CRC172456 – A Coastal Permit under section 12 of the Resource Management Act 1991:

1: To dredge (disturb) seabed material for the purposes of maintaining the depth of a shipping (navigation) channel that includes a ship-turning basin, and berth pockets to the extent authorised by CRC172455; and

2: To deposit seabed material on the seabed associated with 1 above.

CRC172523 – A Discharge Permit under sections 15, 15A and 15B of the Resource Management Act 1991:

1: To discharge contaminants (seabed material and water) into water associated with maintenance dredging as described in CRC172456;

2: To discharge (dump) dredge material from a ship into water at the maintenance disposal grounds as described in CRC172456; and

3: To discharge contaminants (seabed material and water) from a ship into water associated with maintenance as described in CRC172456.

TERM OF CONSENT

The duration of consent shall be 35 years.

General Advice Note on Conditions

1 The conditions below apply to both CRC172455 and CRC172522
2 The Plans attached to and forming part of this consent apply to CRC172455 and to CRC172522

CONDITIONS OF CONSENT - DEFINITIONS

For the purposes of this consent the following definitions shall apply:

"**ALG**" means the Aquaculture Liaison Group;

"**Allowable Duration**" is the maximum number of hours in a rolling 30 day period during which the Intensity prescribed at a telemetered turbidity monitoring location in relation to turbidity trigger Tiers 1, 2 or 3 may be exceeded without a management action being required. The maximum number of hours for each Tier is as follows:

Tier 1: 144

Tier 2: 36

Tier 3: 7.2;

"**Authorised Marine Farm**" means any marine farm that, as at the date this consent is first exercised, exists or which holds an existing but unimplemented resource consent. Authorised Marine Farming Activity has the same meaning;

"**Authorised Marine Farmer**" means any person who operates an Authorised Marine Farm;

"**BMP**" means the Biosecurity Management Plan;

"**Certification**" means that the DMP, BMP, and EMMP ~~contains all information specified in the relevant Plan condition(s) and the Plans~~ meet all the requirements set out in the conditions of the relevant resource consent(s);

"**CHPT**" means the Consent Holder Project Team;

"**Consent Authority**" means the Canterbury Regional Council or any successor;

"**Consent Authority Manager**" means the Canterbury Regional Council, Attention: Regional Leader, Compliance and Monitoring;

"**CRMS**" means Craft Risk Management Standard;

"**DMP**" means the Dredge Management Plan;

"**Dredge Spoil**" means seabed material that has been removed by a dredge and is to be disposed of at the designated spoil disposal ground;

"**Dredging**" means dredging to maintain depths of the Shipping Channel;

"**Dredging Campaign**" means the period when a dredge is deployed at Lyttelton to carry out maintenance dredging;

"**EMMP**" means the Environmental Monitoring and Management Plan;

"**Exceedance**" means the exceedance of an Allowable Duration;

"**IHS**" means Import Health Standard;

"**Intensity**" means the turbidity level (in NTU) established for each Tier at each telemetered turbidity monitoring location using the methodology contained in Appendix 2 and the following percentiles:

Tier 1: 80%

Tier 2: 95%

Tier 3: 99%;

"**Navigation Channel**" means the navigation channel, ship turning basin, and berthage areas;

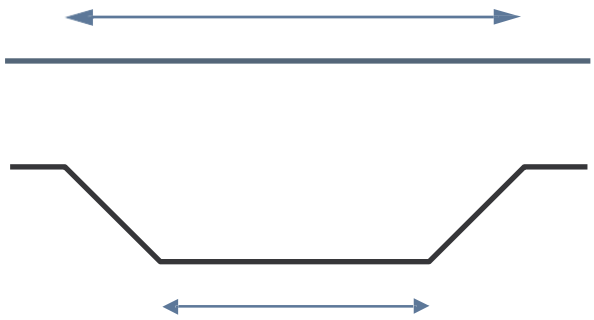
"**Northern Banks Peninsula**" (in the context of marine farms) means those marine farms that are authorised at the date of the first exercise of this consent and are located to the west of a line between Motunau and Steep Head;

"**NTU**" means nephelometric turbidity unit;

"**Predicted Dredging Turbidity**" means the TSS from the Dredging that is predicted from the hydrodynamic modelling detailed in Appendices 9 and 11 of the Assessment of Environmental Effects supporting the application lodged on 28 September 2016;

"**Shipping Channel**" means the Navigation Channel (see diagram below) and includes all batter slopes;

Shipping channel width (including batter slope)



Navigation channel width

(Cut view of channel)

"**TAG**" means the Technical Advisory Group;

"**Tangata Whenua**" means Te Hapu o Ngati Wheke (Rapaki), Te Runanga o Koukourarata and Te Runanga o Ngai Tahu;

"**TSS**" means Total Suspended Solids.

CONDITIONS

1. LOCATION

1.1 Dredging operations, in order to maintain the depth and extent of the Navigation Channel marked on Plan CRC172456A (attached to and forming part of this consent) shall occur within the Shipping Channel. Dredging of the Inner Harbour is excluded by this consent.

Advice Note: *Dredging of the Inner Harbour is authorised under CRC135318*

1.2 The discharge (dumping) of Dredge Spoil shall occur within the area of the offshore maintenance disposal ground or the Godley Head maintenance disposal ground marked on Plan CRC172456A.

