

Consent Holder: Kaipara Limited

Permit: (TBC)

Site: Auckland Offshore Sand
Extraction Site

Report Title: Environmental Monitoring
Management Plan (EMMP)

Report Date: 24/07/2019

Report Version: Draft V1

CONTENTS

1.	Introduction.....	4
2.	EMMP Updates	5
3.	Environmental Monitoring Objectives and Rationale	6
3.1	Monitoring Rationale	6
3.2	Management Cells and Control Areas.....	6
4.	Pre-Sand Extraction Area Assessment	7
5.	Sand Extraction Monitoring.....	8
6.	Sand Extraction and Vessel Tracking Records.....	11
	APPENDIX ONE: COASTAL PERMIT.....	12
	APPENDIX TWO: ONSSENTED SAND EXTRACTION AREA MAP (INCLUDING THE MANAGEMENT CELLS). 13	
	APPENDIX THREE: APPROVED SAND EXTRACTION SUB-AREAS MAP	14
	APPENDIX FOUR: PROPOSED AND EXPECTED SAND EXTRACTION VOLUMES.....	15
	APPENDIX FIVE: CERTIFIED PRE-SAND EXTRACTION ASSESSMENT REPORTS	16
	APPENDIX SIX: SUBMITTED SAND EXTRACTION MONITORING REPORTS	17
	APPENDIX SEVEN: SAND EXTRACTION INFORMATION RECORDING SHEET	18

GLOSSARY

ASEA	Approved sand extraction sub-area.
Cell	The sand extraction management areas defined on the approved plan (Beca Drawing 3233103-CA-011)
EMMP	Environmental Monitoring Management Plan
Extraction Area	The consented sand extraction area.
PSEA	Proposed Sand Extraction Area
PSEAR	Pre-Sand Extraction Assessment Report
SEMR	Sand Extraction Monitoring Report.

DRAFT

1. INTRODUCTION

Kaipara Limited holds Coastal Permit (TBC) (included in Appendix One) for sand extraction from the Auckland Off-Shore Sand Extraction Site (Appendix Two). The consent was granted on (TBC) and expires on (TBC). This consent allows for sand extraction of:

- 1 Up to 2,000,000m³ of sand from the approved sand extraction areas over the life of the consent; and
- 2 Limited to 150,000m³ of sand from approved sand extraction areas between the westward boundary of the sand extraction area (being the 25m isobath) and the 30m isobath every 12 months. There is no annual volume limit for the remainder of the Extraction Area.

Condition (TBC) of the Coastal Permit requires the preparation of an Environmental Monitoring Management Plan (EMMP). This is a living document which outlines the monitoring methodologies, the approved sand extraction areas (within the consented sand extraction site) and is the depository for the required Pre-Sand Extraction Assessment Reports (PSEAR) and Sand Extraction Monitoring Reports (SEMR) and any subsequent Recovery Monitoring Reports (RMR).

The first version of this EMMP is to be submitted to Auckland Council for certification. This certification was received on the (TBC). Section 2 of this EMMP records the subsequent updates to this EMMP.

Prior to sand extraction commencing in any area within the sand extraction site, a Pre-Sand Extraction Assessment Report (PSEAR) is to be undertaken. This PSEAR then identifies the approved sand extraction sub-areas (ASEA) (and including those management cells which it covers). The following sections of this EMMP are relevant to that process:

- Section Four outlines the Pre-Sand Extraction Monitoring methodology.
- Appendix Three includes the maps of those areas where a PSEAR has been undertaken and a PSEA confirmed.
- Appendix Four records the expected and actual sand extraction volumes from each PSEA.
- Appendix Five includes approved PSEAR.

As required under Condition (TBC) of the Coastal Permit, a Sand Extraction Monitoring Report (SEMR) is to be prepared within six months of the completion of each 500,000m³ (+/- 20,000m³) of sand extraction. The following sections of this EMMP are relevant to that process:

- Section Five outlines the Sand Extraction Monitoring methodology
- Appendix Six includes any submitted SEMR

2. EMMP UPDATES

This section records the dates and nature of the EMMP updates. All updates are required to be provided to Auckland Council.

Any changes to any monitoring methodology are to be certified by Auckland Council prior to any change made.

Any other updates, such as the inclusion of certified Pre-Sand Extraction Assessment Reports and updating sand extraction volumes, do not require certification but are to be provided to Auckland Council so Auckland Council can maintain an updated copy of this EMMP.

