Protocol for the Collection by Industry of Shellfish and Water samples from Scotland for the purpose of Official Control Monitoring of classified shellfish production areas under Regulation EC 854/2004

Version 2 FINAL
21 December 2018

14 pages

Document prepared by:	Cefas	Classification: Not classified
Document quality checked by:	Myriam Algoet, 20/12/18	Review Date: N/A
Document approved by:	Jane Heywood, Cefas Project Manager Caroline Thomson, FSS Operations Manager	Date: 21/12/18

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 (Scotland) Ltd. 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 shellfish and water samples must be collected by authorised sampling officers. This defines a '**verified' sample**. The only exception to this rule will be for specific sites in Scotland where the collection of 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 2. 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 2 for details. The definitions 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.

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
E.coli	X
Toxins	X
Chemical contaminants	X
Phytoplankton	X

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.

The use of specialist equipment such as dredges (e.g. oyster dredges), mechanical winches (e.g. as used in rope mussel fisheries) is not in itself grounds for industry lone sampling as it may be quite possible for the appointed officer to supervise or observe the industry operating such equipment to take the sample. Similarly, it may also be possible for the appointed sampling officer to accompany an operator on a boat where diver-gathered sampling may be necessary. Each of these scenarios have been employed under the programme in Scotland and have worked successfully.

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 another 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 will 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. Operators are asked to comply with the request and provide sampling officers with the evidence that they seek. Sampling officers will 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. For this, they will follow HMMH's vessel safety checklist (see example in Appendix 2), with support from the operator. The 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.
- For the following, *E.coli* samples, investigation samples collected following possible human illness and toxin samples collected in order to achieve a 2nd negative result prior to reopening of an area, the expectation remains that these will be verified samples collected by sampling officers (from suitably coded vessels) or collected by harvesters with collection verified from the shore 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, within the framework described above.

Unless exceptional circumstances, unverified samples will only 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 razor clams:

Following adoption of the Razor Clams (Prohibition on Fishing and landing (Scotland) order 2017 ((Scottish Statutory Instrument 2017/49) (https://www.legislation.gov.uk/ssi/2017/419/pdfs/ssi_20170419_en.pdf), sampling officers must ensure that for the duration of the Scottish electrofishing on razor clams trial, sample of razor clams are only collected using vessels that have been issued a

formal derogation to participate in the trail by Marine Scotland Science. A list of approved vessels will be provided to HMMH sampling managers and updated when required. The trial does not currently include Luce Bay and the sound of Barra.

3. TIME OF SAMPLING

All samples must be collected as per the sampling plans drawn up by HMMH. HMMH sampling officers will liaise with the harvesters to agree a suitable time when sampling can take place and to draw up their sampling plans which set out the weekly sampling requirements to meet the testing frequency specified by FSS monitoring plans and policies. These plans are finalised and forwarded by HMMH to the testing laboratories by 3pm each Friday.
Sampling plans will be defined with discussion with industry to ensure that arrangements are in place to allow the planned collection of these samples, in time for dispatch and timely analysis at the laboratories.

Rescheduling of samples will not be accepted, unless agreed in advance with sampling officers. For contact details of local sampling officers, please contact the HMMH sampling co-ordinators – see details in section 6.

4. EQUIPMENT

The following equipment will be required for shellfish sampling by the industry.

Equipment provided by HMMH:

For shellfish sampling:

a. Food grade polythene bags
b. Cable ties
c. Industry sample submission form (please note that a blank template of this form is available on the Cefas website)

For water sampling:

a. Brown 500 ml bottle for water sampling and labels

Please contact your local sampling officer if you are running low on this equipment.

Equipment which may be provided by Cefas/SAMS (unless already available to industry):

For water sampling:

a. Tube sampler

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

a. A device for identification of fixed sampling points (e.g. GPS/Nautical charts).
b. Thermometer
c. A scrubbing brush
d. Rulers/calipers
e. A colander or other draining vessel
f. Absorbent towels
g. A permanent marker pen
h. A stapler
i. A cool box/bag and ice packs
j. Insulating material (for example newspaper)
k. Disinfectant (see section 7)
l. Safety equipment as per collector's employer risk and cosh assessment

5. SAMPLING METHOD – SHELLFISH AND WATER

Wherever possible, shellfish should be sampled by the method normally used for commercial harvesting as this can influence the degree of microbial contamination.

5.1 *Sampling location*:

The stated Representative Monitoring Point (RMP) or Representative Monitoring Zones (RMZ) location should be used as the starting point to identify the position from which samples should be taken. For a list of the current RMP/RMZ locations and tolerances/boundaries, please contact your local sampling officer.

For sampling for microbiological monitoring, sample collectors are asked to comply with the tolerance around the E. coli RMP given in the sampling plan. If sufficient shellfish of the required size are not available within the area prescribed by the tolerance, industry must advise sampling officers who will contact Cefas so that a revised tolerance or alternative sampling location can be considered. 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, collectors are asked to use the same tolerances around the agreed RMPs of the toxin, chemical contaminant or phytoplankton monitoring programmes.