1.3 The Godley Head maintenance disposal ground shall only receive Dredge Spoil in the following circumstances:

1.3.1 The offshore maintenance disposal ground cannot be used due to rough sea-state conditions; or

1.3.2 The vessel used to transport Dredge Spoil is insufficiently sea worthy to dispose of sediment outside the head.

1.4 Notwithstanding condition 1.3, the maximum ~~in situ volume~~amount of Dredge Spoil disposed of at the Godley Head maintenance disposal ground, measured in tons, shall not exceed 167,000 tons per annum ~~shall not exceed 100,000 cubic metres per annum.~~

***Advice note*:** The tons of dredge spoil shall be calculated, for each disposal event, from an empirical relationship between the loaded displacement of the dredger and hopper volume. The total annual maximum of 167,000 tons is equivalent to a 100,000 cubic metre in-situ volume with a wet density of 1.67 tons per cubic metre. ~~In-situ volume shall either be measured by bathymetric survey or calculated from a measured in-hopper tonnage using an established in-situ density.~~

2. ADMINISTRATION

2.1 The Consent Authority may, on any of the last five working days of May and November, serve notice of its intention to review the conditions of this consent for the purposes of:

2.1.1 Dealing with any adverse effect on the environment which may arise from the exercise of this consent;

2.1.2 Amending the monitoring programmes required by this consent, including adding or deleting monitoring site locations and adding or deleting specific monitoring parameters;

2.1.3 Amending the real-time turbidity monitoring, turbidity triggers and the adaptive management actions after a Dredging Campaign should the monitoring reveal an unforeseen effect that is attributable to Dredging;

2.1.4 Require the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment.

2.2 The lapsing date for the purposes of section 125 shall be 12 years after the commencement of the consent.

3. NOTIFICATION AND RECORDS

3.1 The consent holder shall notify the Cconsent Aauthority at least one month prior to the commencement of the first Dredging campaign. The consent holder shall keep records detailing the timing, quantities and location of seabed material dredged, and also of the Dredge Spoil disposed of within the offshore and Godley Head maintenance disposal grounds and detail the reasons why Godley Head disposal ground was used. These records shall be submitted to the Consent Authority Manager within one month of cessation of a Dredging Campaign.

4. DREDGE MANAGEMENT PLAN (DMP)

4.1 At least three months prior to the commencement of the first Dredging Campaign the CHPT shall provide the TAG a copy of a Draft DMP.

4.2 At least one month prior to the commencement of the first Dredging Campaign the consent holder shall provide to the Consent Authority Manager a DMP. A copy of the DMP shall be provided at the same time to the Tangata Whenua, the TAG and the ALG as it is provided to the Consent Authority.

4.3 The purpose of the DMP shall be to specify how Dredging practices and procedures will ensure that any actual or potential adverse effects on the marine receiving environment are avoided or otherwise mitigated to the greatest extent practicable.

4.4 ~~To achieve the purpose of the DMP, the~~The DMP shall include, but not be limited to, the following:

4.4.1 A description of the dredge to be used;

4.4.2 A description of D~~d~~redging methodology typically used;

4.4.3 A description of how the location and quantities of Dredge Spoil are recorded;

4.4.4 A description of the maintenance of equipment and systems;

4.4.5 A description of the storage and handling of hazardous substances;

4.4.6 A description of a turbulence reducing (green or environmental) valve to be incorporated with the overflow system of the maintenance dredge vessel using the offshore maintenance spoil disposal ground;

4.4.7 In relation to marine mammals, details on:

a. The requirement for a regular crew member on the dredge to be a designated marine mammal observer, whose role includes record keeping;

b. The training to be provided to the designated observer, which is to be delivered by a suitably qualified marine mammal expert;

c. Guidelines for the vessel, including speed limits, to reduce any chances of mortality from vessel strikes with whales, particularly the southern right whales; and

d. Provision of information protocols with the Department of Conservation during Dredging to help anticipate any potential seasonal interactions with any whale species sighted; and

4.4.8 A description of all other necessary measures to avoid or mitigate any actual or potential adverse effects on the receiving environment to greatest extent practicable during the operation of the dredge, including measures on the management of :

a. Biofouling;

b. Waste;

c. Refuelling; and

d. Overflow;

4.4.9 Those matters in condition 4.4.7 shall be prepared by a person who is suitably qualified and experienced in managing potential adverse effects on marine mammals.

Certification of DMP

4.5 The DMP shall be approved in writing by the Consent Authority Manager acting in a technical Certification capacity prior to the first commencement of Dredging authorised by this consent and the consent holder shall undertake all activities authorised by this consent in accordance with the approved DMP.

4.6 Any amendment to the DMP shall be approved in writing by the Consent Authority Manager in a technical Certification capacity and the consent holder shall undertake all activities authorised by this consent in accordance with the amended DMP.

4.7 A copy of the DMP and all amended DMPs shall be provided to Tangata Whenua, the TAG and the ALG immediately following Certification.

5. BIOSECURITY MANAGEMENT PLAN (BMP)

5.1 If the consent holder deploys the maintenance dredge vessel directly from overseas then a BMP is required to be prepared and implemented in accordance with conditions 5.2 to 5.8.

5.2 At least two months prior to the arrival of the dredge vessel in New Zealand, the consent holder shall provide a BMP to the Consent Authority. A copy of the BMP shall be provided at the same time to Tangata Whenua, the TAG and the ALG as is provided to the Consent Authority.

