



**Protocol for the Collection
of water samples from Scotland
for the purpose of Official Control Monitoring of
classified shellfish production areas under Regulation
EC 854/2004**

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1. INTRODUCTION

Regulation EC (No.) 854/2004 requires the monitoring of classified shellfish production areas, as part of the Competent Authority's official controls, to check for microbiological contamination, marine biotoxins and chemical contamination.

In Scotland, Food Standards Scotland is the Competent Authority with responsibility for the implementation and delivery of the shellfish official control monitoring programme. Cefas is the contracted laboratory with delegated responsibility for the co-ordination of this programme, the collection of samples and delivery of the required testing. Under contracted arrangements, the collection of field samples is undertaken by HMMH. The transport of the samples to the laboratory is arranged by the laboratories responsible for testing, other than in Shetland where samples (from Shetland and for E.coli monitoring only) are hand delivered to the E. coli testing laboratory by the sampling contractor. The laboratories responsible for testing under the current arrangements are:

- **Cefas** – toxin testing (Scotland), E. coli testing (Scotland other than Shetland and Orkney)
- **SSQC** – E. coli testing (Shetland & Orkney)
- **Fera** – chemical contaminants testing (Scotland)
- **SAMS** – water monitoring for harmful phytoplankton (Scotland)

Official control samples must be collected by authorised sampling officers. The only exception to this rule will be for specific sites in Scotland where the collection of unverified samples by a harvester on behalf of the authorised sampling officer has been agreed between FSS, HMMH and Cefas and complies with the conditions further specified in section 5. Samples collected by the industry may fall in two categories: '**verified from shore**' sample (defined as a sample collected by a harvester but where collection from the agreed monitoring point is observed by an authorised sampling officer from the shore) or an '**unverified**' sample (where collection by the harvester from the monitoring point cannot be observed by the authorised sampling officer (in most cases due to the remoteness of the monitoring point and distance from any vantage point)). See section 5 for details. The definition of verified, unverified and verified from shore used in this protocol are those prescribed by FSS as the Competent Authority, for the purpose of the Scottish official control shellfish monitoring programme.

All samples covered within the scope described in section 2 below must be collected in accordance with this protocol and from the monitoring points designated by FSS, details of which are available from FSS. This protocol can be read in conjunction with FSS '[Guide to shellfish sample collection](#)' DVD.

Samples which fail to meet the requirements of this protocol will not be accepted by the laboratories.

2. SCOPE OF THIS DOCUMENT

Monitoring programme	Scotland
Phytoplankton	X

Please note that a separate protocol for the collection of shellfish samples required by Cefas for the monitoring of shellfish production areas for the presence of toxins, chemical contaminants and *E.coli* is available from the [Shellfish Partnership page](#) of the Cefas website.

A separate protocol for the collection of shellfish and water samples by industry is also available from the [Shellfish Partnership page](#) of the Cefas website.

3. TIME OF SAMPLING

All samples should be collected at the frequency specified by FSS monitoring plans and policies, unless sampling can be rescheduled by agreement or where circumstances are outside of the sampling officers' control. Please note that where a sample is assessed as unsuitable by the laboratory, additional samples will be requested by the laboratories. Sampling officers must comply with these requests, unless exceptional circumstances prevent the collection of these additional samples.

Where industry support is required, HMMH sampling officers must liaise with the harvesters to agree a suitable time when sampling can take place and to draw up their sampling plans. Industry have been advised that rescheduling of samples will not be accepted unless agreed in advance with sampling officers.

To enable the laboratory to plan work for the forthcoming week, HMMH sample collection managers should email their **shellfish/water sampling schedule** each week to SAMS (see section 6) **by 3pm Friday** of the preceding week. The schedule should specify the day when each sample is due for collection. If sampling schedules change after 3pm on Friday, SAMS must be immediately informed of these changes.

Sampling officers are requested to note the arrangements agreed with FSS for the submission and testing of samples around bank holidays and Christmas. These will be communicated to all at the start of each calendar year. Late samples will not be accepted, unless pre-discussed and agreed with Cefas.

Samplers are requested to collect samples early in the week to allow for delivery, settling and analysis of the sample, and reporting of results within same week. This is to enhance the capability of phytoplankton analysis to act as an early warning mechanism for potential biotoxin accumulation in shellfish. Water samples should ideally be taken at high tide (+/- 1 hour) particularly at inshore sites. Sampling at low tide should be avoided.