Update Number	Date of Update	Nature of Updated	Certification from AC required	Certification Date

Appendix Three includes the Site Extraction Plan showing those cells where:

- 1 Approved Sand Extraction Sub-Areas (ASEA) (green)
- 2 Cells where sand extraction has not been approved (red)

3. ENVIRONMENTAL MONITORING OBJECTIVES AND RATIONALE

The objectives of the environmental monitoring of the Auckland Offshore Sand Extraction Site are:

- 1 Pre-Sand Extraction Area Assessment Report
 - To identify those sub-areas within a Proposed Sand Extraction Area suitable for sand extraction.
 - To provide the baseline information for the subsequent sand extraction monitoring.
- 2 Sand Extraction Monitoring Report
 - To identify over time the expected recovery period of an approved sand extraction sub-area after sand extraction has ceased.
 - To identify any changes required to the sand extraction method and timing to further minimise any identified significant adverse effects on the environment.
- 3 Sand Extraction and Vessel Tracking Monitoring
 - To retain a record of sand extraction volumes, locations, timing, water depth and sea conditions during extraction and confirmation that the permitted sand extraction volumes are being complied with.
 - To identify when the sand extraction monitoring is required to be undertaken.
 - To retain a record of where sand extraction has been undertaken and confirmation that sand extraction has only been undertaken within approved sand extraction sub-areas.

3.1 Monitoring Rationale

The monitoring rationale is based on a “cause” and “effect” basis, as well as an accumulative effects basis:

1. Cause is defined as sand extraction.
2. Effects are those changes in the bathymetry, bed forms, grain size or benthic macrofaunal communities in the sand extraction area that are greater than the natural fluctuations recorded at the control sites.
3. Accumulative effects are assessed after significant sand extraction volumes have been reached (the post-sand extraction monitoring).

3.2 Management Cells and Control Areas

To aid in the monitoring and management of the sand extraction, the consented sand extraction area has been divided into management cells orientated along-shore in the general direction of the dredging runs. The plan showing these cells is included in Appendix Two.

Two control areas will be established each covering the same depth range and be divided into similar management cells. One control area will be located adjacent to the south and the other control area will be located adjacent to the north. Both areas will be at least 1000 m long.

The plan in Appendix Two includes these control areas.

4. PRE-SAND EXTRACTION AREA ASSESSMENT

Prior to sand extraction commencing within an approved sand extraction sub-area (ASEA) the following pre-sand extraction area assessment must be undertaken in accordance with conditions (TBC). This assessment is to be recorded in a Pre-Sand Extraction Assessment Report (PSEAR) which, based on that assessment, is to identify the approved sand extraction sub-area (ASEA) within the PSEA (and the management cells which it covers).

1. A multibeam hydrographic survey of the PSEA and the similar (depth) management cells in the two control sites will be undertaken to achieve an accuracy of MB2 or greater. At the current time the survey is undertaken using a WASSP WMB 3250 Multibeam and SMC IMU108 motion sensor mounted on the vessel Ten Seventy.
2. Within each management cell within the PSEA and at the similar (depth) control site cells, one sample location will be subjected to:
 - a) Seabed imagery from a scale referenced drop camera, the images will be suitable to assess changes in fine scale (< 1m) bed forms, provide indications of larger biota and as confirmation of the multibeam interpretations.
 - b) Seabed Ponar grab samples of sediment, will be subjected to a sediment textural analysis using an optical volume-based analysis.
 - c) Seabed Ponar grab samples for biota, samples of at least 2 L, will be washed through 1.0mm sieves, live biota retained preserved and identified and enumerated.
3. Within every third cell offshore and every third cell along shore epibenthic dredge tows (with a minimum length of 200m) will be conducted to assess for the presence of larger biota.

The following areas will be excluded from the ASEA (owing to being unsuitable for sand extraction):

- The sediment in those areas having an average proportion of mud (grain size finer than 0.063 mm) exceeding 20% by volume; and/or
- The presence of significant benthic communities or benthic macrofauna.

5. SAND EXTRACTION MONITORING

To determine any potential changes in the seabed conditions or ecology as a potential result of longer-term accumulative causes, monitoring will be undertaken at the conclusion of the extraction of every 500,000m³ (+/- 20,000m³) of sand from the extraction area as a whole. This will form the basis for the Sand Extraction Monitoring Report which is to be submitted to Auckland Council within six months of the requirement for the monitoring being triggered (condition TBC).

The following monitoring programme is to be undertaken:

(All sampling locations are to be the same (within 50m of each other) across the following sampling studies.)

Geomorphological Monitoring

1. A multibeam hydrographic survey of the PSEA surveyed as part of any previous PSEAR and the similar (depth) management cells in the two control sites.
2. Single drop camera images will be recorded from:
 - a) within each control area management cell;
 - b) within each management cell of an ASEA where sand extraction has occurred within the 500,000m³ total which has triggered the monitoring; and
 - c) every second cell within the PSEA where sand extraction has not occurred within the 500,000m³ total which has triggered the monitoring.

