

MARINE DUMPING CONSENT EEZ400011

Pursuant to section 62 of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (the Act), the application for marine dumping consent under section 20G of the Act by Ports of Auckland Limited to undertake the restricted activity of dumping dredged material at the Cuvier Disposal Site is **GRANTED** subject to conditions set out in Schedule 1 including Appendix 1 to 3 of Schedule 1- as amended under section 84 of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act on 16 July 2019.

Marine dumping consent EEZ400011 expires on 27 June 2054.

Dated this day 27 June 2019.



Siobhan Quayle
General Manager Climate, Land & Oceans

Under delegated authority of the Chief Executive of the Environmental Protection Authority.

SCHEDULE 1: PORTS OF AUCKLAND LIMITED MARINE DUMPING CONSENT EEZ400011 CONDITIONS

Definitions

Terms used in this Schedule of Conditions shall have the following meanings:

ANZECC	means Australian and New Zealand Guidelines for Fresh and Marine Water Quality October 2018 (online accessible through http://www.waterquality.gov.au/anz-guidelines/guideline-values).
ANZECC sediment quality guidelines	means the toxicants listed in “Table 1 Revised toxicant default guideline values for sediment quality” of the ANZECC guidelines (online accessible through http://www.waterquality.gov.au/anz-guidelines/guideline-values/default/sediment-quality-toxicants).
Bottom Dump Barge	means a barge (either self-propelled or towed by a tug) with an opening barge floor in the hull for the dumping of dredged material.
Capital dredging	means material dredged for navigation purposes, to enlarge or deepen existing channel and port areas or to create new ones and for engineering purposes.
Contaminant	has the meaning given to “toxicant” under the ANZECC Glossary of terms: a substance capable of producing an adverse response (effect) in a biological system, which may seriously injure structure or function or produce death at sufficiently high concentration.
CDS	means the Cuvier Disposal Site being a circle of 4 nautical miles radius centred on position 36°28’S 176°20’E (27 nautical miles east of Cuvier Island).
Consent Holder	has the meaning given in section 4 of the EEZ Act.
Dumping Point	means the point where the dredged material is dumped within the CDS as defined by Condition 12.
DGV	means the default guideline values of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality October 2018.
GV-high	means the default guideline values high of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality October 2018.
EEZ Act	means the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012.
EPA	means the Environmental Protection Authority as defined in section 4 of the EEZ Act.
Initial dilution	means mixing of a sample that represents mixing that occurs within four hours of dumping dredged material at the CDS.
Maintenance dredging	means material dredged to ensure that channels, berths, or construction works are maintained at their designed dimensions.
MPI	means the Ministry for Primary Industries.
Rare and vulnerable ecosystems and the habitats of threatened species	has the meaning given to Sensitive Environments under Schedule 6 of the Exclusive Economic Zone and Continental Shelf (Environmental Effects – Permitted Activities) Regulations 2013.

Sampling block	means an area within a Source Site in which sampling occurs for the purposes of sediment characterisation.
Sampling Plan	means a document(s) that contains the methodology for the sediment characterisation and biosecurity characterisation of a Source Site.
Sampling Results	means a document(s) that contains the outcomes of sediment characterisation and biosecurity characterisation of a Source Site undertaken in accordance with a Sampling Plan.
Source Site	means a marine site from which dredged material is intended to be sourced for dumping. In the context of this consent there are two Source Sites where material will be dredged for dumping. These source sites are defined by the Auckland Unitary Plan Operative in part 15 November 2016 as: The Waterfront Precincts comprising: The Port Precinct, The Central Wharves Precinct, The Viaduct Harbour Precinct, and The Wynyard Precinct; and The Waitemata Navigation Channel Precinct.
Suitably qualified and experienced person	means a person who: holds a degree qualification in the relevant subject matter, or holds relevant professional certification from a relevant professional body; and has at least eight years relevant experience.
Trained Marine Mammal Observer	means a crew member who has completed specific training, provided by an appropriately qualified person, in accordance with Appendix 3.
USEPA CCC	means the United States of America Environmental Protection Agency Saltwater chronic criteria.
Working Day	has the same meaning as defined in section 4 of the EEZ Act.

Conditions

1. Subject to compliance with these consent conditions, the activity authorised by this consent shall be undertaken in general accordance with the operational descriptions contained in the documents detailed below:
 - a) Report entitled “Application to the Environmental Protection Authority for a marine dumping consent to undertake a non-notified activity and impact assessment at the authorised location within a circle of 4 nautical miles radius centred on position 36°28’S 176°17’E (27 nautical miles east of Cuvier Island) prepared by Bentley & Co Resource Management Consultants November 2018” including Attachments 1 to 4 (inclusive); and
 - b) The Ports of Auckland Limited email responses to further information requested by the EPA dated 19 March 2019, and 5 April 2019, including the attachments.