4. EQUIPMENT

Collection by sampling officers:

The following equipment is required for water sampling and provided by SAMS/Cefas. Please contact SAMS if you are running low on sampling equipment. For contact information please see the section at the end of this protocol:

- a. Brown 500 ml bottle, fixative, label and box
- b. Spray water bottle
- c. Strong adhesive tape
- d. Return address labels
- e. Gloves or antibacterial wipes
- f. Bucket or tube sampler
- g. GPS have been loaned by Cefas to HMMH sampling officers

The following equipment should also be available (**to be provided by HMMH**):

- a. Absorbent paper towel
- b. Disinfectant (see section 12)
- c. Safety equipment as per HMMH risk and Coshh assessments

Collection by Industry:

When samples are collected by Industry, on behalf of the sampling officer, the following equipment will need to be provided to the industry collector by HMMH: Brown 500 ml bottle and label. Cefas/SAMS will provide tube samplers (unless already available to Industry). Industry will be expected to provide the rest including GPS/plotter/Nautical charts; disinfectant for industry own use (see Industry protocol on the Cefas website for details)

4. SAMPLING METHOD, PACKAGING & DISPATCH TO LABORATORY

Sampling location:

The stated Representative Monitoring Point (RMP) location must be used as the starting point to identify the position from which samples should be taken. Where a Representative Monitoring Zone (RMZ) is given in the sampling plan, sampling should take place within the boundaries of the zone and the actual location of sampling, or the centre of the dredge run, should be recorded as the sampling location.

For consistency across the programmes, sampling officers are asked to use the same tolerances around the agreed RMPs of the phytoplankton monitoring programme.

Recording of actual sampling location:

- **Verified samples:** sampling officers must report the *actual* location of sampling to a 10m accuracy in Ordnance Survey national grid reference (NGR) format i.e. AB 1234 5678. A GPS device should be used for this purpose. To achieve the maximum level of accuracy the WAAS/EGNOS option must be enabled.
- **Samples collected by industry:** the collector must be asked to fill in a HMMH unverified sample submission form for each sample they collect and hand this over to the sampling officer together with the sample. Sampling officers must ensure that they have blank forms available to hand out to collectors. Samples submitted after 31st January 19 without a fully completed unverified sample submission form will not be accepted. (Jan 19 will be used as a transition period for operators).
 - Where a GPS is available to the boat operator, they should be asked to provide details of actual sampling location as described above.
 - When no GPS is available, a plotter or an Admiralty Chart (or similar) should

be used with position recorded in degrees and decimal minutes format i.e. 00° 00'.001N, 000° 00'.001W (or E as appropriate). It is important to record the format of the latitude and longitude position correctly. If the position is provided by the operator for unverified or verified from shore samples in a format other than degrees and decimal minutes (e.g. decimal degrees or degrees, mins and secs), this should be noted on the sample submission form. For example, a location in degrees and decimal minutes is: 54°59.062'N, 5°2.132'W. The same location recorded in degrees, min, sec is: 54°59'3.73"N, 5°2'7.9"W. And the same location recorded in decimal degrees is: 54.98437, -5.03553

For samples where the location is provided in latitude and longitude format, the sampling officer should convert this position to the OS national grid reference format and write this, along with the latitude and longitude on the sample submission form. The online converter nearby.org.uk must be used to convert the coordinates.

Exceptional situations where sampling by industry for official control purposes may be authorised:

FSS recognises that there are situations where industry sampling may have to be considered for the purpose of the Scottish shellfish official control monitoring. This is in line with the provisions of the current version of the EURL Microbiological Monitoring of Bivalve Mollusc Harvesting Areas – the Good Practice Guide (GPG): Technical Application (version 6) (see Appendix 1). To allow industry sampling, the appointed sampling officer must be of the clear view that they cannot undertake sampling for reasons of either practicality or health and safety.

Practicality reasons:

- extreme difficulties in the timing of sampling (e.g. short notice through necessity of specific weather, environmental conditions that mean fitting in with sampling officer work schedules is impractical, harvest times which authorised sampling officers cannot reasonably be expected to meet) or
- extremely long sampling runs. This will most likely occur in sites conforming to the GPG definition of 'Remote area' as follows:

An area where no human or animal sources had been shown to impact on the fishery in the sanitary survey and where no potential changes to sources have been identified during the annual review process. An offshore bivalve shellfishery (≥5 km from shore) not impacted by long sea outfalls is an example of a remote area.

Health and safety reasons:

- From 09th July 2018, Cefas and FSS request that sampling officers only board vessels that show a valid small vessel certificate issued by the Maritime and Coastguard Agency (MCA) (or other authorised certifying authority) ("coded vessel"), as per the requirements of MCA Code of Practice for the safety of small workboats or pilot boats (workboat code) or MGN280 (M), and are maintained to this MCA standard by the operator. These codes are applicable to vessels of up to 24m load line length which are engaged at sea in commercial activities; where larger vessels are used for sample collection, compliance with the MCA code of practice(s) relevant to these vessels will be required.

