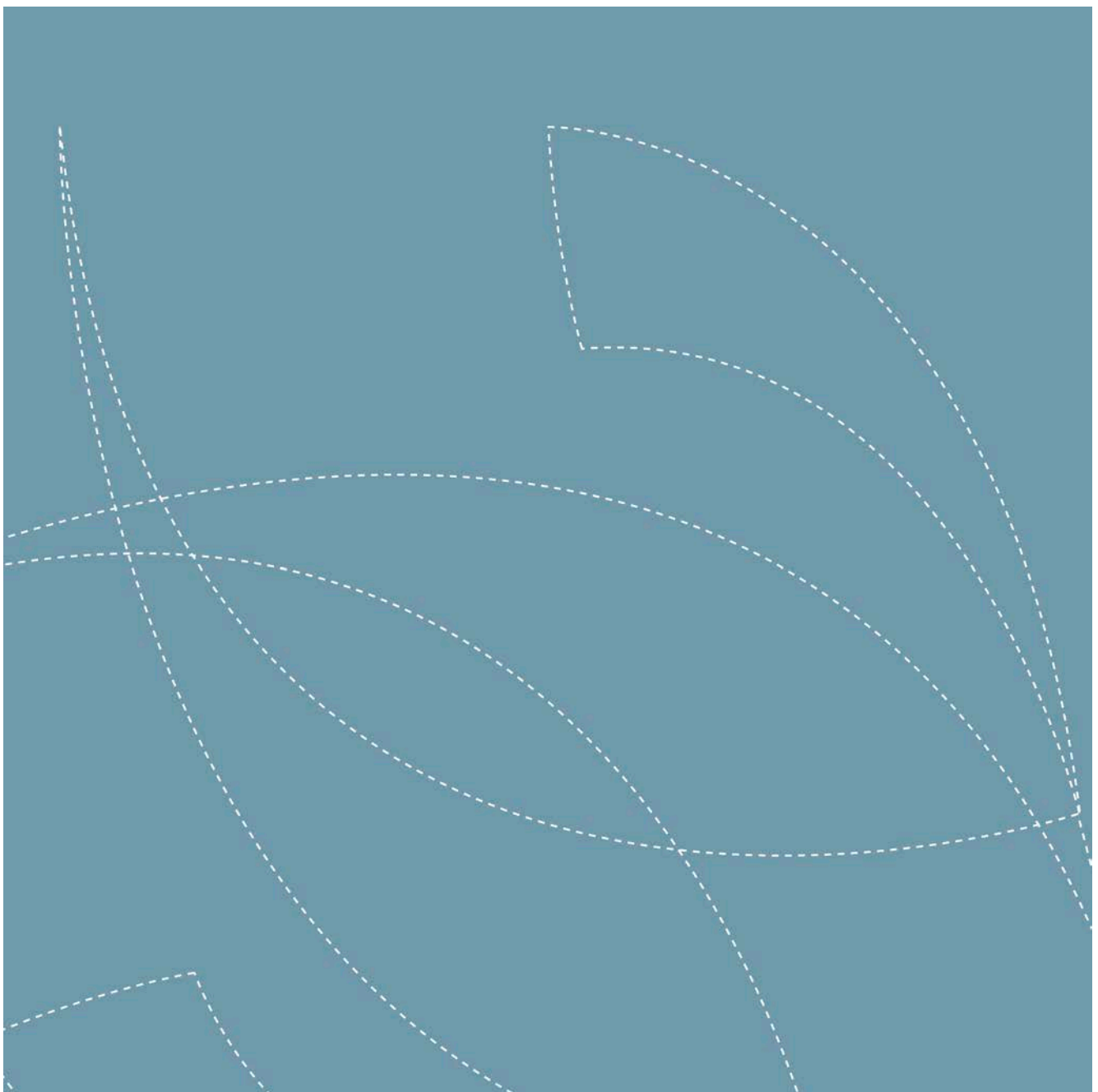


Traceability of mineral water

Specification of the information to be recorded in mineral water distribution chains

Kine Mari Karlsen, Joop van der Roest and Petter Olsen





Nofima is a new industry-oriented research group that conducts research and development for aquaculture, fisheries and food industries.

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Report

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<i>Three keywords:</i> Mineral water, Traceability, Standard		
<i>Summary:</i> This ad-hoc standard has been created as part of the EU project 'Trace the origin of food' (TRACE). TRACE aims to develop generic and sector-specific traceability systems for use in the food industry. This 'ad-hoc standard' forms part of the work undertaken on Mineral Water. This standard is a specification of the information to be recorded in one link, the mineral water bottling plant, in mineral water distribution chains in order to achieve traceability		

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1 Introduction

There are increasing demands for detailed information on the nature and origin of food products. Traceability is becoming a legal and commercial necessity. Transmission of all the required information physically with the products would, in many instances, be impracticable and so the use of information technology is preferable.

The International Standardization Organization (ISO) definition of traceability concerns the ability to trace the history, application and location of that which is under consideration, and for products this can include the origin of materials and parts and processing history (ISO, 1994). Traceability includes not only the principal requirement to be able to physically trace products through the distribution chain, from origin to destination and vice versa, but also to be able to provide information on what they are made of and what has happened to them. These further aspects of traceability are important in relation to food safety, quality and labelling.

This document is an information specification for production of mineral water i.e. what information should be generated and held by the mineral water producer (ad-hoc standard).

The key to the operation of the scheme is the labelling of each unit of goods traded, whether of pre-forms, caps or bottles with mineral water, with a unique ID. This is to be done by the business that creates each unit. Businesses that transform units, such as mineral water producers who convert the units of pre-forms and caps received into the products dispatched, create new units and must give them new IDs.

Each of the businesses that create or physically trade in those units, throughout the distribution chains from pre-form producer or cap producer through to retailer or caterer, are to generate and hold the information necessary for traceability. The information is to be held on computer databases, keyed to the unit IDs.