Where there is any conflict between the contents of any of the above documents, and the conditions of this consent, then the conditions shall prevail.

2. The Consent Holder shall not dump:
 - a) More than 50,000 cubic metres (m³)¹ of dredged material from maintenance dredging, nor more than 400,000 m³ of dredged material from capital dredging, at the CDS in any consecutive 12 month period;
 - b) More than a total volume of 2,000,000 m³ of dredged material from capital dredging at the CDS over the term of this consent.
3. The Consent Holder shall ensure that:
 - a) A copy of this consent is held at all times on any self-propelled barge, or any tug towing a barge, that the Consent Holder has authorised to dump dredged material in the CDS; and
 - b) Personnel directly involved in the exercise of this consent are informed of their obligations and responsibilities in exercising this consent.
4. No sampling under a Sampling Plan shall occur at a Source Site until the EPA has certified a Sampling Plan that confirms that the sediment characterisation for that Source Site will be carried out in accordance with Appendix 1 of this consent, and that MPI is satisfied with the biosecurity risk characterisation of that Source Site, provided that:
 - a) If within twenty (20) Working Days of receiving the Sampling Plan the EPA has not certified or rejected the Sampling Plan, it will be deemed to be certified.
 - b) The EPA may at any time request further information from the Consent Holder following receipt of the Sampling Plan being submitted for certification.
 - c) Where the EPA requests further information, the period starting with the date of the request will be excluded from the 20 Working Day timeframe referred to in clause a) and the Sampling Plan will not be deemed to be certified or rejected (instead the Sampling Plan will be put on hold).
 - d) On receipt of the further information by the EPA, the 20 Working Day timeframe referred to in clause a) will recommence from the date of the receipt of the information by the EPA.

¹ Typographical changes to Conditions 2 a) and 2 b) on page iv, Condition 13 on page vi, and Appendix 1, Level 2 investigation on page xii as amended on 16 July 2019.

5. A Sampling Plan shall include:
 - a) The description of the Source Site including proposed depth of dredging, and volume of material to be dredged, for each Source Site where maintenance dredging will occur including as provided in Appendix 1.
 - b) The description of the Source Site including proposed depth of dredging, and volume of material to be dredged, for each Source Site where capital dredging will occur as provided in Appendix 1.
 - c) A detailed description of the sampling procedure and any analysis to be undertaken accordance with Appendix 1.
 - d) A list of contaminants to be sampled for in the sediment characterisation in accordance with Appendix 1.
 - e) Confirmation that the sediment characterisation of that Source Site, will be in general accordance with Appendix 1, and that the contamination levels in the sediments shall be compared to the ANZECC sediment quality guidelines.
 - f) Confirmation that the biosecurity risk characterisation of that Source Site has been carried out to the satisfaction of MPI, and any comment received from MPI shall be provided to the EPA as part of its certification process as provided in Condition 7.
6. A Sampling Plan shall be prepared:
 - a) Every three years for Source Sites that have been sampled within the preceding three years for maintenance dredging within the Waterfront Precincts;
 - b) Prior to the commencement of maintenance dredging activities for Source Sites that have not been sampled within the preceding three years for maintenance dredging within the Waterfront Precincts;
 - c) Every five years for Source Sites that have been sampled within the preceding five years for maintenance dredging within the Waitemata Navigation Channel Precinct;
 - d) Prior to the commencement of maintenance dredging activities for Source Sites that have not been sampled within the preceding five years for maintenance dredging within the Waitemata Navigation Channel Precinct; and
 - e) Prior to the commencement of capital works dredging activities for any Source Site.
7. No dredged sediment from a Sampling block within a Source Site shall be dumped at the CDS unless the EPA has certified that the Sampling Results confirm the dredged sediment is suitable for dumping in accordance with Appendix 1 of this consent provided that:
 - a) If within twenty (20) Working Days of receiving the Sampling Results the EPA has not certified or rejected the Sampling Results they will be deemed to be certified.
 - b) The EPA may at any time request further information from the Consent Holder following receipt of the Sampling Results being submitted for certification.
 - c) Where the EPA requests further information, the period starting with the date of the request will be excluded from the 20 Working Day timeframe referred to in clause a), and the Sampling Results will not be deemed to be certified or rejected (instead the assessment of the sediment and biosecurity risk characterisation will be put on hold).
 - d) On receipt of the further information by the EPA, the 20 Working Day timeframe referred to in clause a) will recommence from the date of the receipt of the information by the EPA.