- From this date, sampling officers must request from the industry evidence of coding or dispensation from the MCA and compliance with the MCA code for each vessel made available to sampling officers. Sampling officers must keep a record of this evidence.
- Where it has been established that the vessel is suitably coded or dispensed from coding, sampling officers will undertake a succinct check of the vessel safety before boarding, in accordance with HMMH's vessel safety checklist. This check will be a quick confirmation of vessel safety. Where all checks are satisfactory, the sampling officer will be authorised to board the vessel and undertake verified sampling. Sampling officers will not be allowed to board the vessels if the safety check cannot be completed or if they reveal that the vessel does not meet minimum safety requirements in accordance with the checklist.
- Working with the industry, sampling officers will establish a list of sites from which verified sample collection should be the norm or alternatively where onshore verification can be organised. Unverified samples collected by the industry and handed over to sampling officers will be accepted only if no suitable coded vessel is available and no onshore verification by sampling officer can be implemented for the site.

The nature of the sample (unverified (e.g. samples that are collected by harvesters, on behalf of and without direct supervision by an authorised sampling officer) or verified from the shore (e.g. samples that are collected by harvesters and collection from the RMP is observed by an authorised sampling officer from the shore)) must be recorded on the sample submission form by placing a tick in the relevant box. If known, the actual location of sampling should still be recorded, however if no location is provided by the harvester, sampling officers are asked to record this as "not provided" on the form. From 1st Feb 19, co-ordinates will need to be provided for all samples. Samples without co-ordinates will not be accepted by sampling officers.

In summary, if the taking of samples by the appointed sampling officer is not possible, then the next consideration should be officer supervision of the industry taking the sample. Only in the exceptional situations outlined above, could industry take the OC samples unsupervised. Ultimately the decision rests with FSS as the Competent Authority.

Unless exceptional circumstances, unverified samples must be collected at the point of landing. Sampling officers will be requested to provide a justification for collections other than at point of landing (to be recorded on the sample submission form).

Collection of water by sampling officers

The aim of this method is to collect samples of phytoplankton that are representative of the phytoplankton community in the water body being sampled. The water sample should be taken as close to the shellfish bed as possible and at the location from where shellfish samples for flesh testing are taken. The sampling method used will be dependent on the depth of water at the site. Surface sampling may result in predominantly freshwater (rainwater/river run-off) being collected.

Variation in the depth of water sampled means that different methods may be employed in order to collect this sample.

Water Depth	Method
< 2 m	Bucket
> 2 m	Tube sampler

The water collected should be mixed before a 500 ml sub-sample is taken using a brown Nalgene bottle. This sub-sample is then preserved in acidic Lugol's iodine fixative. The bottle should be externally labelled and returned to SAMS (Oban) for analysis as soon as possible.

1. Sampling: Water Depth < 2 m

1.1 At those sites where the water depth is less than 2 m and the water column is well mixed, a bucket should be used to collect the water sample.

1.2 Take a near-surface sample of sea water using a bucket from as far from the shore as practicable, but from the same location as the shellfish sample is obtained, or in the vicinity of the shellfish harvesting area. **Avoid stirring up the sediment** before sample collection.

1.3 Mix the contents of the bucket and immediately fill a 500 ml Nalgene sample bottle to the neck by immersing the bottle in the bucket. Do not allow the contents of the bucket to settle before filling the bottle.

1.4 Check the Lugol's solution provided is within the use-by date specified on the label before adding the contents of the fixative bottle to the Nalgene sample bottle (back on land).

1.5 Close the Nalgene sample bottle lid tightly and gently invert the sample bottle three times to ensure complete mixing of the fixative and seawater.

1.6 Seal the lid with insulating tape.

1.7 Label the bottle with the following details:

Site Name:

SIN (Site Identification Number for classified shellfish growing areas)

Collection Date:

Collection Time:

OS grid reference (8 digits = 10m accuracy)

Name of person collecting sample

Mode of collection (specify bucket or sampling tube)

Sample depth (in metres)

Tidal state (ideally within +/- 1h of high water)

1.8 Wrap the labelled Nalgene sample and the empty glass vial in bubble-wrap, place in a plastic bag and then in the pre-labelled cardboard box (if posting), or return to SAMS (Oban) for analysis.

