QualcoDuna Proficiency Testing Hungary Nonprofit Ltd.
Proficiency Testing Department
Programme Desciption 2026.

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Changes				
#	Modified parts	Modified by	Version	Date
1.	-	-	1	2026.01.23.
2.	• In Chapter 3, the list of sample codes has been expanded. • In Chapter 6, the descriptions of the matrices have been clarified. • In Annex 1, the option for personal collection and the presumed sampling locations have been indicated. • In Annexes 1 and 2, the right to make changes regarding the sampling dates and locations has been included.	Dr. Mátrai Norbert	2	2026.01.28.
3.	• Section 9.2 has been expanded with the evaluation of microbiological parameters. • In Annex 1, the QDJM-1 Drinking Water Microbiological Sampling PT has been added.	Dr. Mátrai Norbert	3	2026.03.26.

1. General information

This Programme Description presents the accredited proficiency testing schemes announced for 2026 by the Proficiency Testing Department of QualcoDuna Proficiency Testing Hungary Nonprofit Ltd. (hereinafter: the Provider). Further details regarding participation are available in the document titled “General Protocol 2026”.

The evaluation procedure forming the basis of the sampling proficiency testing detailed in this programme description includes elements that exceed the requirements of system standard MSZ EN ISO/IEC 17043, standard ISO 13528:2022, and the relevant professional guidelines. These elements constitute protected knowledge (know-how), and their preservation is in the economic interest of the Provider.

The complete description of the Method is provided in Annex III of the present programme description. The Provider will make Annex III available to Participants following the establishment of the contractual relationship and subject to the acceptance of the confidentiality obligations set out in the “General Protocol 2026”.

2. Accreditation

The Provider is a proficiency testing provider accredited by the National Accreditation Authority (NAH) under accreditation number NAH-8-0003/2023.

The current NAH accreditation covers the system standard MSZ EN ISO/IEC 17043:2010(w); however, the transition to the MSZ EN ISO/IEC 17043:2023 standard is in progress. Up-to-date information on the completion of the transition is available on the Provider’s website: www.qualcoduna.hu.

3. Sample identification

In 2026, within the scope of the proficiency testing schemes, proficiency testing will be organised for various types of proficiency testing items and sampling activities. The proficiency testing items are designated as follows:

code of the proficiency testing item type – parameter group code – item serial number

Respective codes are:

Jártassági vizsgálati tétel típusa	**Code**	**Parameter group**	**Code**
drinking water	IV	general parameters	G
surface water	FSZ	nutrients	N
groundwater	FSZA	metals	M
bathing water	FV	organic substances	Org
wastewater	SZV	other parameters	NS
sewage sludge / sediment	ISZ	hidrobiological parameters	HB
soil	T	toxicologial paramters	TOX
solid waste	H		
drinking water sampling	IVM		
surface water sampling	FSZM		

Jártassági vizsgálati tétel típusa	Code	Parameter group	Code
groundwater sampling	FSZAM		
bathing water sampling	FVM		
wastewater sampling	SZVM		
contaminated soil sampling	SZTM		
solid waste sampling	HM		

In 2026, proficiency tests involving joint proficiency testing item types – so-called '**common samples'** – have also been published. For these proficiency tests, the results may be applicable to more than one proficiency testing item type (matrix). The evaluation will be carried out **separately for each item type.**

4. Distribution of samples

The planned distribution and dispatch dates of the samples are indicated by month in Annex I of the programme description. Participants will be informed of the exact dates in a separate notification at least four weeks prior to distribution.

Information regarding the sample distribution procedure can be found in **Chapter 7.**

5. Prices and discounts

An "early bird" discount of 5% is granted from the total order value for all Participants who submit their complete annual order through our website by **23rd February 2026**.

Orders may also be placed after this deadline, but no later than one month before the planned sample distribution or the sampling exercise.

The Provider reserves the right to charge a **registration fee** of HUF 3,000 + VAT per round.

6. Proficiency testing schemes

The topics of the proficiency testing schemes are listed in **Annex I**, which is available as a separate document on our website among the downloadable documents for 2026 ("Programme Description – Annexes I and II").

The planned methods for determining the assigned values, as well as the planned ranges and standard deviation for proficiency assessment (standard deviations used for performance evaluation, expressed as a percentage of the assigned value, σ_pt%), are provided in **Annex II,** which is likewise available as a separate document among the downloadable documents for 2026 ("Programme Description – Annexes I and II").