5.3 The purpose of the BMP shall be to reduce the risk of a biosecurity incursion to the greatest extent practicable.

5.4 ~~To achieve the purpose of the BMP, the~~The BMP shall include, but not be limited to, the following:

5.4.1 A description of the dredge vessel and its attributes that affect risk, including key operational attributes (e.g. voyage speed, periods of time idle), maintenance history (including prior inspection and cleaning undertaken), and voyage history since last dry-docking and antifouling (e.g. countries visited and duration of stay);

5.4.2 A description of the key sources of potential marine biosecurity risk from ballast water, sediments and biofouling. This should cover the hull, niche areas, and associated equipment, and consider both submerged and above-water surfaces;

5.4.3 An assessment of the biosecurity risks to Authorised Marine Farming Activities from activities authorised by this consent and the methods to be used to minimise those risks to the greatest extent practicable.

5.4.4 Findings from any previous inspections;

5.4.5 A description of the risk mitigation taken prior to arrival in New Zealand, including but not limited to:

5.4.5.1 Routine preventative treatment measures and their efficacy, including the age and condition of the antifouling coating, and marine growth prevention systems for sea chests and internal sea water systems;

5.4.5.2 Specific treatments for submerged and above-water surfaces that will be undertaken to address IHS and CRMS requirements prior to departure for New Zealand. These could include, for example, in-water removal of biofouling, or above-water cleaning to remove sediment;

5.4.5.3 Additional risk mitigation planned during transit to New Zealand, including expected procedures for ballast water management;

5.4.5.4 Expected desiccation period of above-water surfaces on arrival to New Zealand (i.e. period of air exposure since last dredging operations);

5.4.6 The nature and extent of pre-border inspection that will be undertaken (e.g. at the overseas port of departure) to verify compliance with IHS and CRMS requirements; and

5.4.7 Record keeping and documentation of all mitigation undertaken (i.e. prior to and during transit to New Zealand) to enable border verification if requested by Ministry for Primary Industries or its successor, and to facilitate final clearance.

5.5 The BMP shall be prepared by a person who is suitably qualified experienced in managing the risk of biosecurity incursions and shall be appointed by the consent holder following consultation with the ALG.

Certification of BMP

5.6 The BMP shall be approved in writing by the Consent Authority Manager acting in a technical Certification capacity prior to the first commencement of Dredging authorised by this consent and the consent holder shall undertake all activities authorised by this consent in accordance with the approved BMP.

5.7 Any amendment of the BMP shall be approved in writing by the Consent Authority Manager acting in a technical Certification capacity and the consent holder shall undertake all activities authorised by this consent in accordance with the amended BMP.

5.8 A copy of the BMP and all amended BMPs shall be provided to Tangata Whenua, the TAG and the ALG immediately following Certification.

6 ENVIRONMENTAL MONITORING AND MANAGEMENT PLAN (EMMP)

6.1 At least three months prior to the commencement of the first Dredging Campaign the CHPT shall provide the TAG a copy of a Draft EMMP.

6.2 At least two months prior to the commencement of the first Dredging Campaign, the consent holder shall provide an EMMP to the Consent Authority for Ccertification. A copy of the EMMP shall be provided at the same time to Tangata Whenua, the TAG and the ALG as it is provided to the Consent Authority.

6.3 The purpose of the EMMP is to detail how:

(a) Turbidity monitoring and adaptive management actions are implemented to minimise the risk of elevated turbidity that can be attributed to disposal of dredge material at the offshore maintenance disposal grounds, causing adverse effects on sensitive receptors including Authorised Marine Farms;

(b) Assurance monitoring is implemented to evaluate any actual or potential biological and physical effects and compare them with those predicted effects in the information filed in support of the application; and

(c) The circumstances when turbidity and adaptive management action requirements may cease and the frequency of the assurance monitoring that may be reduced.

6.4 ~~To achieve the purpose of the EMMP, the~~The EMMP shall, at a minimum, address the following topics:

(a) The monitoring of turbidity plumes;

(b) Adaptive management actions to be undertaken in response to an exceedance of a turbidity trigger ~~value~~;

(c) Assurance monitoring, including in respect of Authorised Marine Farms;

(d) Reporting requirements;

(e) Roles and responsibilities of groups involved in monitoring and any adaptive management actions;

(f) Identifying any other relevant management plans; and

(g) Documenting procedures for handling complaints.

Monitoring of Turbidity

6.5 As part of the EMMP, the consent holder shall detail how turbidity plumes are to be monitored to:

(a) Confirm whether or not turbidity exceeds the specified turbidity triggers values that are to be specified under condition 6.8; and

(b) Assess the relative contributions of Dredging and non-Dredging sources to observed turbidity.

6.6 The EMMP shall include, but not be limited to, the following details:

(a) The turbidity monitoring equipment to be used;

(b) The location of the monitoring equipment;

(c) The setting up and maintenance of monitoring equipment;

(d) The establishment of real-time monitoring that can be made readily accessible to the TAG and PRG through reporting or notification emails, and a summary of the real-time turbidity monitoring that is readily accessible on the web for the community generally; and

(e) Data management.

Adaptive Management Actions in Response to Turbidity Plumes

6.7 As part of an EMMP, the consent holder shall detail the adaptive management actions to be carried out in response to elevated turbidity as defined by the turbidity triggers values.