The information remains in the ownership of the business that generated it, but is available when required by law for the purposes of traceability (in the event of a food safety problem) or by commercial agreement between businesses. The means of communicating the information is standardised so that it can be readily accessed from business to business through the distribution chains, when required.

This is a development beyond the forthcoming EU legal requirement, came into force January 1st 2005 (EC-178/02, 2002; EC-178/02-Guidance, 2004), for each food business to independently record sources of supplies and destinations of foods, but builds on that basis.

Commercial arrangements for businesses to communicate information through the distribution chains are to be encouraged, particularly for the information desired by the trade to be *visible* at the various transaction points in the chains, but that is not the subject of this document.

The method of identifying the units of goods traded is based on the Global Solution One (GS1) system that is already in use throughout the world. The information is keyed to unique IDs given to the individual trade units (e.g. six-packs of mineral water, boxes of mineral water), but the scheme also accommodates trade in logistic units made up of numbers of trade units (e.g. pallets of boxes or six-packs). Businesses that create logistic units have to label them with a logistic unit ID and also record the IDs of the component trade units.

The scheme does not demand perfect traceability, i.e. that a particular retail product should be traceable back to a batch of origin, or vice versa from origin to destination. Pragmatically it is recognised that mixing of units is likely to occur at a number of stages in the distribution chains, e.g. in the production of caps or pre-forms into bottles of mineral water. Where such mixing occurs, the business is transforming the trade units. The requirement for traceability is that the business records the IDs of the received trade units that may be input to each created trade unit, and vice versa. The particular product is then traceable back to a finite number of pre-forms and caps, and vice versa.

The information itemised in the specifications for recording by the food businesses includes:

- the fundamental information necessary to identify and physically trace the products, that shall be recorded;
- specific information that is required by law in relation to food safety, quality and labelling, together with important elements of commercially desirable information related to those matters, that should be recorded;
- and further specific and commercial information considered to be of sufficient relevance to be included in the specifications, that may be recorded.

Given the enormous variety legal requirements of mineral water, the information specifications cannot itemise all the information that may possibly be required in every situation. The specifications provide a generic basis for traceability. Flexibility is allowed for businesses to record further information, in their own non-standardised files, but keyed to the unit IDs.

Although virtually every distribution chain is different, they all appear to be made up of a number of characteristic components or *building blocks*. The types of business identified in this document for mineral water distribution chains are:

- pre-form producers;
- cap producers;
- processors;
- transporters and storage holders ;
- and retailers and caterers.

Any given mineral water distribution chain may be made up of some or all of these components, but not necessarily in the sequence listed.

The information specifications separately tabulate the information to be recorded by each of these types of business. Some businesses may carry out the functions of more than one of the types listed, for example distribution businesses may act as *transporters*, in which case those businesses must record the relevant information requirements for each of the functions carried out.

These specifications will provide a basis for Information Technology (IT) service providers to develop business solutions (applications) for the trade. The information specifications do not preclude the use of paper systems, although the obvious benefits of business efficiency, including rapid communication, will be lost.

Further information on the background to the development of the scheme and on its philosophy is given in informative annexes A and B.

2 Scope

This document specifies the information to be recorded in distribution chains in order to establish the traceability of mineral water. There are other bottled water e.g. artesian well water, spring water and well water, which is not the scope in this ad-hoc standard.

It specifies how mineral water traded are to be identified and the information to be generated and held on those products by each of the businesses that physically trade them through the distribution chains.

It is applicable to the distribution for human consumption of mineral water, from pre-form producers and cap producers through to retailers or caterers.

3 Terms and definitions

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

3.1 Mineral water

The Food and Drug Administration (FDA) defines mineral water as: Water from an underground source that contains at least 250 parts per million total dissolved solids (Posnick and Kim, 2002). Minerals and trace elements must come from the source of the underground water and cannot be added later.

3.2 Traceability

The International Standardization Organization (ISO) defines traceability as (ISO, 2000):

Ability to trace the history, application or location of that which is under consideration

NOTE when considering products traceability can relate to

- the origin of materials and parts
- the processing history

4 Symbols and abbreviations

AI	GS1 system Application Identifier
GS1 system	Unique global identification system
EFSIS	European Food Safety Inspection Service
FDA	The Food and Drug Administration
GLN	GS1 system Global Location Number
GMP	Good Manufacturing Practice.
GTIN	GS1 system Global Trade Item Number.
GTIN+	GTIN plus a further number to uniquely identify each particular trade unit (e.g. the production batch and serial number or the date and time of production).
ID	Identification
ISO	The International Standardization Organization
n2 or n14, etc	GS1 identifier numbers consisting of 2 or 14, etc digits
SGTIN	GS1 system Serial Global Trade Item Number
SSCC	GS1 system Serial Shipping Container Code
UCC	Uniform Code Council

5 Requirements

5.1 The identification of the units traded

Mineral water shall be traded as uniquely identified and labelled units.

Businesses that create trade units shall identify and label each of them with a GTIN+/SGTIN.

Businesses that create logistic units, made up of numbers of separately identified trade units, shall identify and label each logistic unit with a SSCC.

For more explanations of the terms see annex B.

5.2 The recording of information

Businesses that physically trade in mineral water shall generate and hold the required information, appropriate to the type of business, for each of the units traded.

The detailed information requirements are tabulated below as follows:

- for pre-form producers in 5.3;
- for cap producers in 5.4;
- for mineral water producers in 5.5;
- for transporters and storage holders in 5.6;
- for retailers and caterers in 5.7;

Businesses that carry out the functions of more than one of the categories listed above shall record the information relevant to each of the functions carried out.

The data elements tabulated in table 5.3 to table 5.8 categorised as *shall* are considered to be fundamental information necessary to identify and physically trace the products. These elements must be recorded to achieve traceability for mineral water.

