effect on the nationally protected significant surf breaks at Aramoana and Murdering Beach, and wish for the dumping to be monitored by an independent authority for its entire duration.



- 121. The association seek compulsory monitoring of the effects of soil dumping on the aforementioned surf breaks
- 122. *Director General, Department of Conservation*. The Director General did not request to be heard in support of its submission.
- 123. The Director General identified that the south-eastern flank of Blueskin Bay to Taiaroa Head is habitat for many threatened indigenous species, including but not limited to New Zealand Sealions (nationally critical), Hectors Dolphins (nationally endangered), Yellow-eyed Penguins (nationally vulnerable), and Stewart Island Shags (nationally vulnerable).
- 124. The Director General noted that the application does not clearly state what quantity of fines will be dumped annually and considered that the dumping of fines within this area could impose potential adverse effects on the aforementioned as well as other indigenous species.
- 125. The Director General also identifies that surf breaks identified in the New Zealand Coastal Policy Statement 2010 should be protected from adverse effects.

4.1.3 Submissions in support

126. *J Davis* Mr Davis supports the dumping as the location of the Mole means that there is no natural source of sand to replenish the beach. Mr Davis requested to be heard in support of his submission.

4.2 Pre-hearing Meeting

- 127. Following the close of the submission period, the applicant requested that a prehearing meeting be convened to enable the applicant to discuss with submitters the concerns that they have raised. Two pre-hearing meetings were held in Committee Room 1 at Regional House on Wednesday 14 December 2011 and Monday 17 September 2012. The pre-hearing meetings commenced at approximately 7.00 pm on both occasions, lasting between 1.5 and 2.5 hours in duration.
- 128. The pre-hearing meeting held on 14 December 2011 was attended by David Agnew (Department of Conservation), Rod Rust (South Coast Board Riders Assoc Inc), Ted Whittaker (representing M. Gunson and N J Reeves) and Matt Skellern, via Skype (Surfbreak Protection Society (MS))
- 129. The pre-hearing meeting held on 17 September 2012 was attended by Rod Rust (South Coast Board Riders Assoc Inc) Nicola Reeves (on behalf of herself and Surfbreak Protection Society), Ted Whittaker and Leroy Rust.
- 130. During the pre-hearing meeting all submitters had an opportunity to discuss matters of concern. It was noted that significant understanding of each parties point of view and goodwill was evident in the series of pre hearing meetings.
- 131. It was agreed and noted in discussions that;
 - The surfbreaks at Karitane, Aramoana (Spit Beach) and Whareakeake (locally know as "Murderers" surf breaks were listed as Surfbreaks of National Significance in the NZCPS.



- The applicant outlined that operationally there was a need to continue depositing dredge material at the Hayward's Point, Aramoana Beach and Shelly Beach locations. However, the programme would certainly be open to modification.
- The applicant confirmed that the goal was to establish sufficient information over the 3 year term of the consent to enable a more sustainable activity to be undertaken long term than had occurred over the last 28 years.
- The current application was a stand alone 3 year consent. The granting of a 3 year permit does not mean that a longer term consent would be granted in the future.
- Conditions of consent were acceptable to the applicant which included specific references to the identified surf breaks. Any monitoring data would be available for peer review and the applicant is open to discussions as to who could complete the peer review.
- The applicant was to submit conditions of consent to Council and the submitters for review prior to moving towards a hearing.
- 132. A copy of the pre-hearing meeting agenda, minutes, and the Chair's (Colin Weatherall) pre-hearing report are provided in the Panel papers.
- 133. As noted in Section 2.6 of this report, following completion of the pre-hearing meetings the applicant proposed draft conditions of consent (Appendix 2).

5 Assessment of Environmental Effects

134. As noted the application is to deposit up to 450,000 m³ per year of dredged material for 3 years at 3 locations. The likely biological, recreational and physical effects of the spoil disposal are considered in the following sections.

5.1 Biological effects

5.1.1 Introduction

- 135. The main benthic effects within and adjacent to the disposal sites relate to the direct effects of smothering of the benthic community, increased levels of suspended sediments and reduced water clarity.
- 136. A mean 510 m³ of dredge spoil per day was discharged at sea in 2010 with disposal occurring during most weeks. The sediments discharged to the sites have generally been medium and fine sand from the Otago Harbour entrance and several lower harbour claims with fine material from ship berths, approaches, and the upper harbour contributing a smaller volume.
- 137. A variety of sampling and analytical methods have been used to collect biological and physical information in the study area since 2003, including the following:
 - Grab Sampling (Macrofauna, Sediment Texture and Carbon Texture)
 - Macrofaunal Sample Processing
 - Epibenthic Dredges
 - Benthic Imagery (Still and Video)
 - Air-lift Sampling
 - Sidescan Sonar Survey.



- 138. The Director General identified that the dump sites are located within the habitat for a number of species whose 'threat of extinction' classification include nationally endangered, nationally critical and nationally vulnerable. The Director General also identified that the application does not clearly state what quantity of fines will be dumped annually and considers that the deposition of fines within these areas could impose potential adverse effects on indigenous species.
- 139. The coastal subtidal study area between Taiaroa Head and the northern limits of Blueskin Bay is a dynamic environment where sediments, water depth, and hydraulic energy gradients help shape the animal communities of the benthic (seafloor) habitats. The benthic ecology of the Shelly Beach disposal ground has not been investigated by the applicant due to the overarching conservation efforts focused on the South Spit shoreline and the Aramoana saltmarsh it shelters.

5.1.2 Heyward Point

- 140. The Heyward Point disposal site is a physically and biologically complex area spanning significant, 'natural' assemblage boundaries. It lies in waters varying from 9 m to 23 m deep off the cliffs and rocky reefs of the Heyward Point headland separating the north east facing Aramoana shore from the more northerly facing southern shores of Blueskin Bay.
- 141. In the period of 2002–2005, when the applicant's ecological studies began, approximately 40,000 m³ of spoil was released at the Heyward Point disposal site per year. Between 2005 and 2010, approximately 48,000 m³ were disposed of per year with 109,000 m³ released in 2010 alone.
- 142. Paavo (2011) found that macrofaunal abundances were generally lower in areas associated with mounds in the disposal area. Consequently, the applicant is gathering data on the actual spatial utilisation of the Heyward Point disposal site in response to these analyses. However, occasional field observations and anecdotal evidence suggest that recent disposals have been more common in the central area just north west of the existing submarine mound than elsewhere. Paavo (2011) adds that if this is correct, then the abundance and taxon distributions suggest that the impacts of disposal activities rarely extend into the northern third of the site boundary, but probably do extend beyond the western boundary to some degree by 250–500 m. Given the arbitrary origins of the disposal ground boundaries, it is not unexpected for the disposal effects to not match the actual disposal limits.
- 143. Paavo (2011) also noted that the small-scale heterogeneity of the Heyward Point macrofauna supports the view that disposal effects at the current rates, volume, and composition are localised in space (on the scale of 10s of m from each disposal) and that recolonisation from surrounding sediments has been rapid (on the scale of months rather than years) with no substantial taxon extinctions.

5.1.3 Aramoana

144. The Aramoana disposal ground is wholly contained within the energetic nearshore band occupied by taxa intolerant to mud or silt sediments, lying in waters varying from 6 to 12 m in depth seaward of Aramoana Beach.



- 145. Paavo (2011) noted that between 2002 and 2005 when Aramoana received approximately 108,000 m³ of sediment per annum, mound accretion occurred at this site.
- 146. More recently an average of 52,000 m³ per year was released at Aramoana between 2005 and 2010. Recent bathymetry and modelling (MetOcean Ltd. reports) indicates that the spoil mound is a dynamic morphological feature currently shoreward and north of its 2005 position. Aramoana is the most hydrodynamically energetic of the three disposal areas with frequent mobilisation of medium-sized sand grains.
- 147. The applicant notes that separate studies on coastal water movements (MetOcean Ltd. and others) and sediments (Single et al. 2011 and others) complement the available biological information and validate a relationship between the mound and a decrease in benthic macrofaunal abundance and species richness. However, some robust species, such as the wheel–shell snail *Zethalia zelandica*, thrive in the energetic areas inshore of the disposal areas while most other taxa are excluded.
- 148. At Aramoana, disposal—related effects are probably limited to the inshore portion of the disposal ground and extend not more than 250 m beyond the disposal ground boundary. Both the Heyward Point site and Aramoana sites are dispersive with respect to silty sediments and retain sand—sized sediments to different degrees. There is no evidence that disposal has deleterious ecological effects beyond these areas.
- 149. Paavo (2011) noted that Macrofaunal abundances were generally lower in areas associated with mounds at the Aramoana disposal areas. At Aramoana there was an increase in abundance with increasing distance from the disposal area at bathymetrically matched sites. Taxon richness was correspondingly lower in these areas, as a consequence of lowered abundance. This likely signifies an assemblage—wide effect of disposal rather than taxon—specific effects with the exception of *Zethalia zelandica* and a few other taxa.
- 150. Although 2003–2005 data did not provide high spatial resolution around the disposal areas, the samples fit into the general bathymetric and impact patterns observed in 2008 and 2010. It is not plausible that disposal activities have substantially altered the entire area covered by the present synthetic analyses, so the patterns observed indicate that disposal impacts appear to be localised around the existing disposal sites.

5.1.4 Shelly Beach

151. The Shelly Beach disposal ground is a shallow disposal ground in 3–8 m of water depth seaward of Shelly Beach. The 750 m wide sand beach has been in an erosive condition since construction of the adjacent breakwater (c. 1884) blocked southerly transport of sediments. In the late 1980s erosion critically threatened the low dune system, human dwellings, and the Aramoana Salt Marsh, an area of national ecological significance (DOC 2011). Since then, the applicant has disposed of a quantity (approximately 20,000 m³ per annum in 1987–2010) of sand from specific, texture–matched, claims into the Shelly Beach disposal ground at the request of regional and national authorities to renourish and stabilise the shoreline.



- 152. Other than physical studies, the applicant has not commissioned ecological work in this area given the overriding conservation effort pertaining to shoreline systems.
- 153. It is noted that as there is proposed to be no consented increase in the volume of sediment to be deposited at this location as well as no change in the grain size of the sediments being deposited, then it is expected that there will be no change to the existing benthic ecology within this disposal area.

