



International
Water Association

THE BONN CHARTER FOR SAFE DRINKING WATER

September 2004

A decorative graphic at the bottom of the page consisting of several overlapping, wavy bands in shades of blue and white, creating a sense of movement and water.



ACKNOWLEDGMENTS

The Bonn Charter for Safe Drinking Water has been developed through the efforts of a large group of experts across many disciplines. It is not possible to list them individually, but they are thanked for their efforts and insights. Particular mention must also be made of the organisations listed below, each of which contributed resources to the development of the Charter¹. They are sincerely thanked for their support:

- The American Water Works Association ^(USA)
- The Awwa Research Foundation ^(USA)
- The Cooperative Research Centre for Water Quality and Treatment ^(Australia)
- Deutsche Vereinigung des Gas-und Wasserfaches e.V.
Technisch-wissenschaftlicher Verein ^(Deutschland)
(The German Technical and Scientific Association for Gas and Water) ^(Germany)
- The Drinking Water Inspectorate ^(England and Wales)
- UK Water Industry Research ^(UK)
- United States Environmental Protection Agency ^(USA)
- Water Services Association of Australia ^(Australia)

¹ *Contribution of resources does not necessarily imply that the organisations referred to endorse the Charter.*

TIDTJAM & PWML



LETTER OF INTRODUCTION

The reliable supply of good safe drinking water is fundamental to a healthy community and to its economic development. Establishment of an effective management framework to achieve this goal is therefore of critical importance.

The Bonn Charter for Safe Drinking Water provides a high-level framework describing the operational and institutional arrangements that are basic requirements for managing water supplies from catchment to consumer.

Having been developed by senior industry professionals from regulatory authorities, the water industry, members' associations and research institutions, the Charter is broad in scope and will be of value to all those responsible for provision of good, safe drinking water, taking into account local circumstances.

The Charter will be accompanied by an implementation guide containing further advice, case-studies, links and other information to help guide implementation of the Charter in the jurisdictions adopting it.

The World Health Organisation (WHO) recognises the need for such a management framework and has released the 3rd edition of its Drinking Water Quality Guidelines. Among other things, the Guidelines establish the concept of a framework for safe drinking water, comprising health-based standards, water safety plans and independent regulation. The WHO Guidelines and the Bonn Charter are interrelated and complementary documents.

It is hoped that implementation of the Bonn Charter and adoption of the processes set out in the WHO Guidelines will provide greater surety in the provision of drinking water, which, I believe, will cover the spectra between well-established and developing systems, both large and small.

I commend the Bonn Charter for Safe Drinking Water to you.



Michael Rouse
President
International Water Association





TABLE OF CONTENTS

LETTER OF INTRODUCTION	3
TABLE OF CONTENTS	5
1. INTRODUCTION	6
2. CONSUMER OUTCOMES	8
3. KEY PRINCIPLES	9
4. DIAGRAMMATIC REPRESENTATION	10
5. ROLES AND RESPONSIBILITIES	11
6. DRINKING WATER SAFETY PLANS	13
Box 1 - Water Safety Plans as described in the WHO Guidelines	14
7. VERIFICATION OF DRINKING WATER QUALITY	15
Box 2 - Setting and Verifying Drinking Water Quality Standards	16
8. CONCLUSION	17

1. INTRODUCTION

1.1. PURPOSE

The reliable supply of good, safe drinking water is fundamental to a healthy community and to its economic development.

Its delivery requires a comprehensive understanding of contamination risks and effective control of those risks. It also requires that robust quality standards be in place and that systems be implemented to verify that safe water is produced. Systems established should be transparent. The provision of safe drinking water demands the participation of all stakeholders.

This Charter provides a framework for establishment of such systems including assessment and mitigation of risks at all points in the supply system – from catchment² to consumer – and performance verification based on predetermined standards and controls. It also provides guidance as to the institutional roles that should be established and the benefits to be achieved through close cooperation.