The data elements tabulated in table 5.3 to table 5.8 categorised as *should* are specific information required by law in relation to food safety, quality and labelling together with important elements of commercially desirable information related to those matters. It is recommended that these elements are recorded.

The data elements tabulated in table 5.3 to table 5.8 categorised as *may* are further specific information required by law and commercially desirable information, considered to be of sufficient relevance to be included in the document. Businesses may choose to record these elements.

NOTE In these tabulations there is no repetition of the information originally recorded to describe the units created and their history, although businesses receiving those units later in the distribution chain will often need some of that information. The information is keyed to the unit IDs and can be supplied by commercial agreement between the businesses without having to re-input the data.

5.3 Pre-form producers

For the purposes of this document, *pre-form producers* are considered to be the producer of the pre-forms and deliver the pre-forms to the mineral water producer.

Table 1 — Detailed information requirements for pre-form producer.

Data element		Description	Examples	Categorisation		
				Shall	Should	May
PRE-FORMS PRODUCER						
MVPP1	Producer ID	Name and address or GLN of pre-form producer	Humber Ltd., Albert Street, Hull, HU1 7AR, England or n3+n13	x		
MVPP2	Production establishment ID	Name, address and registration number or GLN of production establishment	Humber Pre-forms Ltd., Charles Street, Hull, HU1 7AR, England or n3+n13	x		
FOR EACH TRADE UNIT CREATED						
Identity						
MVPP3	Trade unit ID	GTIN+ (n2+n14+AI's)	(01) 07012345000001 (10) 0000000125	x		
FOR EACH LOGISTIC UNIT CREATED						
Identities						
MVPP4	Logistic unit ID	SSCC	n2+n18	x		
MVPP5	Trade unit Ids	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
MVPP6	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AI's	x		
Destination						
MVPP7	Next business ID	Name and address or GLN of the business to whom the unit is dispatched (transporter)	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
MVPP8	Date and time of dispatch	Date and time of transfer to next business	2008-06-28T04:00	x		

5.4 Cap producers

For the purposes of this document, *cap producers* are considered to be the producer of the caps and deliver the caps to the mineral water producer.

Table 2 — Detailed information requirements for cap producer

Data element	Description	Examples	Categorisation			
			Shall	Should	May	
CAP PRODUCER						
MWCP1	Producer ID	Name and address or GLN of cap producer	The Caps Company, 22 Prince Street, London, SE5 7TK, England or n3+n13	x		
MVCP2	Production establishment ID	Name, address and registration number or GLN of production establishment	Grimsby Cap, Cap Dock Road, Grimsby, GY1 9SE, England. GY789 UK or n3+n13	x		
FOR EACH NEW TRADE UNIT CREATED						
<i>Identity</i>						
MVCP3	Trade unit ID	GTIN+ (n2+n14+AI's)	(01) 07012345000001 (10) 0000000125	x		
FOR EACH LOGISTIC UNIT CREATED						
Identities						
MVCP4	Logistic unit ID	SSCC	n2+n18	x		
MVCP5	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AI's	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
<i>Identity</i>						
MVCP6	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AI's	x		
Destination						
MVCP7	Transporter ID	Name and address or GLN of the transporter to whom the unit is dispatched (transporter)	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
MVCP8	Date and time of dispatch	Date and time of transfer to transporter	2008 06 28, 07:30	x		

5.5 Mineral water producers

For the purposes of this document, *Mineral water producers* are considered to be businesses that produce plastic and/or glass bottles of mineral water. The water comes from a natural source of the underground that contains at least 250 parts per million total dissolved solids. The mineral water producers create new trade units and do not add minerals and trace elements to the bottles of mineral water.

Table 3 — Detailed information requirements for Mineral water producer

Data element		Description	Examples	Categorisation		
				Shall	Should	May
MINERAL WATER PRODUCER						
MWMP1	Mineral water producer ID	Name and address or GLN of mineral water producer that operates processing establishment	The Mineral Water Co, 13 Mineral Water Street, Manchester, MA14 2LP, England or n3+n13	x		
MWMP2	Mineral water producer establishment ID	Name, address and registration number or GLN of processing establishment	The Mineral Water Co, 13 Mineral Water Street, Manchester, MA14 2LP, England or n3+n13	x		
MWMP3	GMP certification	Names of quality or food safety GMP schemes by which Mineral water producer is certified				x
MWMP4	Laboratory certification	Names of laboratory certification				x
FOR WATER RECEIVED						
Source						
MWMP5	Source ID	Name of the source / place		x		
MWMP6	Date and time of reception	Date and time of transfer from source	2008-06-28T08:30	x		
Control checks (related to the date and time of reception)						
MWMP7	Further quality control checks	Records of further quality control checks, each in the form of description of measurement and value, are available in electronic form, on paper or not available	Paper			x
FOR EACH UNIT OF PRE-FORMS RECEIVED						
Identities						
MWMP8	Unit ID	SSCC if received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
MWMP9	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit (if received as a logistic unit)	List of n2+n14+AIs	x		
Source						
MWMP10	Transporter ID	Name and address or GLN of transporter from whom the unit was received	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		