5.1.5 *Summary*

- 154. Dr Paavo (2011) reports that the disposal related effects of the sites studied are limited as follows:
 - "Heyward Point effects are limited to the central portion of the site and an area 100-500 metres west of its shoreward boundary. Spit Beach (Aramoana) effects are limited to the inshore portion and not more than 250 metres beyond."
- 155. There are also no areas of significant conservation value within the areas identified by Dr Paavo. Dr Paavo reports that "there is no evidence that dumping has deleterious ecological effects beyond these areas". He adds that "Dredge-related effects at Aramoana appear spatially stable in comparisons between 2005 and 2010 and the area retains a 'buffer zone' of animals well-suited to colonise sandy spoil. Dredge-related effects also appear spatially stable at Heyward Point in comparisons between 2005 and 2010".
- 156. On the basis of Dr Paavo's assessment, the applicant concludes that effects on the benthic environment from the continued disposal of dredged material at the three disposal sites will continue to be minor and will impact upon a relatively small area, of historically modified seafloor within the coastal environment.
- 157. It is agreed that effects on the existing benthic environment at the Heyward Point and Aramoana sites will be minor. It is also noted that there will be no change to the existing benthic environment at Shelly Beach caused by the continued sediment disposal for another 3 years.
- 158. However, as discussed, the applicant has proposed investigations to take place during the short term consent period which aim to prepare an effective monitoring and management programme for a subsequent 35-year consent application. The key points of the applicant's proposed investigations are that within 3 months of the commencement of this consent, it shall commission a biological study, which considers the findings of the biological monitoring work undertaken as a condition of the former maintenance disposal consent and provides recommendations as to suitable biological monitoring indicator species that could be adopted for the long term adaptive management of disposal activities at the Heyward Point and Aramoana disposal sites.

5.2 Recreational Effects

5.2.1 Surf Break

Surfing is a popular pastime at many locations along the Otago coastline including a number of beaches from Aramoana through to Karitane. In particular: the Spit, Karitane and Whareakeake are identified in the New Zealand Coastal Policy Statement 2010 as being nationally significant surf breaks.



- 159. The presence of the disposal mound modifies the incoming wave field producing subtle differences in the wave height gradients along the beach in the surf zone. The mound acts as a secondary focusing feature, redistributing wave energy into zones of slightly increased and decreased wave height. This has a slight effect on the local coastal processes, and influences surfing wave quality.
- 160. Focusing effects that increase the local wave heights along the adjacent beach are likely to confer positive outcomes for surfing. However, the wave focusing process is highly dependent on the mound shape. Therefore as the mound erodes over time and the sediments are distributed shoreward and eventually spread along the beach and nearshore regions, the effects will also change.
- 161. The sediment character of the nearshore, beaches and wider Blueskin Bay is near homogenous. The dredge disposal sites do not show as anomalies to the adjacent seabed and beaches. Shoaling within the disposal sites has resulted in an improved wave break for surfing at Aramoana, and a reduction in erosion of Shelly Beach. There is no evidence that wave energy is focussed on to the beaches, generating sites of increased erosion during storms.
- 162. The applicant notes that on the basis of the specialist work undertaken, the effects on surfing from the ongoing disposal activity will not be adverse and is expected to continue to be a positive effect within the term of the consent sought.
- 163. There is a relationship between the disposal mound and the waves generated at Aramoana. Dr Single (2011) confirmed and it is agreed that shoaling within the disposal sites has resulted in an improved wave break for surfing at Aramoana.
- 164. However, the level of proposed deposition is in excess of what has previously been deposited (Figure 6) and therefore effects on the surf break are unknown and potentially detrimental, if the deposition is not managed appropriately.
- 165. Over the term of this consent the applicant proposes to manage the disposal in a way which enables effects on the surf break to be monitored. This will involve local surfers in a working party, as well as the use of remote photographic monitoring of the Aramoana surf break and the establishment of a web site to allow surfers to record their personal observations of surf quality. This information will then be used to develop an operational management plan which will minimise negative effects on the surf break being developed in the future.
- 166. In summary, the effect of the continued disposal activity at the Aramoana disposal ground on wave generation could be both positive and negative. Consequently, the applicant intends to work with local surfers during the term of the 3-year consent to get a better understanding of the relationship between disposal and "surfability" at Aramoana, in order to develop management plan which minimises any long term negative effects on this surf break.

5.2.2 Other Recreational Effects

- 167. Recreational boating activity within the dredge disposal area includes sailing, motor boats and kayaking.
- 168. Fishing from boats occurs within the harbour and the entrance channel is a popular site for salmon and other species. Fishing from the Mole and Taiaroa



Head near the entrance channel is also popular as is surfcasting from many beaches and rocky headlands. The ongoing disposal of dredged material is unlikely to cause any conflict with boating and recreational fishing activities within the coastal marine area, as no conflicts have been identified to date. Neither the current dredge movements nor the disposed material are considered to be a danger to navigation.

169. Recreational diving is popular at the Mole which is a voluntary marine reserve. Swimming and kayaking also occurs at Aramoana and Shelly beaches. Though the sediment will not be directly disposed onto these beaches, a reduction in water clarity may occur. However, reduced water clarity is a temporary effect which should not impact significantly upon these activities, given there separation distances to the actual disposal site.

5.3 Physical Effects

170. Single 2011a and Met Ocean Solutions Ltd reviewed the coastal environment and provided the following assessment of the physical effect of depositing material at the three disposal sites.

5.3.1 Heyward Point

- 171. A mound on the surrounding seabed has been evident at this site since the late 1970s. The position of the mound at the SW corner of the disposal site is constant, but its size varies significantly over time. The mound appeared to grow between 1978 and 1985 resulting in shoaling of the seabed. However by the late 1980's the mound appeared deflated.
- 172. Shoaling and seabed lowering continued through the 1990s and 2000, with the apparent cyclic trend of growth and reduction approximately coincident with periods of high and low dredge spoil disposal at the site.
- 173. Both the historical survey measurements and numerical modelling suggest that sediments within the shallow parts can become mobilised by wave action and tend to migrate westward, while the deeper regions (i.e. greater than about 15 m) are clearly retentive. Accordingly, the effects of the proposed deposition will depend on the discrete areas used for disposal within the ground. The historical survey data indicate a disposal mound has been slowly accreting in the shallow regions of the ground, which indicates the supply to these areas over recent years has exceeded the natural transportation capacity (i.e. waves and currents).
- 174. Consequently, to avoid its mobilisation by wave action, the applicant is proposing that any volume of material in excess of 200,000 m³ annually deposited at the Heyward Point site, shall be deposited within water greater than 18 m below chart datum.
- 175. Therefore it is considered that over the term of the consent there is scope to further manage the applied for disposal volumes within discrete areas of the disposal ground. Consequently, it is recommended that the applied for volume of 350,000 m³ can be disposed at this site whilst avoiding adverse physical effects.



5.3.2 Aramoana

- 176. Dr Single notes that Aramoana Beach responds naturally to storm events with some erosion of the dunes and movement of sand from the beach to the nearshore, and it accretes again during lower energy swell conditions.
- 177. The seabed in the immediate vicinity of this site is dynamic, with substantial changes in both the size and position of a raised part of the bed since 1982. Formation and reduction of the shoal in the northern part of the site, combined with movement toward the nearshore appears to have happened twice since 1982. Recent deflation of the seabed along the offshore edge of the disposal site and onshore movement of the shoal may be an effect of reduction in disposal volumes at this site since 2004. However, a similar pattern of deflation offshore and shoaling in the nearshore occurred in the late 1980s with no associated reduction in disposal volumes.
- 178. The applicant notes that the model results indicate that the sediment deposited here tends to migrate westwards with the incident wave field. No direct transport vector has been identified from the Aramoana Beach region to the adjacent coastal cells, and so it is likely that the dredged sediments deposited will have long residence times. Significant transport beyond this immediate area (i.e. the wider Aramoana Beach system) is likely to occur infrequently and only during high storm conditions.
- 179. On the basis of this information, it is highly probable that material placed will slowly migrate shoreward and gradually disperse along the wider Aramoana Beach system. While the region into which this material will disperse is relatively broad, it is considered that a deposition rate of 200,000 m³ per year is not a sustainable practise over the long term. This is because only approximately 750,000 m³ of material has been deposited at this site between 2000 and 2010. This is also recognised by the applicant, which now proposes that, except to maintain the existing wave environment, a maximum of 50,000 m³ per year will be deposited at this location.
- 180. In the short term, the presence of the disposal mound will modify the incoming wave field. Wave transformation studies have shown that the historical disposal mound bathymetries produce subtle differences in the wave height gradients along the beach in the surf zone. The mound acts as a secondary focusing feature, redistributing wave energy into zones of slightly increased and decreased wave height. This has a slight effect on the local coastal processes, and does influence the surfing wave quality.
- 181. Focusing effects that increase the local wave heights along the adjacent beach are likely to confer positive outcomes for surfing. However, the wave focusing process is highly dependent on the mound shape. Therefore as the mound erodes over time and the sediments are distributed shoreward and eventually spread along the beach and nearshore regions, the effects will also change.