2. Sampling: Water Depth > 2 m

2.1 At those sites where the water depth is greater than 2m, a tube sampler should be used to collect the water sample.

2.2 The tube sampler takes an integrated sample from the surface to a depth defined by the depth of water at the site. The tube sampler has been marked at 1m intervals with insulating tape, so that the depth over which the sample has been taken can be estimated.

2.3 Attach a line/rope to the bottom of the tube sampler to allow it to be raised from its base.

2.4 Open the valve at the top of the tube.

2.5 Slowly lower the weighted end of the tube into the water until most of it is immersed or until the weight is approximately 1m from the seabed. The tube sampler must remain taut and vertical in order to take an even sample of the whole water column. If the weight touches the bottom, redeploy the tube sampler as disturbed sediment will affect the quality of the water sample collected.

2.6 Take note of the depth using the guide of 1m intervals on the tube.

2.7 Close the valve at the top of the tube sampler and retrieve the bottom of the tube sampler using the attached line/rope.

2.8 Empty all the contents of the tube sampler into a bucket by opening the top valve. If necessary, lift the valve end of the tube sampler up to allow the water to drain into the bucket.

2.9 Mix the contents of the bucket and immediately fill a 500 ml Nalgene sample bottle to the neck by immersing the bottle in the bucket. Do not allow the contents of the bucket to settle before filling the bottle.

2.10 Check the Lugol's solution provided is within the use-by date specified on the label before adding the contents of the fixative bottle to the Nalgene sample bottle (back on land).

2.11 Close the Nalgene sample bottle lid tightly and gently invert the sample bottle three times to ensure complete mixing of the fixative and seawater. Seal the lid with insulating tape.

2.12 Label the bottle as detailed in section 1.7

2.13 Wrap the labelled Nalgene sample and the empty glass vial in bubble-wrap, place in a plastic bag and then in the pre-labelled cardboard box (if posting) or return to SAMS (Oban) for analysis.

Collection of water by Industry:

The collection of water by industry may be authorised where suitable equipment is available and discussions have taken place between Cefas (and SAMS), the harvester, HMMH and FSS to agree the conditions under which water sampling can take place. Cefas will confirm sites for which industry sampling has been approved. No water samples will be accepted unless collection by industry has been agreed. Water collection by industry will only be in cases where access to the monitoring site by sampling officers is not possible and will only be for sites where tube sampling is used (water depth >2m). Tube samplers would normally be supplied by Cefas/SAMS. The use of industry tube samplers may be acceptable but will require separate discussion and agreement with Cefas/FSS.

Please see details of Industry sampling in the Industry protocol available on the Cefas website. In summary, Industry will collect a sample, fill in the label (as per 1.7 above) and hand the sample over to the sampling officer but please note that this sample will not have been fixed. The sampling officer will need to add the fixative and finish packing the bottle and box before dispatching the sample to SAMS for analysis. The sampling officer must also indicate on the label if the sample was unverified (UNV) or verified from shore (VFS), initial and date the label.

6. CONTACT INFORMATION

Enquiries relating to the delivery of the FSS monitoring programme (including monitoring points, frequency of sampling, actions in case of breach of pre-defined levels, general queries or problems relating to sampling, sample collection/delivery) should be referred to the SAMS Programme Co-ordinator:

Monitoring programme	SAMS Programme Co-ordinator
Phytoplankton Monitoring Programme	Sarah Swan toxicalgae@sams.ac.uk

Weekly sampling schedules must be submitted to the following generic email address: toxicalgae@sams.ac.uk,

7. HEALTH, SAFETY & BIOSECURITY ADVICE

Sampling officers must comply with the HMMH Health and Safety policies and procedures. This includes compliance with all safety measures prescribed in risk assessments relevant to their travelling to the agreed sampling locations and the collection and handling of shellfish samples

from such areas for the purpose of the FSS monitoring programmes. The drafting, implementation and review of all relevant H&S documentations are the responsibility of HMMH.

When undertaking sampling duties, sampling officers must be mindful of the risks of introduction or transfer of aquatic pathogens and invasive species to the areas being visited, through their sampling activities. Officers are asked to comply with minimum biosecurity measures such as cleaning and disinfection of instruments, equipment and shoes/boots between sites and not driving/parking onto beaches or in close proximity to shellfish beds. All disposable items should be treated as clinical waste. Advice on suitable disinfectant and disinfection procedures are available from Marine Scotland Science. As a minimum, Marine Scotland Science recommends removing all organic matter (e.g. mud) from PPE and equipment surfaces, followed by the application of Virkon S or Virkon Aquatic S at 2% and with a minimum contact time of 10 min (or spray onto clean surface and leave to dry). A list of other suitable disinfectants is available at: <http://www.defra.gov.uk/aahm/guidance/disinfectant/list/>. All equipment should be checked to ensure that it is clean. After use, equipment (tube sampler and/or bucket) should be disinfected.