8. The Consent Holder shall, if it becomes aware of any event which would likely change the characteristics of the sediments collected for dumping from a Source Site (such as, without limitation, a pollution event, operational activities, or arrival of a vessel compromised with an exotic organism) that could increase concentrations of contaminants, or biosecurity risk, at that Source Site:
 - a) Suspend dumping operations at the CDS of material sourced at that Source Site immediately upon the Consent Holder becoming aware of such an event; and
 - b) Notify the EPA of the event within 24 hours of the Consent Holder becoming aware of such an event; and
 - c) For that Source Site, undertake the process set out in Conditions 4 and 7, to determine the detailed description and characterisation of the sediment to be dredged, and the biosecurity characterisation of the Source Site; and
 - d) Not resume dumping operations at the CDS of material sourced at that Source Site, until the EPA provides written certification of the Sampling Results for that Source Site, as per Condition 7.
9. If as a consequence of the benthic survey that is required to be undertaken by Condition 25 the Consent Holder becomes aware of an unwanted organism (as defined under the Biosecurity Act 1993) at the CDS, it shall notify MPI (Biosecurity New Zealand), the Auckland Council, the EPA, and the Waikato Regional Council, within 48 hours.
10. The Consent Holder shall only dump dredged material which has been dredged by a mechanical excavator. For the avoidance of doubt, no dredged material shall be dumped within the boundaries of the CDS that has been:
 - a) Removed from the Source Site by the method of suction dredging; or
 - b) Subsequently mixed with water to produce a slurry.
11. The Consent Holder shall only dump dredged material from a Bottom Dump Barge.
12. The Consent Holder shall ensure dredged material is dumped within a circle of 200 metres radius ~~centered~~² on position 36°28'S 176°17'E.
13. There shall be no more than two dumping events over a 24-hour period, with a minimum of one (1) hour between each dumping event, provided that no dumping event shall be more than 1,200 m³ per dumping event.
14. Upon the EPA's request, the Consent Holder shall allow the EPA (or its representative or delegate) to attend in an observer status during the Consent Holder's monitoring surveys, and dumping activity, at the CDS. The Consent Holder shall bear the reasonable costs of the EPA's attendance.
15. The Consent Holder shall:
 - a) Provide the stakeholders identified in the Engagement Log Summary (Attachment 3 of the application) with up-to-date information on the activity authorised by this consent. This information shall include the results of any monitoring, and reports, required to be prepared by the conditions of this consent.
 - b) Make available the information provided to stakeholders under clause a) for the duration of this consent through a website maintained by the Consent Holder.
 - c) The website shall be operational within three (3) calendar months of the date of the grant of consent.

² Condition 12 as amended on 16 July 2019.

- d) The Consent Holder shall advise the EPA and the stakeholders of the website address within five (5) Working Days of the website going live.
16. The Consent Holder shall, by the 15th Working Day of the following month, provide a written record to the EPA of each individual load of dredged material dumped at the CDS in the preceding month. The record shall include details of:
- a) The Source Site;
 - b) The quantity of dredged material dumped, and identification of whether the material is maintenance dredging or capital dredging;
 - c) The exact location of the dumping determined by GPS (and including reference to the relevant Dumping Point in Condition 12);
 - d) The GPS evidence of the exact dumping location point;
 - e) The date, time and duration of each dumping activity.
17. If no dumping at the CDS occurs under this consent during a calendar month, the Consent Holder shall provide to the EPA a written record stating the same by the 15th Working Day of the following month.
18. If any dumping activity by the Consent Holder occurs outside the CDS the Consent Holder shall notify the EPA within 24 hours of:
- a) The Source Site of the dredged material that was dumped;
 - b) The quantity of dredged material dumped;
 - c) The exact location of the dumping activity determined by GPS;
 - d) The date, time and duration of the dumping event;
 - e) An explanation of the reasons for the dumping; and
 - f) A description of any mitigation measures adopted.
19. The lighting for all vessels, including barges, associated with the dumping of dredged material at the CDS shall be inward and downward facing, and minimised as far as practicable, while still complying with any relevant regulations and safety requirements.
20. Visual detection of marine mammals is to be undertaken by a Trained Marine Mammal Observer during transit from a Source Site and prior to any dumping activity occurring. If a marine mammal is sighted 15 minutes prior to dumping, and within 300 metres of the bottom dump barge and its towing vessel, then dumping shall not commence until all marine mammals are seen to move out of the 300 metre area, or have not been sighted for 30 minutes.
21. A written record of the period over which marine mammal detections are undertaken will be summarised in a monthly written record and include:
- a) Species and number of marine mammals detected;
 - b) Method of detection;
 - c) Any actions taken;
 - d) Personnel undertaking detection;
 - e) Confirmation that the personnel have the required training; and
 - f) General weather conditions.
22. POAL will make available to all crew members undertaking dumping activity at the CDS, a New Zealand marine mammal species identification guide to assist in the accurate identification of species.