5.3.3 Shelly Beach

182. Dr Single notes that Shelly Beach also appears to respond naturally to storm events and periods of more quiescent wave energy. Like Aramoana Beach it adjusts naturally to storm events with some erosion of the dunes and movement



- of sand from the beach to the nearshore, and it accretes again during lower energy swell conditions.
- 183. The applicant notes that Shelly Beach has been cut off significantly from natural sediment inputs (especially from the north and west) since the construction of the Mole. The beach is therefore susceptible to changes in the amount of dredge spoil placed at the site. This is evident with fluctuations in sediment volume in the nearshore associated with periods of decreased dredge spoil disposal. Although there was a negative sediment balance between 2002 and 2010 for the broader area around the Heyward Point and Aramoana disposal sites, the Shelly Beach site showed accretion through to 2010.
- 184. The surveys of this site from 1987 to 2009 show an area of shoaling in the southwest corner of the disposal site. This was a common feature of the disposal site until 2002, when dredged sediment was placed closer to the central area of the site. Patterns of change are indicative of the location of the placement of the dredge spoil within the disposal site, and movement of the placed sediment within the embayment, onshore and southeast along the nearshore.
- 185. At the Shelly Beach disposal site, the effects of the continued disposal of up to 50,000 m³ per year are not expected to produce outcomes that differ from between 2000 and 2010. In this time, some 237,092 m³ has been placed at the disposal site, with a relatively low retention rate. Though the sediment transport has not been modelled for this area in the present study, it is highly probable that sediments are actively flushed from this region during periods of elevated wave penetration, with subsequent deposition in the adjacent shipping channel. Consequently, the exercise of the consent for this site over the three—year period will provide a short term sediment supply to Shelly Beach, whilst not producing outcomes that differ from the observations since 2000.
- 186. In summary at the Shelly Beach ground, the effect of disposal to 50,000 m³ per year is not expected to produce outcomes that differ from the past 10 years. The exercise of the full consent volume for this ground over the three—year period will continue to provide a short term sediment supply to Shelly Beach. Therefore the applied for volume of 50,000 m³ is recommended

5.3.4 Other Beaches

- 187. It is noted that at Karitane and Whareakeake are identified in the NZCPS New Zealand Coastal Policy Statement 2010, as such special consideration of the potential effects of dredge spoil deposition on these surfbreaks has to be given. Single (2011) states that beaches north of Heyward Point also appear to respond naturally to variations in wave energy, and do not show any adverse effect from the sediment deposition at the three disposal sites.
- 188. As sediment is dredged from the Otago Harbour channel, the deposition of material at the disposal grounds is considered to have no effect on sediment accumulation to the east of the Otago Harbour channel.

5.4 Recommended Total Annual Sediment Deposition Volume

189. The applicant seeks to continue to dispose up to 450,000 m³ per year of dredge spoil into the existing grounds. A term of three years is sought, which the



applicant deems is sufficient time to allow further studies to be undertaken and the associated management strategies to be developed, to enable a long term consent to be sought in the future.

190. Figure 7 shows that the volumes of material that have been deposited at the three sites since 1985 have been considerably less than the applied for consent volume of 450,000 m³ per year. This equates to a total volume of 1,350,000 m³ being deposited during the three year term of the consent which is similar to the 1,419,945 m³ deposited between 2000 and 2010.

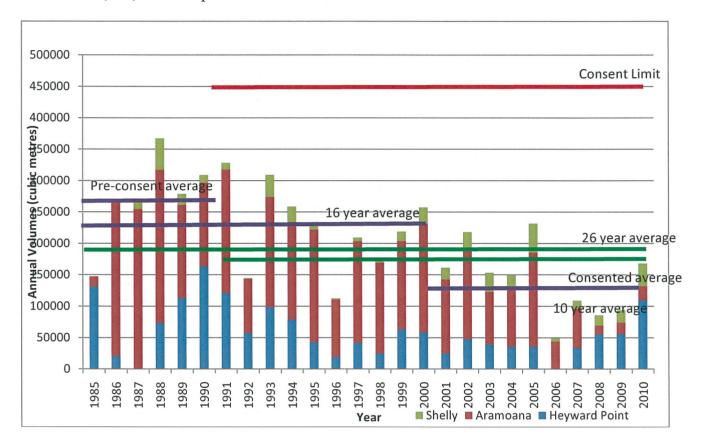


Figure 7 Sediment Deposition Summary

Explanation:

Red line (Consent Limit) is the applied for combined maximum annual volume of material to be deposited at the three disposal sites.

Top green line (26 year average) is the average annual volume of material deposited at the three disposal sites during the last 26 years.

Bottom green line (Consented average) is the average annual volume of material deposited at the three disposal sites during the term since resource consents (Coastal Permits 3676 and 2000.472) have been held by the applicant.

Top purple line (Pre consent average) is the average annual volume of material deposited at the three disposal sites prior to Coastal Permit 3676 being granted.

Middle purple line (16 year average) is the average annual volume of material deposited at the three disposal sites prior to Coastal Permit 2000.472 being granted.

Lower purple line (10 year average) is the average annual volume of material deposited at the three disposal sites since Coastal Permit 2000.472 has been held by the applicant.

191. Too much short term sediment deposition could potentially cause the beach system to either take years to re-establish itself as suggested by the applicant, or in a worst case establish a different equilibrium which may cause an irreversible effect by changing the coastal environment. As such, the applicant has reduced the volume of material to be deposited at Aramoana, whilst restricting the excess



- material deposited at Heyward Point to locations greater than 18 m in depth to prevent wave remobilisation.
- 192. Consequently, the volume of material proposed to be deposited during the three year term of consent is considered reasonable.

6 Statutory Considerations

193. Section 104 of the Act sets out the matters to be considered when assessing an application for a resource consent.

6.1 Part 2 Matters

- 194. These matters are subject to Part 2, the purpose and principles, which are set out in Sections 5 to 8 of the Act. Those matters which should be considered for these applications are as follows.
- 195. Subject to recommended consent conditions, the proposal is consistent with the purpose and principles of the Act, as outlined in Section 5. Section 5 states that the purpose of the Act is to "to promote the sustainable management of natural and physical resources". Sustainable management has two facets. The first aspect is "managing the use, development and protection of natural and physical resources in a way, or at a rate which enables people and communities to provide for their social, economic and cultural well being and for their health and safety". In this respect, the concept of sustainable management is permissive. The purpose of the Act is achieved by allowing activities that benefit people. In this case the dredge spoil is sourced from the dredging of the harbour, which is required for its operational purposes.
- 196. However, there is another aspect to sustainable management. The use, development and protection of resources are only allowed while:
 - (a) "sustaining the potential of natural and physical resources, (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
 - (b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and
 - (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment."
- 197. The granting of these short term coastal permits with the recommended conditions imposed is consistent with the ethic of sustainable management of resources.
- 198. Section 6 of the Act requires that in assessing the applications, the following matters of national importance are recognised and provided for:
 - a) The preservation of the natural character of the coastal marine area), wetlands, and lakes and rivers and from inappropriate subdivision, use, and development:
 - *b) The protection of outstanding natural features and use, and development:*
 - c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:
 - *d)* The maintenance and enhancement of public access lakes, and rivers:



- e) The relationship of Māori and their culture and traditions sites, waahi tapu, and other taonga.
- f) The protection of historic heritage from inappropriate subdivision, use and development.
- g) The protection of recognised customary activities.
- 199. The applications are not contrary to Section 6(a) of the Act, in that the location and recommended volumes of the sediment disposal are not inconsistent with the protection of the Aramoana tidal flats and natural character this section of the Otago coastline. Consequently, subject to recommended consent conditions the remaining natural character of these areas will be preserved.
- 200. The applications are not contrary to Section 6(b) of the Act, in that though the Regional Plan: Coast identifies Otago Peninsula as an area of outstanding natural features and landscapes (ONFL9), as the spoil will be deposited within the existing spoil disposal areas, the landscape values and natural character of the coastal environment will be preserved.
- 201. Regarding Section 6 (c) recommended consent conditions will ensure that areas of significant indigenous vegetation and significant habitats of indigenous fauna outside of the dredge spoil disposal areas will be protected.
- 202. Regarding Section 6 (e) the applicant acknowledges that the entire Otago Harbour and Blueskin Bay are of special significance to iwi and that iwi have a long association with this area in term of travel, settlement and fishing.
- 203. Consultation with between the applicant and iwi in relation to dredging disposal has been continuing throughout the term of the previous consent Furthermore, iwi are represented on the existing working party established to discuss and review the annual monitoring report, to the previous consent. In addition, iwi have been specifically consulted in relation to this replacement application.
- 204. Section 7 of the Act sets out those matters that have particular regard attributed to them in achieving the purpose of the Act. Matters relevant to the proposal under consideration are as follows:
 - (a) kaitiakitanga and
 - (aa) the ethic of stewardship;
 - *(b) the efficient use and development of natural and physical resources;*
 - (c) maintenance and enhancement of amenity values;
 - (d) intrinsic values of ecosystems;
 - (f) maintenance and enhancement of the quality of the environment; and
 - (g) any finite characteristics of natural and physical resources;
- 205. In contrast to section 6, the matters set out in section 7 are not declared to be matters of national importance.
- 206. The proposed activities will affect ecosystems located within dredge spoil disposal areas. However, as the sediment has been disposed of at these locations since at least 1985, the local ecosystems will be well adjusted to this activity.
- 207. Section 8 requires all persons acting under the Act to take into account the principles of the Treaty of Waitangi.



- 208. Consultation with iwi in relation to dredging disposal has been continuing throughout the term of the existing consent. Consultation is being carried out through Kai Tahu Ki Otago Ltd (KTKO Ltd) and the working party established to address any matters of significance to tangata whenua.
- 209. Consequently the principles of the Treaty of Waitangi (the Tiriti o Waitangi) have been taken into account.
- 210. Overall, these applications are consistent with Part 2 of the Act.

6.2 Section 104 Matters

- 211. The remaining matters of Section 104(1) to be considered when assessing an application for resource consent are as follows:
 - (a) any actual and potential effects on the environment of allowing the activity; and
 - (b) any relevant provisions of
 - (i) a national environmental standard;
 - (ii) other regulations;
 - (iii) a national policy statement;
 - (iv) a New Zealand coastal policy statement;
 - (v) a regional policy statement or proposed regional policy statement;
 - (vi) a plan or proposed plan; and
 - (c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.
- 212. These matters are discussed in the following sections.

6.2.1 Environmental Effects

213. The actual and potential effects of the proposed activities were discussed in Section 5 of this report. It is considered that there are positive effects to be gained by granting this proposal and recommended conditions of consent will ensure that any actual or potential effects are avoided, remedied or mitigated.

6.2.2 New Zealand Coastal Policy Statement

- 214. The purpose of the New Zealand Coastal Policy Statement 2010 (NZCPS) is to state policies in order to achieve the purpose of the Resource Management Act in relation to the coastal environment of New Zealand.
- 215. In particular, the following policies state:

Policy 1: Extent and characteristics of the coastal environment

Recognise that the extent and characteristics of the coastal environment vary from region to region and locality to locality; and the issues that arise may have different effects in different localities.