The Charter is offered as a framework that could be applied universally by appropriate organisations as a basis for reliably achieving good, safe drinking water supplies. Wherever it is adopted, local circumstances will affect the approaches ultimately taken and the pace of implementation.

1.2. THE GOAL

The Goal of the Bonn Charter is:

“Good safe drinking water that has the trust of consumers”.

1.3. WHO IS THE CHARTER FOR?

The Charter has been prepared for all those collectively contributing to the provision of safe drinking water from catchment to consumer recognising the different roles of different parties. Given their responsibility for delivery of safe, reliable drinking water, the Charter recognises the pivotal role of water suppliers for managing those aspects of water supplies within their control.

² *The concept of water resources in this document refers to raw water collection, whether from surface sources, groundwater, the sea or other brackish sources.*

1.4. HOW SHOULD THE CHARTER BE USED?

The Charter sets out the principles of an effective drinking water quality management framework and the responsibilities of key parties. It is therefore a basis for designing management and operational systems to ensure a high standard of performance by all. Independent third party assessment is seen as an important aspect of the Charter.

1.5. IMPETUS FOR DEVELOPMENT OF THE CHARTER

There has been a growing consensus among water professionals about the need for a more consistent framework to be developed within which the quality of drinking water can be assured. These discussions have been given impetus by the World Health Organisation's development of the 3rd Edition of its *Guidelines for Drinking Water Quality* that place greater emphasis on proactive risk-based management of drinking water supplies, complementing end-product monitoring of compliance against quality standards³.

Accordingly, a generic framework for the effective management of water quality was developed at an invited workshop of senior water industry professionals in Bonn in October 2001 and refined at a second workshop in February 2004.

The Bonn Charter for Safe Drinking Water is the outcome of those discussions. An Implementation Guide – also linked with the WHO Guidelines – will be developed.

³*The World Health Organisation has produced Guidelines for Drinking Water Quality (3rd Edition) that specifies, among other things:*

- *The process by which drinking water quality standards should be set;*
- *The process through which Drinking Water Safety Plans are developed; and*
- *The need for independent regulation.*

This Charter complements the WHO Guidelines. Updates in those Guidelines should be taken as updating this Charter in as much as the Charter refers to the Guidelines.

2. CONSUMER OUTCOMES

The primary beneficiary of this Charter is the community being served through its water supply system. There are a number of fundamental objectives for which all those involved in the supply of drinking water should strive:

- 2.1.** Access to good, safe, and reliable drinking water. This is one of the most basic needs of human society. In many areas water quality may already be high and continuing to improve. In others, where waterborne disease or other quality deficiencies are still prevalent, the basic provision of safe and good supplies is vital;
- 2.2.** Water that is not just safe to drink but considered of good aesthetic quality by consumers; and
- 2.3.** Water supplies in which consumers have confidence.



3. KEY PRINCIPLES

This Charter is based on the identification of key principles considered essential in creating a management framework for the reliable provision of good, safe drinking water. Each of these is considered fundamental; each needs to be addressed:

- 3.1.** Management of the whole water supply chain should always be set in the context of management of the whole water cycle, including, but not limited to:
 - Management of water resource provision, including, where necessary resource augmentation;
 - Management of water and land interactions, taking into account agricultural practices and urban development; and
 - The collection and treatment of wastewater.
- 3.2.** Systems to ensure drinking water quality should not be based solely on end-of-pipe verification (testing against predetermined standards). Rather, management control systems should be implemented to assess risks at all points throughout water supply systems and to manage such risks.
- 3.3.** Such an integrated approach requires close co-operation and partnership between all stakeholders including governments, independent regulatory authorities, water suppliers, local public authorities, health agencies, environmental agencies, land users, contractors, plumbers and manufacturers of relevant materials and products, and consumers themselves.
- 3.4.** Open, transparent and honest communication between all stakeholders is essential to developing trust. It contributes to the development of effective water supply systems.
- 3.5.** The roles and responsibilities of the different institutions contributing to the delivery of safe and reliable drinking water need to be clearly defined and ensure complete coverage of the system from catchment to consumer. Governments should establish the legal and institutional arrangements necessary to assign appropriate responsibilities among the various parties.
- 3.6.** The way in which decisions are made relating to standards for the quality and reliability⁴ of water supplies should be transparent.
- 3.7.** Water should be safe, reliable and aesthetically acceptable. In progressively realising the goals, however, the standards applied may legitimately vary from location to location and over time.
- 3.8.** The price of water should be set so that it does not prevent consumers from obtaining water of sufficient quantity and quality to meet fundamental domestic needs⁵.
- 3.9.** Any system for assuring drinking water quality should:
 - 3.9.1.** Be based on the best available scientific evidence; and
 - 3.9.2.** Be sufficiently flexible to take account of the different legal, institutional, cultural and socio-economic situations of different countries;

⁴ The term 'reliability' refers to both the quality of the water supplied, and the dependability of supplies.

⁵ This clause specifically does not suggest how such a price should be set nor should it be taken to mean that those capable of paying the full cost-reflective price should not do so. Rather, it means the most economically disadvantaged should not be excluded from access to water because they cannot afford it. Prices for the economically disadvantaged can be kept at an appropriate level through a range of mechanisms, including transparent cross-subsidies or social subsidies from government. The way which price is set is a matter for governments or the regulatory authorities which they have delegated authority as is determination of the groups in society eligible to benefit from such subsidies.