23. The Consent Holder shall not dump any sediment at the CDS until it has completed a survey of the seabed within the predicted northern sedimentation plume outside the CDS boundary to identify if any rare or vulnerable ecosystems, or habitats of threatened species, are present.
24. The pre-dumping survey required by Condition 23 shall be undertaken:
 - a) As close as reasonably practicable to the trajectory of the three (3) transects aligned with the predicted sedimentation contours to the north of the CDS boundary as shown in Appendix 2; and
 - b) Within 1000 m long subsections along each transect, and with each subsection examined beginning at 1, 3, 5, 10 and 20 km from the boundary of the CDS; and
 - c) By a remotely operated vehicle, or glider, obtaining continuous video of the seabed, and high resolution images taken every 10 metres within each subsection on each transect.
25. Should the pre-dumping survey required by Condition 23 confirm the presence of any rare or vulnerable ecosystems, or habitats of threatened species, within the predicted northern sedimentation plume outside the CDS boundary, the survey shall be repeated:
 - a) As close as reasonably practicable to the transects undertaken for the pre-dumping survey.
 - b) Three years from the commencement of this marine dumping consent, and the completion of the capital dredging, and then at least every ten years thereafter for the duration of this consent.
 - c) If no dumping of dredged material under this consent has occurred within the previous three or ten year period, no survey is required to be undertaken for that period.
26. A report summarising the surveying undertaken under Conditions 23, 24, and 25 shall:
 - a) Be prepared by a suitably qualified and experienced person; and
 - b) Be provided to the EPA within six (6) months of each survey event; and
 - c) Posted on the website required by Condition 15 of this marine dumping consent.
27. Should dumping activities of dredged sediment occur in the CDS by a third party, the Consent Holder may cease any further survey required to be undertaken under Conditions 23, 24, and 25 of this consent.
28. The EPA may initiate a review under section 76(1)(a) of the EEZ Act by serving a notice on the Consent Holder at any time for the purposes of updating the reference to the values in the ANZECC guidelines against which the contaminants that must be listed in a Sampling Plan are compared against and/or otherwise updating Appendix 1 to this consent.

Advice Notes

1. The Consent Holder is reminded of its obligations under the Marine Mammals Protection Act 1978.
2. The Consent Holder is reminded of its obligations under the Wildlife Act 1953.
3. The Consent Holder is reminded that benthic survey activity must be authorised by a marine consent, or as a Permitted Activity as marine scientific research.

Appendix 1: Chemical Characterisation Methodology, Ports of Auckland Limited Marine Dumping Consent EEZ400011

Introduction

This methodology sets out the procedure to characterise the sediment of a Source Site in a Sampling Plan as specified in Condition 5.

Target contaminant selection

The Sampling Plan shall include a list of contaminants to be characterised at the Source Site. The list of contaminants must include:

- a) All contaminants listed in the ANZECC sediment quality guidelines that could be present at elevated levels within the Source Site; and
- b) Any other contaminants that are not included in the ANZECC sediment quality guidelines that could be present at elevated levels within the Source Site; and
- c) Rationale for the inclusion of each contaminant listed.

The dredged material from a Sampling block is only deemed suitable for dumping at the CDS if:

- a) The Level 1 investigation is completed and the existing information is sufficient to determine the dredged material is suitable for dumping at the CDS; or
- b) The Level 2 investigation determines that:
 - i. If the data are normally distributed, the mean concentrations of all contaminants listed in the Sampling Plan are statistically significantly less than ($p=0.05$) the ANZECC DGV concentration based on the 95 per cent upper confidence limit of the mean; or
 - ii. If the data are not normally distributed, the geometric mean concentrations of all contaminants listed in the Sampling Plan are statistically significantly less than ($p=0.05$) the ANZECC DGV concentration based on the 95 per cent upper confidence limit of the mean; or
- c) The Level 3 investigation determines that:
 - i. The concentrations of all the contaminants listed in the Sampling Plan in elutriate are less than the ANZECC 99% DGV concentrations, or USEPA CCC criteria (where an ANZECC 99% DGV concentration is not available), after initial dilution; or
 - ii. Acute toxicity testing of the contaminants with a concentration above the ANZECC 99% DGV concentrations, or USEPA CCC criteria (where an ANZECC 99% DGV concentration is not available) after initial dilution, determines those contaminants to be non-toxic; or
- d) The Level 4 investigation determines that the acute toxicity, chronic toxicity, and bioaccumulative properties of any contaminant that is not deemed suitable under any other Level does not present an unacceptable adverse effect.