Recognise that the coastal environment includes:

- (a) The coastal marine area:
- (b) Islands within the coastal marine area:
- (c) Areas where coastal processes, influences or qualities are significant, including coastal lakes, lagoons, tidal estuaries, saltmarshes, coastal wetlands, and the margins of these;
- (d) Areas at risk from coastal hazards;



- (e) coastal vegetation and the habitat of indigenous coastal species including migratory birds;
- (f) elements and features that contribute to the natural character, landscape, visual qualities or amenity values;
- (g) items of cultural and historic heritage in the coastal marine area or on the coast;
- (h) inter-related coastal marine and terrestrial systems, including the intertidal zone; and
- (i) physical resources and built facilities, including infrastructure, that have modified the coastal environment.
- 216. The Aramoana spit protects the Aramoana township and saltmarsh. The deposition of sand will ensure that these features continue to be protected.

Policy 2: The Treaty of Waitangi, tangata and Māori

In taking account of the principles of the Treaty of Waitangi (Te Tiriti o Waitangi), and kaitiakitanga, in relation to the coastal environment:

- (a) recognise that tangata whenua have traditional and continuing cultural relationships with areas of the coastal environment, including places where they have lived and fished for generations;
- (b) involve iwi authorities or hapū on behalf of tangata whenua in the preparation of regional policy statements, and plans, by undertaking effective consultation with tangata whenua; with such consultation to be early, meaningful, and as far as practicable in accordance with tikanga Māori;
- (f) Provide for opportunities for tangata whenua to exercise kaitiakitanga over waters, forests, lands and fisheries in the coastal environment through such measures as:
 - 1) Bringing cultural understanding to monitoring of natural resources;
 - 2) Providing appropriate methods for the management, maintenance and protection of the taonga of tangata whenua;
 - 3) Having regard to regulations, rules or bylaws relating to ensuring sustainability of fisheries resources such as taiāpure, mahinga mātaitai or other non commercial Māori customary fishing; and
- 217. The applicant has recognised the iwi's relationship with the Otago Coastline. Consequently, consultation is being carried with local iwi to address any matters of significance to tangata whenua.

Policy 3: Precautionary approach

- Adopt a precautionary approach towards proposed activities whose effects on the coastal environment are uncertain, unknown, or little understood, but potentially significantly adverse.
- 218. Given the potentially significant adverse effects that could be caused by the continued deposition of dredge spoil into an essentially closed system, it is appropriate a precautionary approach be adopted. In this instance though the applicant is applying to deposit more material than has annually been deposited at the disposal sites, the short term duration of the consent and the recommended consent conditions ensure a precautionary approach has been taken.



Policy 6: Activities in the coastal environment

In relation to the coastal environment:

- (a) recognise that the provision of infrastructure, the supply and transport of energy including the generation and transmission of electricity, and the extraction of minerals are activities important to the social, economic and cultural well-being of people and communities; and
- (j) where appropriate, buffer areas and sites of significant indigenous biological diversity, or historic heritage value.

Additionally, in relation to the coastal marine area:

- (a) recognise potential contributions to the social, economic and cultural wellbeing of people and communities from use and development of the coastal marine area, including the potential for renewable marine energy to contribute to meeting the energy needs of future generations;
- (b) recognise the need to maintain and enhance the public open space and recreation qualities and values of the coastal marine area;
- (c) recognise that there are activities that have a functional need to be located in the coastal marine area, and provide for those activities in appropriate places;
- 219. The operation of Port Otago is important to the economic well being of the Otago Region.

Policy 9: Ports

Recognise that a sustainable national transport system requires an efficient national network of safe ports, servicing national and international shipping, with efficient connections with other transport modes, including by: (a) ensuring that development in the coastal environment does not adversely affect the efficient and safe operation of these ports, or their connections with other transport modes;

220. The proposed dredging of the harbour and associated dredge spoil disposal will enable the applicant to continue to operate the port safely and efficiently.

Policy 11: Indigenous biological diversity (biodiversity)

To protect indigenous biological diversity in the coastal environment:

- (a) avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of activities on:
 - a. areas of predominantly indigenous vegetation in the coastal environment;
 - b. habitats in the coastal environment that are important during the vulnerable life stages of indigenous species;
 - c. indigenous ecosystems and habitats that are only found in the coastal environment and are particularly vulnerable to modification, including estuaries, lagoons, coastal wetlands, dunelands, intertidal zones, rocky reef systems, eelgrass and saltmarsh;
 - d. habitats of indigenous species in the coastal environment that are important for recreational, commercial, traditional or cultural purposes;
 - e. habitats, including areas and routes, important to migratory species; and



- f. ecological corridors, and areas important for linking or maintaining biological values identified under this policy.
- 221. The dredge spoil will be deposited into areas where spoil has been disposed of for many years. It is also noted that the disposal areas are occupied by taxa well-suited to colonise spoil of matching texture dredged from the harbour entrance and many lower-harbour claims. As such, the short term disposal at the recommended volumes will ensure significant effects on indigenous biological diversity are avoided.

Policy 13: Preservation of natural character

- (1)To preserve the natural character of the coastal environment and to protect it from inappropriate subdivision, use, and development:
 - (a) avoid adverse effects of activities on natural character in areas of the coastal environment with outstanding natural character; and
 - (b) avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of activities on natural character in all other areas of the coastal environment; including by:....
- 222. As discussed in section 5 of this report, subject to recommended consent conditions the proposal will not impact upon any areas of outstanding natural character. Furthermore proposed consent conditions will avoid significant effects on the natural character of the existing coastal environment.

Policy 16: Surf breaks of national significance

Protect the surf breaks of national significance for surfing listed in <u>Schedule 1</u>, by:

- (a) ensuring that activities in the coastal environment do not adversely affect the surf breaks; and
- (b) avoiding adverse effects of other activities on access to, and use and enjoyment of the surf breaks.
- 223. The importance of the surf break to the surfing community is also reflected by the number of submissions received regarding its protection. It is recognised by the applicant that there is a relationship between the disposal mound and the waves generated at Aramoana. Consequently, the effect of continued disposal at the Aramoana disposal ground on wave generation could be both positive and negative. The applicant proposes to undertake photographic monitoring of the Aramoana surf break and the establishment of a web site to allow surfers to record their personal observations of surf quality. Monitoring the effects of the sediment disposal on the surf break, will also help ensure that the surf break over the short term of this consent is not adversely affected.

Policy 22: Sedimentation

- (1) Assess and monitor sedimentation levels and impacts on the coastal environment.
- (2) Require that subdivision, use, or development will not result in a significant increase in sedimentation in the coastal marine area, or other coastal water.



- 224. Bathymetric surveys have been proposed by the applicant to assess the effects of the dredge spoil deposition at the three sites. This requirement has been recommended as a condition of consent.
- 225. The amount of retention or dispersal of sediment at the maintenance disposal sites has been estimated from bathymetric surveys, and is understood at a qualitative level. Although it is thought that the spoil contributes to the stability and health of the beaches and dunes of Aramoana, Shelly Beach and beaches north of Heyward Point, the quantity of sediment from the disposal sites that nourishes these areas is not known.
- 226. Consequently, because of this uncertainty the applicant is applying for a short term consent with recommended monitoring conditions that requires the impact of sedimentation on the foreshore to be assessed.

Policy 23: Discharge of contaminants

- (1)In managing discharges to water in the coastal environment, have particular regard to:
 - a) the sensitivity of the receiving environment;
 - b) the nature of the contaminants to be discharged, the particular concentration of contaminants needed to achieve the required water quality in the receiving environment, and the risks if that concentration of contaminants is exceeded; and
 - c) the capacity of the receiving environment to assimilate the contaminants; and:
 - d) avoid significant adverse effects on ecosystems and habitats after reasonable mixing;
- 227. As dredge spoil has been deposited at these locations for many years, their associated ecosystems will be well adjusted to the current environment and therefore significant adverse effects on these ecosystems will be avoided.

Policy 26: Natural defences against coastal hazards

- (1) Provide where appropriate for the protection, restoration or enhancement of natural defences that protect coastal land uses, or sites of significant biodiversity, cultural or historic heritage or geological values, from coastal hazards.
- (2) Recognise that such natural defences include beaches, estuaries, wetlands, intertidal areas, coastal vegetation, dunes and barrier islands
- 228. The deposition of sediment will continue to provide the shoreline with sediment to provide protection of the Aramoana foreshore and wetlands.
- 229. In summary, the proposal is consistent with the New Zealand Coastal Policy Statement 2010.

6.2.3 Regional Policy Statement for Otago

230. The Regional Policy Statement for Otago (RPS) provides an overview of Otago's resource management issues, and ways of achieving integrated management of natural and physical resources. The provisions of Chapter 4 (Manawhenua Perspective), Coast (Section 8) and Built Environment (Section 9) are relevant to this application.



Section 4 - Manawhenua

- 231. The objectives in this chapter require that the Principles of the Treaty of Waitangi be taken into account in sustainable management of natural and physical resources, and in doing so, recognise the role of kaitiakitanga and provide for the relationship of Kai Tahu with ancestral lands, waahi tapu, water, sites and other taonga.
- 232. As discussed, the applicant recognises the relationship Kai Tahu has with the Otago Harbour and the coastline, and has therefore undertaken extensive consultation with iwi. Furthermore, through its established working group the applicant has established an ongoing relationship with local iwi.

Section 8 - Coast

- 233. The following objectives and policies of this chapter are relevant to this application.
- 234. Objective 8.4.1 to promote the sustainable management of Otago's coastal resources in order to meet the present and reasonably foreseeable needs of Otago's people and communities.
- 235. Objective 8.4.2 of the RPS seeks to maintain and enhance the health and diversity of Otago's existing coastal ecology.
- 236. Objective 8.4.3 seeks to recognise and understand the action of natural physical coastal processes affecting the natural and physical resources within Otago's coastal environment.
- 237. Objective 8.4.4 seeks to maintain water quality within Otago's coastal waters and where water quality is degraded, to seek to achieve water quality suitable for contact recreation and the eating of shellfish.
- 238. Objective 8.4.5 seeks to protect areas of natural character, outstanding natural features and landscapes and their associated values within the coastal environment
- 239. Policy 8.5.2 seeks to recognise existing uses within the coastal environment.
- 240. Policy 8.5.6(c) requires that all discharges into Otago's coastal waters maintain the standard for the receiving waters after reasonable mixing.
- 241. Recommended consent conditions will ensure that adverse effects on the local coastal ecology will be minimised. Though the existing water quality will be degraded by the deposition of the dredge spoil the effect will be short term and water quality will not be degraded to below contact recreation standards or impact upon the consumption of shellfish. The short term consent and recommended consent conditions will ensure that natural character of the area is protected. The port facilities have been an established part of Otago Harbour for approximately 150 years with offshore dredge spoil deposition occurring since 1882.