6.8 To achieve condition 6.7, the EMMP shall include, but not be limited to, the following:

(a) Details of the rationale for classifying the turbidity observations into three tiers of turbidity triggers;

(b) Details of how the Tier 1, Tier 2 and Tier 3 turbidity triggers are determined using the ~~intensity and duration values derived from the~~ methodology ~~contained~~ referred to in conditions 8.2, ~~to 8.4.~~

(c) Setting out the Intensity values for Tier 1, Tier 2 and Tier 3 turbidity triggers which are based on the 80th, 95th, and 99th percentile of baseline plus Predicted Dredge Turbidity ~~modelled dredge addition~~ respectively; and

(d) Description of the adaptive management actions during disposal at the offshore maintenance disposal ground and how they may be applied by the dredge operator when a Tier 1, Tier 2 or Tier 3 turbidity trigger is exceeded, and a description of the compliance requirements for a Tier 3 exceedance as specified under condition 8.10.

Assurance Monitoring

6.9 The consent holder shall monitor the receiving environment to evaluate how the marine ecology and the physical environment is responding to Dredging Campaigns and confirm that D~~d~~redging related suspended solids are not adversely affecting Authorised Marine Farms and other sensitive receptors.

6.10 The EMMP shall include, but not be limited to, the following:

(a) Sub-tidal, intertidal, and benthic ecological surveys that will be carried out after a Dredging Campaign;

(b) Water quality monitoring that will be carried out during a Dredging Campaign;

(c) Bathymetric surveys and physical shoreline monitoring that will be carried out after a Dredging Campaign; and

(d) Inspections of marine farms, where necessary.

Reporting Requirements

6.11 As part of the EMMP, the consent holder shall detail the reporting requirements specified in the conditions of consent and otherwise needed to achieve the purpose of the EMMP.

Other Management Plans

6.12 As part of the EMMP, the consent holder shall list the other Plans prepared under this consent.

Certification of EMMP

6.13 The EMMP shall be certified in writing by the Consent Authority Manager acting in a technical Certification capacity prior to the first commencement of Dredging authorised by this consent and the consent holder shall undertake all activities authorised by this consent in accordance with the approved EMMP.

6.14 Any amendment of the EMMP shall be certified in writing by the Consent Authority Manager acting in a technical Certification capacity and the consent holder shall undertake all activities authorised by this consent in accordance with the amended EMMP.

6.15 A copy of the certified EMMP and all amended EMMPs shall be provided to Tangata Whenua and the ALG immediately following Certification.

7 MONITORING

7.1 The consent holder shall prepare and undertake monitoring programmes in accordance with these conditions.

7.2 The monitoring programmes shall be designed and carried out by a person(s) suitably qualified and experienced in the monitoring of the marine environment.

Five Yearly Monitoring of Lyttelton Harbour (including Godley Head Area)

7.3 The consent holder shall carry out surveys to monitor the effects of the disposal of Dredge Spoil at the Godley Head maintenance disposal ground and the offshore maintenance disposal grounds marked on Plan CRC172456A (attached to and forming part of this consent).

7.4 The monitoring surveys shall be carried out by the consent holder at five yearly intervals with the first survey being completed no later than 2020 and

the subsequent monitoring surveys shall be carried out at five yearly intervals thereafter.

7.5 If no Dredging Campaign is performed during the year when the five yearly monitoring survey is due under condition 7.4, the monitoring survey shall be carried out in the next year that a Dredging Campaign is undertaken, and the subsequent monitoring survey shall be carried out at five yearly intervals thereafter.

7.6 The consent holder shall complete the monitoring survey between four and six months after the cessation of a Dredging Campaign.

7.7 The monitoring survey shall include, but not be limited to, the benthic stations DD01, DD02b, DD03, DD04b, DD05, DD06b, DD07b, DD08b, DD09, DD10, DD11, DD12 inter-tidal stations DD03-Int and DD12-Int and two bioaccumulation stations at Gollans Bay and Rapaki Bay shown on marked on Plan CRC172456B attached to and forming part of this consent.

7.8 The monitoring survey shall include, but not be limited to, sampling for the following:

(a) Sediment physico-chemical characteristics (including trace contaminants);

(b) Presence and abundance of benthic macrofauna; and

(c) Presence and abundance of inter-tidal flora and fauna.

Advice Note: The five yearly monitoring surveys required under this consent mirrors the five yearly monitoring surveys required under CRC135318. In other words each five yearly survey required to be undertaken pursuant to this consent will also satisfy the requirements under CRC135318.

Baseline Turbidity applied for the Offshore Maintenance Disposal Ground

7.9 The baseline turbidity conditions at the offshore maintenance disposal ground shall be established using the baseline turbidity information required

to be obtained under condition 8.3 and reported on under condition 8.13 of CRC172455 and CRC172522 (channel deepening consent).

7.10 The consent holder shall prepare a report setting out the baseline turbidity conditions for the offshore maintenance disposal ground in accordance with condition 7.9 and the report shall be provided to the TAG, ALG and the Consent Authority no less than three months prior to commencement of the first Dredging Campaign authorised by this consent.

Turbidity and Associated Water Quality Monitoring of the Offshore Maintenance Disposal Ground during a Dredging Campaign

7.11 The consent holder shall monitor for turbidity plumes generated from the disposal of spoil at the offshore maintenance disposal ground, and shall monitor for water quality, for the duration of each Dredging Campaign.

7.12 There shall be no fewer than two stations carrying out the telemetered monitoring of turbidity (NTU) and the monitoring of water quality. The stations shall be located in the Instrumentation Zones shown on marked on Plan CRC172456C attached to and forming part of this consent.

