QUASIMEME Laboratory Performance Studies

Programme 2022

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What is QUASIMEME ?

QUASIMEME (Quality Assurance of Information in Marine Environmental monitoring) is an accredited organiser for laboratory proficiency (LP) testing in the marine environment. Proficiency testing determines the performance of individual laboratories for specific tests or measurements and is used to monitor laboratories' continuing performance. Proficiency testing is also called interlaboratory comparison. As this term implies, proficiency testing compares the measuring results obtained by the participating laboratories. Routine laboratory performance studies provide the basis of external quality assurance for institutes that make regular chemical measurements in the marine environment.

As a result of participating in a LP study it is possible to identify areas of poor performance, which would benefit from a more detailed scrutiny. An improvement programme may be initiated through a workshop run at an institute with sound expertise followed by a series of development exercises to provide detailed tuition and information, with a range of test materials tailored to the specific needs of the problem. The QUASIMEME LP studies provide external quality assurance (QA) for national and/or international monitoring programmes, individual or collaborative research and for contract studies. The QUASIMEME LP studies support quality management and quality measurement in the participating laboratories.

Participants may use the assessment of the study data to:

- Validate internal laboratory QA
- Support accreditation
- Support QA of environmental monitoring data
- Provide data for national or international programmes

QUASIMEME was founded in 1992 as a project with EU funding (1992-1996) and was continued by subscription of the participating institutes. Since 2011, QUASIMEME is part of WEPAL (Wageningen Evaluating Programmes for Analytical Laboratories). WEPAL-QUASIMEME is accredited for the organisation of Interlaboratory Studies by the Dutch Accreditation Council RvA since April 26, 2000 (registration number R002). The accreditation is based on the ISO 17043 requirements. The scope can be found at: https://www.rva.nl/. The roles and responsibilities of the WEPAL-QUASIMEME staff is listed in Annex 1.

Most proficiency test studies that QUASIMEME offer have two rounds per annum with a minimum of two test materials containing the analytes at different concentrations. The output from these studies is reviewed annually by the QUASIMEME Scientific Advisory Board, which is comprised of experts in each of the main areas of the QUASIMEME Laboratory Performance studies. Further information relating to the membership and terms of reference for the Scientific Advisory Board is given in Annex 2.

The QUASIMEME programme is updated annually and made available to all current and former participants and as well as to third parties that have a close interest in the project and its outcome e.g. OSPAR, HELCOM, MEDPOL and ICES. The WEPAL programmes exists of five different proficiency tests covering soil, plant, sediment, manure and biomass. Information about these programmes can be found in Annex 7 of this brochure.

QUASIMEME collaborates with the following organisations which are represented as well in the QUASIMEME Scientific Advisory Board:

- Helsinki Commission (HELCOM)
- Oslo and Paris Commissions (OSPAR)
- Mediterranean Pollution Monitoring and Research Programme (MEDPOL) - Barcelona Convention
- Arctic Monitoring and Assessment Programme (AMAP)
- International Council for the Exploration of the Seas (ICES)
- European Environment Agency (EEA)
- National Marine Monitoring Programmes of member countries
- Network of reference laboratories, research centres and related organisations for monitoring of emerging environmental substances (NORMAN network).

QUASIMEME is one of the founding members of the Norman network, which has been established as a continuation of an EU project (http://www.norman-network.com/). Among others, Norman has the objective to encourage the validation and harmonisation of common measurement methods and monitoring tools so that the demands of risk assessors can be better met. QUASIMEME has been requested to take part owing to its large experience with the conduct of interlaboratory studies, workshops and the range of materials which it possesses.

Participation

Participation in the QUASIMEME Laboratory Performance studies is open to all institutes and companies world-wide that make chemical measurements in (sea)water, sediment and biological materials, and require external quality assurance.

The application form to participate in this year's rounds can be found in Annex 6 of this document and also on the QUASIMEME website.

The minimum number of participants for any study is preferably 10. When QUASIMEME offers a new type of test material or "determinand" group, and the number of participants is less than 10, the study probably will be cancelled. The project office will determine, on case by case basis, what to do when an existing study has less than 10 participants. Important considerations are costs and the possibilities to establish reliable assigned values and thus meaningful z-scores. When a study is cancelled, participants will be notified and no costs will be incurred.

Most Laboratory Performance studies are conducted twice per year, with a minimum of two test materials per study. The timetable for this year's programme and the exercise details for the rounds held this year are given in tables 1 and 2 in the timetable section of this document.

Material preparation

WEPAL-QUASIMEME has a number of collaborators who prepare and provide test materials for the Laboratory Performance (LP) studies, and who analyse these test materials for homogeneity and, where appropriate, stability. All collaborators are experts in their particular field and operate to a traceable standard, which can be audited. This may include:

- Accreditation to a standard acceptable to e.g. ISO 17025, ISO17043, ISO 9000 series.
- National reference laboratory.
- Documented evidence of the quality of the test materials provided.

A list of all QUASIMEME collaborators and their role in the provision and testing of materials for the LP studies is given in Annex 3.

Subscription

QUASIMEME is non-profit making and is funded by the participating laboratories. All materials and services are provided at cost. Details of the costs are given in table 3 of the participation section of this document.

The subscription includes:

- Two (or more) test materials for each analysis group delivered to your laboratory mostly twice per year.
- A protocol for each study, which includes information on the analyses required, the timescale for analysis and reporting of the data. This will be provided electronically.
- Assessment and confidential report of performance (data and z-scores) provided.
- LP study summary report, provided electronically on the Participant's sites.
- Electronic QUASIMEME study report to enable participants to prepare their own paper copies of reports when required.
- Provision of a helpdesk.
- Access to QUASIMEME Participant's site.
- QUASIMEME publications and newsletters.
- Development exercises operated in conjunction with expert laboratories, usually involving one round per year, often accompanied by a workshop.
- Invitation to QUASIMEME workshops, and preferential reduced registration fee.
- Use of excess test materials as a laboratory reference material[1].

QUASIMEME organises specialised workshops in support of the routine and development exercises, in addition to more general conferences. Participants pay for their own travel and accommodation, and for most of the workshops there is a registration fee to cover organisational expenses.

[1] QUASIMEME supply sufficient quantities of the test materials for each study. Excess test materials can subsequently be used as LRMs with a known assigned value and uncertainty obtained from the QUASIMEME reports.

Sample handling and delivery

All test materials samples sent by WEPAL-QUASIMEME will be delivered by courier. Most samples will be sent in an ambient condition, with the exception of chlorophyll samples and shellfish toxin samples. These samples will be sent under cooled conditions, for stability reasons. These samples will be packed in an EPS box accompanied with cool packs frozen at -80 ˚C.

Please notify the WEPAL-QUASIMEME Project Office immediately on receipt of test material samples if there are any breakages, leaks or wrongly received orders. New samples will be sent the following Monday after receipt of complaint.

If Customs in your country of delivery require extra information please inform WEPAL-QUASIMEME as this will ensure quick delivery to your laboratory.

All labels come with test material storage requirement advice. Please be aware that test material samples arriving at your laboratory labelled -20˚C, have travelled with frozen blocks and should be placed immediately in deep freezers.

Methods and Procedures

Participants should use their normal validated methods and procedures to analyse the test materials. Method codes are provided, in the form of a tick list, which cover sample preparation through to sample detection. Participants are requested to complete the method code tick list. The method codes are collated and included in the LP study reports. This allows participants to review the range and similarity of the methodologies used. As part of the new database, QUASIMEME has updated and integrated these method codes more interactively, providing more depth in assessment relating to the different methodologies used.

Units

The units of measurement are given in the Data Submission Forms. Ensure that the concentration of each determinand is reported in the units given. This may differ from your normal units for reporting; it is essential that all data reported are comparable. It is not possible for you to alter the units for reporting in the Data Submission Forms. The precision of the reported results should reflect the level of uncertainty of the measurement in your laboratory

Reporting Left Censored Values

If the concentration of a determinand is below the detection limit of your method, you may wish to report the value as less than the detection limit. Left censored values are included in the statistical evaluation of the data, and in the reports. Please report all measured concentrations for determinands when they exceed your limit of detection.

Method Codes

You are kindly asked to report your methods used, by the Method codes given in the Data Submission Forms. When the method used by your laboratory can not be chosen by one of the MIC (Method Information Code) options given in the Data Submission Form, please select others (option Z) and provide us with the details of the method used by your lab.

Return of Data

Upload all analytical data to the QUASIMEME site only with the Data Submission Forms on the Participant Site. This allows a rapid and accurate transfer of your data and an early report to you. Additional information and comments may be provided as attached files.

Data should only be submitted to the WEPAL-QUASIMEME Project Office when all quality checks have been made. If data are submitted beyond the deadline, they might not be included in the report. Data submitted after the issue of the report will not be included in the report, and these data will also not be included as part of the consensus value. Any certificate prepared with data submitted late will include the statement “Data submitted after report issued”. No data will be re-entered into the database after the report is issued. No data will be changed in the database UNLESS there is evidence that QUASIMEME or data transfer has caused an error. In such cases QUASIMEME will undertake a quality query to investigate the problem and inform the participant of the outcome of the Query.

Collusion and Falsification of Results

QUASIMEME accepts that most participants operate with professional integrity and that data returned as part of the LP studies are correct and are submitted without interference or collusion. However, in some circumstances, data or information may be influenced by, for example, (i) repeated analyses and submitting mean data, or (ii) collaboration with colleagues undertaking the same study.

QUASIMEME checks for evidence of collusion and confirm to all participants that such activity is contrary to professional scientific conduct and will only nullify the benefits of the LP studies to accreditation bodies and analysts alike.

QUASIMEME reserves the right to withdraw participation of any institute who, in the opinion of the Scientific Advisory Board, has submitted data following collusion or falsification. This statement is made as a formal requirement for accreditation for Laboratory Performance Studies under ISO17043.

Assessment

Each study is fully assessed using the Cofino Model[2]. All data provided at the time of the assessment, including extreme values and left censored values (LCVs)[3] are used to establish the consensus value. At the end of the assessment the consensus value is known as the assigned value. In the assessment a z-score (bias)[4] [5] is used to normalise the data and provide an assessment for each participating institute and a comparison of performance between institutes and studies. Details of the formulae used to calculate the z-scores are given in Annex 4. The constant and proportional errors used to calculate the z-scores, have been established by the QUASIMEME Scientific Advisory Board and are given for each determinand in the sections for each Analysis Group in this document. Information on the use of the Cofino Model and the assessment rules used for the evaluation of the QUASIMEME Laboratory Performance studies data can be downloaded from the QUASIMEME website.

The report for each study, including each laboratory's individual assessment and z-scores, will be distributed to participants within one month after the deadline for uploading results. Background information on the data assessment will be provided with the reports.

Confidentiality and Data Submission to Third Parties

QUASIMEME operates a fully confidential service to all participants. The results remain the property of each participant and full confidentiality is maintained. No information on individual participants' performance is disclosed to any third party.

QUASIMEME will provide each participant with a unique code for the Laboratory Performance (LP) studies.

QUASIMEME will publish the evaluation and overview of the LP studies in peer review journals, maintaining confidentiality. All data, however presented, will be non-attributable. The codes described above will be the only codes used in publications.

The data generated by participants is valuable to the national and/or international organisations that collate and assess environmental data for the chemical determinands analysed in the QUASIMEME LP studies. QUASIMEME encourages all participants to submit their QA data, including their LP studies results, in the submission of environmental information to the national and/or international marine monitoring programmes. QA data submission to any third party, including submission of LP studies data, is the responsibility of the individual institutes. The assessment files, in text, ASCII, and html formats, will be provided electronically after the completion of each LP study.

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[2] Cofino, W.P., Wells, D.E., Arise, F., van Stokkum, I, Wegener, J. W. & Peerboom, R. (2000). A new model for the inference of population characteristics from experimental data using uncertainties. Application to interlaboratory studies. Chemometrics and Intelligent Laboratory Systems, 53, 37-55.
Wells, D.E., Cofino, W.P. & Scurfield, J. A. (2004). The application of the Cofino model to evaluate laboratory performance study data using bandwidth estimator. FRS Marine Laboratory, Aberdeen, Report No. 04/04.
Cofino, W. P., van Stokkum, I.H.M., van Steenwijk, J., and Wells, D.E. (2005). A new model for the inference of population characteristics from experimental data using uncertainties. Part II. Application to censored datasets. Analytica Chimica Acta, 533, 31-39.
Cofino, W.P., Molenaar, J. and Torfs, P. (2018) Evaluating Proficiency tests with Robust Statistics. Wiley StatsRef: Statistics Reference Online © 2014 John Wiley & Sons, Ltd.
Molenaar, J., Cofino, W.P. and Torfs, P.J.J.F (2018) Efficient and robust analysis of interlaboratory studies. Chemometrics and Intelligent Laboratory Systems, vol.175, 15 April 2018, pages 65-73

[3] Left Censored Values is the correct nomenclature for "less than" values.

[4] International Harmonised Protocol for Proficiency Testing of (Chemical) Analytical Laboratories. M. Thompson & R. Wood, Journal of AOAC International, Vol. 76, No. 4, 1993.

[5] The formula used in calculation of the z-scores are given in Annex 4.

Timetable 2022 and Exercises

QUASIMEME follows an annual timetable. The time between each round is approximately six months with four months to report the data. This timetable allows all participants to incorporate the test materials into their ongoing analytical programme. This is particularly important for those participants who need to undertake their QA analysis alongside their environmental samples in the laboratory or at sea. The timetable is given in this scheme and a reminder, in the form of an e-mail, is to participants prior to the start of each round.

The deadlines for submission of data are fixed. Any data received after the deadline may not be included in the assessment. A confidential individual laboratory report, the full study report and the electronic summary files will be provided within two months of the deadline for the submission of data. These reports and summary files will also be provided for data received after the report is issued, but the individual laboratory report will include the statement, "Data received after the report was issued."

Table 1. Timetable

Round	Start date[6]	Deadline (submission of data)	Reports available
2022.1	4 April 2022	31 June 2022	15 July 2022
2022.2	3 October 2022	31 January 2023	13 February 2023

Table 2. Exercises

Round	Analysis Group Code	Number of Test materials	Matrix	Analytes
1 & 2	AQ-1	3	Seawater	Nutrients
1 & 2	AQ-2	4	Estuarine and Low Salinity Open Water	Nutrients
1 & 2	AQ-3	4	Seawater	Metals
1 & 2	AQ-4	4	Seawater	Mercury
1	AQ-5	3	Seawater	Halogenated Organics
1	AQ-6	2	Seawater	Volatile Organics
1	AQ-7	3	Seawater	Pentachlorophenol
1	AQ-8	3	Seawater	Triazines and organophosphorus compounds
1 & 2	AQ-11	2	Seawater Filter	Chlorophyll and Phaeopigments
1	AQ-12	2	Seawater	Organotins
1	AQ-13	3	Seawater	Polycyclic Aromatic Hydrocarbons
1 & 2	AQ-14	4	Seawater	DOC
1 & 2	AQ-15	3	Seawater	Alkalinity and DIC
1 & 2	BT-1	2	Fish or Shellfish	Trace Metals
1 & 2	BT-2	2	Fish or Shellfish	Chlorinated Organics
1 & 2	BT-4	2	Shellfish	Polycyclic Aromatic Hydrocarbons
1 & 2	BT-8	2	Biota	Organotins
1 & 2	BT-9	2	Fish or Shellfish	Brominated Flame Retardants

[6] The start date is an indication of the beginning of the round. Test materials will be dispatched in the week starting with this date. The WEPAL-QUASIMEME Project Office will notify all participants of the exact date of dispatch by e-mail.