242. The applicant has also considered the disposal of dredge material to land, but concluded that given the large volume of material required to be disposed and that the sediment will be adequately mixed so that no measureable affects on the shoreline will occur, disposal in open water is considered to be the only practical disposal option.

Section 9 - Built Environment

- 243. Objective 9.4.2 relates to promotion of the sustainable management of infrastructure.
- 244. Port Otago is crucial to the economic wellbeing of the Otago region. Dredging is required to ensure the safe and efficient operation of the port. Disposal of the dredge spoil at sea is the only practical option available to the applicant.

6.2.4 Regional Plan: Coast for Otago

245. The RPC contains issues, objectives and policies that address coastal management (Chapter 5) public access and occupation of space (Chapter 7), structures (Chapter 8), disturbance (Chapter 9), discharges (Chapter 10), noise (Chapter 12) and exotic plants (Chapter 13). The following objectives and policies are relevant to these applications.

Chapter 5 - Coastal Management

- 246. Objective 5.3.1 To provide for the use and development of Otago's coastal marine area while maintaining or enhancing its natural character, outstanding natural features and landscapes, and its ecosystem, amenity, cultural and historical values.
- 247. Policy 5.4.1 To recognise the following areas, as identified in Schedule 2.1, as coastal protection areas within Otago's coastal marine area:
 - CPA 7 Hawksbury Inlet
 - CPA 8 Waikouaiti River Estuary
 - CPA 9 Karitane Headland
 - CPA 10 Puketeraki
 - CPA 11 Blueskin Bay
 - CPA 12 Orokonui Inlet
 - CPA 13 Mapoutahi
 - CPA 14 Purakanui Inlet
 - CPA 15 Aramoana
 - CPA 16 Historic Otago Harbour walls.
 - CPA 17 Otakou & Taiaroa Head
- 248. *Policy 5.4.2* Priority will be given to avoiding adverse effects on:
 - (a) The values identified in Schedule 2.1, associated with any coastal protection area; and
 - (b) The habitat and movement of marine mammals and birds in the coastal marine area adjacent to any marine mammal and bird site identified in Schedule 3.1; when considering the use, development and protection of Otago's coastal marine area.



- 249. The continued deposition of dredge spoil into the dredge spoil grounds identified in Schedule 5 of the RPC will provide for the use and development of Otago's coastal marine area while maintaining or enhancing its natural character, outstanding natural features and landscapes, and its ecosystem, amenity, cultural and historical values. The proposal will also avoid effects on any coastal protection areas. The short term consent in conjunction with recommended consent conditions will avoid the movement of new material into Coastal Protection Areas and local marine mammal sites (MMB 9 Potato Point and Long Beach and MMB10 Otago Peninsula).
- 250. Policy 5.4.3 To recognise the following areas, as identified in Schedule 2.2, as Coastal Development Areas within Otago's coastal marine area:
 - CDA 3 Karitane
 - CDA 4 Otago Harbour
- 251. Policy 5.4.4 Regard will be given to the need to provide for the values associated with any coastal development area when considering the use, development and protection of Otago's coastal marine area.
- 252. This policy recognises the importance of the facilities, services, and infrastructure associated with the developed areas for the social, cultural and economic well being of Otago's communities.
- 253. The port facilities were developed approximately 150 years ago and its continued use is important for the social, economic and cultural well being of the people of Otago. The short term deposition in conjunction with recommended consent conditions means that the proposal will not impact upon either Karitane or Otago Harbour.
- 254. Policy 5.4.5. To recognise the following areas, as identified in Schedule 2.3, as Coastal Recreation Areas:
 - CRA 4 Waikouaiti Beach
 - CRA 5 Warrington Beach
 - CRA 6 Purakanui Inlet
 - CRA 7 Potato Point & Long Beach
 - CRA 8 Spit Beach
 - CRA 9 Otago Harbour
- 255. Policy 5.4.6 Priority will be given to the need to provide for and protect the values associated with the coastal recreation areas when considering the use, development and protection of Otago's coastal marine area.
- 256. It is important that all effects on recreational values are taken into account when considering a proposed use of the CMA. The recreational values of the areas identified in Policy 5.4.5 have been considered and subject to recommended consent conditions, existing recreational use of these areas will not be significantly affected.
- 257. Policy 5.4.10 To recognise and provide for the following elements which contribute to the natural character of Otago's coastal marine area:
 - (a) Natural coastal processes;
 - (b) Water quality;



- (c) Landforms, seascapes; and
- (d) Coastal ecosystems.
- 258. Policy 5.4.11 To have particular regard to the:
 - (a) Amenity values;
 - (b) Cultural values:
 - (c) Scenic values;
 - (d) Ecological values; and
 - (e) Historical values, including those identified in Schedule 8; associated with Otago's coastal marine area when considering its subdivision, use or development.
- 259. It is considered that subject to recommended consent conditions the short term proposal will have minimal effect on this section of the Otago coastline's existing values.

Chapter 9 – Alteration of the Foreshore and Seabed

- 260. Objective 9.3.1 To recognise and provide for values associated with:
 - (a) Areas of cultural significance; and
 - (b) Areas of conservation value; and
 - (c) Areas of public amenity; when considering any alteration of the foreshore or seabed within the coastal marine area.
- 261. Objective 9.3.2 To preserve the natural character of Otago's coastal marine area as far as practicable from the adverse effects associated with any alteration of the foreshore or seabed.
- 262. Objective 9.3.3 To take into account the effects of natural physical coastal processes when considering activities which alter the foreshore or seabed in the coastal marine area.
- 263. Objective 9.3.4 To restrict the disturbance of the foreshore and seabed to those activities which require a coastal location.
- 264. As the disposal sites are historic, their continued use ensures that effects on other areas which may contain cultural, conservation or public amenity values are avoided. Restricting the volume of material to be deposited to that which has previously been consented, in conjunction with the short term duration ensures the proposal will not significantly impact upon the existing natural character of Blueskin Bay or the Otago Harbour. Given the large volume of material to be disposed the disturbance is required to occur within the coastal marine area.
- 265. Policy 9.4.1 In order that any proposed alteration of the foreshore or seabed that will, or is likely to, have an adverse effect on cultural values, can be identified by kaitiaki runanga, Kai Tahu will be:
 - (a) Treated as an affected party for non-notified resource consent applications to alter the foreshore or seabed within areas, or adjacent to such areas, identified in Schedules 2 and 3 of this Plan as having cultural or spiritual values to Kai Tahu; and be
 - (b) Notified about notified resource consent applications to alter the foreshore or seabed within the coastal marine area.



- 266. The application was publicly notified and a submission was not received from local runanga.
- 267. Policy 9.4.2 For activities involving the alteration of the foreshore or seabed, priority will be given to avoiding adverse effects on values associated with any area identified in Schedules 2 and 3 of this Plan as being a coastal protection area, a coastal recreation area, an area of outstanding natural features and landscapes or an area important to marine mammals or birds.
- 268. Policy 9.4.3 To recognise and have regard for the values associated with coastal development areas when considering activities involving alterations of the foreshore and seabed in and adjacent to coastal development areas.
- 269. The disposal has not caused a significant adverse effect on any coastal development area, coastal protection area, coastal recreation area, area of outstanding natural features and landscapes or an area important to marine mammals or birds. Therefore the short term duration of consent in conjunction with recommended conditions will ensure that adverse effects on these areas will continue to be avoided.
- 270. Policy 9.4.5 The area to be disturbed during any operation altering the foreshore or seabed will be limited as far as practicable to the area necessary to carry out that operation.
- 271. The area of disturbance will be limited to those areas identified in Schedule 5 of the RPC as dredge spoil grounds.
- 272. Policy 9.4.6 The integrity of natural features such as beaches, sand dunes, salt marshes, wetlands, and barrier islands, and their ability to protect areas above the line of mean high water springs from natural physical coastal processes will be maintained and enhanced wherever practicable.
- 273. On the basis of the Single 2011 A&B and McComb 2011 reports the applicant has concluded that physical coastal processes have not been adversely affected in the past by the disposal and this is not expected to change as a result of the proposed disposal.
- 274. It is also recognised that in the late 1980s erosion critically threatened the Aramoana low dune system, Aramoana Salt Marsh as well as human dwellings. Since then, the applicant has disposed of significant volumes of sand (e.g. approximately 50,000 m³ in 1988) from specific, texture—matched claims into the Shelly Beach disposal ground to renourish and stabilise the shoreline.
- 275. Policy 9.4.8 For the following activities, consideration will be given to the reasons for undertaking the activity in the coastal marine area, the public benefit to be derived and to any other available alternatives:
 - (a) Any reclamation; or
 - (b) The removal of sand, shingle, shell or other natural materials for commercial purposes; or
 - (c) Any deposition of material.



276. The operation of Port Otago creates significant economic benefits for the Otago community and there are no other practicable options for the disposal of the dredge spoil material.

Chapter 12 - Noise

- 277. Policy 12.4.1 In managing and controlling noise levels within the coastal marine area:
 - (a) Particular regard will be had to ensuring consistency with any noise control provisions or standards in any district plan for adjacent land; and
 - (b) Regard will be had to the New Zealand Standards NZS 6801 (1991), NZS 6802 (1991), NZS 6803P (1984) and NZS 6807 (1994); and
 - (c) Regard will be had to any other relevant information relating to the emission and effects of noise, and the measures which may be taken to avoid, remedy or mitigate those effects; and
 - (d) Regard will be had to the duration and nature of noise produced.
- 278. Noise generated in the coastal marine area can adversely affect values in the coastal marine area and on the adjacent land. However no noise concerns were raised by submitters and a review of Council's database shows no noise complaints have been received regarding the spoil deposition operation. Consequently, noise mitigation measures have not been recommended as consent conditions.