The images will be used to assess changes in fine scale (< 1m) bed forms and as confirmation of the multibeam interpretations.

Sediment Texture

1. Seabed Ponar grab samples of sediment will be collected from:
 - a) One location within each control area management cell;
 - b) One location within each management cell of an ASEA where sand extraction has occurred within the 500,000m³ total which has triggered the monitoring; and
 - c) One location from every second cell within the PSEA where sand extraction has not occurred within the 500,000m³ total which has triggered the monitoring.

Each sample will be subjected to a sediment textural analysis using an optical volume-based analysis.

Biological Monitoring

1. Seabed Ponar grab samples of sediment will be collected from:

- a) One location within each control area management cell;
- b) One location within each management cell of an ASEA where sand extraction has occurred within the 500,000m³ total which has triggered the monitoring; and
- c) One location from every second cell within the PSEA where sand extraction has not occurred within the 500,000m³ total which has triggered the monitoring.

Notes:

Samples will be collected with a Standard Ponar Grab sampler, with a sample area of 229 x 229 mm, and a bite depth of about 100 mm, producing sample volumes of 1 - 4 L. If the sample volume is less than 2 L the grab sample will be discarded and repeated.

Each grab sample will be sieved as soon as practicable by washing each whole sample through 1.0mm mesh sieves with seawater. All samples will be stored in a cool shaded location until sieving, which will occur within six hours of collection. The material retained on the sieves will be transferred to a polyethylene 'zip lock'-type bag, and the samples preserved in a solution of 10% glyoxal, 70% ethanol sea water solution, sealed, placed in a second polyethylene 'zip lock'-type bag and packed into a labelled plastic container, for transportation to the laboratory.

Prior to sorting, the samples will be rinsed through a 0.5 mm sieve with freshwater and placed in a white sorting tray. All organisms will be picked out of the samples and placed in a labelled vial of 70% ethanol solution prior to taxonomic identification, to the lowest taxonomic group possible and counting. Only animals with heads intact will be counted and identified.

In order to survey larger macrofauna that the grab sampler may not adequately sample the seabed photographs recorded in the geomorphological monitoring will be assessed for the presence of larger biota.

In addition, epibenthic dredge tows will be conducted:

1. within the control areas at every third cell; and
2. within the extraction area at every third cell offshore and third cell along shore.

Each tow will consist of lowering a 600 mm wide dredge fitted with a 35 mm mesh bag, to the seafloor and towing it for approximately 200 m in an along shore direction. All species captured during each tow will be removed and immediately sorted. All larger macrofauna such as bivalves, hermit crabs and starfish, will be identified, photographed, counted, measured and returned to the sea.

Reporting

Within six months of the conclusion of this monitoring, the SEMR report (prepared by a suitably qualified specialist) is to be submitted to the Auckland Council.

This is to include an analysis on whether any significant sediment and biological change has occurred in the area surveyed as a result of the extraction of sand. That analysis will require comparison of the

sediment texture and biological survey data gathered during the initial survey(s) for the PSEAR and from previous accumulative studies.

DRAFT

6. SAND EXTRACTION AND VESSEL TRACKING RECORDS

Under Conditions (TBC) the following information is to be retained and submitted to Auckland Council:

1. Daily records of the volume of sand loaded into the barge and the management cells where the sand has been extracted from;
2. Date, time, water depth and sea conditions during the period of extraction; and
3. The track of the sand extraction vessel shall be recorded and mapped using a differential global positioning system (“DGPS”).

Reporting Requirements

The Consent Holder shall provide a copy of the above information and the vessel track map to the Team Leader North-West Monitoring, annually (commencing one year after the consent has been given effect to). The reporting form to be used is included in Appendix Seven.

If no sand extraction has occurred during that 12-month period then a statement to that effect will be provided to the Team Leader North-West Monitoring.

APPENDIX ONE: COASTAL PERMIT

DRAFT

APPENDIX TWO: CONSENTED SAND EXTRACTION AREA MAP (INCLUDING THE MANAGEMENT CELLS)

DRAFT

APPENDIX THREE: APPROVED SAND EXTRACTION SUB-AREAS MAP

DRAFT

APPENDIX FOUR: PROPOSED AND EXPECTED SAND EXTRACTION VOLUMES

Last Updated:

Management Cell	Date Sand Extraction Started	Date Sand Extraction Ceased	Estimated Sand Extraction Volume	Actual Sand Extraction Volume	Notes

DRAFT

APPENDIX FIVE: CERTIFIED PRE-SAND EXTRACTION ASSESSMENT REPORTS

DRAFT

APPENDIX SIX: SUBMITTED SAND EXTRACTION MONITORING REPORTS

DRAFT

APPENDIX SEVEN: SAND EXTRACTION INFORMATION RECORDING SHEET

DRAFT