Round	Analysis Group Code	Number of Test materials	Matrix	Analytes
1 & 2	BT-10	2	Fish or Shellfish	Perfluorinated Alkyl Substances (PFAS)
1 & 2	MS-1	2	Sediment	Trace Metals
1 & 2	MS-2	2	Sediment	Chlorinated Organics
1 & 2	MS-3	2	Sediment	Polycyclic Aromatic Hydrocarbons
1 & 2	MS-6	2	Sediment	Organotins
1 & 2	MS-7	2	Sediment	Brominated Flame Retardants
1 & 2	MS-8	2	Sediment	Perfluorinated Alkyl Substances (PFAS)
1 & 2	BT-7	3	Shellfish and Solution	ASP Shellfish Toxins
1 & 2	BT-11	3	Shellfish and Extracts	Lipophilic Shellfish Toxins
1 & 2	BT-12	3	Shellfish	PSP Shellfish Toxins
2	BE1	1	Snails	Imposex
2	DE-13	2	Seawater	Passive sampling in seawater
2	DE-16	2	Shellfish	Tetrodotoxin in shellfish
1	DE-17	3	Water, sediment & biota	Microplastics
2	DE-18	3	(Sea)water	Perfluorinated Alkyl Substances (PFAS)
2	DE-19	3	(Sea)water	Pharmaceuticals

NB: If there is insufficient interest in one of the two rounds for a test that is organized twice a year, the relevant exercise will only be held in the October round, during which the customer will receive extra test samples. Participants will be notified in advance.

Please inform the WEPAL-QUASIMEME Project Office if you are interested by using the application form and return this to our office.

Participation in the QUASIMEME Laboratory Performance Studies

How to Participate

The QUASIMEME Laboratory Performance Studies are open to any organisation, world-wide.

- Consult the enclosed information on the QUASIMEME LP studies, the timetable and the programme.
- Select the test materials required.
- Complete the application form (included in this document, from the QUASIMEME website or by e-mail from the WEPAL-QUASIMEME Project Office).
- Enter the appropriate fee from the table.
- Send the completed application form to the WEPAL-QUASIMEME Project Office, preferably by e-mail.
- DO NOT send any money with the application form. The WEPAL-QUASIMEME Project Office will invoice your institute within two weeks. Details of how to pay will be provided with the invoice.
- The invoice should be paid in Euros within 30 days of receipt.
- In case of excessive delay in payment of the invoice, additional costs may be charged.

Permanent Membership of QUASIMEME

Laboratories can subscribe annually or choose to subscribe for an indefinite period by becoming a permanent member of QUASIMEME. Subscribing for an indefinite period has a number of advantages:

- You do not have to complete the subscription every year; you only have to notify QPO of any changes in your participation.
- QPO only charge handling fees when you start the subscription for the indefinite period, when changes are made to your yearly subscription or extra test material is ordered during the exercise year.
- You will receive a discount of 3% on the subscription fee.
- A handling fee (administration and courier costs) of € 85,= is not added to the order within the exercise period.

Please tick the appropriate box on the application form if you wish to subscribe for an indefinite period.

Costs of participation

Table 3. Costs for Participation in QUASIMEME LPS per year

Analysis Group		Costs* in Euro (€)
AQ-1	Nutrients in Seawater	700
AQ-2	Nutrients in Estuarine and Low Salinity Open Water	800
AQ-3	Metals in Seawater	700
AQ-4	Mercury in Seawater	700
AQ-5	Halogenated Organics in Seawater	600
AQ-6	Volatile Organics in Seawater	650
AQ-7	Pentachlorophenol in Seawater	550
AQ-8	Triazines and Organophosphorus Pesticides in Seawater	700
AQ-11	Chlorophyll and Phaeopigments in Seawater	700
AQ-12	Organotins in Seawater	600
AQ-13	Polycyclic Aromatic Hydrocarbons in Seawater	600
AQ-14	DOC in Seawater	500
AQ-15	Total alkalinity and DIC in Seawater	650
BT-1	Trace Metals in Biota	750

Analysis Group		Costs* in Euro (€)
BT-2	Chlorinated Organics in Biota	750
BT-4	Polycyclic Aromatic Hydrocarbons in Biota	750
BT-8	Organotins in Biota	750
BT-9	Brominated Flame Retardants in Biota	750
BT-10	Perfluorinated Alkyl Substances (PFAS) in Biota	750
MS-1	Trace Metals in Sediment	625
MS-2	Chlorinated Organics in Sediment	625
MS-3	Polycyclic Aromatic Hydrocarbons in Sediment	625
MS-6	Organotins in Sediment	625
MS-7	Brominated Flame Retardants in Sediment	625
MS-8	Perfluorinated Alkyl Substances (PFAS) in sediment	625
BT-7	ASP Shellfish Toxins	700
BT-11	Lipophilic Shellfish Toxins	750
BT-12	PSP Shellfish Toxins	750
BE-1	Imposex in snails	To be decided
DE-13	Passive Sampling	900
DE-16	Tetrodotoxin in shellfish	750
DE-17	Microplastics	To be decided
DE-18	PFAS in (sea)water	600
DE-19	Pharmaceuticals in (sea)water	600

** Prices excl. VAT and handling fee*

A discount of 5% of the total amount is applied for laboratories subscribing to 5 or more groups.
A discount of 10% of the total amount is applied for laboratories subscribing to 10 or more groups.

Additional sets of samples (maximum 3) can be ordered per exercise. Extra sets will be offered with a 30% discount of the exercise subscription fee.

A handling fee (administration and courier costs) of € 85,= is added to all orders within the exercise period. Customs charges and bank handling charges are accountable to the participant.

VAT (21%) is charged on all orders from Dutch laboratories and on orders from any laboratories in other EU countries if the VAT number is not provided with the order.

It is possible to subscribe for one round of an exercise. Subscription to one round only is offered at a discount of 25% of the exercise subscription fee. Please contact the WEPAL-QUASIMEME Project Office for more information.

Changes to the participation package for our proficiency tests must be reported to QUASIMEME at least 1 month before Start date of the exercise. You may still be able to participate in certain exercises, but they can no longer be cancelled.

Reference materials

Test materials remaining from exercises are for sale when available. A lab specific Z-score Certificate will be made available when requested.

To purchase past round stock the costs are calculated as:

Reference material per test item: € 125, =
Administration and courier costs: € 85, =

We do not permit the purchase of more than three of any single test materials. QUASIMEME does not supply test materials for ring tests not coordinated by QUASIMEME. If you have any queries, please do not hesitate to contact the WEPAL-QUASIMEME Project Office.

Test Materials and Analyte Groups

Test Materials

The QUASIMEME LP studies routinely include test materials, containing determinands at concentrations similar to those possibly found in estuarine, coastal and open water environments. Tests materials used by QUASIMEME include seawater, estuarine water, biota and sediments.

Analyte Groups

In table 4 the analyte group codes can be found for specific groups of determinands in specific matrices. These analysis group codes are used to subscribe to QUASIMEME Laboratory Performance Studies.

Table 4. Analysis Group Code for Determinand-Test Material Combination

Determinand Group	Seawater	Biota	Sediment	Remarks
Nutrients	AQ-1			Seawater
	AQ-2			Seawater + Estuarine water
DOC	AQ-14			Seawater
Total alkalinity and DIC	AQ-15			Seawater
Chlorophyll and Phaeopigments	AQ-11			Filtered Seawater & Freshwater
Trace Metals	AQ-3	BT-1	MS-1	
Mercury	AQ-4			
Chlorinated Organics	AQ-5	BT-2	MS-2	
Polycyclic Aromatic Hydrocarbons (PAHs)	AQ-13	BT-4	MS-3	
Organotins	AQ-12	BT-8	MS-6	
Brominated Flame Retardants (BFRs)		BT-9	MS-7	
Perfluorinated Alkyl Substances (PFAS)	DE-18	BT-10	MS-8	
Volatile Organic Compounds (VOCs)	AQ-6			
Pentachlorophenol	AQ-7			
Triazines & Organophosphorus Pesticides	AQ-8			
ASP - Shellfish Toxins		BT-7		
Lipophilic - Shellfish Toxins		BT-11		
PSP - Shellfish Toxins		BT-12		
Development exercises				
Tetrodotoxin in shellfish		DE-16		
Passive Sampling	DE-13			
Microplastics	DE-17	DE-17	DE-17	
Pharmaceuticals	DE-19			

The details for a specific Analysis group can be found in the specific section dedicated to that analysis group in this document. These sections contain information about test materials used and the determinands to analyse. The given minimum and maximum concentrations in the tables are indicative of the typical ranges and reflect the values in test materials used over the past two years. However, there are test materials where the concentration of a determinand may be outside these values. These would be atypical of the normal range of test materials. Normally, the constant and proportional errors have been agreed by the Scientific Advisory Board and are used by QUASIMEME in the calculation of the z-scores used in the data assessment (Annex 4).

QUASIMEME has set clear guidelines on the boundaries of the uncertainty of the assigned value. When the allowable target error exceeds 100% of the assigned value, then the assigned value is set to be indicative. However, there have been occasions where the assigned value has been indicative, primarily as a function of the magnitude of the constant error, rather than the performance of the laboratories. Therefore, it was decided that assigned values will be given when the target error exceeds 100% of the assigned value in case all other requirements of the data-assessment are met.

Where known AA-EQS was given as stated by the European Union (Directive 2013/39/EU).

NB. (EQS = Ecological Quality Standard; the EQS's are mentioned in the EC Water Framework Directive)

Proficiency tests with Seawater

Seawater Test Materials

The seawater used to prepare the test materials is collected from the North Sea, Atlantic Ocean and the Baltic Sea and they are filtered to remove bacteria and other particles. The filtered seawater is dispensed into 250 ml or 1 litre glass bottles. The low salinity test materials are prepared by diluting the filtered seawater with ultrapure demineralised water to the required salinity. The level of test material homogeneity is assessed following ISO13528: 2015(Cor. 2016-10). The test materials have been shown to be stable for a number of years when stored cold (± 5 °C). The aquatic test materials, used for the analysis of pigments, have been shown to be stable for a number of years when stored in the ultra-freezer (± -80 °C).

Proficiency tests in (Sea)water

Exercise	Description
AQ-1	Nutrients in Seawater
AQ-2	Nutrients in Estuarine and Low Salinity Open Water
AQ-3	Metals in Seawater
AQ-4	Mercury in Seawater
AQ-5	Halogenated Organics in Seawater
AQ-6	Volatile Organics in Seawater
AQ-7	Pentachlorophenol in Seawater
AQ-8	Triazines and Organophosphorus Compounds in Seawater
AQ-11	Chlorophyll and Phaeopigments in Seawater
AQ-12	Organotins in Seawater
AQ-13	Polycyclic Aromatic Hydrocarbons in Seawater
AQ-14	DOC in Seawater
AQ-15	Total alkalinity and DIC in Seawater

AQ-1 Nutrients in Seawater					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**3**
Distribution		**April, October** (55 laboratories expected)			

Introduction

This study covers the determination of nutrients in the seawater test materials. The test materials are prepared in bulk, following the well-defined methods of A. Aminot and R. Kerouel (Analytical Chimica Acta 248(1991), pp.277-283 and Marine Chemistry 49(1995) pp.221-232).

Test Materials

Low nutrient seawater (LNSW), collected from the Eastern Atlantic Ocean during the late spring and summer months after the main plankton bloom, is used to prepare the test materials. This seawater is filtered to remove bacteria and particles. The pH of the seawater is adjusted to pH ~ 7.2 using 0.1M hydrochloric acid. The seawater is spiked, mixed thoroughly and dispensed into appropriate 250 ml bottles for distribution. The dispensed materials are sterilised by autoclaving.

Homogeneity testing is performed on each batch of test materials produced. The nutrient test materials are stable for the period of the test, and have also been shown to be stable for a period of some months even after opening but used under the correct conditions following the storage instructions.

Determinands and Concentration Ranges

The nutrients to be determined are given in the table below. The nitrogen species should be analysed in the distributed glass bottle and the silica and phosphorus species in the distributed plastic bottle.
The table below also shows:
- The expected concentration range for the determinands in the spiked seawater materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range		Error		AA-EQS
		Seawater	Seawater (spiked)	Const	Prop	
Ammonia	µmol/L	0.05—5	0.1—10	0.1	6.0%	
Nitrate	µmol/L	0.05—15	0.1—25	0.05	6.0%	
Nitrite	µmol/L	0.01—2	0.1—5	0.01	6.0%	
Phosphate	µmol/L	0.02—5	0.1—10	0.05	6.0%	
Silicate	µmol/L	0.2—20	0.2—50	0.1	6.0%	
Total-N	µmol/L	2.5—25	5—50	0.5	6.0%	
Total-P	µmol/L	0.05—5	0.2—10	0.05	6.0%	
TOxN	µmol/L	0.05—15	0.1—25	0.05	6.0%	
Salinity	psu			0.02	0.1%	

Determinands which are not in bold are not in the scope of the accreditation

AQ-2 Nutrients in Estuarine and Low Salinity Seawater					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**4**
Distribution		**April, October** (50 laboratories expected)			

Introduction

This study covers the determination of nutrients in the estuarine water and low salinity open water test materials. The test materials are prepared in bulk, following the well-defined methods of A. Aminot and R. Kerouel (Analytical Chimica Acta 248(1991), pp.277-283 and Marine Chemistry 49(1995) pp.221-232).

Test Materials

Low nutrient seawater (LNSW), collected from the Baltic Sea during the late spring and summer months after the main plankton bloom, is used to prepare the estuarine test materials. The low salinity open water material is collected from the Baltic. These materials are filtered to remove bacteria and particles. The seawater is diluted with ultrapure demineralised water to produces the estuarine water matrix. The pH of the materials is adjusted to pH ~ 7.2 using 0.1M hydrochloric acid. The materials are spiked, mixed thoroughly and dispensed into appropriate 250 mL bottles for distribution. The dispensed materials are sterilised by autoclaving.

Homogeneity testing is performed on each batch of test materials produced. The nutrient test materials are stable for the period of the test and have also been shown to be stable for a period of some months even after opening but used under the correct conditions following the storage instructions.

Determinands and Concentration Ranges

The nutrients to be determined are given in the table below. The nitrogen species should be analysed in the distributed glass bottle and the silica and phosphorus species in the distributed plastic bottle.
The table below also shows:
- The expected concentration range for the determinands in the spiked seawater materials.
- The constant and proportional error that will be used for assessment of the results.
-

Salinity is requested as an indicative measurement in support of methodology and should be analysed in the sample material distributed in a separate bottle labelled salinity only.

Determinand	Unit	Concentration Range		Error	
		Estuarine water (spiked)	Low salinity open water (spiked)	Const	Prop
Ammonia	µmol/L	2—50	0.2—5	0.1	6.0%
Nitrate	µmol/L	10—100	0.01—15	0.05	6.0%
Nitrite	µmol/L	0.5—25	0.002—2	0.01	6.0%
Phosphate	µmol/L	1—15	0.01—5	0.05	6.0%
Silicate	µmol/L	5—100	0.2—40	0.1	6.0%
Total-N	µmol/L	10—200	2—40	0.5	6.0%
Total-P	µmol/L	1—20	0.02—2	0.05	6.0%
TOxN	µmol/L	10—100	0.01—15	0.05	6.0%
Salinity	Psu			0.02	0.1%

Determinands which are not in bold are not in the scope of the accreditation

AQ-3 Metals in Seawater					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**4**
Distribution		**April, October** (30 laboratories expected)			

Introduction

This study covers the determination of trace metals in the seawater and low salinity seawater test materials.

Test Materials

The test materials are prepared in bulk from filtered seawater. Low salinity seawater test material is prepared by dilution with ultra-pure demineralised water. All test materials are preserved with 2 mL trace metal analysis grade nitric acid per litre of test material. Normally 1 spiked seawater, 1 unspiked seawater and 1spiked low salinity seawater are supplied for each exercise.

Homogeneity of the test materials is assumed, as they were prepared in bulk and thoroughly mixed, before being dispensed into 1 litre polypropylene bottles for distribution. The test materials are stable for the purposes of the exercise.