Chapter 14 – Natural Hazards

- 279. Policy 14.4.2 The potential effect of activities on natural physical coastal processes operating within the coastal marine area, and the potential for those effects to result in adverse effects within other areas of the coastal marine area will be recognised and taken into account.
- 280. Subject to recommended consent conditions, the short term activity will have no new effect on natural coastal processes. In fact the applicant's deposition of dredge spoil helps to protect the Aramoana Spit and salt marsh from coastal erosion.
- 281. In summary, the proposal is consistent with the above objectives and policies of the RPC.

6.2.5 Kai Tahu Ki Otago Natural Resource Management Plan 2005

- 282. The Kai Tahu ki Otago Natural Resource Management Plan 2005 outlines natural resources of importance to Kai Tahu. The CMA is one of the areas Kai Tahu seeks to preserve and protect.
- 283. The following Wai Māori and Wai Tai policies in the Kai Tahu ki Otago Natural Resource Management Plan 2005 are particularly relevant to this application:
 - (a) To encourage the dumping of all dredging material beyond the continental shelf.
 - (b) Dredging activity should not impact on tuaki and other marine life.



- 284. The following Wai Tapu policies in the Kai Tahu ki Otago Natural Resource Management Plan 2005 are particularly relevant to this application:
 - (a) To protect the abode of Takaroa at Rangiriri from inappropriate development and/or impacts.
- 285. As the width of the continental shelf out from Taiaroa Head is approximately 30km, and the disposal grounds are been used for many years, it is impractical to require the spoil to be deposited beyond the continental shelf. Furthermore the disposal will also have no affect on Rangiriri (Goat Island).
- 286. Consequently, the proposal is not inconsistent with the policies contained within this plan.

6.3 Other Matters

6.3.1 London Convention and NZGSDW Guidelines

- 287. It is noted that New Zealand is a signatory to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972. (London Convention).
- 288. The main objective of the London Convention is to prevent indiscriminate disposal at sea of wastes that could be liable for creating hazards to human health; harming living resources and marine life; damaging amenities; or interfering with other legitimate uses of the sea.
- 289. It is also noted that The New Zealand Guidelines for Sea Disposal of Waste ("NZGSDW Guidelines") have been jointly prepared by the Maritime Safety Authority of New Zealand and the Ministry for the Environment. The NZGSDW Guidelines are New Zealand's way to give effect to the London Convention and the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter (1996) ("the 1996 Protocol"). The NZGSDW Guidelines provide guideline concentrations for contaminants that may be present in wastes proposed for dumping at sea (referred to as the 'Action List'). The Action List is largely based on the ANZECC 1998 Guidelines for Fresh and Marine Water Quality ("the ANZECC Guidelines"). The ANZECC Guidelines are primarily based on biological effects guidelines developed overseas, with modifications to reflect New Zealand conditions.
- 290. The deposition of dredge spoil is consistent with these guidelines as it will not impact upon the aforementioned values, and as discussed, the proposal is consistent with the New Zealand Coastal Policy Statement 2010.
- 291. There are no other matters that the Consent Authority considers relevant and reasonably necessary to determine the application.

7 Conclusion

292. The applicant has applied to replace expired Coastal Permit 2000.472 that authorised the disposal of up to 450,000 m³ per year of sediment (dredged from Otago Harbour.



- 293. The volumes being sought to be deposited is over double the average volume that has been deposited at the sites between 2000 and 2010. As such it is appropriate that a conservative view is being taken and three year term is being sought.
- 294. The applicant acknowledges there are still gaps in the information on the physical processes at and adjacent to the disposal grounds. However, it is noted that the applicant has been aware since February 2002 that a new consent was required in 2011.
- 295. The majority of submitters have identified concerns with the increased deposition that will occur at the inshore sites, with the application being deficient in information regarding the potential effect of the disposal over the proposed 3 year term. In particular submitters have identified that the deposition of dredge spoil will raise the seabed level causing the shoaling process to be modified and wave breaking possibly occurring.
- 296. The likely effects of the potential disposal on the physical coastal environment have been considered in light of measured and observed effects on the nearshore seabed and beach topography, sediment characteristics over the last 30 years of dredging history, and as a result of model and physical studies that contribute to the understanding of ongoing physical coastal processes acting on the placed sediment.
- 297. In summary, the historical record shows that the effects of the sediment disposal at Heyward, Aramoana and Shelly Beach have not had an adverse effect on the physical coastal environment. The historical period includes periods of relatively high sediment disposal for prolonged periods, and a range of wave and current conditions. Replacement of the disposal consent for up to three years should result in no effects that are different to those that have been experienced in the past. Indeed, ongoing disposal of dredged sediment is likely to have beneficial effects in providing sediment to the nearshore and beaches that mitigate erosional effects of storm events.

8 Recommendation

298. That the Panel grants application RM11.153.01, subject to the terms and conditions as set out in the attached draft consent.

8.1 Reasons for recommendation

- 299. It is recommended that the application be granted for the following reasons:

 a) That it is expected that the adverse effects on the environment will be minor,
 - a) I hat it is expected that the adverse effects on the environment will be minor, and can be adequately addressed through the recommended consent conditions.
 - b) That the proposed activity is consistent with the requirements of the Act and Council Policies.



8.2 Term

300. A term of three years is sought by the applicant to allow studies to be undertaken and the associated management strategies to be developed, to enable a long term consent to be sought for this proposal. It is therefore appropriate that this term be granted subject to recommended consent conditions.

9 Draft Conditions of Consent

- 301. As the deposition of material can also impact upon the natural and recreational use values of the area, conditions are recommended that restrict the applicant to maximum volumes of material that can be deposited at the three disposal sites, as well as the total volume of material that can be deposited over the term of the consent.
- 302. Concerns have been raised regarding the protection of the nationally recognised surf break. Though the applicant's activities have in part caused the formation of the surf break, it is appropriate that there be no significant decrease in its quality caused by the exercise of the recommended consent. Consequently it is recommended that a wave, hydrodynamic and sediment dynamics study, by a suitably qualified person or organisation be undertaken. The study shall also consider the equilibrium sediment supply requirements for the beaches west of the harbour entrance and the effects of disposal on surfing wave corridors and wave quality at regional surf breaks of national significance identified in NZCPS (2010).
- 303. As the deposition of material could potentially cause an adverse effect on local ecosystems, conditions are recommended that limit effects on these values.
- 304. As the applicant is applying to deposit over double the volume of material that has been deposited on average in the disposal fields between 1985 and 2010, it is recommended that the beaches are regularly surveyed to ensure that excessive accretion does not occur.
- 305. Given the volumes of material proposed to be deposited at these sites and their close proximity to the nationally recognised surf break, it is recommended that review conditions be attached to any consent granted that allow for the immediate review of consent conditions, if, in the unlikelihood that an adverse effect is caused by the deposition.
- 306. Finally the values associated with this area means that it is recommended that the applicant continues to work with the formal Working Party established as a condition of the former maintenance disposal consent (2000.472) which includes representatives of Te Runanga Otakou, Kati Huirapa Runanga ki Puketeraki, Department of Conservation and the consent authority. The nationally recognised wave environment also means that a representative of the local surfing community should be invited to join this established Working Party



Selva Selvarajah

Director Resource Management

10 References

Single, M: 2011a: Port Otago maintenance dredging consents – Physical Coastal Environment.

Single, M: 2011b: Port Otago maintenance dredging consents – Beach Morphology Otago Harbour entrance to Karitane.

McComb, P; Weppe, S; Johnson, D and Beamsley, B: 2011: Preliminary wave, current and sediment transport model studies for dredge disposal investigations. MetOcean solutions Limited.

Paavo, B; 2011: Benthic Macrofaunal Assemblages near Maintenance Dredge Spoil Disposal Areas. Benthic Science Limited.



Appendix 1 Coastal Permit 2000.472

DOC Consent No SRCA 3.2 1105 ORC Consent No 2000,472

(Area 14.5 ha approx.)

COASTAL PERMIT RESTRICTED COASTAL ACTIVITY

Pursuant to Section 119 of the Resource Management Act 1991 the Minister of Conservation grants consent to:

Name:

Post Otago Limited

Address:

5 Beach Street, Port Chalmers, Donedia

for a coastal general for the discharge into the sea of up to a maximum of $450,000 \, \mathrm{m}^3$ per year of dredging spoil

for the purpose of disposal of deedging spoil derived from maintenance deedging and incremental improvements to the channel and berth areas in and about the Otago Harbour in accordance with the following specific maximum annual discharge quantities at each locations:

15	Heyward Point Spoil Relocation area	(200,000 m3)
***	Aczanoana Spit Relocation area	(200,000 m3)
100	Shelly Beach Renourishment area	(50,000 m²)

for a duration of 10 years expiring on 1 December 2011

Location of activity:

ment of sectivity:		
Heyward Paint	45° (5.07°S 170° 42.09°E	
r	45" 44.95'S 170°42.27'E	
	45" 44.44°S 170° 41.78°F.	
	45" 44 63% 170°41 60%	(Area 38.2 ha approx.)
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Arsoneses Spir		
a sector sector selfers	45° 45.18'S 170° 42.74'E	
	45° 46.05'S 170° 42.97'E	
		b.
	- A	71 0001 V
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81B., 85t.	aso sa mono enos ao meno	
Shelly Besch	THE THE BEST OF THE STATE OF TH	
	45° 46.65'S 170° 42.79'E	
	45° 46,75′5 170° 42,96′15	
	Heyward Point Aramosna Spit Shelly Beach	Heyward Point 45° 45.07\$ 170° 42.07E 45° 44.95\$ 170° 42.27E 45° 44.44°\$ 170° 41.78°E 45° 44.63°\$ 170° 41.60°E Atsmosans Spit 45° 45.18°\$ 170° 42.74°E 45° 46.05°\$ 170° 42.47°E 45° 46.05°\$ 170° 42.47°E 45° 46.65°\$ 170° 42.47°E 5helly Besch 45° 46.65°\$ 170° 42.56°E 45° 46.65°\$ 170° 42.79°E

45° 46,95'S 170° 42,77'E



Conditions:

- Material discharged at the Shelly Beach renourishment area shall not be derived
 from any further up the Otago Flathour than Taylors Bend, being that portion of
 the channel adjacent to Taylor Point, and, as far as is practicable, be only
 discharged on an elbb tide.
- Material discharged shall only be derived from dredging that is authorised by the
 Coastal Plan or a resource consent for maintenance and incremental dredging of
 the channel and beath areas necessary to maintain water depths to previously
 approved levels (being the following depths, based on the Chan Datum on the
 latest navigation chant NZ6612, of the Otago Harbour published by the
 Hydrographic Office of the Royal New Zealand Naver:
 - (i) The upper bends and swing areas: 10 ns.
 - (a) The upper channel: 8.5 m
 - (ii) Port Chalmers benths and swinging areas: 14.5 m
 - (iv) Lower channel 13 m)
- 3. This permit does not authorise the discharge of material from rapinal dreetging.
- Any stredging spoil commining rock material (including spoil derived from removal
 of router rock ridges off Beach Street, Port Chalmers) shall only be discharged at
 the Assamoana Spir site.
- 5. Within 3 months of the commencement of this consent the consent halder shall commission a study by a suitably qualified person or organisation of sediment transport paths covering the coast between Taianoa Head and Kariane Peninsula and the likely direction and true of movement of the deposited deedgings. This study shall include a recommendation on any engoing monitoring requirements. Prior to the study commencing the design of the study shall be presented to the consent authority for their approval. The study is to be reported in stages and to be completed within three years.
- 6. Within 3 months of the commencement of this consent the consent holder shall commission a study by a suitably qualified person or organisation to determine the relationship between dreciging disposal at the Shelly Beach location and acretion of the beach. This study shall include a recommendation on any organing monitoring requirements. Prior to the study commending the design of the study shall be presented to the consent authority for their approval. The study is to be reported in stages and to be completed within 3 years.



- 7. Within 3 months of the commencement of this consent the consent holder shall commission a study by a suitably qualified person or organisation of the effects on biots of dredge spoil damping at and about the damping sites. Prior to the study commencing the design of the study shall be presented to the consent authority for their approval. The study is to be reported in stages and to be completed within 3 years. The study shall include but not be limited to:
 - 1) an assessment of the effects on species diversity,
 - 2) an assessment of the effects on the number of each species,
 - recommending an engoing biological monitoring programms.
- The consent holder shall carry out the following manizaring of the exercise of this
 consent;
 - (a) The quantity of material discharged at each of the three disposal locations, the nature and type of this material, the areas from which the material was derived and the state of the tide when the material was clumped.
 - (b) The monitoring recommended in conditions 5,6, and 7.
- All sampling and analyses undertaken in connection with this permit shall be performed by an IANZ registered laboratory or otherwise as specifically approved by the Consent Authority.
- 10. The consent holder shall establish a formul Working Party including representatives of Te Runanga Otskout, Kati Huimpa Runanga ki Pulseterski, Department of Conservation and Otago Regional Council which shall meet at least annually to discuss and review the annual monitoring report as specified under condition 12 of this pennit.
- The consent holder shall provide a report to the consent authority every twelve months. This report shall include but not be limited to the following:
 - Progress reports on the studies required in conditions 5,6, and 7 of this
 - Besults of any monitoring done in the previous 12 months as required in condition 8.
 - d) Outcomes of the working group meetings over the previous 12 months,
 - d) Recommendations on monitoring for the next 12 months,
 - Recommendations on any mitigation required for any adverse effects that frave arisen over the previous 12 months that are antiburable to dredge spoil clumping.
- 12. As yearly intervals after the first 5 years of exercise of this permit the consent holder may, peasuant to Section 127 of the Resource Management Act 1991, apply to the consent authority for a review of the conditions for the purpose of determining whether the monitoring required under this consent should be charged.



13. The consent authority may within three months of each anniversary of the date of this consent, or within three months of receiving monitoring results under condition 11 in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent for the purpose of determining if the conditions of this consent are adequate to deal with any adverse effects on the environment which may arise from the exercise of this consent and which it is appropriate to deal with at a later stage.

Is such at Wellington this 31% day of Politicary 2002.

Type Sandra Lee W Minister of Conservation

Appendix 2 Applicant's Proposed Consent Conditions

CONDITIONS:

General

- 1. The following specific maximum annual discharge quantities shall apply:
 - (i) No more than 50,000m³ shall be disposed of on an annual basis at Shelly Beach.
 - (ii) No more than 400,000m³ of material shall be deposited on an annual basis across the Heyward Point and Aramoana Spit sites provided that there is no more than 50,000m³ disposed of at Aramoana Spit on an annual basis, unless a greater volume is required to study the effects on the Aramoana surf break (as required by condition 11) or to maintain surf quality.
 - <u>Note</u> this clause reflects an agreement made by Port Otago with local surfers on disposal volumes.
 - (iii) Any volume of material in excess of 200,000m³ annually deposited at the Heyward Point site, shall be deposited within water greater than 18 metres below chart datum.
- 2. Material discharged at the Shelly Beach renourishment area shall not be derived from any further westward of Longitude 170° 39' 50" (being in the vicinity of beacons 15 & 16A between Pulling Point and Tayler Point), and, as far as practicable, be only discharged on an ebb tide.
- 3. Material discharged shall only be derived from dredging that is authorised by the Coastal Plan or by a resource consent, sourced from the Otago Harbour and entrance.
- 4. Rock material shall not be disposed of at the Aramoana Spit or Shelly Beach disposal sites.
- 5. Except for rock material as specified in Condition 4 of this consent, material discharged from dredging activities undertaken in accordance with Consents 2010.193 and 2010.194 shall contain a minimum of 90% sand, on an annual basis.
- 6. During the exercise of this consent, the consent holder shall take all practicable precautions to protect public safety at all times.
- 7. The consent holder shall ensure that no fuel or oils, enter into the coastal marine area as a result of these works. This shall include the maintenance of machinery at all times to prevent leakage of fuel or oil into the coastal marine area. In the event of contamination, the consent holder shall instigate remedial action and shall notify the consent authority as soon as practicable.

Monitoring

DISPOSAL RECORDS

8. The consent holder shall record the following information in relation to the disposal of material at each of the three disposal sites.



- (a) the volume of dredge material in each disposal event; and
- (b) the GPS location (WGS84 format) of the event; and
- (c) the date and time of disposal; and
- (d) a cumulative total of the volumes of disposal from the commencement of the consent.

The records shall be kept and submitted in report format to the consent authority on an annual basis, no later than the anniversary of the date of this permit.

BATHYMETRY

9. At minimum, the consent holder shall undertake annual bathymetric surveys of the seabed at each of the disposal site locations. All bathymetric surveys shall have an accuracy of 0.25 metres vertically.

The consent holder shall submit an annual report to the Consent Authority no later than the anniversary of the date of this permit that summarises the results of all bathymetric surveys undertaken in accordance with this consent and shall clearly indicate the degree of change to the seabed in the surveyed areas.

BIOLOGICAL

10. Within 3 months of the commencement of this consent, the consent holder shall commission a biological study, by a suitably qualified person or organisation, which considers the findings of the biological monitoring work undertaken as a condition of the former maintenance disposal consent (2000.472) and provides recommendations as to suitable biological monitoring indicator species that could be adopted for the long term adaptive management of disposal activities at the Heyward Point and Aramoana Spit disposal sites.

The biological study required by this condition shall also provide recommendations for a long term ecological monitoring programme. The long term ecological monitoring programme must identify management measures that can be adopted for managing the effects of disposal activities on species diversity, community composition and species abundance.

SURF, CURRENT AND SEDIMENT TRANSPORT

11. Within 3 months of the commencement of this consent, the consent holder shall commission a wave, hydrodynamic and sediment dynamics study, by a suitably qualified person or organisation. The study will involve numerical modelling and empirical analysis of the coastal and sediment dynamics, including the transport pathways, for the coastal region between Taiaroa Head and the Karitane Peninsula.

This purpose of the study will be to identify the optimum location and extent of disposal grounds for the long term deposition of the harbour maintenance dredging volumes. The study will consider the equilibrium sediment supply requirements for the beaches west of the harbour entrance and the effects of disposal on surfing wave corridors and wave quality at regional surf breaks of national significance identified in NZCPS (2010). The study shall include at a minimum:

- (a) Hydrographic survey of the existing disposal grounds and inshore to Aramoana Beach at 6 monthly intervals (i.e. winter and summer);
- (b) A program of wave and current measurement for the purpose of calibration and validation of numerical coastal process models;



- (c) Establishment of numerical models of the wave, hydrodynamic, tidal and sediment transport;
- (d) Remote photographic monitoring of the Aramoana surf break and the establishment of a web site to allow surfers to record their personal observations of surf quality; and
- (e) Beach profile analysis and the completion of long-term shoreline change analysis from aerial photographs.
- 12. Within 3 months of the completion of the studies required by Conditions 158-11 of this consent the consent holder shall commission a report, by a suitably qualified person or organisation, that integrates the results of the monitoring required by Conditions 9-11 of this consent and provides a long term sediment budget for each of the disposal sites together with a detailed methodology for adaptive management of the sediment, wave and biological effects associated with potential long term disposal activities. This report shall be completed and submitted to the consent authority no later than 6 months prior to the expiry of this permit.

Working Party

13. The consent holder shall continue to work with the formal Working Party established as a condition of the former maintenance disposal consent (2000.472) which includes representatives of Te Runanga Otakou, Kati Huirapa Runanga ki Puketeraki, Department of Conservation and Otago Regional Council. The consent holder shall invite a representative of the local surfing community to join this established Working Party also. The Working Party shall meet at least 6 monthly to discuss and review the annual monitoring report and other reports required by this permit.

Annual Monitoring Report

- 14. The consent holder shall provide a report to the consent authority every twelve months and no later than the anniversary of the date of this permit. This report shall include but not be limited to the following:
 - (i) Results of monitoring and reporting completed in the previous 12 months,
 - (ii) Outcomes of the working group meetings over the previous 12 months,
 - (iii) The monitoring work programme for the next 12 months,
 - (iv) Recommendations on any mitigation required for any adverse effects that have arisen over the previous 12 months that are attributable to disposal activities.

