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Water quality — Sampling —

Part 24: Guidance on the auditing of water quality sampling

Qualité de l'eau — Échantillonnage —

Partie 24: Lignes directrices pour l'audit de l'échantillonnage de la qualité de l'eau

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 147, *Water quality*, Subcommittee SC 6, *Sampling (general methods)*.

ISO 5667 consists of the following parts, under the general title *Water quality — Sampling*:

— *Part 1: Guidance on the design of sampling programmes and sampling techniques*

— *Part 3: Preservation and handling of water samples*

— *Part 4: Guidance on sampling from lakes, natural and man-made*

— *Part 5: Guidance on sampling of drinking water from treatment works and piped distribution systems*

— *Part 6: Guidance on sampling of rivers and streams*

— *Part 7: Guidance on sampling of water and steam in boiler plants*

— *Part 8: Guidance on the sampling of wet deposition*

— *Part 9: Guidance on sampling from marine waters*

— *Part 10: Guidance on sampling of waste waters*

— *Part 11: Guidance on sampling of groundwaters*

— *Part 12: Guidance on sampling of bottom sediments*

— *Part 13: Guidance on sampling of sludges*

— *Part 14: Guidance on quality assurance and quality control of environmental water sampling and handling*

— *Part 15: Guidance on the preservation and handling of sludge and sediment samples*

— *Part 16: Guidance on biotesting of samples*

— *Part 17: Guidance on sampling of bulk suspended solids*

— *Part 19: Guidance on sampling of marine sediments*

— *Part 20: Guidance on the use of sampling data for decision making — Compliance with thresholds and classification systems*

— *Part 21: Guidance on sampling of drinking water distributed by tankers or means other than distribution pipes*

— *Part 22: Guidance on the design and installation of groundwater monitoring points*

— *Part 23: Guidance on passive sampling in surface water*

— *Part 24: Guidance on the auditing of water quality sampling*

Introduction

The sampling and analysis of drinking water supplies is one of the key elements in the protection of public health. Environmental sampling from rivers and other surface waters; sampling of discharges such as treated sewage effluents and trade discharges; and sampling of water used for non-potable purposes can also have a significant impact on public health, occupational hygiene and asset durability.

One of the major sources of error in gathering water quality monitoring data can be the sampling process. Poor sampling practices create problems for those interpreting results and can lead to costly and incorrect decisions. Failure to manage factors such as *Cryptosporidium* levels in drinking water, pneumonia caused by Legionella and heating system corrosion are examples of where failures of quality control/assurance in the sampling process can lead to expensive and potentially life-threatening consequences.

Auditing of water quality sampling identifies both positive and negative attributes of the management chain. Thus, the goal of a sampling audit is to emphasize the effectiveness of "best practice" and to build up a knowledge base to allow its dissemination within the organization.

No audit is ever intended to cover every aspect of water quality sampling and it is advisable to adopt a risk-based approach to designing the audit programme to ensure that high-risk issues are covered more frequently, and in greater depth, than low-risk issues. For example, it is essential that all high-level documentation, which covers sampling policy and strategy, training policy and health and safety policy, is checked during the first audit, along with its implementation on the ground. Where implementation documents are also produced at a high-level (sampling manuals, training manuals, etc.) they might be regarded as high-level documents for the purpose of designing the audit programme. Providing there are no issues arising, this documentation would only need detailed checking on subsequent audits if any changes have been made during the interim. However, it would still be prudent to check that any issues identified during the initial audit have been addressed satisfactorily; that any other changes are appropriate; and that the circumstances of sampling have not changed in such a way that a revision of these high-level documents is needed.

Larger organizations might wish to either audit fully high-level documentation at regular interims (e.g. every four years) or to audit different parts of the documentation on a rolling programme. They might also wish to consider a regular programme of auditing the dissemination of changes to high-level documentation as these could take time to work their way down to the sampling practitioners/operatives and their managers, especially where there is a large geographical spread and sampling is not the main function. This is rarely a problem in small organizations where the person responsible for writing the high-level documents is usually also responsible for managing, if not carrying out, the sampling.

Risks of nonconformity at sampling locations can vary markedly, and the frequency and extent of each audit needs to reflect this. Some organizations sample only in very closely controlled environments, where purpose-built sampling taps are provided. Here the risk of nonconformity is very low, but, at the same time, a very high degree of conformity can be expected. Other organizations take samples in environments which vary and which are often far from ideal, making compromise necessary. The audit might identify a number of risks of nonconformity with the documented procedures, but allowances have to be made for any guidance given to the sampling practitioner/operative and the process by which a satisfactory compromise is reached and recorded.

The key point in designing an audit programme is to ensure that the effort spent on auditing is proportional to the risk and the size of the organization. The programme is therefore refined in the light of experience.

Water quality — Sampling —

Part 24: Guidance on the auditing of water quality sampling

IMPORTANT — It has been assumed in the preparation of this International Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

1 Scope

This part of ISO 5667 provides an audit protocol to monitor conformity with declared, or assumed, practices in all areas of water quality sampling. Specifically, this part of ISO 5667 provides guidance on the systematic assessment of sampling practices and procedures in the field, and assessing conformity with those given in the organization's sampling manual. It is applicable to the audit of sampling activities from the development of a sampling manual through to the delivery of samples to the laboratory.

NOTE 1 The design of the sampling manual is the prerogative of the data user and this part of ISO 5667 is not intended to deliver criticism of a manual's structure.

This part of ISO 5667 is applicable to sampling practices associated with wastewaters, including discharges to water bodies, environmental monitoring, potable water supplies from source to tap, commercial and industrial uses of water, and power generation.

This part of ISO 5667 is applicable to the auditing of sampling practices relevant to the management of water stored in containers, such as temporary supply tanks and bottled supplies. However, it is not applicable for the auditing (or calibration and maintenance) of on-site test equipment or kits.

NOTE 2 BS 1427 covers water test kits used "in the field".

The following sampling occasions are excluded from both the field- and desk-audit procedures set out in this part of ISO 5667:

a) chemical and microbiological incidents, which are investigated by agencies such as the emergency services, e.g. where an immediate risk to the health of the sampling practitioner/operative is evident;

b) radiochemical sampling of water quality, other than that specified as a routine requirement under the UK Water Supply (Water Quality) Regulations,[9][10][11][12] i.e. radiochemical incidents which are investigated by agencies such as the emergency services.

Informative Annex A contains a series of forms to assist with auditing. These are for guidance only. Informative Annex B gives procedures for monitoring temperature control, while Informative Annex C provides guidance on measuring the uncertainty associated with sampling practices.

2 Normative references

There are no normative references cited in the document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.