Data element		Description	Examples	Categorisation		
				Shall	Should	May
MWMP11	Date and time of reception	Date and time of transfer from transporter	2008-06-28T08:30	x		
Control checks (related to the logistic or separate trade units, as appropriate)						
MWMP12	Further quality control checks	Records of further quality control checks, each in the form of description of measurement and value, are available in electronic form, on paper or not available	Paper			x
Transformation information (for each trade unit)						
MWMP13	Related created trade unit IDs	List of the GTIN+s of the created trade units that may incorporate part of the received trade unit	List of n2+n14+Ais	x		
FOR EACH UNIT OF CAPS RECEIVED						
Identities						
MWMP14	Unit ID	SSCC if received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
MWMP15	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit (if received as a logistic unit)	List of n2+n14+Ais	x		
Source						
MWMP16	Transporter ID	Name and address or GLN of transporter from whom the unit was received	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
MWMP17	Date and time of reception	Date and time of transfer from transporter	2008-06-28T08:30	x		
Control checks (related to the logistic or separate trade units, as appropriate)						
MWMP18	Further quality control checks	Records of further quality control checks, each in the form of description of measurement and value, are available in electronic form, on paper or not available	Paper			x
Transformation information (for each trade unit)						
MWMP19	Related created trade unit IDs	List of the GTIN+s of the created trade units that may incorporate part of the received trade unit	List of n2+n14+Ais	x		
FOR EACH TRADE UNIT CREATED						
<i>Identity</i>						
MWMP20	Trade unit ID	GTIN+ (n2+n14+AI's)	(01) 07012345000001 (10) 0000000125	x		
<i>Description</i>						
MWMP21	Type of unit	Description of physical type of unit (six-pack, box of mineral water)	Six-pack	x		
MWMP22	Litre	Litre of product (l)	9 litre à 1,5 litre	x		
MWMP23	Name/type of product	Descriptive name of product (mineral water)	Mineral water	x		

Data element		Description	Examples	Categorisation		
				Shall	Should	May
MWMP24	Product specification	Records of further details of product specification (quality and size grades, etc) are available in electronic form, on paper or not available	Paper			x
MWMP25	Composition	List of names of minerals and %	Sulphate Calcium Lead	x		
MWMP26	Date of durability	Best before or sell by date, as appropriate	Sell by 2008-06-30		x	
Production history						
MWMP27	Process specification	Records of process specification are available in electronic form, on paper or not available	Paper			X
MWMP28	Production line IDs	The business's own IDs of the particular production lines used	F3, P4			X
MWMP29	Date and time of production	Time of packing/labelling at end of line	2008-06-28T11:30:46		x	
MWMP30	HACCP	Records of HACCP analysis and critical control point checks are available in electronic form, on paper or not available	Paper			X
MWMP31	Hygiene checks	Records of hygiene checks (date and testes) are available in electronic form, on paper or not available	Date: 2008-06-24 Paper			X
MWMP32	Total plate counts	Incl. micro organisms causing decay (Clostridia) and indicator organisms (coli form bacteria, Pseudomonas). For information about the standardized analytical method see annex C.				X
MWMP33	Coli form	For information about the standardized analytical method see annex C.				X
MWMP34	Escherichia coli	For information about the standardized analytical method see annex C.				X
MWMP35	Streptococcus	For information about the standardized analytical method see annex C.				X
MWMP36	Pseudoeques serugiuose	For information about the standardized analytical method see annex C.				X
MWMP37	Clostridium sulphite-reduct.	For information about the standardized analytical method see annex C.				X
MWMP38	Aerobic bacteria	For information about the standardized analytical method see annex C.				X
MWMP39	Detection of pathogenic microbes	Giardia and Crypto-sporidium.				
MWMP40	Microscopic analysis					
MWMP41	Inhibitor tests					
MWMP42	Sterility tests					
MWMP43	Hygiene checks by sampling					
MWMP44	Measurement of airborne microbes					

Data element		Description	Examples	Categorisation		
				Shall	Should	May
MWMP45	Product quality control check	Records of product quality control checks (date and water analysis; pH), each in the form of description of measurement and value, are available in electronic form, on paper or not available.	Date: 2008-06-23 Paper			x
MWMP46	Conductivity	Also salinity.				
MWMP47	pH					x
MWMP48	Colour of water					x
MWMP49	Taste and odour					x
MWMP50	Turbidity					x
MWMP51	Nutrients					
MWMP53	Dissolved metals	For information about the standardized analytical method see annex C.				x
MWMP54	Dissolved organics					x
MWMP55	Nor virus	For information about the standardized analytical method see annex C.				
MWMP56	Acryl amide	For information about the standardized analytical method see annex C.				x
MWMP57	Asbestos					x
MWMP58	Phthalates	For information about the standardized analytical method see annex C.				x
MWMP59	Fluoride	For information about the standardized analytical method see annex C page 23.				x
MWMP60	Arsenic	For information about the standardized analytical method see annex C.				x
MWMP61	Nitrate	For information about the standardized analytical method see annex C.				x
MWMP62	Radioactive substances	Rd-226. For information about the standardized analytical method see annex C.				
MWMP63	Herbicides	For information about the standardized analytical method see annex C.				x
MWMP64	Insecticides					
MWMP65	Antioxidants	For information about the standardized analytical method see annex C.				x
MWMP66	Bromine (halogen)	For information about the standardized analytical method see annex C.				
MWMP67	Chromium (transition metal)	For information about the standardized analytical method see annex C.				
MWMP68	Barium, Strontium (alkaline metal)	For information about the standardized analytical method see annex C.				
MWMP69	Isotopes	For information about the standardized analytical method see annex C.				
MWMP70	CO ₂					x
MWMP71	Water treatment	Records of water treatments (date and type; carbon filtration, softening, deionization etc), are available in electronic form, on paper or not available	Date: 2008-06-23 Carbon filtration Paper			x
Transformation information						
MWMP72	Related received trade unit IDs	List of the GTIN+s of the received trade units that may be input to the created trade unit	List of n2+n14+Als	x		

Data element	Description	Examples	Categorisation			
			Shall	Should	May	
FOR EACH LOGISTIC UNIT CREATED						
Identities						
MWMP73	Logistic unit ID	SSCC	n2+n18	x		
MWMP74	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
MWMP75	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AIs	x		
Destination						
MWMP76	Transporter ID	Name and address or GLN of the transporter to whom the unit is dispatched	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
MWMP77	Date and time of dispatch	Date and time of transfer to transporter	2008-06-29T16:00	x		

5.6 Transporters and storage holders

For the purposes of this document, *transporters and storage holders* are considered to be businesses that provide the service of transporting or storing goods. They may operate at various stages in distribution chains, transporting or storing raw materials or products. Transport may be by land, sea or air.