Where the laboratory proficiency tests relate to **liquid-type samples** (e.g. drinking water, surface water, groundwater, bathing water, wastewater, etc.), and the distributed items are provided as

concentrates or **spiking solutions**, the water required for dilution, as well as the water to be used as the matrix for the spiking solutions – which must not contain the parameter(s) concerned – **shall be supplied by the Participants themselves**. The proficiency testing item type can be found in **Annex 1 of the Programme Description**.

For **solid waste samples**, the Provider reserves the right that, if during preliminary examinations the determination of any announced parameter(s) proves to be subject to high uncertainty due to low concentration, the Provider **may designate alternative parameter**(s) with more reliably determinable concentrations for the evaluation.

Depending on the proficiency testing item type and the parameter(s) to be measured, certain items **may only be distributed in person**. Such items are indicated in the '**Notes'** column in **Annex 1 of the Programme Description**.

With regard to the planning of **sampling proficiency exercises**, the Provider has made arrangements for the **sampling locations and dates** based on preliminary information and agreements, as listed and published in **Annex 1 of the Programme Description**. The Provider reserves the right, in justified and reasonable cases (e.g. weather conditions or other unforeseen circumstances), **to change the sampling date and/or location**, and shall notify the Participants of such changes without delay.

For sampling exercises, the **sampling containers** required for performing the sampling activities, as well as the **preservatives**, **filters**, and **transport of water samples**, are provided by the Provider. Measuring instruments needed for on-site measurements shall be supplied by the Participants.

Of the **3 laboratory samples** collected during sampling, Participants shall retain **1 sample**, while **2 samples** shall be handed over to the Provider at the sampling site. In the shared laboratory, one of these samples will be analysed. The second delivered sample will be stored refrigerated by the Provider and may also be analysed in critical cases.

During evaluation, the Provider will consider, from among the parameters examined by the subcontracted laboratory in the given matrix and listed in Annex I of the Programme Description, those parameters that:

- are present within a concentration range suitable for proper measurement, and
- can be determined with low measurement uncertainty.

Provider reserves the right that, if during the relevant sampling exercise the determination of a parameter by the subcontracted (cooperating) laboratory proves to be have high uncertainty due to low concentration, **an alternative parameter** with a more reliably determinable concentration may **be selected for the evaluation**.

7. Sample preparation and dispatch

7.1. Sample Preparation, Homogeneity and Stability Testing

The **preparation of the test samples** is primarily carried out in the Provider's own laboratory. Should the Provider involve a subcontractor in the performance of this activity, the Provider

assumes full responsibility for the subcontractor's work as if the performance had been carried out by the Provider itself.

During sample preparation, **control charts** are applied for the following purposes:

- to identify potential contaminations,
- to detect primary analytical errors,
- to verify the preliminary homogeneity of the samples.

For **homogeneity testing**, the Provider primarily, but not exclusively, uses the laboratory of Eurofins Environment Testing Hungary Ltd. Where necessary, sample homogeneity is verified in accordance with IUPAC requirements using analysis of variance (ANOVA) [1].

Stability testing is performed in accordance with Annex B of ISO 13528:2022[2]. For these tests, the Provider primarily, but not exclusively, uses the laboratory of Eurofins Environment Testing Hungary Ltd.

7.2. Sample Composition and Concentration Levels

During the laboratory proficiency testing schemes, the Provider supplies the Participants with two samples of similar composition but slightly different concentration levels for each parameter to be determined.

Participants are required to analyse **both samples**.

When defining the concentration levels of the parameters to be examined, the Provider takes into account:

- the applicable regulatory limit values relevant to the given matrix,
- the typical concentration ranges observed in natural samples,
- and the fundamental principle that the selected concentration levels must be measurable with appropriate analytical reliability.

Please note that the **concentration levels** indicated in the programme description are for information purposes only. The planned value will be set within the specified ranges, taking into account the planned standard deviation for proficiency assessment.

7.3. Schedule and Method of Sample Distribution

The planned schedule for sample distribution is provided in **Annexes I and II** of the present Programme Description, broken down by month. The Provider will notify Participants of the exact distribution date no later than **four weeks prior** to shipment.