Collectors must record the *actual* location of sampling on the industry sample submission form (Grid ref or Lat/Long, Production Area Name, Site Name and Site Identification Number). The following may be used to determine the actual location of the sampling point:

- Where a GPS device is available, location should be to a 10m accuracy in Ordnance Survey national grid reference (NGR) format i.e. AB 1234 5678. To achieve the maximum level of accuracy the WAAS/EGNOS option must be

enabled.

- When no GPS is available, a plotter or an Admiralty Chart (or similar) should be used to determine the position of the monitoring point and the location of monitoring 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 provided is in a format other than degrees and decimal minutes (e.g. decimal degrees or degrees, mins and secs), this should be highlighted to the sampling officer and recorded 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

5.2. Sampling and preparation of shellfish

5.2.1. Size of Individual Animals

Samples should only consist of animals that are within the normal commercial size range. Immature/juvenile animals may provide results that are unrepresentative of mature stock that will be harvested for commercial sale/human consumption. In circumstances where less mature stock is being commercially harvested for human consumption then samples of these smaller animals may be collected for analysis.

5.2.2. Sample Composition

A minimum sample size (in terms of number of live animals by species or weight in shell) is recommended for submission for analysis (following NRL guidance). This is summarised in the below table.

Please note that open, gaping or damaged shells should not be included in the sample. Also note that the laboratories will need a minimum of 10 non moribund/dead animals to accept a sample as suitable for analysis. When this criterion cannot be met, the sample will be rejected on receipt at the laboratory. Where the shellfish show an unusually low yield or where morbidity may be an issue, please consider providing more shells/animals than those recommended above to ensure sufficient animals remain available for analysis.

Species	Micro	Toxin	Chem Contam	Chem Contam
		For 50g flesh[1]	For 500g flesh[2]	For 100g flesh[3]
King scallops (*Pecten maximus*)	12 to 15	12 to 15	50 to 70	12 to 15
Queen scallops (*Aequipecten opercularis*)	15 to 30	15 to 30	80 to 100	20
Oysters (*Crassostrea gigas* and *Ostrea edulis*)	12 to 18	12 to 18	80 to 100	20
Hard clams (*Mercenaria*	12 to 18	12 to 18	80 to 100	20

mercenaria)				
Manila clams (*Tapes philippinarum*)	18 to 35	18 to 35	80 to 125	16 to 25
Otter clams (*Lutraria lutraria*)	12 to 18	12 to 15	50 to 70	12 to 15
Palourdes (*Tapes decussatus*)	18 to 35	18 to 35	80 to 125	16 to 25
Surf clams (*Spisula solida*)	30 to 50	30 to 50	80 to 125	16 to 25 or 1 kg shells
Sand Gapers (*Mya arenaria*)	12 to 18	N/A	50 to 70	10 to 15
Razor clams (*Ensis* spp.)	12 to 18	12 to 15	50 to 70	10 to 15
Rope grown mussels (*Mytilus* spp.)	15 to 30	15 to 30	300 or 3kg shells	60 or 600g shells
Shore mussels (*Mytilus* spp.)	N/A	25 to 40	400 or 4kg shells	80 or 800g shells
Cockles (*Cerastoderma edule*)	35 to 55	35 to 55[4]	500 or 3 kg shells	100 or 600g shells

Notes:

1. Min. 50g of flesh is required for all samples submitted for toxin analyses, regardless of the type of analysis required.
2. Min. 500g of flesh will be required for a full suite of chemical contaminants testing (heavy metals, PAHs and PCBs/dioxins) or PCBs/dioxins testing alone.
3. Min. 100g of flesh will be required for heavy metals and/or PAHs testing.
4. Where minimum landing sizes have been reduced, more individuals may be required.

Other species:	**Micro**
Abalone (*Haliotis* spp.)	12-18
Purple sea urchins (*Paracentrotus lividus*. up to 7cm diam)	50-60
Common sea-urchins (*Echinus esculentus*, up to 20 cm diam)	12-15
Green sea-urchins (*Psammechinus miliaris*, up to 11 cm diam)	35-55

5.2.3 Preparation of Shellfish Samples

It is imperative that mud and sediment adhering to the shellfish is removed. This is best achieved by rinsing/scrubbing with seawater from the immediate area of sampling (to avoid contamination). Do **not** totally re-immerse the shellfish in water as this may cause them to open or introduce a source of microbial contamination. Allow to drain.

Shellfish must be placed inside a strong food grade plastic bag and the bag tied leaving some air space. A second bag may be used if required (in particular if the sample is likely to puncture the first plastic bag).