Characterisation of each Source Site shall be undertaken in accordance with Condition 6, and shall be undertaken if an incident occurs at a Source Site that is likely to change the current sediment or biosecurity characterisation at that site in accordance with Condition 8.

Methodology

The characterisation methodology follows a four-level procedure:

1. A **level 1** investigation reviews the existing information on the material to be dredged.
2. A **level 2** investigation confirms the physical and chemical characterisation of the material.

This will establish whether the mean (or geometric mean) concentration of any of the contaminants in the list of contaminants in the Sampling Plan are below their respective ANZECC DGVs.

3. A **level 3** investigation involves:
 - a) Elutriation testing of all contaminants listed in the Sampling Plan that were identified in a Level 2 investigation at sediment concentrations between the ANZECC DGVs and the ANZECC DGV-high³ values, or appropriate sediment quality guidelines (where an ANZECC DGV is not available); and
 - b) Acute toxicity testing of all contaminants listed in the Sampling Plan that were identified as having a concentration in elutriate above the ANZECC 99% DGV concentration or appropriate sediment/water⁴ quality guidelines (where an ANZECC 99% DGV is not available).
4. A **level 4** investigation evaluates acute toxicity in a more comprehensive manner, as well as chronic and bioaccumulative effects of contaminants listed in the Sampling Plan that have:
 - a) Concentrations that exceed the ANZECC GV-high values, or
 - b) Been found acutely toxic under a Level 3 investigation, or
 - c) Otherwise failed to be deemed suitable for dumping at any other Level of investigation.

Level 1 investigation

The investigation needs to determine:

- a) Which contaminants are present based on the Source Site history review, and pre-existing data on the sediments, if any; and
- b) Whether or not the mean or geometric mean concentration of the each of the contaminants is below the ANZECC DGV or appropriate sediment quality guidelines (where an ANZECC DGV is not available).

The investigation will document information on:

- a) All potential contaminants in the Source Site; and
- b) The volume, location and depths of sediment to be dredged; and
- c) Particle sizes of the sediment to be dredged; and
- d) Historical uses of the Source Site and catchment with particular attention to any usage that could have resulted in contamination. It will pay particular attention to potential point sources or pollution events adjacent to the site or upstream, the location of sewage or stormwater discharges, and previous dredging, dumping, or landfilling.

³ Appendix 1, Methodology, 3 a) as amended on 16 July 2019.

⁴ Appendix 1, Methodology, 3 b) as amended on 16 July 2019.

If the Level 1 investigation has identified the potential for site-specific contaminants the Sampling Plan shall include those contaminants.

Level 2 investigation

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

Core numbers

Table 1 contains the minimum number of cores to be collected in each Sampling block based on volume dredged if the results from the Level 1 investigation do not indicate that the Source Site contains contaminants that are present at concentrations above the ANZECC DGV concentrations, or appropriate sediment quality guidance values (where an ANZECC DGV is not available).

Table 2 contains the minimum number of cores to be collected in each Sampling block based on the volume dredged if:

- a) The results from the Level 1 investigation indicate the Source Site contains contaminants present at concentrations that are not below ANZECC DGV concentrations, or appropriate sediment quality guidance values (where an ANZECC DGV is not available); or
- b) The geometric mean concentration of each of the identified contaminants in the sediment are not below the ANZECC DGV concentrations.

Table 1: Minimum Number of Core Samples Required by Total Volume Dredged from Uncontaminated Source Sites

Volume to be Dredged (m ³)	Number of Cores
0-5,000	3
5,000-15,000	4
15,000-100,000	10
Each additional 100,000	3 additional or as agreed in the Sampling Plan

Table 2: Minimum Number of Core Samples Required by Total Volume Dredged from Suspected or Known Contaminated Source Sites

Volume to be Dredged (m ³)	Number of Cores
0-5,000	6
5,000-15,000	6
15,000-100,000	10
Each additional 100,000	3 additional or as agreed in the Sampling Plan

The USEPA approach of stratifying the Source site into arbitrarily sized Sampling blocks and randomly sampling in each block shall be adopted. The size of Sampling blocks can be varied but will not be greater than 10,000 m², unless otherwise agreed by the EPA.

In core sampling carried out by the Consent Holder within the Waterfront Precincts or the Waitemata Navigation Channel Precinct, cores shall be sampled as follows unless otherwise agreed by the EPA:

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

The minimum mass of material necessary for particular analyses is set out in Table 3 below.