Unless otherwise requested by the Participant, samples will be delivered using the following methods:

- personal handover, or

[1] The International Harmonised Protocol for the Proficiency Testing of (Chemical) Analytical Laboratories. (IUPAC Technical Report), *Pure Appl. Chem.*,Vol. 78, No. 1, pp. 145–196, (2006)

[2] ISO 13528:2022: Statistical methods for use in proficiency testing by interlaboratory comparisons.

- 24-hour express courier service.

The method by which the given sample can be **collected is specified in Annex 1 of the Programme Desciption.**

7.4. Notifications and Postal Delivery Conditions

If the Participant provides an e-mail address or mobile phone number at the time of registration, the following notifications will be sent regarding dispatch:

- automatic **e-mail notification** of postal shipment,
- **text message** notification upon request, provided that this service is supported by the express courier provider.

Important information:

- Express courier items **cannot be delivered to a P.O. box address**.
- If the Participant provides only a P.O. box address, the samples will be shipped as priority standard postal items.
- Items weighing **more than 2 kg** cannot be delivered to a P.O. box.

7.5. Receipt and Confirmation of Samples

Upon receipt of the shipment, it is the Participant's responsibility to:

- verify the **proper condition** of the samples,
- confirm the **completeness** of the delivery, and
- immediately **report** any issues to the Provider.

A **statement on the condition** of the samples must be provided by:

- returning the sample **receipt confirmation** form enclosed with the samples, or
- submitting the confirmation through the **Provider's website**.

If the Participant does not return the sample receipt confirmation form within **15 days** following dispatch, and does not report missing or non-conforming samples by any other means, the samples shall be considered delivered in full and in undamaged condition.

For certain parameters—particularly organic micropollutants and biological characteristics—**refrigerated transport is required** to preserve sample stability. Such samples **can only be collected in person** at the Provider's premises. The list of affected parameters is specified in the current programme description.

The Provider will inform the Participant in advance by e-mail regarding the **date and method** of sample collection. Following this notification, the Participant is responsible for arranging the **refrigerated transport** of the samples.

If requested by the laboratory, and subject to prior agreement, it is possible for **all samples** to be collected in person at the Provider's premises.

8. Reporting and modification of measurement results, special occurrences

8.1. Method and Deadline for Submitting Results

Participants are required to record their proficiency testing results directly on the Provider's website (www.qualcoduna.hu) by the **specified deadline**, using the unique username and password provided in the order confirmation.

In exceptional cases—if the Participant is objectively unable to submit the proficiency testing results through the Provider's website by the given deadline—the Provider may, upon **individual request** and within reasonable limits, grant an alternative submission time or deadline.

8.2. Modification and Deletion of Results

Before the submission deadline, the Participant is entitled to request the Provider to delete or correct results already entered, if the Participant's corrective action process has identified a non-conformity (for example: submission of results obtained with an unreliable instrument, incorrect data entry, or switched results).

After the submission deadline, modification or deletion of recorded results is no longer possible.

8.3. Special Cases in the Evaluation of Results

The following rules apply during the evaluation of results:

If the Participant reports a test result of zero ("0"), the value is considered **physically invalid and will be evaluated accordingly**.

If the Participant reports a result as "less than" ("<") or "greater than" (">"), the reported value will be automatically **excluded from the evaluation**.

9. Statistical evaluation of results

9.1. Laboratory proficiency testing

Evaluation of results is performed according to ISO 13528:2022[3]. Reported results are first inspected for obviously erroneous results or blunders (e.g. results reported in measurement units other than requested, swapping samples or parameters etc.) which are excluded from the statistical evaluation in accordance with section B.2.5. of ISO/IEC 17043:2010(w).

Then the assigned value of the parameter [x_{pt}], the standard uncertainty of the assigned value [u(x_{pt})] and the standard deviation for proficiency assessment (σ_{pt}) is determined by one of the methods detailed in **Figure I**. Finally, performance statistics is calculated including z-scores, z'-scores and E_n numbers (section 9.4., 9.5. and 9.7. of ISO 13528:2022). Calculation of performance statistics is also performed for results excluded from statistical evaluation.

As a general rule, assigned values [x_{pt}] and their standard uncertainties [u(x_{pt})] are calculated as robust averages and their standard uncertainties of results reported by all Participants. In case of

[3] ISO/IEC 17043:2010: Conformity assessment – General requirements for proficiency testing (withdrawn)

simulated samples where parameters are sufficiently stable and adequate certified reference material is available for sample preparation, formulation is used. The Provider reserves the right to use other methods detailed in ISO 13528:2022. Assigned values are tested against background measurements.