Transporters and storage holders do not break down or create trade units, but may break down or create logistic units.

Table 4 — Detailed information requirements for transporters and storage holders

Data element		Description	Examples	Categorisation		
				Shall	Should	May
TRANSPORTER OR STORER						
MWTS1	Food business ID	Name and address or GLN of food business that operates transport vehicle or storage establishment	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
MWTS2	Transport vehicle or storage establishment ID	Nationality, name (if applicable) and registration number of vehicle or name, address and registration number of establishment, or GLN	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
FOR EACH UNIT RECEIVED						
Identities						
MWTS3	Unit ID	SSCC if collected or received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
MWTS4	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit (required only if received as a logistic unit and it is to be broken down or transformed by the transporter or storage holders)	List of n2+n14+AIs	x		
Source						
MWTS5	Previous food business ID	Name and address or GLN of food business from whom the unit was received (pre-form producers, cap producers, processors, etc.)	The Mineral Water Co, 13 Mineral Water Street, Manchester, MA14 2LP, England or n3+n13	x		
MWTS6	Date and time of reception	Date and time of transfer from previous food business	2008-07-29T16:00	x		
MWTS7	Place of collection	Name and address or GLN (this is required only for transporters)	The Mineral Water Co, 13 Mineral Water Street, Manchester, MA14 2LP, England or n3+n13	x		
FOR EACH NEW LOGISTIC UNIT PRODUCED BY TRANSPORTER OR STORER						
Identities						
MWTS8	Logistic unit ID	SSCC	n2+n18	x		

Data element		Description	Examples	Categorisation		
				Shall	Should	May
MWTS9	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
FOR EACH UNIT DISPATCHED (either as a logistic unit or a separate trade unit)						
Identity						
MWTS10	Unit ID	SSCC if dispatched as a logistic unit or GTIN+ if dispatched as a trade unit	n2+n18 or n2+n14+AIs	x		
Destination						
MWTS11	Next food business ID	Name and address or GLN of the food business to whom the unit is dispatched (transporter or processor, etc.)	Sons Ltd, High Street, Sheffield, SH1 5GF, England or n3+n13	x		
MWTS12	Date and time of dispatch	Date and time of transfer to next food business	2008-07-29T20:00	x		
MWTS13	Place of delivery	Name and address or GLN (this is required only for transporters)	Sons Ltd, High Street, Sheffield, SH1 5GF, England or n3+n13	x		

5.7 Retailers and caterers

For the purposes of this document, *retailers and caterers* are considered to be suppliers to the public, not to other businesses. Retailers and caterers are encouraged to record information on their sales but the scope of this document does not extend to sale to the public.

Table 5 — Detailed information requirements for retailers and caterers

Data element		Description	Examples	Categorisation		
				Shall	Should	May
RETAILER OR CATERER						
MWRC1	Food business ID	Name and address or GLN of food business that operates retail or catering establishment	Sons Ltd, High Street, Sheffield, SH1 5GF, England or n3+n13	x		
MWRC2	Retail or caterer establishment ID	Name, address and registration number or GLN of retail or catering establishment	Sons Ltd, High Street, Sheffield, SH1 5GF, England or n3+n13	x		
FOR EACH UNIT RECEIVED						
Identities						
MWRC3	Unit ID	SSCC if received as a logistic unit or GTIN+ if received as a separate trade unit	n2+n18 or n2+n14+AI's	x		
MWRC4	Trade unit IDs in logistic unit	List of GTIN+s of the trade units that make up the logistic unit	List of n2+n14+AIs	x		
Source						
MWRC5	Previous food business ID	Name and address or GLN of food business from whom the unit was received (Processor, transporter, etc.)	The Transporters Company, 12 George Street, London, NW3 4TU, England or n3+n13	x		
MWRC6	Date and time of reception	Date and time of transfer from previous food business	2008-07-30T07:00	x		

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Annex A (informative)

The background to the development of the ad-hoc scheme

A.1 The need for traceability

There are increasing demands for traceability throughout the food chain. The root causes of many of the recent food safety problems have been found in the primary production sector, although the problems are manifested at the other end of the food chain in the products sold to consumers. Hence there are needs to trace back through the chain to determine the causes of the problems and then, in taking remedial action, to trace forward from those causes to withdraw or recall all the unsafe products produced. With chain traceability in place, these tasks can be done efficiently and with the minimum of commercial disturbance. Without chain traceability, whole sectors of the food industry may have to be closed down on a precautionary basis and the costs can be ruinous.

Legislators are now acting on traceability in order to protect the public. Food businesses, particularly the large retailers and those producing branded goods, are increasingly demanding traceability to assure their standards and to protect their businesses.

A.2 The legal requirements for traceability

The EU Regulation on the General Principles and Requirements of Food Law came into effect 1st January 2005 (EC-178/02, 2002). Related EU food legislation will have to be adapted to these requirements by 1st January 2007 at latest.

In its article 3 this Regulation provides its own definition of traceability, in Article 18 it specifies traceability requirements and in Article 19 it specifies related product recall requirements:

Article 3

Other Definitions

(15) 'traceability' means the ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution;

Article 18

Traceability

1. The traceability of food, feed, food-producing animals, and any other substance intended to be, or expected to be, incorporated into a food or feed shall be established at all stages of production, processing and distribution.
2. Food and feed business operators shall be able to identify any person from whom they have been supplied with a food, a feed, a food-producing animal, or any substance intended to be, or expected to be, incorporated into a food or feed.

1. To this end, such operators shall have in place systems and procedures which allow for this information to be made available to the competent authorities on demand.
2. Food and feed business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand.
3. Food or feed which is placed on the market or is likely to be placed on the market in the Community shall be adequately labelled or identified to facilitate its traceability, through relevant documentation or information in accordance with the relevant requirements of more specific provisions.
4. Provisions for the purpose of applying the requirements of this Article in respect of specific sectors may be adopted in accordance with the procedures laid down in Article 58(2).