Table 3: Amount of Sediment Required for Various Analyses

Analytical Parameter	Amount required (g, wet weight)
Organic compounds	100 – 250
Metals	10 - 100
Miscellaneous analyses	50 – 100
Grain size	50 – 200
Total organic carbon	10 – 50
Toxicity testing	500 – 2000
Elutriate testing (metals)	200 – 1000
Elutriate testing organics	Up to 2000
Porewater analysis	200 – 1000
Moisture content	10 - 50

The Consent Holder may vary from the amounts required in Table 3 depending on the requirements of the laboratory undertaking the analysis. Reasoning for any variations from Table 2 must be specified in the Sampling Plan.

Sample handling, storage, and transport

The Sampling Plan shall describe the sample handling techniques to be undertaken. The sample handling techniques shall ensure that:

- a) Changes in the composition of the samples as a result of chemical, physical or biological action are minimised.
- b) Cross contamination of samples does not occur during sub-sampling and subsequent handling.
- c) Samples are not lost or mixed up between sampling and arrival at the analysing laboratories.
- d) Sampling will occur in a manner that avoids or minimises contamination.
- e) Decontamination procedures are followed when sub-sampling from cores, and between sites, to avoid cross-contamination of samples.

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

- a) Written standard operating procedures (SOPs) are to be included in the Sampling Plan and variations from SOPs, and the reasons for such variations, noted.
- b) Field conditions (e.g., weather, tides, currents where appropriate), station locations, sampling methods and handling and storage methods, field numbers, date, time, identity of sampler will be noted in ink in the field log, and field descriptions of sediments recorded as collected.
- c) A sample inventory log and a sample tracking log shall be maintained.
- d) Chain-of-custody forms that list all sample numbers and locations and the analyses are to accompany each sample to the laboratory. At each stage of handling, the samples are to be checked against the chain-of-custody forms and after receipt by the laboratory, a checked form sent back to the sampling organisation.
- e) The laboratory shall be accredited by the International Accreditation of New Zealand (IANZ) and shall be experienced in the analysis of marine sediments.

Grain size testing

The Sampling Plan shall include grain size testing for all core and depth sub-samples. The basic physical characteristics to be determined are volume, basic sediment grain size (by volume and/or physical sieving where appropriate as identified in Table 4) and moisture content data. The proportion of litter and other anthropogenic items greater than 2mm in the waste will also be assessed.

Table 4: Sediment Size Classification

Grain size to be reported			Grain size Class grouping to be tested for change
Volumetric (mm)	Sieving (mm)	Class	
>3.35		Gravel	Gravel
3.35 – 2.00	>2.00	Very fine gravel	
2.00 – 1.18	2.00 – 1.00	Very Coarse Sand	Sand
1.18 – 0.600	1 – 0.5	Coarse Sand	
0.600 – 0.300	0.5 – 0.25	Medium Sand	
0.300 – 0.150	0.250 – 0.125	Fine Sand	
0.150 – 0.063	0.125 – 0.063	Very Fine Sand	
0.063 – 0.0313	<0.063	Coarse Silt	Silt
0.0313 – 0.0156		Medium Silt	
0.0156 – 0.0078		Fine Silt	
0.0078 – 0.0039		Very Fine Silt	
<0.0039		Clay	Clay

Minimum sediment analysis

In respect of the contaminants listed in a Sampling Plan the following will be applied as a minimum, unless otherwise agreed by the EPA:

- a) The top 50 cm of each core will be analysed for sediment grain size, moisture content, heavy metals (cadmium, chromium, copper, lead, mercury, nickel, zinc), metalloid (arsenic), total organic carbon, total petroleum hydrocarbons, polynuclear aromatic hydrocarbons, and tributyltin.
- b) 50 – 100 cm interval of each core, will be analysed for sediment grain size, moisture content, heavy metals (cadmium, chromium, copper, lead, mercury, nickel, zinc), metalloid (arsenic), total organic carbon, total petroleum hydrocarbons, polynuclear aromatic hydrocarbons, and tributyltin.
- c) Each further 1 m interval of each core, will be analysed for sediment grain size, moisture content, heavy metals (cadmium, chromium, copper, lead, mercury, nickel, zinc), and metalloid (arsenic).
- d) A composite sample of equal volumes from each 1m interval of the same depth, of each core will be analysed for total organic carbon, total petroleum hydrocarbons, and tributyltin.

Detection limits shall allow wherever possible, comparison with the ANZECC DGV concentrations, or other appropriate sediment quality guidelines (where an ANZECC DGV is not available).

Where the Sampling Plan deviates from this, it shall be identified in the Sampling Plan.

If the Level 2 investigation detects contaminants in one or more samples above ANZECC DGV concentrations, or other appropriate sediment quality guidelines (where an ANZECC DGV is not available), then a Level 3 investigation is required in relation to those contaminants.