For each parameter, planned methods for determination of assigned value, expected concentration ranges and planned standard deviations for proficiency assessment (σ_{pt}) are detailed in the present programme description.

The Provider reserves the right to not evaluate results for parameters if uncertainty of the assigned value is unrealistically high (e.g. small number – typically less than 7 - of reported results, scattering or clustering of results etc). In such cases Participant results and statistical characteristics are reported, but performance assessment is not performed.

Quality of a measurement result (regarded as the average of individual test results) is characterised by trueness (proximity to the accepted reference value) and precision (closeness of agreement between individual test results obtained under defined conditions) (see ISO 5725-1:2023 sections 0.1, 3.6 and 3.12[4]). In practice, trueness is usually expressed numerically as bias, while precision as standard deviation.

In accordance, the following performance characteristics are calculated in the proficiency testing exercise:

- z- or z'-scores, indicative of the extent of measurement error of the proficiency testing results, i.e. **trueness** (z-scores are calculated by dividing the difference between proficiency testing results and the reference value with the standard deviation for proficiency assessment [see section 9.1.1]).
- E_n numbers, for which participants provide their expanded measurement uncertainty (indicative of **precision**) together with the proficiency testing results (E_n numbers are calculated by dividing the difference between proficiency testing results and the reference value with the combined expanded uncertainty [see section 9.1.2]).

9.1.1. Performance assessment based on z-scores and z'-scores

Z-scores (z) and z'-scores (z') are calculated as follows:

if $u(x_{pt}) \leq 0{,}3 \cdot \sigma_{pt}$, z-score is calculated: $$z = \frac{x_i - x_{pt}}{\sigma_{pt}},$$

if $0{,}3 \cdot \sigma_{pt} < u(x_{pt}) \leq 1{,}2 \cdot \sigma_{pt}$, z'-score is calculated: $$z' = \frac{x_i - x_{pt}}{\sqrt{u(x_{pt})^2 + \sigma_{pt}^2}},$$

if $u(x_{pt}) > 1{,}2 \cdot \sigma_{pt}$, evaluation of results is not performed;

where:

z_i: z-score corresponding to result reported by Participant,

z'_i: z'-score corresponding to result reported by Participant,

[4] ISO 5725-1:2023: Accuracy (trueness and precision) of measurement methods and results -- Part 1: General principles and definitions.

x_i: result reported by Participant,
x_{pt}: assigned value of parameter,
σ_{pt}: standard deviation for proficiency assessment,
$u(x_{pt})$: standard uncertainty of assigned value.

Absolute values of calculated z- or z'-scores are compared to critical values of 2,0 and 3,0 as follows:

if	$\|z\| or \|z'\| \leq 2{,}0$	result is regarded as **SATISFACTORY** (i.e. **no actions are needed**);
if	$2{,}0 < \|z\| or \|z'\| < 3{,}0$	result is regarded as **QUESTIONABLE** (i.e. giving a **warning signal**);
if	$3{,}0 \leq \|z\| or \|z'\|$	result is regarded as **UNSATISFACTORY** (i.e. giving an **action signal**).

9.1.2. Performance assessment based E_n numbers

E_n numbers are calculated using the expanded uncertainty of the measurement result as follows:

$$E_n = \frac{x_i - x_{pt}}{\sqrt{U^2(x_i) + U^2(x_{pt})}}$$

where:

$(E_n)_i$: E_n number corresponding to result reported by Participant,
x_i: result reported by Participant,
x_{pt}: assigned value of parameter,
σ_{pt}: standard deviation for proficiency assessment,
$U(x_i)$: expanded uncertainty of measurement result reported by Participant
$U(x_{pt})$: expanded uncertainty of assigned value.

For calculation of expanded uncertainties, the coverage factor (k) is chosen as k = 2. Thus $U(x_{pt})=2*u(x_{pt})$, where $u(x_{pt})$ is the standard uncertainty of the assigned value.
Absolute values of calculated E_n numbers are compared to the critical value of 1,0 as follows:

if	$\|E_n\| < 1{,}0$	result is regarded as **SATISFACTORY** (i.e. **no actions are needed**);
if	$\|E_n\| \geq 1{,}0$	result is regarded as **UNSATISFACTORY** (i.e. giving an **action signal**).