Article 19

Responsibilities for food: food business operators

1. If a food business operator considers or suspects that a food which it has imported, produced, processed, manufactured or distributed is not in compliance with the food safety requirements, it shall immediately initiate procedures to withdraw the food in question from the market and inform the competent authorities thereof. Where the product may have reached the consumer, the operator shall effectively and accurately inform the consumers of the reason for its withdrawal, and if necessary, recall from consumers products already supplied to them when other measures are not sufficient to achieve a high level of health protection.
2. A food business operator responsible for retail or distribution activities which do not affect the packaging, labelling, safety or integrity of the food shall, within the limits of its respective activities, initiate procedures to withdraw from the market products not in compliance with the food-safety requirements and shall participate in contributing to the safety of the food by passing on relevant information necessary to trace a food, cooperating in the action taken by producers, processors, manufacturers and/or the competent authorities.

The Regulation demands a one up, one down traceability system to be operated throughout food distribution chains. It requires the identification of food at all stages, not merely the lot marking after processing required by current legislation. Chain traceability, product withdrawal and recall are based on the sequential interrogation of the food businesses up or down the chain and are dependent on them responding and providing the necessary information to track the materials involved.

Annex B

(informative)

The philosophy of the ad-hoc scheme

B.1 The concept of traceability

ISO defines traceability as the ability to trace the history, application or location of that which is under consideration, and notes that when considering products this can relate to the origin of materials and parts and the processing history.

This is a more extensive definition than that in the EU Regulation on Food Law, with implications beyond that law's fundamental requirement to be able to trace the food through the various food businesses that handle it in the distribution chain. The information required may therefore include what the food is and what has happened to it, as well as where it has come from and who was responsible for it. These further aspects of traceability are important in relation to food safety, quality and labelling.

Traceability concerns only the ability to trace things, which means that the necessary information must be available when required. It does not mean that the information must at all times be visible by being labelled on the food or being with it.

B.2 The types of information required and their prioritisation

The types of information that may be required can be broadly categorised into:

- fundamental traceability information;
- specifically required information;
- and commercially desirable information.

Fundamental traceability information is that required to identify the food and trace its physical movement through the distribution chains. Essential parts of this information concerning the suppliers and destinations of food will, under the EU Regulation on Food Law, have to be held by each producer or food business and be made available to the competent authorities and to other producer or food business operators for the purpose of product withdrawal or recall. For each producer or food business, the fundamental information includes:

- their own ID and location;
- the quantities, nature and unit IDs of the food (including materials to be incorporated in food) received by the business;
- the ID's of the previous producer / food businesses (from whom those units were received);
- the dates/times and places of reception;
- the quantities, nature and unit IDs of the food dispatched by the business;
- the ID's of the next businesses (to whom those units are dispatched);
- the dates/times and places of dispatch;

- and the 'mapping' relationships between the units received and dispatched (when units are transformed by the business).

Note that when units are transformed by a business, the mapping relationship between the units received and the units dispatched need not be simple and direct. For example, a mineral water producer may use many units of pre-forms, perhaps from different suppliers, to produce units of product. Each unit of product may possibly be associated with a number of units of pre-forms, and vice versa. Traceability requires that the mapping relationship is known, not that it should be a simple 1:1 relationship.

Specifically required information is particular information on the nature of the food and on the circumstances of its production that is required by law for particular purposes, and which must be made available to the appropriate authorities or persons for those purposes. These requirements vary with national legislation and the type of food and food business.

Examples of specifically required information include:

- the results of chemical and bacterial analyses, etc, that are specifically required under food safety legislation or under the general obligation for the monitoring of critical control points, which must be held by the food businesses and be accessible by the food authority (and be directly supplied to the food authority in some instances);
- and customs and excise and trading (financial) information that must be held by businesses and be supplied to the appropriate authorities for purposes such as taxation, etc.

Commercially desirable information, on the nature of the food and on the circumstances of its production, is sought by food businesses for a variety of reasons. These include maximising the efficiency of their own operations, limiting their own liabilities under product liability and safety legislation, assuring the safety and quality of their products, enabling accurate labelling and substantiating their marketing claims, etc. The requirements for this information do, of course, vary from business to business.

Examples of commercially desirable information include much of that already listed above and:

- details of raw materials, products, processes and controls that are required for reasons of business efficiency, product labelling and to ensure product safety and quality;
- and information on the Good Manufacture Practice (GMP) status of the food businesses involved in the chain that is required to ensure product safety and quality, etc.

Clearly there is a huge range of information of potential interest. Given the differences between countries in their specific legal requirements, the information specifications cannot itemise all the information that may possibly be required in every situation. Hence there is a need for prioritisation, with the aim of providing a generic basis for traceability. For this purpose, the information itemised in the documents is categorised as:

- the fundamental information necessary to identify and physically trace the products, that shall be recorded;
- specific information that is required by law in relation to food safety, quality and labelling, together with important elements of commercially desirable information related to those matters, that should be recorded;
- and further specific and commercial information considered to be of sufficient relevance to be included in the documents, that may be recorded.

Some areas of relevant information, such as the Hazard Analysis Critical Control Point (HACCP) analyses and checks carried out by a business, are complex data sets that are

individual to each product, process and business and so are difficult to standardise. To account for this, some flexibility is allowed in the specifications for businesses to record further information in their own non-standardised files, but keyed to the units of food produced.

B.3 The units to be identified and traced

The physical units traded are those to be identified and traced.

An ID system that applies to the trade in goods of all types is already in operation throughout the world, under the auspices of Global Solution One (GS1). This system is widely used in the food industry.