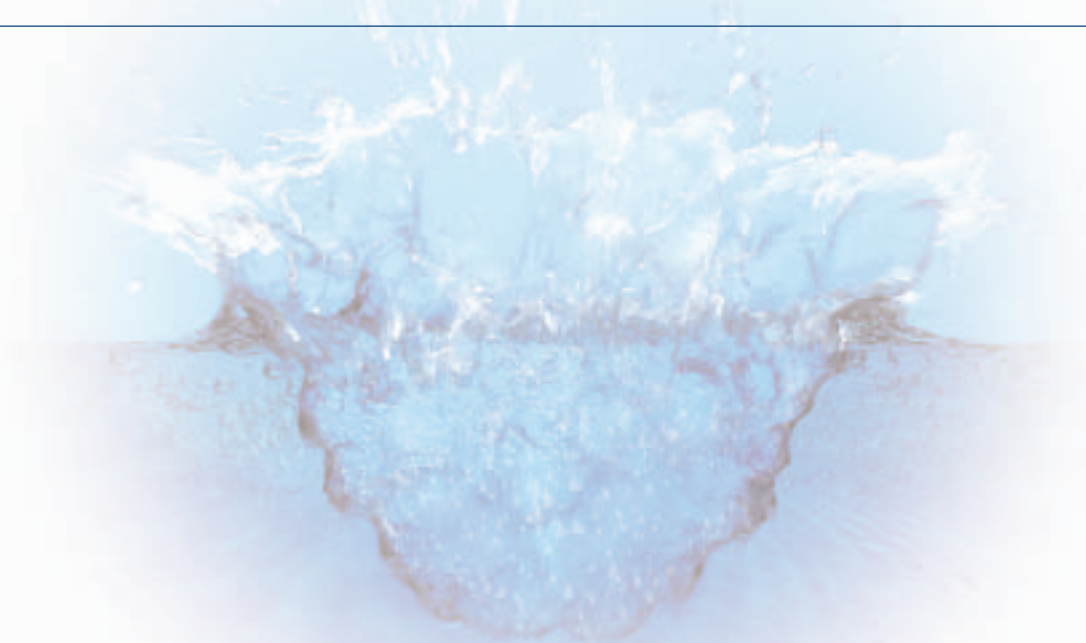
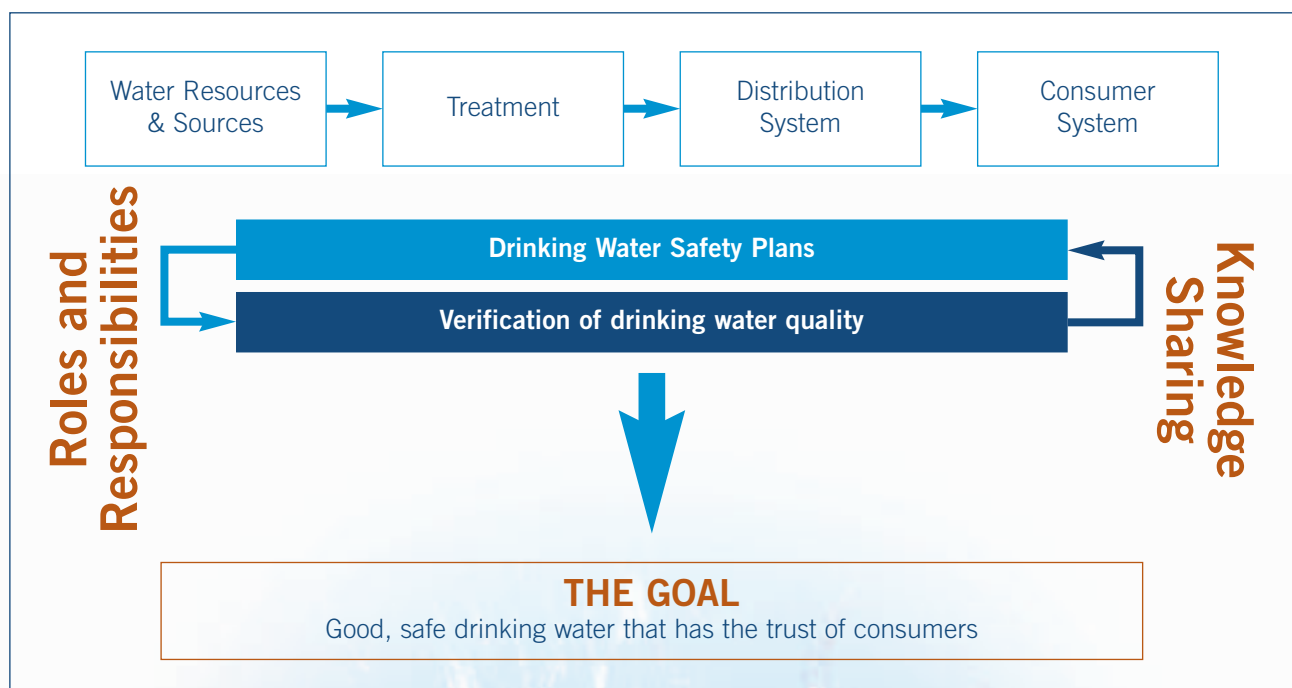
4. DIAGRAMMATIC REPRESENTATION

This Charter proposes a Framework for the delivery of safe and reliable drinking water, incorporating:

- Development of drinking water safety plans to assess risk throughout water supply systems and mitigate these risks; and
- Measurement of drinking water quality against relevant standards.

To be effective, these systems need to exist within an appropriate framework in which roles and responsibilities are clear and where the flow of key information between stakeholders is assured.

These relationships are represented below.



5. ROLES AND RESPONSIBILITIES

An effective water quality management system involves all stakeholders, albeit playing different roles.