Level 3 investigation

A Level 3 investigation shall be undertaken if the concentration of one or more of the contaminants in sediment identified in the Level 2 investigation is between the ANZECC DGV and the ANZECC GV-high.

The Sampling Plan shall describe the methodology to be undertaken for a Level 3 investigation.

The sample handling, storage, and transport shall be in accordance with a Level 2 investigation.

Elutriate testing

Elutriate testing determines whether contaminants present in the dredged material are mobile and will transfer to the water once dredged or dumped. The results of elutriate testing are to be compared to ANZECC 99% DGV concentration, or appropriate sedimentwater⁵ quality guidance values (where an ANZECC 99% DGV concentration is not available), after the application of an appropriate dilution factor (based on volume of sediment to be dumped into volume of water).

If the elutriate test results exceed the ANZECC 99% DGV concentration, or appropriate sedimentwater quality guidance values (where an ANZECC 99% DGV concentration is not available), after initial dilution (defined as that which occurs within four hours after dumping), then acute toxicity testing is required in relation to those contaminants.

⁵ Appendix 1, Level 3 investigation, Elutriate testing, sentences 3 and 6 as amended on 16 July 2019.

Acute toxicity testing

Acute toxicity testing (e.g., whole sediment marine tests or marine water tests) shall be undertaken on all contaminants listed in the Sampling Plan that were identified to have a concentration in elutriate⁶ above the ANZECC 99% DGV concentration, or above appropriate sediment water quality guidance values (where an ANZECC 99% DGV is not available) after initial dilution.

Where possible and appropriate, the organisms used in acute toxicity and bioaccumulation testing should be analogues of the important test species used for similar tests internationally. Testing must be carried out using appropriate protocols, i.e., to a similar standard as the USEPA or American Society for Testing and Materials protocols for sediment toxicity testing.

Acute toxicity testing shall include testing on control sediments that best match the characteristics of the contaminated sediment but are non-toxic.

A sediment sample is deemed to be non-toxic if a toxicity test on a sample of sediment shows less than 20 per cent effect in the end point (e.g. survival or growth), relative to the control.

Acute toxicity testing shall account for grain size of the sediment and ammonia and hydrogen sulphide content.

If acute toxicity testing determines the contaminants are acutely toxic then a Level 4 investigation is required in relation to those contaminants.

Level 4 investigation

A Level 4 investigation shall only be undertaken if the concentration of one or more contaminants in the list of contaminants in the Sampling Plan:

- a) Have been found to exceed the ANZECC GV-high concentrations under a Level 2 investigation, or
- b) Have been found acutely toxic under a Level 3 investigation, or
- c) Have otherwise failed to be deemed suitable for dumping at any other Level of investigation.

The Sampling Plan shall describe the methodology to be undertaken in accordance with a Level 4 investigation.