7.13 There shall be no less than one station measuring currents.

7.14 The consent holder shall monitor for turbidity and monitor for water quality during a Dredging Campaign at the frequency set out in Table 1. The specific location of the monitoring stations, and the methodology and equipment to be used shall be detailed in the EMMP

7.15 The turbidity and water quality monitoring required under conditions 7.11 to 7.14 may cease after a period of not less than five years from the commencement of the first Dredging Campaign provided that there has also been three continuous years where there has not been a recorded ~~cumulative duration above the Tier 3 intensity in any rolling 30-day period as specified in condition 9.2~~ Tier 3 Exceedance.

Table 1: Turbidity and water quality to be monitored and the frequency of monitoring during a Dredging Campaign

Parameter	Monitoring Frequency	Collection Frequency
Turbidity (NTU)	At least every 30 minutes	Telemetered[1] or Logged and collected monthly
TSS mg/L	Monthly	Monthly
Current speeds and direction	At least every 30 minutes	Telemetered Sent 6-hourly
pH	At least every 30 minutes	Telemetered or Logged
Temperature Conductivity Dissolved Oxygen	At least every 30 minutes	Telemetered or Logged
Nutrients (phosphorus and nitrogen) and chlorophyll a (µg/L)	Sampled once during a dredging campaign	
Total and dissolved metals (µg/L)		

[1] For the purposes of this table "telemetered" means the delivering of the monitoring data electronically to LPC as the data is recorded unless otherwise specified in the table.

Ecological, Seabed level and Physical Shoreline Monitoring Associated with the Offshore Maintenance Disposal Ground

7.16 The consent holder shall monitor the presence and abundance of benthic macrofauna at the five benthic ecological stations labelled DD01, DD02b, DD03, DD13, DD14 and DD15 as marked on Plan CRC172456B.

7.17 The consent holder shall monitor the presence and abundance of sub-tidal flora and fauna at the three sub-tidal ecological stations labelled BP02, BP13 and BP14 as marked on Plan CRC172456B.

7.18 The monitoring surveys required under condition 7.16 and 7.17 shall be carried out between four and six months after a Dredging Campaign. No survey is required if no Dredging Campaign is carried out in a particular year.

7.19 The consent holder shall carry out a bathymetric survey to measure seabed levels annually at and immediately adjacent to the Godley Head and offshore maintenance disposal grounds as marked on Plan

CRC172456D attached to and forming part of this consent. The surveys shall be carried out between one and two months after a Dredging Campaign. The bathymetric survey accuracy shall be +/- 0.1m to +/- 0.5m in the vertical and horizontal directions respectively for comparable to every other survey undertaken in the same location. The error for each reading is expected to be in the order of 2-8 cm. No bathymetric survey is required if no Dredging Campaign is carried out in a particular year.

7.20 The frequency of benthic, sub-tidal and bathymetric monitoring required under conditions 7.16, 7.17 and 7.19 may be reduced by the consent holder to five yearly monitoring surveys if condition 7.15 is invoked. The consent holder must notify the Consent Authority that it has done so.

7.21 If condition 7.20 takes effect, then the benthic, sub-tidal and bathymetric survey monitoring required under conditions 7.16, 7.17 and 7.19 shall be completed at the same time as the Lyttelton Harbour monitoring required under conditions 7.3 to 7.8. This may entail an additional monitoring survey to enable it to align with the due date of the Lyttelton Harbour survey.

7.22 The consent holder shall carry out the physical shoreline monitoring at the stations shown on marked on Plan CRC172456E attached to and forming part of this consent. The consent holder shall carry out physical shoreline monitoring at the frequency set out in Table 2, and the methodology and equipment to be used shall be detailed in the EMMP.

Table 2: Type and frequency of physical shoreline monitoring

Shoreline Parameter	Monitoring Frequency
Photo-point monitoring[1]	Annually
Beach profile survey[2]	Annual
Shoreline analysis[3]	Five Yearly

[1] To visually assess beach level change or fine sediment deposition from fixed locations and aspects

[2] To quantify changes in profile geometry and/or location from an established benchmark. Assumes profiles at Bright and Sumner will continue to be monitored at 6-month intervals by the Consent Authority

[3] To determine changes in shoreline position using aerials photographs or satellite imagery

Notes
Survey requirements to achieve beach profile:
- Survey using staff and level, total station or RTK GPS
- Survey during spring low tide, pick up all changes in grade
- Required horizontal accuracy +/- 0.1m, vertical accuracy +/- 0.05m

Reporting

7.23 The CHPT shall provide to the TAG and the Consent Authority at the end of June each year an annual report detailing the monitoring of the disposal of Dredge Spoil at the offshore maintenance disposal ground required under conditions 7.11 to 7.19 and condition 7.22. The report shall include, but is not limited, to the following:

(a) A summary of the monitoring information from the previous year and any monitoring or equipment issues that occurred during period;

(b) An evaluation of the turbidity data collected during a Dredging Campaign;

(c) A review of any triggers being exceeded during a Dredging Campaign, the adaptive management actions carried out and the results of monitoring after the adaptive management actions have been completed;

(d) An evaluation of the benthic and sub-tidal communities surveyed and whether any adverse effects are attributed to disposal activities;

(e) An evaluation of the changes to the seabed level and to the physical shoreline to confirm they are consistent with the predictions made by the hydrodynamic model.