5.1. WHAT SHOULD GOVERNMENTS DO?

Governments are responsible for establishing the legal and institutional framework to ensure delivery of safe and reliable drinking water. To establish such a framework Governments will need to:

- 5.1.1.** Create independent system(s) of co-ordinated water quality regulation that are credible and proportionate;
- 5.1.2.** Take action to protect raw drinking water resources;
- 5.1.3.** Ensure that institutions and coordination arrangements exist to address water quality risks that may occur from the catchment to the tap;
- 5.1.4.** Ensure that these institutions are able to secure sufficient resources to undertake their responsibilities. This would include the creation of mechanisms for funding the installation and ongoing maintenance of water collection, treatment and distribution⁶ infrastructure;
- 5.1.5.** Ensure that verification of procedures and water quality outcomes are undertaken with sufficient frequency and that the results are publicly available and transparent;
- 5.1.6.** Establish general accounting policies that ensure water suppliers maintain adequate and auditable accounts; and
- 5.1.7.** Establish social policies to ensure all members of society can obtain the services that should be the right of every citizen.

5.2. WHAT SHOULD WATER SUPPLIERS⁷ DO?

Water suppliers play a pivotal role in delivering safe and reliable water to consumers. They should:

- 5.2.1.** In conjunction with partners, develop and implement drinking water safety plans, covering catchment to consumer, and regularly verify their implementation and effectiveness using appropriate operational controls and monitoring;
- 5.2.2.** Put in place systems for testing the quality of water supplied including those necessary to meet regulatory requirements and make the compliance results available to the public;

⁶ In the Bonn Charter the term 'distribution system' should be taken to mean those systems used to deliver water to consumers whether through pipes, tankers or other means.

⁷ The term 'Water Suppliers' should be taken to include public and private suppliers, including local public authorities.

-
- 5.2.3.** Ensure that the full cost of service provision is identified (including the maintenance and replacement of assets) and that appropriate investments are made in the provision of water services, in line with Government established frameworks for financing;
 - 5.2.4.** Ensure staff with sufficient skills and training are available to those involved in the management of each element of the quality process from catchment to consumer; and
 - 5.2.5.** Maintain adequate and auditable accounts in line with government requirements.

5.3. WHAT SHOULD REGULATORY AUTHORITIES DO?

Independent and credible water regulation is vital to building consumer confidence in the safety and reliability of supplies. (Note that these functions do not need to be the responsibility of just one authority; multiple authorities could be established to fulfil these roles).

Regulatory Authorities should:

- 5.3.1.** Establish a regulatory regime that incorporates health and reliability standards for drinking water supplies based on best available scientific evidence and consumer requirements;
- 5.3.2.** Ensure that the process of setting quality- and health-related standards is transparent and the choices made with regard to the level of risk considered appropriate fully disclosed;
- 5.3.3.** Establish verification systems to assess compliance with drinking water quality standards, drinking water safety plans, and to ensure that the results of water quality testing are valid; and
- 5.3.4.** Ensure there is full reporting of compliance results and problems in a way that can be understood by all.

5.4. WHAT SHOULD CONSUMERS DO?

- 5.4.1.** Operate and maintain the water systems in houses in a manner consistent with the maintenance of good water quality. Among other things, this requires the use of appropriate materials⁸; and
- 5.4.2.** Be good citizens by ensuring that their behaviour minimises the potential for contamination of water sources to occur or for supply quality or reliability to be diminished.

5.5. WHAT SHOULD ALL PARTIES DO?

- 5.5.1.** Share information pertaining to the achievement and maintenance of drinking water quality through open dialogue.

⁸ *The system the consumer should be responsible for is that which is used to provide water to a household beyond the point of delivery from the water supplier or vendor.*

6. DRINKING WATER SAFETY PLANS

A Drinking Water Safety Plan, as described in the WHO Guidelines, is a documented plan (or a number of plans ⁹) that identifies credible risks from catchment to consumer, prioritises those risks and puts in place controls to mitigate them. It also requires processes to verify the effectiveness of the management control systems put in place and the quality of the water produced.

There are 3 key stages that underpin effective Drinking Water Safety Plans:

- 6.1.** A system wide assessment of risks from catchment to consumers' taps;
- 6.2.** Identification and monitoring of the most effective control points to reduce identified risks; and
- 6.3.** Development of effective management control systems and operational plans to deal with both routine and abnormal operating conditions. Recognition must be given to the potential for serious events to occur and provision made for management of these events.