The GS1 system defines a *trade unit* as *any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced or ordered or invoiced at any point in the supply chain, and adds this definition covers raw materials through to the end-user products and also includes services, all of them having pre-defined characteristics (GS1, 2007).*

Trade units are marked with a *Global Trade Identification Number* (GTIN) which incorporates a code allocated by GS1 to uniquely identify the company and another code allocated by the company to denote the item (usually indicating product type). Further data can be attributed to the item using *Application Identifiers* (AI's), commonly used to further describe the product (e.g. date of minimum durability) and to uniquely identify each particular trade unit. The production batch and item serial numbers, or simply the date and time of production, are often used to uniquely identify each trade unit. A further GS1 code, the *Global Location Number* (GLN), can be allocated by the company to identify particular locations.

However, goods are also transported or stored as *logistic units*, such as pallets, which contain a number of separately identified trade units. The trade units within a logistic unit may all be similar in type or they may be different, for example in a pallet of mixed products assembled by wholesaler to send to a retailer. Each logistic unit is marked with a *Serial Shipping Container Code* (SSCC) which uniquely identifies the company and the particular logistic unit.

These various GS1 identifiers are usually expressed as standardised bar code labels on the units.

To achieve chain traceability, the business that creates each trade unit, whatever its form, must uniquely identify it with a GTIN plus a particular unit code (i.e. a GTIN+ in the terminology of this document). Businesses that transform trade units, such as processors who convert the units of raw materials received into the products dispatched, create new units and must give them new IDs. The relevant information for the traceability of the units is recorded by their creator and by the businesses that subsequently trade them physically through the distribution chain.

Similarly, businesses that assemble logistic units must identify each logistic unit with a SSCC and record the IDs of the trade units that make up each logistic unit. Businesses that transport, store or trade intact logistic units merely have to record the limited information related to those logistic units rather than their component trade units. However, distributors often transform logistic units or break them down to the separate trade units prior to dispatch. These businesses must also record the relationships mapping the trade units between the logistic units received and the units dispatched.

B.4 Dealing with the security, rights of access and supply of information

Clearly the businesses will not wish to make all this traceability information publicly available, particularly not to their competitors or even in many instances to their own suppliers and outlets. Even the fundamental traceability information has considerable commercial value, as open access to it would reveal a business's suppliers, markets and trading patterns. Therefore, there is a need to consider the rights to information and the control of access to it.

The rights of the various authorities to the fundamental traceability and specifically required information are prescribed in law. Business operators have a right to some of the specifically required information that the law requires to be passed on. They will also have a legal right to relevant fundamental traceability information when engaged in withdrawal or recall procedures, but not otherwise. There are no rights to the commercially desirable information other than those agreed or contracted between trading partners.

However, in practice there is considerable and increasing commercial pressure to provide information. Trade with much of the corporate food industry is now subject to suppliers and distributors agreeing to quality assurance standards and traceability requirements, including the holding or the supply of the associated information. Multiple retailers even share relevant on-line sales information with major suppliers to facilitate just-in-time stock replenishment.

To achieve commercial acceptance, the information specifications are for the generation and holding of information, not for the dissemination of that information. The businesses remain, in effect, the owners of their information. The passing on of information, other than that prescribed by law, remains a matter of commercial policy or commercial agreement between businesses. The establishment of the information specifications will, of course, ensure that the necessary information is available, and the technical specification will facilitate the communication of the information when required.

The business solutions built on the specifications will require secure business to business handshaking protocols to ensure that only those with a legitimate reason can gain access, and then only to the particular information on the particular units to which they have a right.

A consequence of this is that the information desired by the trade to be visible at the various transaction points in the distribution chains will not necessarily be available, unless there are commercial arrangements for that information to be passed on through the chains from the businesses that generated it. It is strongly recommended that such arrangements are made, but that is not part of the scheme.

Annex C (informative)

Standardized analytical methods

C.1 Mineral water - Data elements for hygiene checks

In the following table information is given about data elements for hygiene check during a mineral water production with a link to an analytical method.

Table 6 — Overview over the data elements for hygiene checks

Nr. of the data element	Name of the data element	Method number	Page
MWMP32	Total plate counts	1	31
MWMP33	Coli form	1	31
MWMP34	Escherichia coli	1	31
MWMP35	Streptococcus	1	31
MWMP36	Pseudomonas aeruginosa	1	31
MWMP37	Clostridium sulphite-reduct.	1	31
MWMP38	Aerobic bacteria	1	31

C.2 Mineral water - Data elements for product quality checks

In the following table information is given about data elements for product quality checks during a mineral water production with a link to an analytical method.

Table 7 — Overview over the data elements for product quality checks

Nr. of the data element	Name of the data element	Method number	Page
MWMP53	Dissolved metals	9	34
MWMP55	Noro virus	2	31
MWMP56	Acryl amide	13	35
MWMP58	Phthalates	6	32
MWMP59	Fluoride	14	36
MWMP60	Arsenic	9	34
MWMP61	Nitrate/nitrite	15	36
MWMP62	Radioactive substances	10	34
MWMP63	Herbicides	5	32
MWMP64	Insecticides	4	32
MWMP65	Antioxidants	7	33
MWMP66	Bromine (halogen)	3	31
MWMP67	Chromium (transition metal)	8	33
MWMP68	Barium, Strontium (alkaline metal)	11	35
MWMP69	Isotopes	12	35

C.3 Analytical methods

In the following table information is given about methods of analysis in a standardised manner. The format of method of analysis and explanation of the headings is given in table 8.