7.24 The annual reporting requirements under condition 7.23 shall cease if condition 7.15 is invoked. The exception is the photo-point and the beach profile survey set out in Table 2 of condition 7.22. These parameters shall continue to be reported on at the end of June of each year.

7.25 The CHPT shall provide to the TAG and the Consent Authority a report of the five yearly monitoring survey required under conditions 7.3 to 7.8 and the benthic, sub-tidal and bathymetric monitoring survey required under

condition 7.20 (if annual reporting has ceased). The report shall be completed within three months of the survey and the report shall:

(a) Describe the sampling methodology and the rationale for the sampling methodology;

(b) Detail the results;

(c) Provide an interpretation of the results in terms of any actual or potential effects of depositing maintenance Dredge Spoil on the benthic and inter-tidal communities surveyed;

(d) An evaluation of the benthic and inter-tidal communities surveyed and whether any adverse effects could be attributed to disposal activities; and

(e) An evaluation of the bathymetric data collected to examine any changes in the seabed and an analysis of the shoreline measurements.

7.26 A copy of the monitoring reports prepared under conditions 7.23 and 7.25 shall be provided to the Tangata Whenua and the ALG.

8 TURBIDITY TRIGGERS

8A: Establishment of turbidity triggers

8.1 The consent holder shall establish turbidity triggers for each of the telemetered turbidity monitoring locations. There shall be three tiers of turbidity triggers, each with an Intensity and Allowable Duration value. The purpose of turbidity triggers is:

(a) To initiate an adaptive management action(s) in the event of a Tier 1, 2 or 3 Exceedance which is detailed in the EMMP as required under condition 6; and

(b) For compliance in the case of an Exceedance of the Tier 3 trigger as set out in conditions 8.5 to 8.10.

8.2 The turbidity triggers shall be established in accordance with the methodology (including the modified-Intensity-Frequency-Duration approach) attached in Appendix 1.

8.3 Upon completion of the baseline monitoring the Intensity component of the turbidity triggers for each telemetered turbidity monitoring location shall be calculated using the baseline turbidity data referred to in condition 7.9 plus the Predicted Dredging Turbidity at that location, using the methodology attached in Appendix 1.

8.4 The consent holder shall provide to the Consent Authority, at least two months prior to commencement of dredging, a written report prepared by a suitably qualified and experienced expert which demonstrates that the turbidity triggers have been established in accordance conditions 8.2 and 8.3.

9B: Compliance of Tier 3 turbidity trigger

8.5 The telemetered turbidity monitoring locations required under condition 7.11 and 7.12 are to be used to determine when there has been a Tier 3 Exceedance.

8.6 The disposal of Dredge Spoil at the offshore maintenance disposal ground shall cease or not occur in the vicinity of a telemetered turbidity monitoring location when there is a Tier 3 Exceedance.

8.7 The disposal of Dredge Spoil at the offshore maintenance disposal ground may only recommence in the vicinity of a telemetered turbidity monitoring location when the Tier 3 Exceedance no longer occurs or alternatively the turbidity reading at the telemetered turbidity monitoring location referred to at condition 8.6 is below the Tier 3 Intensity level identified in the EMMP.

8.8 Notwithstanding condition 8.6, the disposal of Dredge Spoil at the offshore maintenance disposal ground may continue in the vicinity of a telemetered turbidity monitoring location provided that:

(a) The consent holder provides the Consent Authority a written report, within 24 hours of Tier 3 Allowable Exceedance referred to in condition 8.6, which demonstrates that the elevated turbidity is due to an

extraordinary natural event and not attributable to the disposal of Dredge Spoil at the offshore maintenance disposal ground; and

(b) If the Consent Authority, acting in its technical capacity, disagrees with the findings of the report the Dredging shall cease at the relevant location(s) and only recommence in accordance with condition 8.7. If the Consent Authority provides no written response after two working days then it is deemed that the Consent Authority agrees with the findings of the report prepared under condition 8.8.1 and the disposal of Dredge Spoil at the offshore maintenance ground may continue.

Advice note: An extraordinary natural event that could cause an Exceedance of the tier-3 trigger defined in the EMMP could include a tsunami, a weather event causing significant flooding, extreme off-shore swells, or a land slip.

8.9 The consent holder shall provide a copy of the report prepared under condition 8.8.1 to the TAG and the PRG and place it on its website.

8.10 The compliance measures at condition 8.5 to 8.9 shall cease if turbidity monitoring ceases in accordance with condition 7.15.

9 CONSENT HOLDER PROJECT TEAM (CHPT)

9.1 The consent holder shall employ or otherwise engage person(s) to manage the project and implement the conditions of this consent, which includes ensuring that all monitoring information is gathered and disseminated is consistent with the EMMP and in compliance with the conditions of this consent.

9.2 To achieve condition 9.1, the consent holder shall establish a CHPT which has the necessary expertise to carry out the following:

(a) Prepare monitoring reports required under conditions 7.10, 7.23 and 7.25 and circulate it to the TAG and the Consent Authority as required;

(b) ~~Continually examine~~Assess the monitoring data to ensure ~~the~~ it meets requirements and ~~appropriate information~~ is continually being gathered; and

(c) Ensure~~ing~~ that the dredging contractor has access to all ~~turbidity~~ monitoring information and~~so~~ that ~~any~~ adaptive management actions are ~~completed~~ being initiated and implemented in a timely manner.