Assessment of the efficacy of the management control systems is also essential. Necessary elements include:

- 6.4.** Development of effective measures to assess the effectiveness of the controls that have been put in place and their incorporation within the plan; and
- 6.5.** Independent third party verification of the effectiveness of the control systems. The purpose of such verification is to provide confidence that the systems are effective. Irrespective of how such verification is achieved, it should not conflict with the direct management responsibility of water suppliers and others.

Furthermore:

- 6.6.** Management control systems should include:
 - A definition of responsibilities;
 - Documented procedures; and
 - A training plan to ensure appropriate skills are available among all key operational and other staff.
- 6.7.** Management control systems should be appropriate to the size and complexity of the water supply system. For smaller supply systems the use of a more generic package or tool kit may be appropriate.

⁹ There may be a single plan for a water supply system or multiple, integrated plans where various players have different responsibilities (e.g. there could be one plan for a catchment area, and another for the distribution system). Regardless of the approach taken, it is essential that ownership of the plan(s) is clear and responsibilities allocated appropriately.

BOX 1. WATER SAFETY PLANS AS DESCRIBED IN WHO GUIDELINES

The following is an abstract from WHO Guidelines for Drinking Water Quality (3rd Edition) on development of Drinking Water Safety Plans. It is intended that this Charter and the Guidelines should be in harmony with regard to such plans, and development and verification of water quality standards (see Box 2).

- “Health-based targets based on an evaluation of health concerns;
- System assessment to determine whether the drinking-water supply (from source through treatment to the point of consumption) as a whole can deliver water of a quality that meets the health-based targets;
- Operational monitoring of the control measures in the drinking-water supply that are of particular importance in securing drinking-water safety;
- Management plans documenting the system assessment and monitoring plans and describing actions to be taken in normal operation and incident conditions, including upgrade and improvement, documentation and communication; and
- A system of independent surveillance that verifies that the above are operating properly.”

7. VERIFICATION OF DRINKING WATER QUALITY

In line with the principle of giving greater emphasis to the identification and management of risks from the catchment to the consumers' taps, the number of parameters covered by statutory standards can be kept to a minimum. However, where such standards are necessary they need to be rigorously designed and applied.

End product testing should therefore be based on:

- 7.1.** A core set of parameters tailored to meet local needs;
- 7.2.** Suitable indicator microbiological and chemical parameters where scientifically valid; and
- 7.3.** Appropriate monitoring and reporting systems.

The parameters used can be considered in two sets:

- 7.4.** Those which give early warning of failure of the management control plan and indicate an immediate risk to health or other serious quality deterioration. These are largely operational control parameters, such as turbidity, and should be accompanied by operational reaction procedures;
- 7.5.** Those that are concerned with chronic health or other longer term effects.