Using a permanent marker pen, label each bag with the origin of the sample (site name) and fill in the industry sample submission form, specifying the actual location, date and time of collection and temperature of the surrounding seawater at the time of sampling. The form must be kept (stapled) with the sample at all times. Samples which are not correctly labelled will be rejected by sampling officers. **Forms that are not fully completed and signed will not be accepted**

buy sampling officers. Jan 19 will be used as a transition period to allow adjustments. Full implementation will take place from 1st Feb 19.

The labelled bagged sample should then be placed in a temporary storage container promoting the cooling of the sample prior to repacking into validated coolboxes by the sampling officer. This temporary container may be a ruck sack, bag or box with cool packs where necessary (e.g. in summer) suitably separated (using for example newspaper as insulating material) so as not to come into direct contact with the shellfish. Care should be taken to ensure that samples are not frozen. Frozen samples will be rejected by sampling officers.

The volume of shellfish collected must be suitable to satisfy the requirement for one or more samples to be collected from a site on a given day. Separate samples must be bagged and labelled for toxin, microbiological and chemical analyses. Each must be accompanied by a fully completed industry sample submission form.

Samples collected by industry should be handed to sampling officers as quickly as possible after collection to ensure that samples can be prepared, paperwork completed and samples packed in time for dispatch to the laboratories on that day. It will be the responsibility of sampling officers to pack samples in accordance with Cefas sampling and transport protocol and to send these samples to the testing laboratories.

Please note that sampling officers will measure the temperature of the shellfish sample when handed over to them and record this on their sample submission form. This is to provide the laboratory with additional information on the conditions of the sample prior to shipping.

From 1st Feb 19, the sampling officers have been briefed to not accepted a sample without a completed and signed industry sample submission form.

5.3. *Water sampling*

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. 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.

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. Water samples should ideally be taken at high tide (+/- 1 hour) particularly at inshore sites. Sampling at low tide should be avoided.

Collection of water samples using a tube sampler (water depth >2m)

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

1.2 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.

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

1.4 Open the valve at the top of the tube.

1.5 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.

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

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

1.8 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.

1.9 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.

1.10 Close the Nalgene sample bottle lid tightly.

1.11 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) or Lat/Long
Name of person collecting sample

Mode of collection (specify sampling tube)
Sample depth (in metres)
Tidal state (ideally within +/- 1h of high water)

1.12 Hand the sample to the sampling officer who will add the fixative and finish packing the bottle and box before dispatching the sample to SAMS for analysis. The sampling officer will also indicate on the label if the sample was unverified (UNV) or verified from shore (VFS), initial and date the label.

Please note instruction re. disinfection of sampling equipment in section 7.

6. CONTACT INFORMATION

Enquiries relating to the collection of samples for the purpose of the FSS monitoring programmes (including monitoring points, frequency of sampling) should be referred to HMMH sampling officers. Where local sampling officers are unavailable, the following HMMH sampling managers can be contacted:

Julie Duncan **Shellfish Collection Manager**	07709036660	Julie.Duncan@hallmarkscotland.com
Christopher Murdoch **Deputy Shellfish Collection Manager**	07384756315	Christopher.Murdoch@hallmarkscotland.com

Please note that it will be important for sampling officers to have up-to-date contact details of operators/harvesters to facilitate communications of sampling arrangements. It will be the responsibility of the operator/harvester to notify HMMH sampling officers of any changes to contact details. Details held by sampling officers will only be held for the purpose of delivery of the FSS monitoring programme and may be shared with the testing laboratories and FSS for the same purpose.

7. HEALTH, SAFETY & BIOSECURITY ADVICE

Sample collectors are asked to comply with the Health and Safety policies and procedures of their respective company. 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 the sample collector's employer.

Please note that the use of tube sampler on board vessel constitutes an additional trip hazard which must be considered in risk assessments.

When undertaking sampling duties and if travelling from one area to another, sample collectors must be mindful of the risks of introduction or transfer of aquatic pathogens and invasive species to the areas being visited, through their activities. Collectors are asked to comply with the operator's standard biosecurity measures. 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 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/.

Please note the following safety precautions if using Virkon as a 2% solution (full safety measures must be included in suitable Coshh assessments to be made available to the user by their employer):

- 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.

Recommended procedure for 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 be allowed to dry naturally.

Collectors should 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.

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, HMMH and the collectors as soon as reasonably practicable following notification by Marine Scotland Science.

Transfer of shellfish between sites for the purpose of the FSS official monitoring programmes must not occur without prior written approval by the Fish Health Inspectorate office. This will be done through HMMH.

Operators are reminded that the observation of unusually high shellfish or fish mortalities must be reported 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

Change record

Version	Date released	Change
1	6 July 18	New protocol drawn up – circulated to LAs and ASSG & Scottish Shellfish
2	21 Dec 18	Water sampling for phytoplankton analyses added plus review of all sections Appendices 1 and 2 added

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

GPG_Issue 6 Final 17.01.17.pdf

Appendix 2: Example of vessel safety checklist (July 18 version)

Version 2 - HMS Form 05.1.2.8 Confir