Determinands and concentration ranges

The trace metals to be determined are given in the table below. The table also shows:
- The expected concentration range for the determinands in the spiked test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range		Error		AA-EQS
		Low Salinity Seawater (spiked)	Seawater (spiked)	Const	Prop	
Arsenic	µg/L	0.2—15	0.05—10	0.5	12.5%	
Boron	µg/L	200—5000	1000—5000	0.4	12.5%	
Cadmium	µg/L	0.05—1	0.001—1	0.005	12.5%	0.2
Chromium	µg/L	0.5—10	0.01—10	0.1	12.5%	
Cobalt	µg/L	0.01—5	0.001—0.5	0.01	12.5%	
Copper	µg/L	0.2—10	0.05—10	0.2	12.5%	
Iron	µg/L	0.2—10	0.05—10	0.4	12.5%	
Lead	µg/L	0.01—20	0.0002—15	0.01	12.5%	7.2
Manganese	µg/L	0.1—10	0.02—10	0.4	12.5%	
Nickel	µg/L	0.1—40	0.2—40	0.2	12.5%	20
Silver	µg/L	0.1—2	0.02—2	0.2	12.5%	
Thallium	µg/L	0.01—2	0.001—0.5	0.005	12.5%	
Tin	µg/L	0.1—5	0.02—5	0.2	12.5%	
Uranium	µg/L	0.01—2	0.001—0.5	0.005	12.5%	
Vanadium	µg/L	0.2—10	0.1—10	0.2	12.5%	
Zinc	µg/L	0.2—25	0.5—25	0.4	12.5%	

N.B. In addition to the test materials mentioned above, we are intending to send 1 extra bottle with much higher concentrations (± 20 times higher indicated). This bottle will be clearly indicated as high contaminated.

Determinands which are not in bold are not in the scope of the accreditation

AQ-4 Mercury in Seawater					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**4**
Distribution		**April, October** (30 laboratories expected)			

Introduction

This study covers the determination of mercury in the seawater test materials.

Test Materials

The test materials are prepared in bulk from filtered seawater. All test materials are preserved with 2 mL trace metal analysis grade nitric acid per litre of test material. Normally 3 spiked seawater test materials are supplied for each exercise.

Homogeneity of the test materials is assumed, as they were prepared in bulk and thoroughly mixed, before being dispensed into 1 litre glass bottles for distribution. The test materials are stable for the purposes of the exercise.

Determinands and concentration ranges

Mercury should be determined in each test material. The table shows:
- The expected concentration range in the spiked test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range		Error		AA-EQS
		Low Salinity Seawater (spiked)	Seawater (spiked)	Const	Prop	
Mercury	ng/L	10 - 5000	0.2 -40	0.2	12.5%	50

N.B. In addition to the test materials mentioned above, we are intending to send 1 extra bottle with much higher concentrations (± 20 times higher indicated). This bottle will be clearly indicated as high contaminated.
This determinand is not in the scope of the accreditation.

AQ-5 Halogenated Organics in Seawater					
Year	**2022**	**Number of Rounds / Year**	**1**	**Number of Materials**	**3**
Distribution		**April** (12 laboratories expected)			

Introduction

This study covers the determination of halogenated organics in seawater test materials.

Test Materials

The seawater for this study is collected from the Eastern Atlantic Ocean and is filtered to remove bacteria and particles. The low salinity test material is prepared by dilution with ultra-pure demineralised water. The test materials are thoroughly mixed and dispensed into 1 litre glass bottles. The participants are asked to dilute the supplied standard solutions using the supplied seawater test materials to produce the spiked test materials.

Homogeneity of the test materials is assumed, as they are spiked to the same concentration level. The test materials are stable for the purposes of the exercise.

Determinands and Concentration Ranges

The organochlorines to be determined are given in the table below. The table also shows:
- The expected concentration range for the determinands in the spiked test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range		Error		AA-EQS
		Low Salinity Seawater (spiked)	Seawater (spiked)	Const	Prop	
α-HCH	ng/L	2—500	0.2—20	0.2	12.5%	2
β-HCH	ng/L	1—500	0.2—20	0.2	12.5%	2
γ-HCH	ng/L	2—500	0.5—20	0.2	12.5%	2
δ-HCH	ng/L	1—500	0.2—20	0.2	12.5%	2
HCB	ng/L	0.5—200	0.1—10	0.2	12.5%	10
HCBD	ng/L	2—500	0.2—20	0.2	12.5%	100
Aldrin	ng/L	2—1000	1—20	0.5	12.5%	5
Dieldrin	ng/L	2—1000	1—20	0.5	12.5%	5
Endrin	ng/L	2—1000	1—20	0.5	12.5%	5
Isodrin	ng/L	2—1000	1—20	0.5	12.5%	5
pp'-DDD	ng/L	1—500	0.1—10	0.5	12.5%	25
pp'-DDE	ng/L	1—500	0.2—10	0.5	12.5%	25
op'-DDT	ng/L	1—500	0.2—20	0.5	12.5%	25
pp'-DDT	ng/L	1—500	0.2—20	0.5	12.5%	10
Endosulphan-I	ng/L	1—200	0.2—10	0.2	12.5%	0.5
Endosulphan-II	ng/L	0.5—200	0.1—10	0.2	12.5%	0.5
Pentachlorobenzene	ng/L	2—1000	0.2—5	0.5	12.5%	0.7
1,2,3-TCB	ng/L	2—500	1—20	0.5	12.5%	400
1,2,4-TCB	ng/L	5—1000	1—20	0.5	12.5%	400
1,3,5-TCB	ng/L	2—500	0.5—20	0.5	12.5%	400
Trifluralin	ng/L	2—500	0.5—20	0.5	12.5%	30
PCB28	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
PCB31	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
PCB52	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
PCB101	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
PCB105	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
PCB118	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
PCB138	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
PCB138+PCB163	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
PCB153	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
PCB156	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
PCB180	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
Heptachlor	ng/L	2 - 500	0.5 - 20	0.2	12.5%	
Heptachlorepoxide	ng/L	2 - 500	0.5 - 20	0.2	12.5%	

AA-EQS for HCH's is indicated as the sum for those determinands.
AA-EQS for aldrin, dieldrin, endrin and isodrin is indicated as the sum for those determinands.
AA-EQS for pp'-DDD, pp'-DDE and op'-DDT is indicated as the sum for those determinands and pp'-DDT.
AA-EQS for 1,2,3-TCB, 1,2,4-TCB and 1,3,5-TCB is indicated as the sum for those determinands.
AA-EQS for Endosulphan-I and II are indicated as the sum of both isomers.
These determinands are not in the scope of the accreditation.

AQ-6 Volatile Organics in Seawater					
Year	**2022**	**Number of Rounds / Year**	**1**	**Number of Materials**	**2**
Distribution		**April** (10 laboratories expected)			

Introduction

This study covers the determination of volatile organochlorine compounds (VOCs) in seawater test materials.

Test Materials

The seawater for this study is collected from the Eastern Atlantic Ocean and is filtered to remove bacteria and particles. The test materials are thoroughly mixed and dispensed into 1 litre glass bottles. These bottles are individually spiked with methanol solutions containing the volatile organic compounds (VOCs) to be analysed. Glass beads are added to the spiked test materials to reduce the headspace volume in order to prevent volatilisation of the added VOCs.

Homogeneity of the test materials is assumed, as they were spiked to the same concentration level. The test materials are stable for the purposes of the exercise.

Determinands and Concentration Ranges

The VOCs to be determined are given in the table below. The table also shows:
- The expected concentration range for the determinands in the spiked test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range	Error		AA-EQS
		Seawater (spiked)	Const	Prop	
Benzene	µg/L	0.2—50	0.1	12.5%	8
Carbontetrachloride	µg/L	0.2—10	0.1	12.5%	12
Chloroform	µg/L	0.5—20	0.1	12.5%	2.5
1,2-Dichloroethane	µg/L	0.2—10	0.1	12.5%	10
Dichloromethane	µg/L	0.2—20	0.1	12.5%	20
Trichloroethene	µg/L	0.2—10	0.1	12.5%	10
1,1,1-Trichloroethane	µg/L	0.2—10	0.1	12.5%	
1,1,2-Trichloroethane	µg/L	1—20	0.1	12.5%	
Tetrachloroethene	µg/L	0.2—10	0.1	12.5%	10
Styrene	µg/L	0.1—50	0.1	12.5%	
2-chlorotoluene	µg/L	0.1 - 10	0.1	12.5%	
4-chlorotoluene	µg/L	0.1 - 10	0.1	12.5%	
1,1-dichloroethane	µg/L	0.1 - 10	0.1	12.5%	
1,1-dichloroethene	µg/L	0.1 - 10	0.1	12.5%	
1,2-dichloropropane	µg/L	0.1 - 10	0.1	12.5%	
1,2-dichlorobenzene	µg/L	0.1 - 10	0.1	12.5%	
1,3-dichlorobenzene	µg/L	0.1 - 10	0.1	12.5%	
1,4-dichlorobenzene	µg/L	0.1 - 10	0.1	12.5%	
1,3,5-trimethylbenzene	µg/L	0.1 - 10	0.1	12.5%	
1,1,1,2-tetrachloroethane	µg/L	0.1 - 10	0.1	12.5%	
Chlorobenzene	µg/L	0.1 - 10	0.1	12.5%	
cis-1,2-dichloroethene	µg/L	0.1 - 10	0.1	12.5%	
trans-1,2-dichloroethene	µg/L	0.1 - 10	0.1	12.5%	
Toluene	µg/L	0.1 - 10	0.1	12.5%	
Ethylbenzene	µg/L	0.1 - 10	0.1	12.5%	
o-xylene	µg/L	0.1 - 10	0.1	12.5%	
m+p-xylene	µg/L	0.1 - 10	0.1	12.5%	
Isopropylbenzene	µg/L	0.1 - 10	0.1	12.5%	
n-propylbenzene	µg/L	0.1 - 10	0.1	12.5%	
tert-butylbenzene	µg/L	0.1 - 10	0.1	12.5%	

These determinands are not in the scope of the accreditation.

AQ-7 Pentachlorophenol in Seawater					
Year	**2022**	**Number of Rounds / Year**	**1**	**Number of Materials**	**3**
Distribution		**April** (5 laboratories expected)			

Introduction

This study covers the determination of pentachlorophenol (PCP) in seawater test materials. As PCP is usually determined by a special method this exercise is offered separately.

Test Materials

The seawater for this study is collected from the Eastern Atlantic Ocean and is filtered to remove bacteria and particles. The test materials are thoroughly mixed and dispensed into 1 litre glass bottles. These bottles are individually spiked with methanol solutions containing PCP.

Homogeneity of the test materials is assumed, as they were spiked to the same concentration level. The test materials are stable for the purposes of the exercise.

Determinands and Concentration Ranges

The table shows:
- The expected concentration range for the determinand in the spiked test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range	Error		AA-EQS
		Seawater (spiked)	Const	Prop	
Pentachlorophenol	ng/L	20—2000	10	12.5%	400

This determinand is not in the scope of the accreditation.

AQ-8 Triazines and Organophosphorus Pesticides in Seawater					
Year	**2022**	**Number of Rounds / Year**	**1**	**Number of Materials**	**3**
Distribution		**April** (10 laboratories expected)			

Introduction

This study covers the determination of triazines and organophosphorus pesticides in seawater and low salinity seawater test materials.

Test Materials

The seawater for this study is collected from the Eastern Atlantic Ocean and is filtered to remove bacteria and particles. The low salinity test material is prepared by dilution with ultra-pure demineralised water. The test materials are thoroughly mixed and dispensed into 1 litre glass bottles. These bottles are distributed together with methanol standard solutions containing the compounds to be analysed. The participants are asked to dilute the supplied standard solutions using the supplied seawater test materials to produce the spiked test materials.

Homogeneity of the test materials is assumed, as they are spiked to the same concentration level. The test materials are stable for the purposes of the exercise.

Determinands and Concentration Ranges

The triazines and organophosphorus compounds to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the spiked test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range		Error		AA-EQS
		Low salinity Seawater with SS	Seawater with SS	Const	Prop	
Aclonifen	ng/L	20—2000	2—200	1	12.5%	
Alachlor	ng/L	20—2000	2—200	1	12.5%	300
Atrazine	ng/L	20—2000	5—200	1	12.5%	600
Atrazine-desethyl	ng/L	20—2000	5—200	1	12.5%	
Azinphos-ethyl	ng/L	20—2000	5—200	1	12.5%	
Azinphos-methyl	ng/L	20—2000	5—200	1	12.5%	
Bifenox	ng/L	20—2000	5—200	1	12.5%	
Bifenthrin	ng/L	20—2000	5—200	1	12.5%	
Chlorfenvinphos	ng/L	20—2000	5—200	1	12.5%	100
Chlorpyriphos	ng/L	20—2000	5—200	1	12.5%	30
Chlotianidin	ng/L	20—2000	5—200	1	12.5%	
Coumaphos	ng/L	20—2000	5—200	1	12.5%	
Cypermethrin	ng/L	20—2000	5—200	1	12.5%	
Deltamethrin	ng/L	20—2000	5—200	1	12.5%	
Demeton	ng/L	20—2000	5—200	1	12.5%	
Diazinon	ng/L	20—2000	5—200	1	12.5%	
Dichlorvos	ng/L	20—2000	5—200	1	12.5%	0.06
Dicofol	ng/L	20—2000	5—200	1	12.5%	
Dimethoate	ng/L	20—2000	5—200	1	12.5%	
Diuron	ng/L	20—2000	5—200	1	12.5%	200
Esfenvalerate	ng/L	20—2000	5—200	1	12.5%	
Fenchlorphos	ng/L	20—2000	5—200	1	12.5%	
Fenitrothion	ng/L	20—2000	5—200	1	12.5%	
Fenthion	ng/L	20—2000	5—200	1	12.5%	
Glyphosate	ng/L	20—2000	5—200	1	12.5%	
Imidacloprid	ng/L	20—2000	5—200	1	12.5%	
Irgarol-1051	ng/L	20—2000	5—200	1	12.5%	
Isoproturon	ng/L	20—2000	5—200	1	12.5%	300
Malathion	ng/L	20—2000	5—200	1	12.5%	
Nicosulfuron	ng/L	20—2000	5—200	1	12.5%	
Omethoate	ng/L	20—2000	5—200	1	12.5%	
Parathion-ethyl	ng/L	20—2000	5—200	1	12.5%	
Parathion-methyl	ng/L	20—2000	5—200	1	12.5%	
Permethrin	ng/L	20—2000	5—200	1	12.5%	

Quinoxyfen	ng/L	20—2000	5—200	1	12.5%	
Simazine	ng/L	20—2000	5—200	1	12.5%	1000
Terbutryn	ng/L	20—2000	5—200	1	12.5%	
Terbuthylazine	ng/L	20—2000	5—200	1	12.5%	
Thiacloprid	ng/L	20—2000	5—200	1	12.5%	
Thiamethoxam	ng/L	20—2000	5—200	1	12.5%	
Triazophos	ng/L	20—2000	5—200	1	12.5%	
Triclosan	ng/L	20—2000	5—200	1	12.5%	

These determinands are not in the scope of the accreditation.

AQ-11 Chlorophyll and Phaeopigments in Seawater					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (45 laboratories expected)			

Introduction

This study covers the determination of chlorophyll and phaeopigments in seawater and estuarine water. Normally, filtered residues are prepared from seawater or estuarine water. Occasionally, filtered residues are prepared from freshwater.

Test Materials

Test materials are prepared from seawater or estuarine water and sub-sampled onto Whatman GF/F, 47 mm filter papers each test material is immediately 'flash frozen' in liquid nitrogen. The sequence in which the test materials are filtered is recorded. Selected filters at regular intervals are chosen for homogeneity testing. The test materials are homogeneous for the purposes of the LP study.