Adaptive Management

15. The consent holder shall provide an annual work plan to the Consent Authority which shall incorporate any mitigation recommendations provided in the most recent Annual Monitoring Report required by condition 14. The work plan shall be provided within 1 month of submitting the Annual Monitoring Report.

Review

16. The consent authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within three months of each anniversary of the commencement of this consent, and on receipt of any reports received under Conditions 8-12 for the purpose of:



- (a) ensuring that the monitoring regime is appropriate; or
- (b) determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; including but not limited to:
 - i. the effects of the exercise of this consent on the ecology and water quality of the near shore and offshore areas; or
 - ii. the effects of the exercise of this consent on surf breaks of national significance identified in the NZCPS (2010); or
 - iii. the appropriate mitigation of the environmental effects of the activity having regard to the available deposition technology; or
 - iv. ensuring the conditions of this consent are consistent with any National Environmental Standards.

Advice Note

The consent holder shall ensure that any contractors engaged to undertake work authorised by this consent abide by the conditions of this consent. A copy of this consent should be present on site at all times while the work is being undertaken.



Consent No. RM11.153.01

COASTAL PERMIT

Pursuant to Section 104 B of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name: Port Otago Limited

Address: 15 Beach Street, Port Chalmers, Dunedin

To dispose into the Pacific Ocean up to 450,000 cubic metres of dredged material at three disposal grounds

For a term expiring three years from the date of commencement in accordance with s.116 of the Resource Management Act 1991

Location of consent activity: Pacific Ocean, adjacent to Shelly Beach, Aramoana

Beach and Hayward Point

Legal description of consent location: Common Marine and Coastal Area

1ap reference NZTM2000: Heyward Point, being an area of approximately 38.2 hectares bounded by:

E1421227 N4931030 E1421454 N4931259 E1420791 N4932185 E1420568 N4931826

Aramoana Spit, being an area of approximately 38.2 hectares bounded by:

E1422075 N4930850 E1422368 N4929246 E1421754 N4929840 E1421590 N4929243

Shelly Beach, being an area of approximately 14.5 hectares bounded by:

E1421929 N4927807 E1422218 N 4928130 E1422444 N4927951 E1422208 N4927574 Chart Reference:

Heyward Point, being an area of approximately 38.2 hectares bounded by:

45° 45.07'S 170° 42.09'E 45° 44.95'S 170° 42.27'E 45° 44.44'S 170° 41.78'E 45° 44.63'S 170° 41.60'E

Aramoana Spit, being an area of approximately 38.2 hectares bounded by:

45° 45.18'S 170° 42.74'E 45° 46.05'S 170° 42.93'E 45° 45.72'S 170° 42.47'E 45° 46.04'S 170° 42.33'E

Shelly Beach, being an area of approximately 14.5 hectares bounded by:

45° 46.82'S 170° 42.56'E 45° 46.65'S 170° 42.79'E 45° 46.75'S 170° 42.96'E 45° 46.95'S 170° 42.77'E

Conditions:

Specific

- 1. The following specific maximum annual discharge quantities shall apply:
 - (i) No more than 50,000 cubic metres shall be disposed of on an annual basis at Shelly Beach.
 - (ii) No more than 400,000 cubic metres of material shall be deposited on an annual basis across the Heyward Point and Aramoana Spit sites provided that there is no more than 50,000 cubic metres disposed of at Aramoana Spit on an annual basis, unless a greater volume is required to study the effects on the Aramoana surf break (as required by condition 11) or to maintain surf quality.
 - (iii) Any volume of material in excess of 200,000 cubic metres annually deposited at the Heyward Point site shall be deposited within water greater than 18 metres below chart datum.
- 2. Material discharged at the Shelly Beach renourishment area shall not be derived from any further westward of Longitude 170° 39' 50" (being in the vicinity of Otago Harbour beacons 15 & 16A between Pulling Point and Tayler Point), and, as far as practicable, be only discharged on an ebb tide.
- 3. Material discharged shall only be derived from dredging that is authorised by the Coastal Plan or by a resource consent, and that is sourced from the Otago Harbour and its entrance.

- 4. Rock material shall not be disposed of at the Aramoana Spit or Shelly Beach disposal sites.
- 5. Except for rock material as specified in Condition 4 of this consent, material discharged from dredging activities undertaken in accordance with Consents 2010.193 and 2010.194 shall contain a minimum of 90% sand, on an annual basis.

Performance Monitoring

Disposal Records

- 6. The consent holder shall record the following information in relation to the disposal of material at each of the three disposal sites.
 - (a) the volume of dredge material in each disposal event; and
 - (b) the GPS location (WGS84 format) of the event; and
 - (c) the date and time of disposal; and
 - (d) a cumulative total of the volumes of disposal from the commencement of the consent.

The records shall be kept and submitted in report format to the consent authority on an annual basis, no later than the anniversary of the date of the commencement of this permit.

Bathymetry

- 7. At minimum, the consent holder shall undertake annual bathymetric surveys of the seabed at each of the disposal site locations. All bathymetric surveys shall have an accuracy of 0.25 metres vertically.
- 8. The consent holder shall submit an annual report to the Consent Authority no later than the anniversary of the date of the commencement of this permit that summarises the results of all bathymetric surveys undertaken in accordance with this consent and shall clearly indicate the degree of change to the seabed in the surveyed areas.

Biological

- 9. Within 3 months of the commencement of this consent, the consent holder shall commission a biological study, by a suitably qualified person or organisation, which considers the findings of the biological monitoring work undertaken as a condition of the former maintenance disposal consent (2000.472) and provides recommendations as to suitable biological monitoring indicator species that could be adopted for the long term adaptive management of disposal activities at the Heyward Point and Aramoana Spit disposal sites.
- 10. The biological study required by condition 9 shall be completed within 2 years and 8 months from the date of commencement of this consent in accordance with s.116 of the Resource Management Act 1991. The study shall include at a minimum recommendations for a long term ecological monitoring programme. The long term ecological monitoring programme

must identify management measures that can be adopted for managing the effects of disposal activities on species diversity, community composition and species abundance.

Surf, Current and Sediment Transport

11. Within 3 months of the commencement of this consent, the consent holder shall commission a wave, hydrodynamic and sediment dynamics study, by a suitably qualified person or organisation. The study will involve numerical modelling and empirical analysis of the coastal and sediment dynamics, including the transport pathways, for the coastal region between Taiaroa Head and the Karitane Peninsula.

This purpose of the study will be to identify the optimum location and extent of disposal grounds for the long term deposition of the harbour maintenance dredging volumes. The study will consider the equilibrium sediment supply requirements for the beaches west of the harbour entrance and the effects of disposal on surfing wave corridors and wave quality at regional surf breaks of national significance identified in NZCPS (2010). The study shall be completed within 2 years and 8 months from the date of commencement of this consent in accordance with s.116 of the Resource Management Act 1991and shall include at a minimum:

- (a) Hydrographic survey of the existing disposal grounds and inshore to Aramoana Beach at 6 monthly intervals (i.e. winter and summer);
- (b) A program of wave and current measurement for the purpose of calibration and validation of numerical coastal process models;
- (c) Establishment of numerical models of the wave, hydrodynamic, tidal and sediment transport;
- (d) Remote photographic monitoring of the Aramoana surf break and the establishment of a web site to allow surfers to record their personal observations of surf quality; and
- (e) Beach profile analysis and the completion of long-term shoreline change analysis from aerial photographs.
- 12. Within 3 months of the completion of the studies required by Conditions 9-11 of this consent the consent holder shall commission a report, by a suitably qualified person or organisation, that integrates the results of the monitoring required by Conditions 7-11 of this consent and provides a long term sediment budget for each of the disposal sites together with a detailed methodology for adaptive management of the sediment, wave and biological effects associated with potential long term disposal activities. This report shall be completed and submitted to the consent authority no later than 6 months prior to the expiry of this permit.
- 13. The consent holder shall continue to work with the formal Working Party established as a condition of the former maintenance disposal consent (2000.472) which includes representatives of Te Runanga Otakou, Kati Huirapa Runanga ki Puketeraki, Department of Conservation and Otago Regional Council. The consent holder shall invite a representative of the local surfing community to join this established Working Party also. The Working Party shall meet at least 6 monthly to discuss and review the annual

monitoring report and other reports required by this permit.

- 14. The consent holder shall provide a report to the consent authority every twelve months and no later than the anniversary of the date of the commencement of this permit. This report shall include but not be limited to the following:
 - (i) Results of monitoring and reporting completed in the previous 12 months,
 - (ii) Outcomes of the working group meetings over the previous 12 months,
 - (iii) The monitoring work programme for the next 12 months,
 - (iv) Recommendations on any mitigation required for any adverse effects that have arisen over the previous 12 months that are attributable to disposal activities.

Adaptive Management

15. The consent holder shall provide an annual work plan to the Consent Authority which shall incorporate any mitigation recommendations provided in the most recent Annual Monitoring Report required by condition 14. The work plan shall be provided within 1 month of submitting the Annual Monitoring Report.

General

- 16. During the exercise of this consent, the consent holder shall take all practicable precautions to protect public safety at all times.
- 17. The consent holder shall ensure that no fuel or oils enter into the coastal marine area as a result of these works. This shall include the maintenance of machinery at all times to prevent leakage of fuel or oil into the coastal marine area. In the event of contamination, the consent holder shall instigate remedial action and shall notify the consent authority as soon as practicable.
- 18. The consent authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within three months of each anniversary of the commencement of this consent, and on receipt of any reports received under Conditions 6-12 for the purpose of:
 - (a) ensuring that the monitoring regime is appropriate; or
 - (b) determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; including but not limited to:
 - i. the effects of the exercise of this consent on the ecology and water quality of the near shore and offshore areas; or
 - ii. the effects of the exercise of this consent on surf breaks of

- national significance identified in the NZCPS (2010); or
- iii. the appropriate mitigation of the environmental effects of the activity having regard to the available deposition technology; or
- iv. ensuring the conditions of this consent are consistent with any National Environmental Standards.

Notes to Consent

1. The consent holder shall ensure that any contractors engaged to undertake work authorised by this consent abide by the conditions of this consent. A copy of this consent should be present on site at all times while the work is being undertaken.

