



20th September 2023

**Benthic Environmental Monitoring
Plan (EMP)
Quanterness**

Environmental Monitoring Plan, BENTHIC – SITE SPECIFIC

EMP/CAR/L/5003381

FOR

LICENCE REFERENCE NUMBER: CAR/L/ 5003381
ADDRESS OF PREMISES: Quanterness, Kirkwall, Orkney

The responsible person (Cooke Aquaculture Scotland Limited), as named in the licence, will carry out monitoring at the premises as specified in the protocol below.

The benthic Environmental Monitoring Plan (EMP) will be modified, in agreement with SEPA should it be deemed necessary. The modified EMP will be dated and shall clearly state that it replaces and supersedes the previous version.

Version: 2

Dated: 20th September 2023

Sampling Plans and Protocol

The purpose of this EMP is to monitor seabed impacts from the marine fish farm in order to assess compliance with the seabed standards specified in schedule 4 of the permit.

This plan has been developed in accordance with SEPA guidance: “Version 1 May 2022 Seabed Environmental Standards - Demonstrating Compliance”.

Two environmental monitoring survey designs are required:

1. Biological Sampling
2. Chemical Residues Sampling

Biological Sampling

This sampling is designed to collect the required seabed data that will allow an assessment of compliance against schedule 4.1 of the permit.

The default monitoring layout will be followed. Transect direction is illustrated in Figure 1 and Table 1. The primary south-east transect (T1) is aligned with the near bed major axis. T2, T3 and T4 are arranged orthogonally to T1.

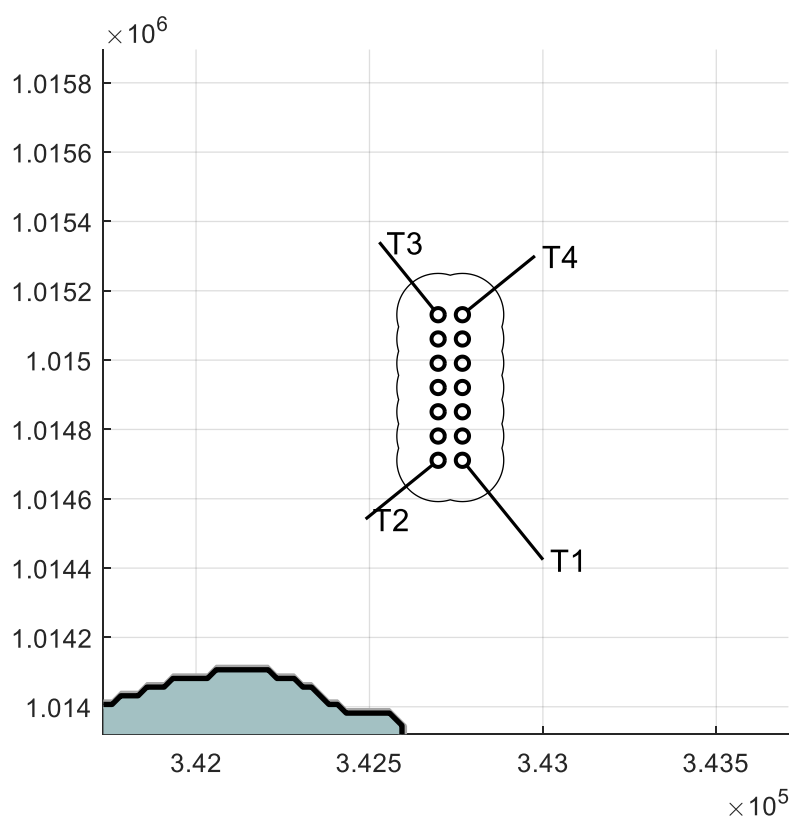


Figure 1. Pen layout, 100m mixing zone, and proposed sample transects.

Table 1. Benthic sampling transects information

Transect	Name	Bearing
T1	SE	141
T2	SW	231
T3	NW	321
T4	NE	51

At each sample station comprising of soft substrate, samples of sediment will be collected and analysed for:

- Benthic infauna
- Particle size analysis (PSA)

In the case of extensive presence of protected marine habitats or species and hard substrate around a farm, it may be unlikely that a sufficient number of stations can be sampled for benthic infauna and PSA.

Visual imagery will be used to verify the presence of these features and provide an estimate of extent.

Chemical Residues Sampling

This sampling is designed to collect the required seabed data that will allow an assessment of compliance against schedule 4.2 of the permit.

Samples will be collected at the locations specified above.

At each sample station samples of sediment will be collected and analysed for:

- Organic carbon
- Particle size analysis (PSA)
- Emamectin Benzoate

Deviations from Monitoring Layout

Deviations from the default monitoring layout maybe required if hard substrate or protected marine features are identified. This is only applicable where enough soft sediment samples may be collected to allow the calculation of an area.

Where a sample cannot be collected, the spacing between stations on a transect can be adjusted. Failing this, samples will be collected along a replacement transect, this may:

- Originate from a new pen edge within the same pen group.
- Vary the transect bearing $\pm 5^\circ$ in the direction of predominant bed flow (primary transects) and $\pm 20^\circ$ from the orthogonal direction (minor transects).
- Or a combination of both options above

Performance Standards

Sampling and analyses will be carried out in accordance with the following MACS documents:

- Performance Standard MACS-FFA-PSO1 - Version 2 July 2023
- Performance Standard MACS-FFA-PSO2 - Version 1 March 2022
- Performance Standard MACS-FFA-PSO3 - Version 1 March 2022

References

Scottish Environmental Protection Agency (2023) “Measurement Assurance and Certification Scotland - Performance Standard MACS-FFA-PSO1”

Scottish Environmental Protection Agency (2022) “Measurement Assurance and Certification Scotland - Performance Standard MACS-FFA-PSO2”

Scottish Environmental Protection Agency (2022) “Measurement Assurance and Certification Scotland - Performance Standard MACS-FFA-PSO3”

Scottish Environmental Protection Agency (2022) “Seabed environmental standards: Demonstrating compliance”.