Determinands and Concentration Ranges

The pigments to be determined are given in the table below. The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range	Error	
		Filtered Residues	Const	Prop
Chlorophyll-a	µg/L	0.1—20	0.05	12.5%
Chlorophyll-b	µg/L	0.01—5	0.01	12.5%
Chlorophyll-c	µg/L	0.02—2.5	0.01	12.5%
Phaeopigments	µg/L	0.02—2.5	0.01	12.5%
Chlorophyll-a (HPLC)	µg/L	0.1—20	0.05	12.5%
Chlorophyll-b (HPLC)	µg/L	0.01—5	0.01	12.5%
Chlorophyll-c (HPLC)	µg/L	0.02—2.5	0.01	12.5%
Chlorophyll-a (corrected)	µg/L	0.1—20	0.05	12.5%

Determinands which are not in bold are not in the scope of the accreditation

AQ-12 Organotins in Seawater					
Year	**2022**	**Number of Rounds / Year**	**1**	**Number of Materials**	**2**
Distribution		**April** (20 laboratories expected)			

Introduction

This study covers the determination of organotin compounds in the seawater test materials.

Test Materials

The seawater for this study is collected from the Eastern Atlantic Ocean and is filtered to remove bacteria and particles. The test materials are spiked, thoroughly mixed and dispensed into 1 litre glass bottles for distribution.

Homogeneity of the test materials is assumed, as they are produced in bulk. The test materials are stable for the purposes of the exercise.

Determinands and concentration ranges

The organotin compounds to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the spiked test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range	Error		AA-EQS
		Seawater with SS	Const	Prop	
Tributyltin(TBT)	ng Sn/L	1—200	0.05	12.5%	0.2
Dibutyltin(DBT)	ng Sn/L	1—100	0.05	12.5%	0.2
Monobutyltin(MBT)	ng Sn/L	1—200	0.05	12.5%	0.2
Triphenyltin(TPhT)	ng Sn/L	1—200	0.05	12.5%	
Diphenyltin(DPhT)	ng Sn/L	1—100	0.05	12.5%	
Monophenyltin (MPhT)	ng Sn/L	1—50	0.05	12.5%	

These determinands are not in the scope of the accreditation.

AQ-13 Polycyclic Aromatic Hydrocarbons in Seawater					
Year	**2022**	**Number of Rounds / Year**	**1**	**Number of Materials**	**3**
Distribution		**April** (15 laboratories expected)			

Introduction

This study covers the determination of PAHs in seawater test materials.

Test Materials

The seawater for this study is collected from the Eastern Atlantic Ocean and is filtered to remove bacteria and particles. The test materials are spiked, thoroughly mixed and dispensed into glass bottles for distribution.

Homogeneity of the test materials is assumed, as they are produced in bulk. The test materials are stable for the purposes of the exercise.

Determinands and Concentration Ranges

The PAHs to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the spiked test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range			Error		AA-EQS
		Seawater (Sediment Spiked)	Seawater (Spiked)	Low Salinity Seawater (spiked)	Const	Prop	
Acenaphthene	µg/L	0.02—20	0.2—5	0.5 - 20	0.01	12.5%	
Acenaphthylene	µg/L	0.01—1	0.5—10	0.5 - 20	0.01	12.5%	
Anthracene	µg/L	0.2—20	0.05—2	0.5 - 10	0.01	12.5%	0.1
Benzo[a]anthracene	µg/L	0.1—10	0.001—0.1	0.01- 0.5	0.01	12.5%	
Benzo[a]pyrene	µg/L	0.1—10	0.001—0.1	0.01- 0.5	0.01	12.5%	0.05
Benzo[b]fluoranthene	µg/L	0.1—10	0.001—0.1	0.01- 0.5	0.01	12.5%	0.03
Benzo[e]pyrene	µg/L	0.1—10	0.001—0.1	0.01- 0.5	0.01	12.5%	
Benzo[k]fluoranthene	µg/L	0.1—10	0.001—0.1	0.01- 0.5	0.01	12.5%	0.03
Benzo[g,h,i]perylene	µg/L	0.02—2	0.001—0.1	0.01- 0.5	0.01	12.5%	0.002
Chrysene	µg/L	0.1—10	0.001—0.1	0.01- 0.5	0.01	12.5%	
Dibenzo[ah]anthracene	µg/L	0.1—10	0.001—0.1	0.01- 0.5	0.01	12.5%	
Fluorene	µg/L	0.1—10	0.001—0.1	0.01- 0.5	0.01	12.5%	
Fluoranthene	µg/L	0.4—40	0.05—2	0.1 - 10	0.01	12.5%	0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.2—40	0.02—1	0.1 - 5	0.01	12.5%	0.002
Naphthalene	µg/L	0.1—10	0.5—10	1 - 50	0.01	12.5%	1.2
Phenanthrene	µg/L	0.2—50	0.05—2	0.5 - 10	0.01	12.5%	
Pyrene	µg/L	0.1—10	0.001—0.1	0.01- 0.5	0.01	12.5%	
Total Petroleum-Hydrocarbons	µg/L	0.1—10	0.001—0.1	0.01- 5	0.01	12.5%	

AA-EQS for benzo[g,h,i]perylene and Indeno(1,2,3-cd)pyrene is indicated as the some of those determinands.
AA-EQS for benzo[b]fluoranthene and benzo[k]fluoranthene is indicated as the some of those determinands.
These determinands are not in the scope of the accreditation.

AQ-14 DOC in Seawater					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**4**
Distribution		**April, October** (20 laboratories expected)			

Introduction

This study covers the determination of dissolved organic carbon in the seawater test materials. The test materials are prepared in bulk, following the well-defined methods of A. Aminot and R. Kerouel (Analytical Chimica Acta 248(1991), pp.277-283 and Marine Chemistry 49(1995) pp.221-232).

Test Materials

Low nutrient seawater (LNSW), collected from the Eastern Atlantic Ocean during the late spring and summer months after the main plankton bloom, is used to prepare the test materials. This seawater is filtered to remove bacteria and particles.

Homogeneity testing is performed on each batch of test materials produced. The test materials are stable for the period of the test, and have also been shown to be stable for a period of some months even after opening but used under the correct conditions following the storage instructions.

Determinands and Concentration Ranges

The DOC content should be analysed in the distributed glass bottles.
The table below also shows:
- The expected concentration range for DOC in the spiked seawater materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range	Error	
		Seawater (spiked)	Const	Prop
DOC	mg C/L	0.5—20	0.1	6.0%

Determinands which are not in bold are not in the scope of the accreditation

AQ-15 Ocean acidification					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**3**
Distribution		**April** (20 laboratories expected)			

Introduction

This study covers the determination of total alkalinity and dissolved inorganic carbon in the seawater test materials. The test materials are prepared in bulk.

Test Materials

Low nutrient seawater (LNSW), collected from the Eastern Atlantic Ocean and Baltic Sea during the late spring and summer months after the main plankton bloom, is used to prepare the test materials. This seawater is filtered to remove bacteria and particles.

Homogeneity testing is performed on each batch of test materials produced. The test materials are stable for the period of the test under the correct conditions following the storage instructions.

Determinands and Concentration Ranges

The DIC content and Total Alkalinity should be analysed in the distributed glass bottles.
The table below also shows:
- The expected concentration range for DIC in the spiked seawater materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range	Error	
		Seawater (spiked)	Const	Prop
DIC	µmol/kg	10 – 5000		
Total Alkalinity	µmol/kg	100 – 5000		

These determinands are not in the scope of the accreditation.
The constant and total error used for the z-score calculations will be determined by the SAB as soon as possible

Proficiency tests with Biota

Biota Test Materials

The biota test materials are collected from contaminated waters, open water and coastal locations around the North Sea and Mediterranean, and include e.g. plaice, cod, mussels, shrimps, flounder and tuna. All materials are homogenised and sterilised by autoclaving. The use of wet tissues by QUASIMEME is unique for the purposes of the Laboratory Performance studies, and allows participants to analyse determinands in a test material matrix similar to a natural sample. The level of test material homogeneity is assessed following ISO13528: 2015(Cor. 2016-10). The test materials have been shown to be stable for a number of years when stored at room temperature. The test materials used for the analysis of amnesic, lipophilic and paralysing shellfish poisons have been shown to be stable for a number of years when stored in the freezer (± -18˚C).

Proficiency tests in Biota

Exercise	Description
BT-1	Trace Metals in Biota
BT-2	Chlorinated Organics in Biota
BT-4	Polycyclic Aromatic Hydrocarbons in Biota
BT-7	ASP Shellfish Toxins
BT-8	Organotins in Biota
BT-9	Brominated Flame Retardants in Biota
BT-10	Perfluorinated Alkyl Substances (PFAS) in Biota
BT-11	Lipophilic Shellfish Toxins
BT-12	PSP Shellfish Toxins
BE-1	Imposex in snails

BT-1 Trace Metals in Biota					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (50 laboratories expected)			

Introduction

This study covers the determination of trace metals, ash weight, dry weight and total and extractable lipid in biota test materials.

Test Materials

The test materials cover a range of natural biota species from contaminated waters from the North Sea and/or Mediterranean. The supplied biota test materials can consist of fish muscle, fish liver and shellfish tissue. Wet biota test materials are homogenised and sterilised by autoclaving. These biota test materials have been shown to be stable over a number of years when stored at room temperature.

Determinands and concentration ranges

The trace metals to be determined are given in the table below. The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range			Error		EQS_{biota}
		Fish Liver Tissue	Fish Muscle Tissue	Shellfish Tissue	Const	Prop	
Aluminium	mg/kg	1 – 100	0.5 – 10	2 – 50	0.2	12.5%	
Arsenic	mg/kg	1 - 5	1 - 10	0.2 - 10	0.02	12.5%	
Barium	µg/kg	5 – 500	5 – 500	100 – 10000	0.2	12.5%	
Cadmium	µg/kg	5—1000	0.5—50	10—500	0.5	12.5%	
Calcium	mg/kg	20 – 1000	50 – 5000	50 – 2000	10	12.5%	
Chromium	µg/kg	20—1000	25—500	10—5000	20	12.5%	
Cobalt	µg/kg	10 – 500	1 – 100	10 – 500	0.2	12.5%	
Copper	µg/kg	2000—10000	100—1500	50—10000	100	12.5%	
Iron	mg/kg	10 - 500	2.5 – 200	5 - 200	0.2	12.5%	
Lead	µg/kg	10—1000	2.5—50	10—1000	5	12.5%	
Magnesium	mg/kg	50 – 1000	50 - 1000	100 – 2000	10	12.5%	
Manganese	µg/kg	200 – 5000	50 – 5000	500 – 5000	0.2	12.5%	
Mercury	µg/kg	20—100	10—1000	2—500	2	12.5%	20
Molybdenum	µg/kg	20 – 500	2 – 200	10 – 500	0.2	12.5%	
Nickel	µg/kg	20—1000	10—200	10—2000	20	12.5%	
Potassium	mg/kg	500 – 5000	500 – 5000	500 - 5000	10	12.5%	
Selenium	µg/kg	200—5000	50—2000	200—1000	10	12.5%	
Silver	µg/kg	20—1000	0.5—50	1—500	5	12.5%	
Sodium	mg/kg	200 - 5000	200 – 5000	1000 - 10000	10	12.5%	
Uranium	µg/kg	0.2 – 50	0.2 – 50	2 - 100	0.2	12.5%	
Vanadium	µg/kg	5 – 200	2 – 200	50 – 5000	0.2	12.5%	
Zinc	mg/kg	10—50	2—20	2—200	2	12.5%	
Ash-weight	%				0.1	12.5%	
Dry-weight	%				0.1	12.5%	
Total-Lipid	%				0.1	12.5%	
Extractable-Lipid	%				0.1	12.5%	

In addition to the parameters given in this table, we will add several additional metals into the dataset form on the Participant's sites. There you will find e.g. Li, Be, P, S, Sc, Ti, Rb, Sr, Y, Zr, Pd, Sn, Sb, Te, Cs, La, Ce, Nd, Ta, W, Pt, Au, Tl, Bi, Th and MeHg. In case enough participants report results these additional metals will be added permanently to the programme.

Determinands which are not in bold are not in the scope of the accreditation

BT-2 Chlorinated Organics in Biota					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of**	**2**
Distribution		**April, October** (40 laboratories expected)			

Introduction

This study covers the determination poly chlorinated biphenyls (PCBs), organochlorine pesticides (OCPs), total and extractable lipid in biota test materials.

Test Materials

The test materials cover a range of natural biota species from contaminated waters from the North Sea and/or Mediterranean. The supplied biota test materials can consist of fish muscle, fish liver and shellfish tissue. Wet biota test materials are homogenised and sterilised by autoclaving. These biota test materials have been shown to be stable over a number of years when stored at room temperature.

Determinands and Concentration Ranges

The organochlorines to be determined are given in the table below. The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range			Error		EQS_{biota}
		Fish Liver tissue and Freshwater Fish	Fish Muscle Tissue	Shellfish Tissue	Const	Prop	
PCB28	µg/kg	0.5—50	0.05—5	0.05—5	0.025	12.5%	
PCB31	µg/kg	0.2—10	0.03—3	0.03—3	0.025	12.5%	
PCB52	µg/kg	1—100	0.05—20	0.05—5	0.025	12.5%	
PCB99	µg/kg				0.025	12.5%	
PCB101	µg/kg	5—300	0.1—50	0.1—20	0.025	12.5%	
PCB105	µg/kg	2—100	0.05—10	0.05—10	0.025	12.5%	
PCB107	µg/kg				0.025	12.5%	
PCB108	µg/kg				0.025	12.5%	
PCB109	µg/kg				0.025	12.5%	
PCB110	µg/kg				0.025	12.5%	
PCB111	µg/kg				0.025	12.5%	
PCB112	µg/kg				0.025	12.5%	
PCB113	µg/kg				0.025	12.5%	
PCB114	µg/kg				0.025	12.5%	
PCB118	µg/kg	5—300	0.2—30	0.2—20	0.025	12.5%	
PCB128	µg/kg				0.025	12.5%	
PCB138+PCB163	µg/kg	10—600	0.3—70	0.3—30	0.025	12.5%	
PCB138	µg/kg	10—600	0.3—70	0.3—30	0.025	12.5%	
PCB153	µg/kg	20—1000	0.4—100	0.4—40	0.025	12.5%	
PCB156	µg/kg	0.5—40	0.03—10	0.03—10	0.025	12.5%	
PCB170	µg/kg				0.025	12.5%	
PCB180	µg/kg	2—200	0.05—20	0.05—5	0.025	12.5%	
PCB183	µg/kg				0.025	12.5%	
PCB187	µg/kg				0.025	12.5%	
PCB194	µg/kg				0.025	12.5%	
PCB203	µg/kg				0.025	12.5%	
PCB209	µg/kg				0.025	12.5%	
α-HCH	µg/kg	0.05—5	0.05—5	0.05—5	0.02	12.5%	
β-HCH	µg/kg	0.1—5	0.05—5	0.05—5	0.025	12.5%	
γ-HCH	µg/kg	0.05—5	0.05—5	0.05—5	0.025	12.5%	
δ-HCH	µg/kg	0.05—5	0.05—5	0.05—5	0.025	12.5%	
HCB	µg/kg	1—50	0.02—5	0.02—5	0.025	12.5%	10
HCBD	µg/kg	0.05—5			0.025	12.5%	55
Dieldrin	µg/kg	0.5—100	0.2—20	0.2—20	0.025	12.5%	
pp'-DDD	µg/kg	0.5—100	0.1—10	0.1—10	0.025	12.5%	
pp'-DDE	µg/kg	10—500	0.3—30	0.3—30	0.025	12.5%	
op'-DDT	µg/kg	0.1—2	0.01—1	0.01—1	0.025	12.5%	
pp'-DDT	µg/kg	0.1—10	0.1—10	0.1—10	0.025	12.5%	
Transnonachlor	µg/kg	0.05—40	0.02—10	0.02—10	0.025	12.5%	

Heptachlor	µg/kg				0.025	12.5%	0.0067
Heptachlor-epoxide (sum)	µg/kg				0.025	12.5%	0.0067
Cis-chlordane	µg/kg				0.025	12.5%	
Trans-chlordane	µg/kg				0.025	12.5%	
Oxychlordane	µg/kg				0.025	12.5%	
Dicofol	µg/kg				0.025	12.5%	
Total-Lipid	%				0.1	12.5%	
Extractable-Lipid	%				0.1	12.5%	

EQS_{biota} for heptachlor and heptachlor-epoxide is indicated as the some of those determinands.
Determinands which are not in bold are not in the scope of the accreditation

BT-4 Polycyclic Aromatic Hydrocarbons in Biota					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (35 laboratories expected)			

Introduction

This study covers the determination of Polycyclic Aromatic Hydrocarbons (PAHs) and total and extractable lipid in shellfish tissue test materials.