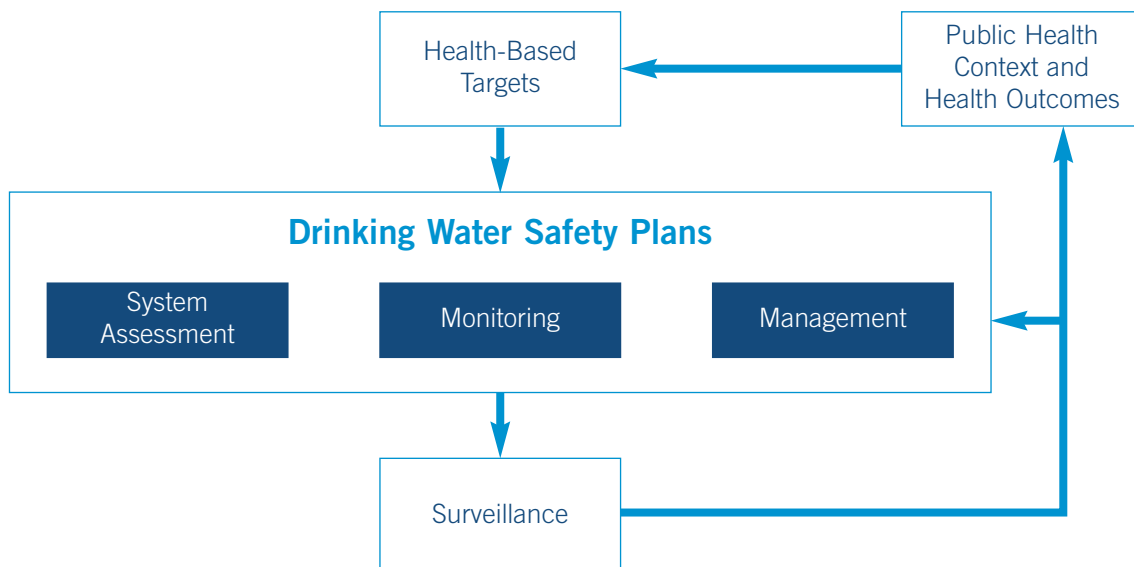
Furthermore:

- 7.6.** The use of operational control parameters is essential to allow operators to monitor the effectiveness of treatment (e.g. chlorine residual to monitor disinfection, and turbidity to monitor the effectiveness of particle removal); and
- 7.7.** Standards should be based on the protection of human health and consumer acceptability.

BOX 2. SETTING AND VERIFYING DRINKING WATER QUALITY STANDARDS

The WHO Guidelines for Drinking Water Quality (3rd Edition) set out a recommended process for determining drinking water quality standards and verifying performance against them. The Guidelines express the approach required as set out below.

Framework for Safe Drinking-Water



“Drinking-water safety is secured by application of a Water Safety Plan (WSP), which includes monitoring the efficiency of control measures using appropriately selected determinants. In addition to this operational monitoring, a final verification of quality is required.

Verification is the use of methods, procedures or tests in addition to those used in operational monitoring to determine if the performance of the drinking-water supply is in compliance with the stated objectives outlined by the Water Quality Targets (WQT) and/or whether the WSP needs modification and revalidation.

For microbial water quality, verification is likely to include microbiological testing. In most cases, it will involve the analysis of faecal indicator micro-organisms, but in some circumstances it may also include assessment of specific pathogen densities. Verification of the microbial quality of drinking-water may be undertaken by the supplier, surveillance agencies or a combination of the two.

Assessment of the adequacy of the chemical quality of drinking-water relies on comparison of the results of water quality analysis with guideline values.

For additives (i.e., chemicals deriving primarily from materials and chemicals used in the production and distribution of drinking-water), emphasis is placed on the direct control of the quality of these products. In controlling drinking-water additives, testing procedures typically assess the contribution of the additive to drinking-water and take account of variations over time in deriving a value that can be compared with the guideline value”.

8. CONCLUSION

In combination with the 3rd edition of the *WHO Drinking Water Quality Guidelines* the Bonn Charter provides a comprehensive approach to the elements required to deliver good, safe drinking water that has the trust of consumers.

Access to good, safe drinking water should be the right of every human. While it is acknowledged that economic conditions, civil unrest, drought and other circumstances limit society's capacity to achieve this objective, the adoption of the objective itself is of fundamental importance.

This Charter, however, goes beyond mere adoption; it sets out elements, the implementation of which are considered fundamental if the objective is to be achieved. Local conditions will, of course, remain important and will affect the shape of the institutions created and other steps taken. Nevertheless, the commitment of all parties to implementing the elements of this Charter and responding to the WHO Guidelines will provide important benefits to the communities served.

To download a copy of the Charter in pdf format, please visit www.iwahq.org.uk/template.cfm?name=bonn_charter

**THE BONN CHARTER
FOR SAFE DRINKING WATER**

September 2004