Increasing the measurement uncertainty of the proficiency testing result by participant in order to obtain satisfactory E_n numbers ($|E_n| \leq 1{,}0$) is limited by the principles outlined in ILAC-G8:09/2019 guide: if the expanded uncertainty of the measurement result exceeds the tolerance limit (in this case, limits of unsatisfactory z- or z'-scores), risk of compliance assessment is increased.

This requirement can be easily checked visually on plot charts of results where reported values and their associated expanded uncertainties are presented together with, among others, unsatisfactory z- or z'-score limits.

9.1. Sampling proficiency testing

Within the framework of the sampling proficiency testing schemes, Participants perform the sampling activities using their own equipment and in accordance with their internal procedures, and—where relevant—carry out the on-site measurements as well. The laboratory analyses are performed by a designated common laboratory, in a single measurement series, within a short timeframe.

All measurement results generated during the process form the basis of the evaluation, including both on-site and laboratory measurements.

The detailed evaluation methodology is provided in Annex III. This document is made available to Participants by the Provider after the establishment of the contractual relationship and following the acceptance of the confidentiality obligations set out in the document titled "General Protocol 2026".

For **microbiological parameters**—particularly colony count–type results—the evaluation is always performed on the **log10-transformed data**. The following statistical characteristics are determined using the transformed values:

- mean,
- standard deviation,
- median,
- robust mean (ISO 13528),
- robust standard deviation (ISO 13528).

When determining the target standard deviation, the Provider primarily follows recommendations from international scientific literature and professional guidelines. For microbiological proficiency testing, considering the Eurachem expert recommendations, the target standard deviation for log10-transformed values is set within the range of **0.22–0.50 log**. If justified by the characteristics of the parameter or the dispersion of the data, the Provider may also apply the **Horwitz-based target standard deviation**, in accordance with the permissible methods specified in ISO 13528:2022.

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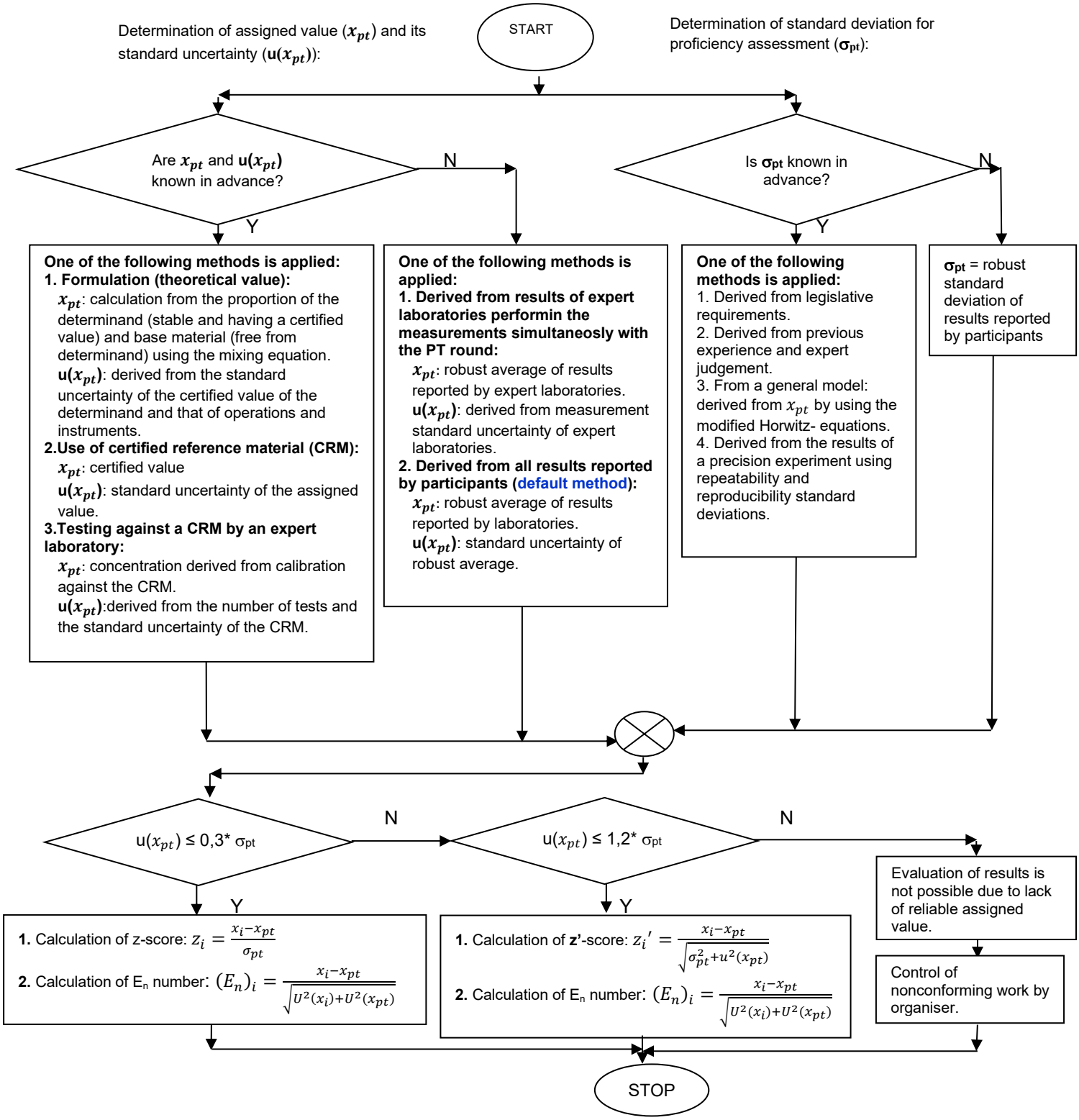
Figure I. Flowchart showing evaluation methods in laboratory proficiency testing.