Test Materials

The test materials consist of natural shellfish species from contaminated waters from the North Sea and/or Mediterranean. The supplied wet shellfish tissues are homogenised and sterilised by autoclaving. These test materials have shown to be stable over a number of years when stored at room temperature.

Determinands and Concentration Ranges

The PAHs to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

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Determinand	Unit	Concentration range	Error		EQS_{biota}
		Shellfish Tissue	Const	Prop	
Acenaphthene	µg/kg	0.5 - 100	0.2	12.5%	
Acenaphthylene	µg/kg	0.2 - 5	0.2	12.5%	
Anthracene	µg/kg	0.2 - 10	0.2	12.5%	
Benzo[a]anthracene	µg/kg	0.2 - 20	0.2	12.5%	
Benzo[a]fluorene	µg/kg		0.5	12.5%	
Benzo[a]pyrene	µg/kg	0.2 - 5	0.2	12.5%	5
Benzo[b]fluoranthene	µg/kg	0.2 - 10	0.2	12.5%	
Benzo[k]fluoranthene	µg/kg	0.2 - 10	0.2	12.5%	
Benzo[e]pyrene	µg/kg	0.2 - 10	0.2	12.5%	
Benzo[g,h,i]perylene	µg/kg	0.2 - 10	0.2	12.5%	
Chrysene	µg/kg	0.2 - 20	0.2	12.5%	
Chrysene+Triphenylene	µg/kg	0.2- -20	0.2	12.5%	
Triphenylene	µg/kg	0.1 - 10	0.5	12.5%	
Dibenz[a,h]anthracene	µg/kg	0.2 - 5	0.1	12.5%	
Dibenzo[a,i]pyrene	µg/kg		0.5	12.5%	
Dibenzothiophene	µg/kg	0.2 - 5	0.5	12.5%	
Fluoranthene	µg/kg	5 - 50	0.2	12.5%	30
Fluorene	µg/kg	1 - 50	0.2	12.5%	
Indeno[1,2,3-cd]pyrene	µg/kg	0.2 - 5	0.2	12.5%	
Naphthalene	µg/kg	1 - 100	0.2	12.5%	
1-methylnaphthalene	µg/kg		0.2	12.5%	
2-methylnaphthalene	µg/kg		0.2	12.5%	
1-methylanthracene	µg/kg		0.2	12.5%	
2- methylanthracene	µg/kg		0.2	12.5%	
1 methylphenanthrene	µg/kg		0.1	12.5%	
Perylene	µg/kg	0.1 - 5	0.5	12.5%	
Phenanthrene	µg/kg	2 - 50	0.2	12.5%	
2-Methylphenanthrene	µg/kg	0.2 - 20	2	12.5%	
3,6-Dimethylphenanthrene	µg/kg	0.2 - 10	0.5	12.5%	
1,2-benzodiphenylene sulfide	µg/kg		0.1	12.5%	
Pyrene	µg/kg	1 - 50	0.2	12.5%	
1-Methylpyrene	µg/kg		2	12.5%	
Benzo Fluoranthenes (a+b+j+k)	µg/kg		0.2	12.5%	
Total-Lipid	%		0.1	12.5%	
Extractable-Lipid	%		0.1	12.5%	
C1-dibenzothiophenes	µg/kg		0.1	12.5%	
C2-dibenzothiophenes	µg/kg		0.1	12.5%	
C3-dibenzothiophenes	µg/kg		0.1	12.5%	

Determinand	Unit	Concentration range	Error		EQS_{biota}
		Shellfish Tissue	Const	Prop	
C1-phenanthrenes/anthracenes	µg/kg		0.2	12.5%	
C2-phenanthrenes/anthracenes	µg/kg		0.2	12.5%	
C3-phenanthrenes/anthracenes	µg/kg		0.2	12.5%	
C1-pyrenes/fluoranthenes	µg/kg		0.2	12.5%	
C2-pyrenes/fluoranthenes	µg/kg		0.2	12.5%	
C1-chrysenes	µg/kg		0.2	12.5%	
C2-chrysenes	µg/kg		0.2	12.5%	
C1-benzofluoranthenes	µg/kg		0.2	12.5%	
Total petroleum hydrocarbons	µg/kg	0.1 - 50	0.1	12.5%	

Determinands which are not in bold are not in the scope of the accreditation

BT-7 ASP Shellfish Toxins					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**3**
Distribution		**April, October** (45 laboratories expected)			

Introduction

This study covers the determination of the amnesic shellfish toxins (ASP) in shellfish tissue test materials.

Test Materials

The supplied test materials consist of a standard solution and shellfish tissues, sufficient for one-shot analysis. Each batch of test materials is prepared in bulk, dispensed in 5 mL plastic vials and frozen at -20°C.

The level of within and between sample homogeneity and stability is determined. All materials show to be homogeneous and stable for the purpose of the study.

Determinands and concentration ranges

The toxins to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range	Error	
		Shellfish Tissue	Const	Prop
Domoic+Epidomoic	**mg/kg**	**0.2 - 100**	**0.1**	**12.5%**

*This determinand in **bold** is in the scope of the accreditation.*

BT-8 Organotins in Biota					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (15 laboratories expected)			

Introduction

This study covers the determination of organotin compounds in biota test materials.

Test Materials

The test materials cover a range of natural biota species from contaminated waters from the North Sea and/or Mediterranean. The supplied wet biota test materials are homogenised and sterilised by autoclaving. These biota test materials have been shown to be stable over a number of years when stored at room temperature.

Determinands and Concentration Ranges

The organotin compounds to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range	Error	
		Biota	Const	Prop
Tributyltin(TBT)	µg Sn/kg	0.2 - 50	0.1	12.5%
Dibutyltin(DBT)	µg Sn/kg	0.1 - 10	0.1	12.5%
Monobutyltin(MBT)	µg Sn/kg	0.5 - 30	0.1	12.5%
Triphenyltin(TPhT)	µg Sn/kg	0.1 – 10	0.1	12.5%
Diphenyltin(DPhT)	µg Sn/kg	0.1 – 5	0.1	12.5%
Monophenyltin (MPhT)	µg Sn/kg	0.1 - 5	0.1	12.5%

These determinands are not in the scope of the accreditation.

BT-9 Brominated Flame Retardants in Biota					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (25 laboratories expected)			

Introduction

This study covers the determination of brominated flame retardants (BFRs) in biota.

Test Materials

The test materials cover a range of natural unspiked biota types. Wet biota test materials are homogenised and sterilised by autoclaving. Biota test materials have been shown to be stable over a number of years when stored at room temperature.

Determinands and concentration ranges

The BFRs to be determined are given in the table below. The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range	Error		EQS_{biota}
		Biota	Const	Prop	
BDE28	µg/kg	0.001 – 1	0.005	12.5%	0.0085
BDE47	µg/kg	0.05 - 40	0.005	12.5%	0.0085
BDE49	µg/kg		0.005	12.5%	
BDE66	µg/kg	0.01 - 10	0.005	12.5%	
BDE85	µg/kg	0.01 - 10	0.005	12.5%	
BDE99	µg/kg	0.01 - 10	0.005	12.5%	0.0085
BDE100	µg/kg	0.005 - 10	0.005	12.5%	0.0085
BDE153	µg/kg	0.01 - 2	0.005	12.5%	0.0085
BDE154	µg/kg	0.001 - 5	0.005	12.5%	0.0085
BDE183	µg/kg	0.001 – 1	0.005	12.5%	
BDE209	µg/kg	0.01 - 1	0.005	12.5%	
TBBP-A	µg/kg	0.01 - 1	0.005	12.5%	
Dimethyl-TBBP-A	µg/kg		0.005	12.5%	
α-HBCD	µg/kg	0.01 – 1	0.005	12.5%	
β-HBCD	µg/kg	0.01 – 1	0.005	12.5%	
γ-HBCD	µg/kg	0.01 – 1	0.005	12.5%	
Total-HBCD	µg/kg	0.01 – 2	0.005	12.5%	167
BTBPE	µg/kg		0.005	12.5%	
DBDPE	µg/kg		0.005	12.5%	
HBBz	µg/kg		0.005	12.5%	
Total lipid	%		0.1	12.5%	

The EQS_{biota} for BDE28, BDE47, BDE99, BDE100, BDE153 and BDE154 is given as the sum for these congeners.
Determinands which are not in bold are not in the scope of the accreditation

BT-10 Perfluorinated Alkyl Substances (PFAS) in Biota					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (10 laboratories expected)			

Introduction

This study covers the determination of perfluorinated alkyl substances (PFAS) in biota.

Test Materials

The test materials cover a range of natural unspiked biota types. Wet biota test materials are homogenised and sterilised by autoclaving. Biota test materials have been shown to be stable over a number of years when stored at room temperature.

Determinands and concentration ranges

The PFAS can to be determined are given in the table below. The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range	Error		EQS_{biota}
		Biota	Const	Prop	
n-PFOS	µg/kg	0.1 - 1000	0.1	12.5%	9.1
PFBA	µg/kg	0.01 - 2	0.1	12.5%	
PFPeA	µg/kg	0.01 – 2	0.1	12.5%	
PFHxA	µg/kg	0.01 – 2	0.1	12.5%	
PFHpA	µg/kg	0.01 – 2	0.1	12.5%	
PFOA	µg/kg	0.01 – 5	0.1	12.5%	
PFNA	µg/kg	0.01 – 5	0.1	12.5%	
PFDA	µg/kg	0.01 – 10	0.1	12.5%	
PFUnDA	µg/kg	0.01 - 10	0.1	12.5%	
PFDoA	µg/kg	0.01 – 5	0.1	12.5%	
PFTrDA	µg/kg	0.01 - 5	0.1	12.5%	
PFTeDA	µg/kg	0.01 - 5	0.1	12.5%	
L-PFBS**	µg/kg	0.01 - 10	0.1	12.5%	
L-PFHxS**	µg/kg	0.01 - 5	0.1	12.5%	
L-PFHpS**	µg/kg	0.01 – 5	0.1	12.5%	
PFOSA	µg/kg	0.01 - 50	0.1	12.5%	
PFDS	µg/kg		0.1	12.5%	
PFODA	µg/kg		0.1	12.5%	
Total-PFOS	µg/kg	0.1 – 1000	0.1	12.5%	9.1
GenX	µg/kg		0.1	12.5%	
F-53B	µg/kg		0.1	12.5%	
PFBSA	µg/kg		0.1	12.5%	
PFHxSA	µg/kg		0.1	12.5%	
NMeFOSAA	µg/kg		0.1	12.5%	
NEtFOSAA	µg/kg		0.1	12.5%	

These determinands are not in the scope of the accreditation.

BT-11 Lipophilic Shellfish Toxins					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**3**
Distribution		**April, October** (40 laboratories expected)			

Introduction

This study covers the determination of lipophilic shellfish toxins in shellfish tissue test materials.

Test Materials

The supplied test materials can consist of standard solutions, shellfish tissues and shellfish tissue extracts sufficient for one-shot analysis. Each batch of test materials is prepared in bulk, dispensed in 5 mL plastic vials and frozen at -20°C. The level of within and between sample homogeneity and stability is determined. All materials show to be homogeneous and stable for the purpose of the study.

Determinands and concentration ranges

The Toxins to be determined are given in the table below.
The table also shows the constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range	Error	
			Const	Prop
Free-Okadaic-Acid	µg/kg	0.5 - 500	0.1	12.5%
Free-DTX1	µg/kg	0.2 - 500	0.1	12.5%
Free-DTX2	µg/kg	0.5 - 1000	0.1	12.5%
Total-Free-OA+DTX1+DTX2	µg OA eq./kg	0.5 - 1000	0.1	12.5%
Total-Okadaic-Acid	µg/kg	0.5 – 500	0.1	12.5%
Total-DTX1	µg/kg	0.5 – 1000	0.1	12.5%
Total-DTX2	µg/kg	0.5 – 1000	0.1	12.5%
Total-hy-OA+DTX1+DTX2	µg OA eq./kg	0.5 – 1000	0.1	12.5%
PTX-1	µg/kg	0.5 – 20	0.1	12.5%
PTX-2	µg/kg	0.2 - 50	0.1	12.5%
Total OA group and PTX group	µg OA eq./kg	0.5 - 1000	0.1	12.5%
AZA-1	µg/kg	0.5 - 1500	0.1	12.5%
AZA-2	µg/kg	0.5 – 500	0.1	12.5%
AZA-3	µg/kg	0.5 - 500	0.1	12.5%
AZA-total	µg AZA eq./kg	0.5 - 5000	0.1	12.5%
YTX	mg/kg	0.01 – 2	0.02	12.5%
homo-YTX	mg/kg	0.5 – 5	0.02	12.5%
45-OH-homo-YTX	mg/kg	0.5 – 5	0.02	12.5%
45-OH-YTX	mg/kg	0.02 – 2	0.02	12.5%
YTX-total	mg YTX eq./kg	0.01 – 10	0.02	12.5%

Determinands which are not in bold are not in the scope of the accreditation

BT-12 PSP Shellfish Toxins					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**3**
Distribution		**April, October** (40 laboratories expected)			

Introduction

This study covers the determination of the paralytic shellfish toxins (PSP) in shellfish tissue test materials.

Test Materials

The supplied test materials consist of shellfish tissues sufficient for one-shot analysis. Each batch of test materials is prepared in bulk, dispensed in vials and frozen at -20˚C. The level of within and between sample homogeneity and stability is determined. All materials show to be homogeneous and stable for the purpose of the study.