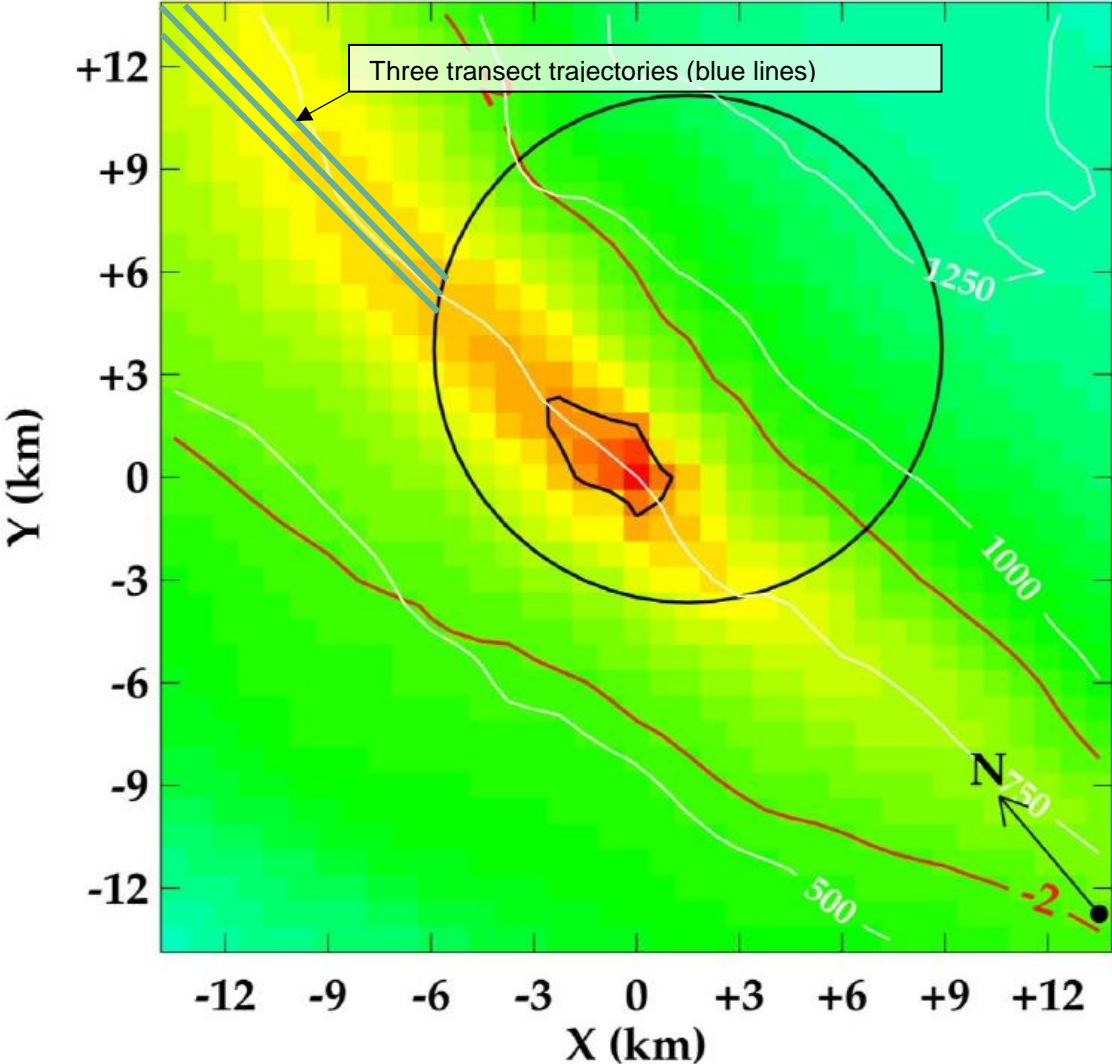
The applicant may elect to carry out further assays to evaluate acute toxicity in a more comprehensive manner, as well as chronic and bioaccumulative effects and prepare a comprehensive assessment of environmental effects.

Where possible and appropriate, the organisms used in chronic toxicity and bioaccumulation testing should be analogues of the important test species used for similar tests internationally. Testing must be carried out using appropriate protocols, i.e., to a similar standard as the USEPA or American Society for Testing and Materials protocols for sediment toxicity testing.

⁶ Appendix 1, Level 3 investigation, Acute toxicity testing, sentences 2 and 3 as amended on 16 July 2019.

Appendix 2: Transect trajectories

Figure 1: Transect trajectories (blue lines) from the boundary of the CDS. Black circle marks the CDS boundary. Point 0 - 0 marks the co-ordinates 36°28'S 176°17'E.



Appendix 3: Marine Mammal Detection Training Outline

1. Course introduction

An outline of the purpose of the course is to be provided including a description of the consented activity.

2. The Marine Mammal Protection Act and Regulations

An outline of the Marine Mammal Protection Act and how it applies to all vessels at all times. A specific focus on requirements for maintaining lookouts, vessel speeds and vessel behaviour once marine mammals are spotted.

3. Consent conditions relevant to marine mammals

An outline of the Consent Conditions stipulated in the approved consent. Explanations will cover all issues either directly or indirectly relevant to marine mammals including responsibilities, monitoring, mitigation, shutdowns and reporting.

4. The role of observers

A description of the role of observers that builds on issues identified in 2 and 3 above. It will include their specific responsibilities, chain of command (e.g. observer notifies Master of a sighting who takes appropriate action), general description of duties and any specific Health and Safety in Employment requirements relevant to the role.

5. NZ marine mammals

General description of marine mammal biology and ecology including a list of the marine mammals that might occur in the Hauraki Gulf. This includes how to identify different species and why this is important. It will also cover how to identify and categorise marine mammal behaviour including potential disturbance. Time will also be spent on introducing the material available for observers to aid them in their role (e.g. Field identification guides & books).

6. Visual observations

A description of the methods and techniques for the estimation of distance. Appropriate methods will vary depending on conditions (e.g. day/night). Items to be covered include reticule binoculars, thermal imaging cameras and laser range finders. This will also include how to estimate the distance of a sighting from the barge when observations are taken from the tug ~100 m -200 m ahead of the barge (e.g. MMO range finder app). The course will include practical demonstration and opportunity for observers to practice with each method.

7. Marine Mammal Detection Reporting

Outline the consent requirements for reporting including working through the paperwork to be completed after each detection period (whether or not a marine mammal has been sighted) and in the event a marine mammal is detected during this period. Include responsibilities for who has to record data and where it goes when completed. Include actual completion of a sighting form.

ENDS

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