10. Publication of proficiency testing results evaluation

For laboratory proficiency testing schemes, the Provider publishes the preliminary evaluations (preliminary results) and the final reports in electronic format according to the following planned schedule:

- **Preliminary results:** within 21 days after the submission deadline,
- **Final report:** no later than 35 days after the submission deadline.

For sampling proficiency testing schemes, the Provider undertakes the following planned publication deadlines:

- **Preliminary results:** within 45 days after sampling,
- **Final report:** no later than 60 days after sampling.

If the Provider is unable to meet the committed deadlines due to unforeseen circumstances, all Participants will be informed without delay.

Participants may view and download the results using the unique username and password provided in the order confirmation, via the Provider's website (www.qualcoduna.hu).

Paper copies of the reports are sent by post **only upon special request** and **only after the advance payment of the associated costs**. Information regarding the fees applicable to specific reports is available upon request through the Provider's contact channels.

11. Certificates of Attendance

Upon completion of the proficiency testing programme, Participants receive a **Certificate of Attendance**, which is valid only together with its associated annexes.

For each matrix, the Provider summarises and displays on the Certificate of Participation the number of test results submitted and evaluated by the Participant, as well as the number and percentage distribution of results classified—**based on the z- or z'-scores**—as:

- "satisfactory",
- "questionable", and
- "unsatisfactory (requiring intervention)".

Based on the **E_n numbers**, the Certificate also includes the number and percentage of results classified as:

- "satisfactory",
- "unsatisfactory", and
- "not evaluated due to missing data".

A result is considered to have "**missing data**" if the Participant did not report the expanded measurement uncertainty corresponding to the test result.

The **Annex to the Certificate of Participation** includes, broken down by matrix:

- the parameters announced in the programme,
- the proficiency testing results submitted by the Participant and their expanded uncertainties,
- the assigned values and their standard uncertainties,

- the **standard deviation for proficiency assessment (σ_pt)** applied for performance evaluation,
- the deviation between the proficiency testing result and the assigned value, and
- the calculated performance statistics (z- or z'-score, E_n number).

A notation of **"not evaluated" (N.E.)** appears next to the performance statistics (z- or z'-score and E_n number) if the parameter concerned was not evaluated, for example:

- the number of Participants was insufficient, or
- the uncertainty of the assigned value was too large in relation to the standard deviation for proficiency assessment.

The notation **"not evaluated" (N.E.)** is also displayed for z- or z'-scores and En numbers if the Participant reported the result in "<" or ">" format.

If the Participant did not report the expanded measurement uncertainty of the proficiency testing result, the En classification will contain the notation **"N.A." (no data available)**.

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