10 TECHNICAL ADVISORY GROUP (TAG)

10.1 The consent holder shall establish, at its own cost, a TAG, which is to:

(a) Review the Draft EMMP and DMP and provide technical advice to the CHPT as to whether these plans are fit for purpose; and

(b) Review the monitoring reports and provide technical advice to the CHPT on whether the monitoring programmes required under condition 7 are fit for purpose.

10.2 The consent holder shall establish a TAG at least three months prior to the commencement of the first Dredging Campaign.

10.3 The TAG shall only meet to examine and provide technical advice on the five yearly survey report prepared under condition 7.25 if condition 7.15 is invoked.

10.4 The TAG shall comprise no more than ~~1~~12 members as detailed below.

Tangata Whenua

10.5 The consent holder shall offer Tangata Whenua the opportunity to have up to three members consisting of the following expertise:

(a) A ~~suitably qualified and experienced specialist in~~person knowledgeable and reputable with regard to mahinga kai;

(b) A suitably qualified and experienced specialist in marine ecology and/or water quality, including turbidity; and

(c) A person knowledgeable and reputable with regard to ~~suitably qualified and experienced person in~~ tikanga Maori.

Marine Farm Technical Representative

10.6 The consent holder shall offer the opportunity to have up to two technical representatives of the local Authorised Marine Farms consisting of the following expertise:

(a) A suitably qualified person that has direct experience in operating a marine farm and is currently managing or operating an Authorised Marine Farm in the vicinity of the project;

(b) A suitably qualified person, experienced in assessing environmental effects of or on aquaculture activities or one of the disciplines referred to in condition 10.7.

Consent Holder

10.7 The consent holder may have up to seven ~~six~~ members consisting of the following expertise:

(a) A suitably qualified and experienced specialist in marine ecology;

(b) A suitably qualified and experienced specialist in aquaculture;

(c) A suitably qualified and experienced specialist in monitoring the marine environment;

(d) A suitably qualified and experienced specialist in hydrodynamic modelling;

(e) A suitably qualified statistician having experience in natural resource management; and

(f) No more than two other members of the CHPT.

10.8 The TAG shall:

(a) Review and provide initial technical advice on the DMP and the EMMP;

(b) Review the annual monitoring report prepared by the CHPT and meet to discuss the report and where necessary provide advice to the CHPT

in writing on whether the monitoring programme detailed in the EMMP requires amendment (including the location of monitoring stations); and

(c) Review any exceedances of the turbidity triggers values contained in the EMMP and where necessary provide written advice to the CHPT on whether the monitoring programme detailed in the EMMP needs to be amended to better understand whether exceedances are attributed to Dredging or other environment parameters; and

(c)(d) Provide advice on any other technical matters as sought by the Consent Holder.

10.9 The consent holder shall provide any administrative support necessary for the TAG to carry out its functions.

10.10 Where the TAG does not have the expertise in any of the areas on which it is required to report on, it may engage the services of an appropriate expert to advise on a relevant matter to the TAG.

11 AQUACULTURE LIAISON GROUP (ALG)

11.1 Not less than three months prior to the first Dredging Campaign, the consent holder shall invite representatives of the aquaculture industry to participate in an ALG.

11.2 The purposes of the ALG are:

(a) To enable the consent holder and the aquaculture industry to share information relating to the exercise of this consent;

(b) To discuss the monitoring required by this consent, insofar as it relates to the effects of exercising this consent on Authorised Marine Farming Activities, including but not limited to the matters covered in conditions 6.3.1, 6.10,4; 10.8.2 and 10.8.3; and

(c) To ensure that any adverse effects on Authorised Marine Farming Activities are avoided or remedied.

11.3 Invitations to participate in the ALG shall be extended to:

(a) Sanford Limited; and

(b) Authorised Marine Farmers from Northern Banks Peninsula.

11.4 Sanford shall be entitled to appoint one representative to the ALG.

11.5 The Authorised Marine Farmers from Northern Banks Peninsula shall be entitled to appoint three representatives to the ALG.

11.6 The consent holder shall be entitled to appoint up to three representatives to the ALG.

11.7 Once established, the consent holder shall offer to hold meetings of the ALG at least once prior to the first Dredging Campaign and thereafter within two months of the completion of the annual monitoring report required under condition 7.23.

11.8 The costs of participation in the ALG shall lie where they fall, except that all administration costs will be the responsibility of the consent holder.

11.9 The consent holder shall provide no less than two weeks' notice of all ALG meetings and shall keep minutes of these meetings and distribute them within five working days.

11.10 The consent holder shall ensure that the ALG is given an opportunity to provide input into the preparation of the management plans required under conditions 4, 5 and 6. Any written recommendations from the aquaculture representatives on the ALG that are not included in the final management plans shall be provided to the Consent Authority at the same time as the plan is lodged under conditions 4.2, 5.2 and 6.2.

12 WEBSITE OBLIGATIONS

12.1 The consent holder shall maintain a website that is accessible to, and readily usable by, the public during each Dredging Campaign.

12.2 The website shall include but not be limited to the following information:

(a) A summary of real-time data collected from the telemetered stations required under conditions 7.11 to 7.14 of this consent;

(b) Annual monitoring reports prepared under condition 7.23 of this consent;

(c) Any Tier 3 turbidity trigger report prepared under condition 8.12 of this consent;

(d) The DMP and the EMMP or amendments thereof; and

(e) All written reports and reviews prepared by the TAG under condition 10.