Determinands and concentration ranges

The Toxins to be determined are given in the table below.
The table also shows the constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range	Error	
			Const	Prop
11-OH-STX	µmol/kg		0.1	12.5%
C1	µmol/kg	0.01 – 5	0.1	12.5%
C1,2	µmol/kg	0.01 – 5	0.1	12.5%
C2	µmol/kg	0.01 – 1	0.1	12.5%
C3	µmol/kg		0.1	12.5%
C3,4	µmol/kg		0.1	12.5%
C4	µmol/kg		0.1	12.5%
dc-GTX1	µmol/kg		0.1	12.5%
dc-GTX1,4	µmol/kg		0.1	12.5%
dc-GTX2	µmol/kg	0.01 - 1	0.1	12.5%
dc-GTX2,3	µmol/kg		0.1	12.5%
dc-GTX3	µmol/kg		0.1	12.5%
dc-GTX4	µmol/kg		0.1	12.5%
dc-NEO	µmol/kg	0.01 - 2	0.1	12.5%
dc-STX	µmol/kg	0.01 – 5	0.1	12.5%
GTX-1	µmol/kg	0.01 – 1	0.1	12.5%
GTX-2	µmol/kg	0.01 - 10	0.1	12.5%
GTX-3	µmol/kg	0.01 – 2	0.1	12.5%
GTX-4	µmol/kg	0.02 – 1	0.1	12.5%
GTX-5	µmol/kg	0.05 – 5	0.1	12.5%
GTX-6	µmol/kg		0.1	12.5%
NEO	µmol/kg	0.02 – 1	0.1	12.5%
STX	µmol/kg	0.05 – 5	0.1	12.5%
Total toxicity	µgSTXdiHCl-eq/kg	50 – 3000	2	12.5%
GTX-2,3	µmol/kg	0.05 – 10	0.1	12.5%
GTX-1,4	µmol/kg	0.01 - 2	0.1	12.5%

Results should be reported for as many of these determinands as possible. Take this opportunity either to develop your methodology or check your performance on the less common determinands.
Determinands which are not in bold are not in the scope of the accreditation

Proficiency tests with Marine sediment

Sediment Test Materials

The sediment test materials cover a range of natural sandy and silty sediments from open water, estuaries, rivers and harbour locations around the North Sea, Eastern Atlantic Ocean and Mediterranean Sea. Although wet sediments constitute a more realistic natural material, previous QUASIMEME Laboratory Performance studies have shown that there was no significant difference in laboratory performance when dry sediments were used compared to wet sediments. Where wet sediments are provided, these are stabilised by sterilisation. The dry sediments are sieved and milled to <0.5 mm and may also be stabilised by sterilisation. Both the wet and dry sediments are divided into representative sub samples. The level of test material homogeneity is assessed following ISO13528: 2015(Cor. 2016-10). The dry sediments have been shown to be stable over a number of years when stored at room temperature. The dry sediments, used for analysis of organotins, have been shown to be stable over a number of years when stored in the freezer (± -18˚C). Dry sediments are considerably less expensive to produce and handle compared to wet sediments. Therefore, QUASIMEME will continue to provide dry sediments, unless there are specific reasons / requests to provide wet sediments.

Proficiency tests in Sediment

Exercise	Description
MS-1	Trace Metals in Sediment
MS-2	Chlorinated Organics in Sediment
MS-3	Polycyclic Aromatic Hydrocarbons in Sediment
MS-6	Organotins in Sediment
MS-7	Brominated Flame Retardants in Sediment
MS-8	Perfluorinated Alkyl Substances (PFAS) in sediment

MS-1 Trace Metals in Sediment					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (45 laboratories expected)			

Introduction

This study covers the determination of metals, total organic carbon (TOC) and carbonate in marine sediments.

Test Materials

The test materials cover a range of natural sediments from contaminated waters from the North Sea and/or Mediterranean. Each batch of material is prepared in bulk. The level of within and between sample homogeneity for the sediment is determined. All materials show to be homogeneous and stable for the purpose of the test.

Determinands and concentration ranges

The metals to be determined are given in the table below. The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

For aluminium a total method of analysis should be used. For other elements you can use your method of choice, keeping in mind that for some elements in some samples the total method can result in a somewhat higher result compared to a partial method.

Determinand	Unit	Concentration range	Error	
		Sediment	Const	Prop
Aluminium-AE	%	0.5—10	0.1	12.5%
Aluminium-RT	%	1—10	0.1	12.5%
Arsenic-AE	mg/kg	2—50	1	12.5%
Arsenic-RT	mg/kg	2—50	1	12.5%
Barium-AE	mg/kg	50 - 1000	1	12.5%
Barium-RT	mg/kg	50 - 1000	1	12.5%
Cadmium-AE	µg/kg	10—5000	20	12.5%
Cadmium-RT	µg/kg	10—5000	20	12.5%
Calcium-AE	g/kg	5 - 100	1	12.5%
Calcium-RT	g/kg	5 - 100	1	12.5%
Chromium-AE	mg/kg	10—1000	2	12.5%
Chromium-RT	mg/kg	10—1000	2	12.5%
Cobalt-AE	mg/kg	1 - 50	1	12.5%
Cobalt-RT	mg/kg	1 - 50	1	12.5%
Copper-AE	mg/kg	1—500	1	12.5%
Copper-RT	mg/kg	1—500	1	12.5%
Iron-AE	%	0.5—10	0.1	12.5%
Iron-RT	%	0.5—10	0.1	12.5%
Lead-AE	mg/kg	5—500	2	12.5%
Lead-RT	mg/kg	5—500	2	12.5%
Lithium-AE	mg/kg	10—100	0.1	12.5%
Lithium-RT	mg/kg	10—100	0.1	12.5%
Magnesium-AE	mg/kg	2000 - 20000	1	12.5%
Magnesium-RT	mg/kg	2000 - 20000	1	12.5%
Manganese-AE	mg/kg	100—2000	0.1	12.5%
Manganese-RT	mg/kg	100—2000	0.1	12.5%
Mercury-AE	µg/kg	10—2500	10	12.5%
Mercury-RT	µg/kg	10—2500	10	12.5%
Molybdene-AE	mg/kg	2 - 1000	1	12.5%
Molybdene-RT	mg/kg	2 - 1000	1	12.5%
Nickel-AE	mg/kg	2—100	1	12.5%
Nickel-RT	mg/kg	2—100	1	12.5%
Phosporus-AE	mg/kg	100 - 2500	1	12.5%
Phosphorus-RT	mg/kg	100 - 2500	1	12.5%
Scandium-AE	mg/kg	1—20	0.1	12.5%
Scandium-RT	mg/kg	1—20	0.1	12.5%
Strontium-AE	mg/kg	50 - 500	1	12.5%

Determinand	Unit	Concentration range	Error	
		Sediment	Const	Prop
Strontium-RT	mg/kg	50 – 500	1	12.5%
Vanadium-AE	mg/kg	5 -500	1	12.5%
Vanadium-RT	mg/kg	5 -500	1	12.5%
Zinc-AE	mg/kg	20—1500	2.5	12.5%
Zinc-RT	mg/kg	20—1500	2.5	12.5%
TOC	%	0.2—10	0.02	12.5%
Inorganic-carbonate	%	0.05—10	0.05	12.5%
Loss on ignition	%	0.02 - 10	0.05	12.5%

RT = Real Total destructions e.g. HF-destruction, rÖntgen-diffraction and neutron activation.
AE= Acid extractable and all other methods.
In addition to these parameters given in this table, we will add several additional metals into the dataset form on the Participant's sites. There you will find e.g. Na, S, K, Ti, Ga, Rb, Se, Sn, Cs, Ce, Ta, Tl, Th, U. In case enough participants report results these additional metals will be added permanently to the program.
Determinands which are not in bold are not in the scope of the accreditation

MS-2 Chlorinated Organics in Sediment					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (25 laboratories expected)			

Introduction

This study covers the determination of poly chlorinated biphenyls (PCBs), organochlorine pesticides (OCPs) and total organic carbon (TOC) in marine sediment.

Test Materials

The test materials cover a range of natural sediments from contaminated waters from the North Sea and/or Mediterranean. Each batch of material is prepared in bulk. The level of within and between sample homogeneity for the sediment is determined. All materials show to be homogeneous and stable for the purpose of the test.

Determinands and Concentration Ranges

The organochlorines to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.
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Determinand	Unit	Concentration Range	Error	
		Sediment	Const	Prop
PCB18	µg/kg	0.1—10		
PCB28	µg/kg	0.1—100	0.025	12.5%
PCB31	µg/kg	0.1—100	0.025	12.5%
PCB44	µg/kg	0.1—100	0.025	12.5%
PCB47	µg/kg	0.1 — 50	0.025	12.5%
PCB49	µg/kg	0.02 — 100	0.025	12.5%
PCB52	µg/kg	0.1—500	0.025	12.5%
PCB66	µg/kg	0.02 — 100	0.025	12.5%
PCB99	µg/kg		0.025	12.5%
PCB101	µg/kg	0.2—300	0.025	12.5%
PCB105	µg/kg	0.1—50	0.025	12.5%
PCB107	µg/kg		0.025	12.5%
PCB108	µg/kg		0.025	12.5%
PCB109	µg/kg		0.025	12.5%
PCB110	µg/kg	0.1—100	0.025	12.5%
PCB111	µg/kg		0.025	12.5%
PCB112	µg/kg		0.025	12.5%
PCB113	µg/kg		0.025	12.5%
PCB114	µg/kg		0.025	12.5%
PCB118	µg/kg	0.1—200	0.025	12.5%
PCB128	µg/kg	0.05 — 5	0.025	12.5%
PCB138+PCB163	µg/kg	0.2—50	0.025	12.5%
PCB138	µg/kg	0.2—50	0.025	12.5%
PCB141	µg/kg	0.05 — 10	0.025	12.5%
PCB149	µg/kg	0.05 — 100	0.025	12.5%
PCB151	µg/kg	0.1—20	0.025	12.5%
PCB153	µg/kg	0.2—100	0.025	12.5%
PCB156	µg/kg	0.05—5	0.025	12.5%
PCB158	µg/kg	0.1 — 5	0.025	12.5%
PCB170	µg/kg	0.05 — 10	0.025	12.5%
PCB180	µg/kg	0.1—50	0.025	12.5%
PCB183	µg/kg	0.05 — 5	0.025	12.5%
PCB187	µg/kg		0.025	12.5%
PCB188	µg/kg	0.05 — 10	0.025	12.5%
PCB194	µg/kg	0.02 — 2	0.025	12.5%
PCB203	µg/kg		0.025	12.5%
PCB209	µg/kg		0.025	12.5%
α-HCH	µg/kg	0.02—1	0.02	12.5%
β-HCH	µg/kg	0.05—2	0.025	12.5%
γ-HCH	µg/kg	0.05—2	0.025	12.5%
δ-HCH	µg/kg	0.05—2	0.025	12.5%
HCB	µg/kg	0.05—250	0.025	12.5%

Determinand	Unit	Concentration Range	Error	
		Sediment	Const	Prop
HCBD	µg/kg	0.02—10	0.025	12.5%
Dieldrin	µg/kg	0.1—10	0.025	12.5%
pp'-DDD	µg/kg	0.1—25	0.025	12.5%
pp'-DDE	µg/kg	0.1—20	0.025	12.5%
op'-DDT	µg/kg	0.02—250	0.025	12.5%
pp'-DDT	µg/kg	0.1—10	0.025	12.5%
Transnonachlor	µg/kg	0.01—2	0.025	12.5%
Heptachlor	µg/kg		0.025	12.5%
Heptachlor-epoxide (sum)	µg/kg		0.025	12.5%
Emamectin	µg/kg		0.025	12.5%
Teflubenzuron	µg/kg		0.025	12.5%
TOC	%	0.2—10	0.02	12.5%
PN	%		0.02	12.5%

Determinands which are not in bold are not in the scope of the accreditation

MS-3 Polycyclic Aromatic Hydrocarbons in Sediment					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (30 laboratories expected)			

Introduction

This study covers the determination of Polycyclic Aromatic Hydrocarbons (PAHs) and total organic carbon (TOC) in marine sediment.

Test Materials

The test materials cover a range of natural sediments from contaminated waters from the North Sea and/or Mediterranean. Each batch of material is prepared in bulk. The level of within and between sample homogeneity for the sediment is determined. All materials show to be homogeneous and stable for the purpose of the test.

Determinands and Concentration Ranges

The PAHs to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration Range	Error	
		Sediment	Const	Prop
Acenaphthene	µg/kg	0.5—2000	0.1	12.5%
Acenaphthylene	µg/kg	0.5—1000	0.2	12.5%
Anthracene	µg/kg	1—500	0.1	12.5%
Benzo[a]anthracene	µg/kg	2—1500	0.1	12.5%
Benzo[a]fluorene	µg/kg	2—1000	0.5	12.5%
Benzo[a]pyrene	µg/kg	2—1500	0.1	12.5%
Benzo[b]fluoranthene	µg/kg	5—1500	0.5	12.5%
Benzo[k]fluoranthene	µg/kg	2—1000	0.1	12.5%
Benzo[e]pyrene	µg/kg	2—1500	0.2	12.5%
Benzo[g,h,i]perylene	µg/kg	2—1500	0.2	12.5%
Chrysene	µg/kg	2—1500	0.2	12.5%
Chrysene+Triphenylene	µg/kg	2—3000	0.2	12.5%
Triphenylene	µg/kg	1—3000	0.5	12.5%
Dibenz[a,h]anthracene	µg/kg	0.5—500	0.05	12.5%
Dibenzo[a,i]pyrene	µg/kg		0.5	12.5%
Dibenzothiophene	µg/kg	0.5—200	0.1	12.5%
Fluoranthene	µg/kg	5—4000	0.2	12.5%
Fluorene	µg/kg	0.5—1000	0.1	12.5%
Indeno[1,2,3-cd]pyrene	µg/kg	2—1500	0.2	12.5%
Naphthalene	µg/kg	2—4000	0.5	12.5%
1-methylnaphthalene	µg/kg		0.2	12.5%
2-methylnaphthalene	µg/kg		0.2	12.5%
1-methylanthracene	µg/kg		0.2	12.5%
2-methylanthracene	µg/kg		0.2	12.5%
Perylene	µg/kg	2—500	0.2	12.5%
Phenanthrene	µg/kg	5—3000	0.5	12.5%
1-methylphenanthrene	µg/kg		0.2	12.5%
2-Methylphenanthrene	µg/kg	1—1000	0.5	12.5%
3,6-Dimethylphenanthrene	µg/kg	0.5—500	0.5	12.5%
Pyrene	µg/kg	2—4000	0.2	12.5%
1-Methylpyrene	µg/kg	0.5—500	0.5	12.5%
1,2-benzodiphenylene sulfide	µg/kg		0.2	12.5%
TOC	%	0.2—10	0.02	12.5%
C1-phenanthrenes/anthracenes	µg/kg		0.5	12.5%
C2-phenanthrenes/anthracenes	µg/kg		0.5	12.5%
C3-phenanthrenes/anthracenes	µg/kg		0.5	12.5%
C1-pyrenes/fluoranthenes	µg/kg		0.5	12.5%
C2-pyrenes/fluoranthenes	µg/kg		0.5	12.5%
C1-chrysenes	µg/kg		0.5	12.5%

Determinand	Unit	Concentration Range	Error	
		Sediment	Const	Prop
C2-chrysenes	µg/kg		0.5	12.5%
C1-benzofluoranthenes	µg/kg		0.5	12.5%
C1-dibenzothiophenes	µg/kg		0.2	12.5%
C2-dibenzothiophenes	µg/kg		0.2	12.5%
C3-dibenzothiophenes	µg/kg		0.2	12.5%
C1-naphtalenes	µg/kg		0.2	12.5%
C2-naphtalenes	µg/kg		0.2	12.5%
C3-naphtalenes	µg/kg		0.2	12.5%
C1-phenanthrenes	µg/kg		0.5	12.5%
Benzofluoranthenes (b+j)	µg/kg		0.2	12.5%
Benzofluoranthenes (a+b+j+k)	µg/kg		0.2	12.5%
Total petroleum hydrocarbons	mg/kg		0.2	12.5%
PN	%		0.02	12.5%

Determinands which are not in bold are not in the scope of the accreditation

MS-6 Organotins in Sediment					
Year	2022	Number of Rounds / Year	2	Number of Materials	2
Distribution		April, October (25 laboratories expected)			

Introduction

This study covers the determination of organotin compounds in marine sediment.

Test Materials

The test materials cover a range of natural sediments from contaminated waters from the North Sea and/or Mediterranean. Each batch of material is prepared in bulk. The level of within and between sample homogeneity for the sediment is determined. All materials show to be homogeneous and stable for the purpose of the test.

Determinands and Concentration Ranges

The organotin compounds to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

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Determinand	Unit	Concentration Range	Error	
		Sediment	Const	Prop
Tributyltin(TBT)	µg Sn/kg	1—5000	0.1	12.5%
Dibutyltin(DBT)	µg Sn/kg	1—5000	0.1	12.5%
Monobutyltin(MBT)	µg Sn/kg	1—5000	0.1	12.5%
Triphenyltin(TPhT)	µg Sn/kg	0.1—200	0.1	12.5%
Diphenyltin(DPhT)	µg Sn/kg	0.1—200	0.1	12.5%
Monophenyltin (MPhT)	µg Sn/kg	0.1—200	0.1	12.5%

These determinands are not in the scope of the accreditation

MS-7 Brominated Flame Retardants in Sediment					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (15 laboratories expected)			

Introduction

This study covers the determination of brominated flame retardants (BFRs) in sediment.