Recommended procedure for the disinfection of the tube sampler (this is required between boat runs (a boat sampling several RMPs in one run will not need to disinfect between sites however please note that runs should not include sites of different biosecurity levels (see below)):

- 1.1 Prepare 1 Litre of Virkon disinfectant solution at a concentration of 2%.
- 1.2 Lay the tube sampler out and pour the disinfectant into the tube, ensuring the whole of the inner surface is coated.
- 1.3 Empty the disinfectant from the tube sampler into the bucket, covering the whole surface of the bucket. Dispose of the bucket contents.
- 1.4 Virkon solution may be disposed of via normal liquid waste systems – it should **NOT** be disposed of via storm water drains or other unprotected water systems e.g. septic tank systems
- 1.5 Scrub the outside of the tube sampler to remove debris, spray tube sampler including rope with 2% Virkon solution and leave to air dry. The inner surface of the tube may also be allowed to dry naturally.

Specific safety considerations:

The tube sampler may provide a trip hazard – please take care during its deployment.

Personal Protective Equipment required: Safety goggles, gloves.

Lugol's Iodine Solution

- The water sampling kit contains 5ml of cell fixative called “Lugol's Iodine Solution” in a glass vial. This is a dilute mixture of glacial acetic acid, iodine and potassium iodide. Although dilute, it is still classified as harmful and care should be taken. Ensure that the lid of the fixative vial is tightly closed and that it is stored in a safe place out of the reach of children and animals. The fixative will stain clothing and more importantly skin, so gloves **must** be worn during the handling process. Goggles **must** also be worn to protect the eyes.
- **If the fixative splashes into the eyes then wash out with copious amounts of water and seek medical advice immediately.**
- **If the chemical is swallowed seek medical advice immediately.**

- If spilled, dilute/wash away with large quantities of water.
- Refer to NERC COSHH record number 1361 (supplied by SAMS) for hazard identification and management.
- **Note: The fixation of water samples should be done as soon as possible after taking the sample, BUT should always be done on dry land with a water supply on hand in case of splash/spillage.**

Virkon 2% solution

- Virkon is a broad spectrum disinfectant. Care should be taken when using **Virkon 2% solution** to disinfect equipment, as it can cause irritation to eyes, skin and respiratory system.
- The solution should be used only outdoors or in a well-ventilated area. Gloves **must** be worn during the handling process.
- If the product is splashed in the eyes, rinse immediately with plenty of water and seek medical advice.
- In case of skin contact, rinse any product off the skin immediately with water.
- If ingested allow patient to drink water (1 or 2 glasses) if conscious, but do NOT induce vomiting. Seek medical advice

Sampling officers should also be mindful of the health status of the sites that they visit and schedule their visits to ensure that the risk of transfer of pathogens and invasive species from site to site is minimised. Details of sites under specific designations and for which specific movement controls do apply are available from Marine Scotland Science and up to date lists and maps of designated areas are published on the following links: [notifiable diseases page on the Scottish Government website](#)

Sampling officers should familiarise themselves with biosecurity plans operated by operators in each harvesting area and with rules that apply to site visitors.

Where new risks of transfer of specific fish or shellfish pathogens are identified, the requirement for implementation of additional biosecurity measures will be discussed between Cefas programme co-ordinators and HMMH as soon as reasonably practicable following notification by Marine Scotland Science.

Sampling officers observing unusually high shellfish or fish mortalities during the course of their activities must report their findings to the Fish Health Inspectorate (see below).

Information on non-invasive aquatic species and how to prevent their introduction and spread can be found on the GB non native species Secretariat [webpage](#). This website includes access to [identification sheets](#) for all UK invasive species.

Fish Health Inspectorate, Marine Scotland Science PO Box 101 375, Victoria Street Aberdeen AB11 9DB	Tel: 0131 244 3498 Email: MS.FishHealth@gov.scot
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Change record

Version	Date released	Change
1	29 March 18	New Shellfish Partnership protocol drawn up at contract start
2	10 Dec 18	Addition of disinfection procedure
3	21 Dec 18	Update to all section and reformatting to match shellfish sampling protocol Addition of information contained in shellfish sampling protocol to this protocol, for consistency Addition of reference to industry sampling and conditions under which this may be possible Addition of Appendix 1

Appendix 1: EURL Microbiological Monitoring of Bivalve Mollusc Harvesting Areas – the Good Practice Guide: Technical Application (Jan 17 version (6))



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