12.3 The consent holder may elect to cease the website if condition 7.15 is invoked.

13 COMPLAINTS

13.1 A record of complaints relating to any activity associated with Dredging shall be maintained. Each record, where practicable, shall include:

(a) The location of the reported nuisance or effect;

(b) The date and time of the complaint;

(c) A description of the weather conditions at the time of complaint, if relevant;

(d) Any possible cause of the nuisance or effect; and

(e) Any management actions undertaken to address the cause of the complaint; and the name of complainant, if offered.

13.2 The record of complaints shall be provided to the Consent Authority Manager every year or on request.

13.3 An aggregated summary of the complaints shall be incorporated into the annual monitoring report prepared in accordance with condition 7.23.

Statistical methodology outline – Development of Intensity component of Turbidity Triggers

The below is a summary of the methodology set out in the Environmetrics Australia Report: *Statistical Considerations Associated with the Establishment of Turbidity Triggers: Candidate Methodologies for Large Scale Dredging Projects dated 11 May 2017*

Step 1: Raw data collected by turbidity monitoring stations and sent via telemetry to data warehouse facility.

Step 2: Raw data undergoes preliminary inspection and quality assurance using a combination of both manual and automated processing tools to produce *functionally-assured (F-qaqc)* data.

The purpose of the *F-qaqc* step is to check the consistency and integrity of the data obtained from the monitoring instruments and, where appropriate, to take remedial action. These activities include, but are not limited to:

- Flagging and if necessary, removing readings obtained when equipment was known to be faulty, unreliable, or unserviceable;
- Flagging, but **not** removing readings obtained during adverse weather or oceanographic conditions;
- In the case of dual-instrument deployments, aggregating readings in accordance with agreed protocols;
- Implementing agreed protocols in the case of instrument failure for a dual-instrument deployment.

Step 3: Functionall-assured data then is subjected to rigorous analysis using a variety of statistical proceduresto produce *statistically assured data*. Activities within this step include:

1. Identify extreme and unusual data in terms of their *statistical* properties and address as required;
2. Use statistical data imputation techniques in accordance with agreed protocols to overcome problems created by blocks of missing data;
3. Apply the Kolmogorov-Zurbenko (KZ) filter, in accordance with agreed protocols, to attenuate the influence of extreme, transient observations; and

Step 4: Establish TSS-NTU relationship(s)

In order to assimilate the modelled turbidity data (in units of mg/L) with the monitoring data (in NTU) models describing the TSS-NTU relationship need to be established. This involves:

1. Using the complete baseline data record of depth-profiling data at all sites to establish the relationship between sub-surface total suspended sediment concentrations (in mg/L) and contemporaneous measurements of NTU;
2. Additional statistical analysis to establish whether significant spatial variations in the empirical TSS-NTU relationship are evident. If this is the case, *separate* (site-specific) TSS-NTU

models will be used in step 5 below; if not – a single 'omnibus' TSS-NTU model will be used in step 5 below.

Step 5: Convert the modelled data to NTU and combine with measured baseline

1. The TSS-NTU relationship(s) from step 4 will be applied to the modelled TSS concentrations (for an indicative year) at each monitoring location to convert predicted TSS concentrations into NTU. At each monitoring site, the timestamp on the modelled output will be used to match a converted TSS value with the measured turbidity obtained at the same day, month, and hour during the baseline monitoring campaign;
2. The converted TSS and baseline NTU values obtained at step 5.1 will be added together to obtain an annual (or longer) time-series of ***total turbidity*** in NTU at each monitoring location;
3. The ***total turbidity*** data obtained at step 5.2 will be used as the basis for determining trigger values for each monitoring location.

Step 6: Calculate the *Intensity* parameters for each site for all three tiers

1. Using the *total turbidity* data at each monitoring location, calculate the Intensity (NTU) for each tier as the relevant percentile in Table 1 of the data obtained in step 5.3

Table 1

Turbidity Trigger	Intensity level $(1-\alpha)$	Nominal Intensity Trigger	Intensity (NTU)	Allowable duration of exceedance (hours) per rolling 30 day period
Tier 1	0.8	$Y_{(1-\alpha)}^{(1)}$	$I_{(1-\alpha)}^{(1)}$	144
Tier 2	0.95	$Y_{(1-\alpha)}^{(2)}$	$I_{(1-\alpha)}^{(2)}$	36
Tier 3	0.99	$Y_{(1-\alpha)}^{(3)}$	$I_{(1-\alpha)}^{(3)}$	7.2

2. For a chosen intensity level $(1-\alpha)$ determine the nominal intensity triggers, $Y_{(1-\alpha)}^{(i)}$, $i=1,2,3$;
3. For a nominal intensity trigger $Y_{(1-\alpha)}^{(i)}$ determine the corresponding upper limit $I_{(1-\alpha)}^{(i)}$ such that the probability that the $(1-\alpha)$ percentile of a sample of *n* filtered turbidity readings (obtained at the end of step 3) exceeding $I_{(1-\alpha)}^{(i)}$ is no more than 1% The determination of $I_{(1-\alpha)}^{(i)}$ shall be based on part (c) of Theorem 7.1 in DasGupta (2008) . The upper limits $\left\{I_{(1-\alpha)}^{(i)}, i=1,2,3\right\}$ so determined are referred to as *'intensity'* and form the basis of all monitoring and compliance activities.