Test Materials

The test materials cover a range of natural unspiked sediments from contaminated waters from the North Sea and/or Mediterranean. Sediments are dried and sieved to <0.5 mm before sub-sampling into glass jars for distribution. Sediment test materials have been shown to be stable over a number of years when stored at room temperature.

Determinands and concentration ranges

The BFRs to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

Determinand	Unit	Concentration range	Error	
		Sediment	Const	Prop
BDE28	µg/kg	0.01—2	0.05	12.5%
BDE47	µg/kg	0.1—20	0.05	12.5%
BDE66	µg/kg	0.01—10	0.05	12.5%
BDE85	µg/kg	0.01—10	0.05	12.5%
BDE99	µg/kg	0.1—50	0.05	12.5%
BDE100	µg/kg	0.01—10	0.05	12.5%
BDE153	µg/kg	0.1—5	0.05	12.5%
BDE154	µg/kg	0.01—5	0.05	12.5%
BDE183	µg/kg	0.1—2	0.05	12.5%
BDE209	µg/kg	2—2000	0.05	12.5%
TBBP-A	µg/kg		0.05	12.5%
Dimethyl-TBBP-A	µg/kg		0.05	12.5%
α-HBCD	µg/kg		0.05	12.5%
β-HBCD	µg/kg		0.05	12.5%
γ-HBCD	µg/kg	0.01 - 20	0.05	12.5%
Total-HBCD	µg/kg	50—1000	0.05	12.5%

Determinands which are not in bold are not in the scope of the accreditation

MS-8 Perfluorinated Alkyl Substances (PFAS) in Sediment					
Year	**2022**	**Number of Rounds / Year**	**2**	**Number of Materials**	**2**
Distribution		**April, October** (10 laboratories expected)			

Introduction

This study covers the determination of perfluorinated alkyl substances (PFAS) in sediment.

Test Materials

The test materials cover a range of natural sediments from contaminated waters from the North Sea and/or Mediterranean. Each batch of material is prepared in bulk. The level of within and between sample homogeneity for the sediment is determined. All materials show to be homogeneous and stable for the purpose of the test.

Determinands and concentration ranges

The PFAS can to be determined are given in the table below.
The table also shows:
- The expected concentration range for the determinands in the test materials.
- The constant and proportional error that will be used for assessment of the results.

.

Determinand	Unit	Concentration Range	Error		AA-EQS
			Const	Prop	
n-PFOS	µg/kg	0.05 - 2	0.005	12.5%	
PFBA	µg/kg		0.005	12.5%	
PFPeA	µg/kg		0.005	12.5%	
PFHxA	µg/kg		0.005	12.5%	
PFHpA	µg/kg		0.005	12.5%	
PFOA	µg/kg		0.005	12.5%	
PFNA	µg/kg		0.005	12.5%	
PFDA	µg/kg		0.005	12.5%	
PFUnDA	µg/kg	0.001—1	0.005	12.5%	
PFDoA	µg/kg	0.001—0.1	0.005	12.5%	
PFTrDA	µg/kg	0.01—0.1	0.005	12.5%	
PFTeDA	µg/kg	0.001 – 1	0.005	12.5%	
L-PFBS**	µg/kg		0.005	12.5%	
L-PFHxS**	µg/kg		0.005	12.5%	
L-PFHpS**	µg/kg		0.005	12.5%	
PFOSA	µg/kg	0.01—1	0.005	12.5%	
PFDS	µg/kg		0.005	12.5%	
PFODA	µg/kg		0.005	12.5%	
Total-PFOS	µg/kg	0.05 - 2	0.005	12.5%	
GenX	µg/kg		0.005	12.5%	
F-53B	µg/kg		0.005	12.5%	
PFBSA	µg/kg		0.005	12.5%	
PFHxSA	µg/kg		0.005	12.5%	
NMeFOSAA	µg/kg		0.005	12.5%	
NEtFOSAA	µg/kg		0.005	12.5%	

These determinands are not in the scope of the accreditation.

Development exercises

For emerging pollutants / determinands or in case of poor comparability among laboratories analytical methodology may need to be refined. On request WEPAL/QUASIMEME offers development exercises to develop and improve the methodology, that may result in a new PT scheme on a regular base.

Part of these development exercises are workshops to focus on specific problems and to discuss achievements and corrective actions.

Proficiency tests currently in Development

Exercise	Description
DE-13	Passive Sampling
DE-16	Tetrodotoxin in shellfish
DE-17	Microplastics
DE-18	PFAS in (sea)water
DE-19	Pharmaceuticals in (sea)water

BE-1 Imposex					
Year	2022	Number of Rounds / Year	1	Number of Materials	1
Distribution		October, (8 laboratories expected)			

More specific information will be available on our webpage and will be communicated to all participants.

DE-13 Passive sampling in Seawater					
Year	2022	Number of Rounds / Year	1	Number of Materials	2
Distribution		October (15 laboratories expected)			

Passive sampling will become an important procedure to measure concentrations of determinands, like e.g. HCB, HCBD, PCBs, PAHs and Brominated flame retardants in seawater. Therefore, a development exercise will be offered in the new proficiency testing scheme.

The development exercise will be conducted in co-operation with Foppe Smedes (Deltares/Masaryk University) and Kees Booij (NIOZ/PaSOC). Following your subscription, an inventory will be held with respect to internal standards which are used in your laboratory and may conflict with PRC's to be used within the development exercise itself.

We expect to start the development exercise in September 2022. Estimated price is € 900,=.

DE-16 Tetrodotoxin in shellfish					
Year	2022	Number of Rounds / Year	1	Number of Materials	2
Distribution		October, (15 laboratories expected)			

This study is coordinated by Dr Arjan Gerssen, BU Contaminants & Toxins, WFSR, Wageningen the Netherlands

More specific information will be available on our webpage and will be communicated to participants of the shellfish toxin exercises.

DE-17 Microplastics					
Year	2022	Number of Rounds / Year	1	Number of Materials	3
Distribution		April, (50 laboratories expected)			

More specific information will be available on our webpage and will be communicated to all participants.

DE-18 PFAS in (sea)water					
Year	**2022**	**Number of Rounds / Year**	**1**	**Number of Materials**	**3**
Distribution		**October,** (20 laboratories expected)			

More specific information will be available on our webpage and will be communicated to all participants. As much as the following PFAS determinands will be spiked to estuarine and seawater samples: PFOS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnDA, PFDoA, PFTrDA, PFTeDA, L-PFBS, L-PFHxS, L-PFHpS, PFOSA, PFDS, PFODA, GenX, F-53B, PFBSA, PFHxSA, NMeFOSAA and NEtFOSAA. We cannot guarantee that all individual PFAS will be spiked. This will be due to availability of the certified reference materials. A final decision about concentration levels will be discussed at the SAB meeting, but a first indication will be 0.01 – 10 ng/L per individual PFAS.

DE-19 Pharmaceuticals in (sea)water					
Year	**2022**	**Number of Rounds / Year**	**1**	**Number of Materials**	**3**
Distribution		**October,** (15 laboratories expected)			

More specific information will be available on our webpage and will be communicated to all participants. At least Diclofenac, Carbamazepine, Ibuprofen, Azithromycin, Clarithromycin and Erythromycin will be spiked to estuarine and seawater samples, when individual reference materials will be available for these determinands.

Annex 1 Organisation and Structure QUASIMEME

The WEPAL-QUASIMEME staff

The QUASIMEME Project Office at FRS Marine Laboratory, Aberdeen, United Kingdom was established for the EU funded project, QUASIMEME I (1992-1996), and continued to operate as the project coordination centre for QUASIMEME from 1996 to 2005, when coordination of the project transferred to Wageningen University and Research. A small team was responsible for the QUASIMEME LP studies at Wageningen University and Research from 2005 to January 2012. From 1st of January 2012 onwards, QUASIMEME merged with WEPAL (Wageningen Evaluating Programmes for Analytical Laboratories). Roles and responsibilities of the WEPAL-QUASIMEME team are outlined in the table below. The contact details for the WEPAL-QUASIMEME Project Office are given on the first page of this document.

Name	Role	Responsibilities
Mrs. Winnie van Vark	Manager WEPAL-QUASIMEME	Manager of the WEPAL-QUASIMEME team Data assessment and statistics WEPAL
Mr Wim Cofino	Project advisor	Scientific responsibility of the QUASIMEME Laboratory Performance studies. Chairman of the Scientific Assessment Board Statistics QUASIMEME
Mr. Steven Crum	Project coordinator QUASIMEME	Coordination and organisation of the QUASIMEME Laboratory Performance studies Preparation of Aquatic test materials Homogeneity and stability testing Aquatic samples Test material dispatch QUASIMEME Data assessment and statistics QUASIMEME Dispatch of QUASIMEME samples
Mr. Jan Groenwold	Project assistant	Data-base and statistics WEPAL-QUASIMEME
Mr. Pieter Hazenberg	Quality Assurance Officer	Quality Assurance
Mrs. Esther van den Brug	Project assistant	QUASIMEME Front Office (secretariat and subscription) Communications QUASIMEME Secretariat to the QUASIMEME Scientific Advisory Board Help desk QUASIMEME
Mrs. Minke van Veldhuizen	Project assistant	WEPAL Front Office (secretariat and subscription) WEPAL-QUASIMEME Finances Help desk WEPAL
Mrs. Laura Buijse	Project assistant	Preparation of aquatic test materials and homogeneity testing sediment and biota for organic parameters
Mrs. Arrienne Matser	Project assistant	Preparation of aquatic test materials and homogeneity testing sediment and biota for organic parameters
Mr. Peter Pellen	Project assistant	Preparation of test materials Processing of submitted data WEPAL Dispatch of samples
Mr. Fred Bransen	Project assistant	Preparation of test materials
Mrs. Carolina Sessler	Project advisor	Communications, website, LinkedIn
Mrs. Andrea Sneekes	Project advisor	Scientific advise, communications, website, LinkedIn

Annex 2 The QUASIMEME Scientific Advisory Board

The QUASIMEME Scientific Advisory Board is now joined together with the Advisory Board and a new Board Members Group is formed as at September 2013. The new name for this Board is the Scientific Advisory Board (SAB). The QUASIMEME SAB gives advice on the implementation of the scientific programme to the QUASIMEME Project Office and oversees the data assessments and reports on the results of the Laboratory Performance (LP) studies.

The QUASIMEME Advisory Board consist of experts in the field of QA and the assessment of LP studies. The members have experience in the design and operation of LP studies and / or environmental measurements in matrices related to the marine environment. The QUASIMEME Project Advisor is the chairman of the SAB. Membership of the SAB is confirmed annually. The membership of the SAB will be sufficient in number and breadth of experience to adequately cover the areas included in the QUASIMEME LP studies. The SAB may recommend specialists to the QUASIMEME Project Advisor to be invited to contribute to specific QUASIMEME activities as required. The contact details for members of the SAB are to be found at the back of this brochure.

Terms of Reference of the QUASIMEME SAB were agreed at the newly formed SAB Board Meeting, 26-27 September 2013 and are confirmed annually. The SAB will meet at least annually to advise and assist the QUASIMEME Project Office on:

1. The design of the QUASIMEME LP studies and provision of test materials and protocols.
2. The assessment of the LP studies and study reports.
3. The preparation of documentation, both printed and electronic.
4. Recommendations of changes in structure or content of the LP studies.
5. A proposed work programme for future LP studies.
6. The SAB will review and make recommendations to the QUASIMEME Project Office on the composition and breadth of expertise which is required to maintain the objective assessment of the programme and the results of the participants' studies. Advise on matters relating to the Quality Assurance and Quality Control requirements for the national and international marine monitoring programmes and to provide links with these programmes.
7. Provide information and advice on the list of determinands required for the national and international monitoring programmes, the matrices and the concentration ranges. Where lists of studies in the current LP studies are being revised, the Board shall indicate the relative priority of the studies to be undertaken.
8. On the level of performance required for specific monitoring programmes in terms of precision and bias for each determinand - matrix combination.
9. Review and revise the terms of reference of the Advisory Board, when necessary.
10. Advise QUASIMEME on activities to meet future needs.

QUASIMEME Scientific Advisory Board will consist of representatives from organisations to which QUASIMEME participants submit environmental monitoring data:

1. A representative from the Oslo Commission (OSPAR) to maintain communication with OSPAR, particularly in relation to the QA requirements of the Joint Assessment and Monitoring Programme (JAMP).
2. A representative to maintain communication with the Helsinki Commission (HELCOM), particularly in relation to the QA requirements of the Baltic Monitoring Programme (BMP) and the Coastal Monitoring Programme (CMP).
3. A representative to maintain communication with the International Council for the Exploration of the Sea (ICES).
4. Representatives of national monitoring programmes. Two representatives from national monitoring programmes will be invited based on the national levels of participation in QUASIMEME. Representatives of other national monitoring programmes may request to attend.
5. The QUASIMEME Project Advisor.
6. A representative to maintain communication with the European Environmental Agency.
7. A representative to maintain communication with the Arctic Monitoring and Assessment Programme (AMAP).

The organisations represented will be responsible for nominating their member of the QUASIMEME Scientific Advisory Board.

Membership of the QUASIMEME Scientific Advisory Board		
Name	**Address (postal / visiting)**	**Tel / Fax / E-mail**
Em. Prof. Dr. Wim Cofino (QUASIMEME Project Advisor, chairman)	Wageningen University WEPAL-QUASIMEME Project Office Bornsesteeg 10 6721 NG Bennekom The Netherlands	+ 31 317 486 547 + 31 317 485 666 wim.cofino@wur.nl
Mrs. Esther van den Brug (Secretariat)	Wageningen University WEPAL-QUASIMEME Project Office Bornsesteeg 10 6721 NG Bennekom The Netherlands	+ 31 317 486 546 + 31 317 485 666 esther.vandenbrug@wur.nl
Pamela Walsham Msc. (UK NMCAG)	Marine Scotland Science Marine Laboratory, 375 Victoria Road, Torry Aberdeen, AB11 9DB United Kingdom	+ 44 131 24 43 543 Pamela.walsham@gov.scot
Vacancy (HELCOM)	Helsinki Commission Katajanokanlaituri 6B 00160, Helsinki Finland	
Vacancy (AMAP)	Institute of Marine Research P.O. Box 1870 Nordnes 5817 Bergen Norway	
Dr. Nicole Bandow	Umweltbundesamt Bismarckplatz 1 14193 Berlin Germany	+49 30 8903-5724 Nicole.bandow@uba.de
Dr. Martin Mork Larsen (OSPAR)	Department of Bioscience Aarhus Universitet Frederiksborgvej 399 4000 Roskilde Denmark	+ 45 8715 8558 mml@dmu.dk
Mrs. Winnie van Vark	Wageningen University WEPAL-QUASIMEME Project Office Bornsesteeg 10 6721 NG Bennekom The Netherlands	+ 31 317 483 643 + 31 317 485 666 winnie.vanvark@wur.nl
Prof. Dr. Jacob de Boer	Dept. of Environment and Health, Faculty of Science, Vrije Universiteit, Amsterdam De Boelelaan 1108 1081 HV Amsterdam The Netherlands	+ 31 20 59 89 530 + 31 20 59 89 553 jacob.de.boer@vu.nl
Mr. Ing. Steven Crum	Wageningen University WEPAL-QUASIMEME Project Office P.O. Box 8005 6700 EC Wageningen The Netherlands Bornsesteeg 10 6721 NG Bennekom The Netherlands	+ 31 317 481 623 + 31 317 485 666 steven.crum@wur.nl
Dr. Michiel Kotterman	Wageningen Marine Research Haringkade 1 1976 CP IJmuiden The Netherlands	+ 31 317 487 132 + 31 317 487 326 michiel.kotterman@wur.nl
Dr. Andrew Turner	CEFAS The Nothe, Barrack road BT48UB Weymouth	+ 44 1305206636 andrew.turner@cefas.co.uk

Membership of the QUASIMEME Scientific Advisory Board		
Name	**Address (postal / visiting)**	**Tel / Fax / E-mail**
	Dorset United Kingdom	
Dr. Koen Parmentier	Royal Belgian Institute of Natural Sciences OD Nature, ECOCHEM 3de & 23ste Linieregimentsplein, 8400 Oostende Belgium	+ 32 59 55 22 41 + 32 59 70 49 35 kparmentier@naturalsciences.be
Dr. Patrick Roose	Royal Belgian Institute of Natural Sciences Gulledelle 100 1200 Brussels Belgium	+ 32 2 627 42 06 patrick.roose@naturalsciences.be
Mrs Ing. Andrea Sneekes	Wageningen Marine Research Haringkade 1 1976 CP IJmuiden The Netherlands	+31 317 487 141 andrea.sneekes@wur.nl

Annex 3 Overview of (outsourced) activities

NB. Various aspects of the proficiency testing scheme is subcontracted to collaborators. When subcontracting occurs, it is placed with a competent subcontractor and WEPAL-QUASIMEME is responsible for this work. Part of the work is done by WEPAL-QUASIMEME itself

Activity In-home	Organization	Contact person
• Coordination QUASIMEME PT-scheme • Preparation aqueous test materials • Homogeneity testing chlorophyl • Assessment of all homogeneity tests	Wageningen University WEPAL-QUASIMEME Bornsesteeg 10 6721 NG Bennekom The Netherlands	Steven Crum steven.crum@wur.nl
• Preparation sediment test materials	Wageningen University WEPAL-QUASIMEME Bornsesteeg 10 6721 NG Bennekom The Netherlands	Winnie van Vark winnie.vanvark@wur.nl

Activity Outsourced	Organization	Contact person
• Preparation and homogeneity testing of nutrient, DOC and Ocean acidification test materials	Royal Belgian Institute of Natural Sciences Directorate Natural Environment Marine Environment3e & 23e Linieregimentsplein 8400 Oostende Belgium	Marc Knockaert mknockaert@naturalsciences.be
• Preparation of biological test materials and homogeneity testing organic contaminants in biota	Wageningen Marine Research P.O. Box 68 1970 AB Ijmuiden The Netherlands	Andrea Sneekes andrea.sneekes@wur.nl
• Preparation and homogeneity testing of shellfish toxins testmaterials (ASP, DSP and PSP)	CEFAS The Nothe, Barrack road BT48UB Weymouth Dorset United Kingdom	Andrew Turner andrew.turner@cefas.co.uk
• Homogeneity testing of sediment and biota samples on metals	Wageningen University Department of Environmental Sciences CBLB Soil chemistry Droevendaalsesteeg 3 6708 PB Wageningen The Netherlands	Anne Roepert anne.roepert@wur.nl
• Preparation and homogeneity testing of tetrodotoxin shellfish toxin testmaterials	Wageningen Food Safety Research BU Contaminants & Toxins Akkermaalsbos 2 6708WB Wageningen The Netherlands	Mirjam Klijnstra mirjam.klijnstra@wur.nl

• Preparation and homogeneity testing of sediment and biota samples on microplastics	Dept. of Environment and Health, Faculty of Science, Vrije Universiteit, Amsterdam De Boelelaan 1108 1081 HV Amsterdam The Netherlands	Jacob de Boer jacob.de.boer@vu.nl
• Preparation and homogeneity testing of tablet samples on microplastics	NIVA Økernveien 94 0579 Oslo Norway	Bert van Bavel bert.vanbavel@niva.no

Annex 4 Z-scores

A z-score[7] is calculated for each participant's data for each matrix / determinand combination which is given an assigned value. The z-score is calculated as follows:

$$\text{z-score} = \frac{\text{Laboratory Result - Assigned Value}}{\text{Total Error}}$$

It is emphasised that in many interlaboratory studies the between-laboratory standard deviation obtained from the statistical evaluation of the study is used as 'total error' in the formula above. In QUASIMEME the total error is estimated independently taking the needs of present-day international monitoring programme as a starting point. For each determinand in a particular matrix, a proportional error (PE) and a constant error (CE) have been defined. The target error depends on the magnitudes of these errors and on the assigned value. The total error is based on the target error and the uncertainty of the assigned value, calculated according to ISO13528:

$$\text{Target Error} = \frac{\text{Assigned Value} \times \text{Proportional Error (\%)}}{100} + 0.5 \times \text{Constant Error}$$

$$\text{Total Error} = \sqrt{U_x^2 + (\text{Target Error})^2}$$

The values for the PE and CE are set by the Scientific Advisory Board and are monitored annually. The values are based on the following criteria:

- Consistency of the required standard of performance to enable participating laboratories to monitor their assessment over time.
- Achievable targets in relation to the current state of the art and the level of performance needed for national and international monitoring programmes.

The assessment is based on ISO 13528 as z-scores. The QUASIMEME model is designed to provide a consistent interpretation over the whole range of concentration of analytes provided, including an assessment where Left Censored Values (LCVs) are reported.

The proportional error is set at 6% for nutrients and for standard solutions, and 12.5% for all other matrices. This applies to all determinands. The constant error has been set for each determinand or determinand group (e.g. chlorinated biphenyls). This value was initially set to reflect the limit of determination, but is at present more closely related to the overall laboratory performance. The magnitude of the CE is set to provide a constant assessment in terms of z-score regardless of concentration. Therefore at low concentrations the level of accuracy required to obtain a satisfactory z-score is less stringent than those at high concentrations.

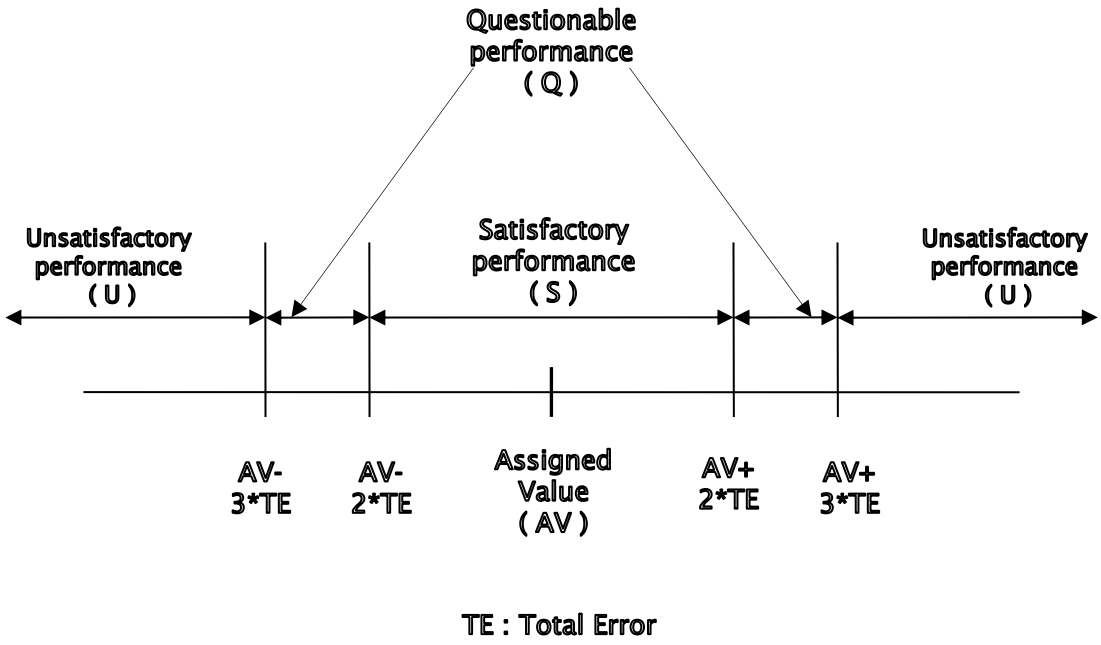
The performance of the laboratories is examined in detail when the total error exceeds 50% of the consensus concentration. If there is good agreement between the laboratories, i.e. the criteria to set an assigned value are met, the CE may be revised to a lower value reflecting the performance of laboratories for this measurement at lower concentrations. These revisions are undertaken at the time of the assessment and ratified by the Scientific Advisory Board. In making any adjustments to the CE an overall assessment of performance at these lower concentrations over a number of different rounds is reviewed. This provides evidence of a long-term trend of improved performance rather than a single set of data. When the agreement is judged to be insufficient, no assigned value is established. In such cases an indicative value is given.

[7] International Harmonized Protocol for Proficiency Testing of (Chemical) Analytical Laboratories. M. Thompson, R. Wood, Journal of AOAC International Vol. 76, No. 4, 1993.

Following usual practices e.g. ISO 13528, the z-scores can be interpreted as follows for laboratories which take part in QUASIMEME to assure the quality of their data for use in international marine monitoring programmes:

	|Z|	<2	Satisfactory performance (S)
2<	|Z|	<3	Questionable performance (Q)
	|Z|	>3	Unsatisfactory performance (U)

The following figure illustrates the interpretation of the z-scores:



|z| > 6 frequently points to gross errors (mistakes with units during reporting, calculation or dilution errors, and so on).

It is not possible to calculate a z-score for left censored values (LCV's). QUASIMEME provides a simple quality criterion:

LCV/2 < (concentration corresponding to |z|=3): LCV consistent (C) with assigned value
LCV/2 > (concentration corresponding to |z|=3): LCV inconsistent (I) with assigned value, i.e. LCV reported by laboratory much higher than numerical values reported by other laboratories.

Annex 5 List of Abbreviations (alphabetical order)

11-OH-STX	11 hydroxy saxitoxin
AZA	azaspiracide
BDE	Brominated diphenyl ether
C1	*N*-sulfocarbamoyl toxins C1 (equal for C2, C3 and C4)
dc-NEO	Decarbamoyl Neo saxitoxin
dc-STX	Decarbamoyl saxitoxin
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DIC	Dissolved Inorganic Carbon
DOC	Dissolved Organic Carbon
DTX	dinophysistoxin
EQS	Environmental Quality Standard
GTX	Gonyautoxin
HBCD	Hexabromocyclododecane
HCB	Hexachlorobenzene
HCBD	Hexachlorobutadiene
HCH	Hexachlorocyclohexane
HpCDD	Heptachlorodibenzodioxin
HpCDF	Heptachlorodibenzofuran
HxCDD	Hexachlorodibenzodioxin
HxCDF	Hexachlorodibenzofuran
L-PFBS	Perfluorobutanesulfonate
L-PFHpS	Perfluoroheptanesulfonate
L-PFHxS	Perfluorohexanesulfonate
NEO	Neo saxitoxin
NEtFOSAA	N-ethylperfluorooctane sulfonamidoacetic acid
NMeFOSAA	N-Methylperfluorooctane Sulfonamidoacetic Acid
OA	Okadaic acid
OCDD	Octachlorodibenzodioxin
OCDF	Octachlorodibenzofuran
PAHs	Polycyclic aromatic hydrocarbons
PCB	Poly Chlorinated Biphenyl
PeCDD	Pentachlorodibenzodioxin
PeCDF	Pentachlorodibenzofuran
PFAS	Perfluorinated Alkylated Substances
PFBA	Perfluorobutanoic Acid
PFBSA	Perfluorobenzenesulfonic acid
PFDA	Perfluorodecanoic Acid
PFDS	Perfluorododecanesulfonate
PFDoA	Perfluorododecanoic Acid
PFHpA	Perfluoroheptanoic Acid
PFHxA	Perfluorohexanoic Acid
PFHxSA	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFODA	Perfluorooctadecanoic Acid
PFOS	Perfluorooctanesulfonate
PFOSA	Perfluorooctanesulfonamide
PFPeA	Perfluoro-n-pentanoic Acid
PFTeDA	Perfluorotetradecanoic Acid
PFTrDA	Perfluorotridecanoic Acid
PFUnDA	Perfluoroundecanoic Acid
PN	Particulate Nitrogen
PTX	Pectenotoxin

STX	Saxitoxin
TBBP-A	Tetrabromobisphenol-A
TCB	Trichlorobenzene
TCDD	Tetrachlorodibenzodioxin
TCDF	Tetrachlorodibenzofuran
TEQ	Toxic equivalent
TOC	Total Organic Carbon
YTX	Yessotoxin

Annex 6 Application Form

QUASIMEME welcomes subscribers at any time during the year. However, to ensure on time delivery please return your application form before dispatch dates listed on page 5 of our Brochure to:

Wageningen University
WEPAL-QUASIMEME Project Office
P.O. Box 8005
6700 EC Wageningen
The Netherlands
Phone: +31 317 48 65 46 (Direct Line)
Fax: +31 317 48 56 66
e-mail: QUASIMEME@wur.nl

Please type or print the information requested below. An electronic version of this form is available on the QUASIMEME website or by e-mail from the WEPAL-QUASIMEME Project Office.

Group	Round 1 April 2022	Round 2 October 2022	Group	Round 1 April 2022	Round 2 October 2022	Extra CRM Test Material from past rounds. Please state clearly what test material you wish to have by checking past Protocols on the Participant Site
AQ-1			BT-1			
AQ-2			BT-2			
AQ-3			BT-4			
AQ-4			BT-8			
AQ-5			BT-9			
AQ-6			BT-10			
AQ-7						
AQ-8						
AQ-11			BT-7			
AQ-12			BT-11			
AQ-13			BT-12			
AQ-14						
AQ-15			DE-13			
MS-1			DE-16			
MS-2			DE-17			
MS-3			DE-18			
MS-6			DE-19			
MS-7						
MS-8			BE-1			
Total number of groups ordered						
Administration/Handling/courier fee					€85	
Total					€	

Most exercises have 2 rounds with some running only once each year.
If you wish to participate in 1 round of an exercise please mark which round in the table above with e.g. an x.
If you are unsure how to complete this form please contact the W-QPO for confirmation to avoid surplus ordering as we are unable to accept returned samples.

If for a certain exercise there is insufficient participation in a certain round, W-QPO can decide to merge both rounds into 1 round including extra samples

Yes, I wish to be a permanent member of QUASIMEME ☐ **For benefits see our brochure page 10.**

Accounting contact name for **invoice**			
QUASIMEME Client Number (where applicable)			
Institute			
Address			
Postal Code			
Town / City	Region / State		
Country			
Telephone number	Fax number		
E-mail address			
VAT no[8].			
Your reference or purchase order number			
Signature:			
Date:			

Delivery address for the test materials <u>if different from invoice address</u>:

Shipment contact name for shipment of **test materials** and **reports if different from above**	
Test material groups	
QUASIMEME Client Number(where applicable)	
Institute	
Address	
Town / City	
Postal Code	
Region / State	
Country	
Telephone number	
Fax number	
E-mail address	

[8] The VAT number must be entered for all EU institutes to avoid VAT being added.

Annex 7 Laboratory Performance Studies of WEPAL-QUASIMEME

International Soil-Analytical Exchange
Fee € 675,- (EUR) per year
In this period 330 participants

International Plant-Analytical Exchange
Fee € 675,- (EUR) per year
In this period 250 participants

International Sediment Exchange for Tests on Organic Contaminants
Fee € 1015,- (EUR) per year
In this period 93 participants

International Manure and Refuse Sample Exchange Programme
Fee € 810,- (EUR) per year
In this period 56 participants

International Biomass Exchange Programme
Fee € 810,- (EUR) per year
In this period 23 participants

QUASIMEME Laboratory Performance Studies
Organic contaminants, metals, nutrients in seawater, sediment and biota
More than 250 laboratories participating

For more information please contact:

Wageningen University
WEPAL-QUASIMEME Project Office
P.O. Box 8005
6700 EC Wageningen
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