Table 8 — Explanation of items in standardized analytical methods

Method number	Number of all methods recorded within the ad-hoc standard
Method of analysis	Method name may include analyte and type of method
Category of method of analysis	Reference to official status of cooperating organisation
Parameter group	Main group of parameters like microbiological, chemical or others
Parameter	Analyte level
Legislative limit	Residual concentration allowed in e.g. EU directive of regulation
Monitoring	Subject to monitoring according to legislation
Literature reference	EU directive or published research reference of the method
Chemical Abstract Service	Registry number, a unique identifier to be used to search a number of data-retrieval systems
Cross reference	Method may also include references in other chapters/products

Various additions to this standardized table of analytical methods are possible, but this depends on the level of thoroughness of data required. The following items may be considered to include in the table:

- Applicability statement: Limitations on use of method or other information
- Method performance: Statistical information generated by collaborative study like, trueness %, precision % or limit of detection %
- Principle: Scientific basis for the method of analysis
- Apparatus and reagents: Specifications for necessary laboratory apparatus and reagent preparations
- Preparation of sample: Description of method of analysis in several sections
- Calculation: Description of final result of method of analysis

The following tables show the methods of analysis for the determination of presence of contaminants in samples of mineral water.

Method number 1

Method of analysis	Total Colony count (per ml of water) by inoculation in a nutrient agar medium
Category of method of analysis	ISO 9308-1, ISO 7899-2, EN-ISO 12780, EN-ISO 6222
Parameter group	Microbiological
Parameter	Escherichia coli and coliform bacteria Enterococci Sporulated sulphite-reducing anaerobes Pseudomonas aeruginosa
Legislative value	0/250 ml at 22°C and 37°C (absence) 0/250 ml (absence) 0/50 ml (absence) 0/250 ml (absence)
Monitoring	Yes
Literature reference	EU directive 80/777/EEC
Chemical Abstract Service	
Cross Reference	

Method number 2

Method of analysis	Reverse transcription Polymerase Chain Reaction (RT-PCR)
Category of method of analysis	
Parameter group	Microbiological
Parameter	Norovirus
Legislative value	
Monitoring	
Literature reference	Applied and Environmental Microbiology. 2003, 69 (11) 6541 - 6549
Chemical Abstract Service	
Cross reference	

Method number 3

Method of analysis	Gas chromatography (GC) incl. solvent extraction
Category of method of analysis	
Parameter group	Chemical
Parameter	Bromate
Legislative value	10 µg/l (EU); 25 µg/l (guideline WHO, 1998)
Monitoring	
Literature reference	EU directive 98/83 Food Additives and Contaminants, 2002, Vol. 19, No. 8, 721-732
Chemical Abstract Service	7726-95-6 (bromine – Br)
Cross reference	

Method number 4

Method of analysis	Gas chromatography with liquid-liquid extraction
Category of method of analysis	ISO 6468:1996

Parameter group	Chemical (organochlorine insecticides)
Parameter	Polychlorinated biphenyls (PCB's) Chlorobenzenes
Legislative value	0,10 µg/l (EU-pesticides) 0,50 µg/l (EU-pesticides – total)
Monitoring	

Literature reference	EU directive 98/83/EC
Chemical Abstract Service	1336-36-3 108-90-7
Cross reference	

Method number 5

Method of analysis	Gas chromatography after solid phase extraction and derivatization
Category of method of analysis	ISO 15913:2000

Parameter group	Chemical (phenoxyalkanoic herbicides)
Parameter	bentazones hydroxybenzonnitrils
Legislative value	0,10 µg/l (EU-pesticides) 0,50 µg/l (EU-pesticides – total)
Monitoring	

Literature reference	EU directive 98/83/EC
Chemical Abstract Service	25057-89-0
Cross reference	

Method number 6

Method of analysis	Gas chromatography/mass spectrometry – GC/MS (with liquid phase microextraction – LPME)
Category of method of analysis	ISO 18856:2004

Parameter group	Chemical (plasticizer)
Parameter	Phthalate esters
Legislative value	
Monitoring	

Literature reference	Journal of Chromatography A, 30 May 2003, 999 (1-2), 145-153 (Psillakis, 2003)
Chemical Abstract Service	
Cross reference	

Method number 7

Method of analysis	Gas chromatography mass spectrometry (GS/MS) with solid phase microextraction
Category of method of analysis	

Parameter group	Chemical (antioxidant in packaging plastics)
Parameter	Butylated hydroxytoluene (BHT)
Legislative value	
Monitoring	

Literature reference	Journal of Chromatography A, july 2002, 963 (1-2), 179-183 (Tombesi, 2002)
Chemical Abstract Service	128-37-0
Cross reference	

Method number 8

Method of analysis	Ion chromatography (IC) with colorimetric detection
Category of method of analysis	

Parameter group	Chemical
Parameter	Chromium
Legislative value	50 µg/l (EU)
Monitoring	

Literature reference	EU directive 2003/40/EC Food Additives and Contaminants, 2002, Vol. 19, No. 8, 721-732
Chemical Abstract Service	7440-47-3 (Chromium VI - Cr)
Cross reference	

Method number 9

Method of analysis	Inductively coupled plasma mass spectrometry (ICPMS)
Category of method of analysis	ISO 17294-2:2003
Parameter group	Chemical (trace elements)
Parameter	Arsenic Boron Cadmium Copper Nickel Lead Selenium
Legislative value	10 µg/l (EU 2003/40) 1,0 mg/l (EU 98/83) 5,0 µl (EU 2003/40) 1,0 mg/l (EU 2003/40) 20 µg/l (EU 2003/40) 10 µg/l (EU 2003/40) 10 µg/l (EU 2003/40)
Monitoring	
Literature reference	EU directive 98/83/EC EU directive 2003/40/EC Food Additives and Contaminants, 2002, Vol. 19, No. 8, 721-732
Chemical Abstract Service	7440-38-2 (Arsenic - As) 7440-42-8 (Boron - B) 7440-43-9 (Cadmium – Cd) 7440-50-8 (Copper – Cu) 7440-02-0 (Nickel – Ni) 7439-92-1 (Lead – Pb) 7782-49-2 (Selenium – Se)
Cross reference	

Method number 10

Method of analysis	Capillary zone electrophoresis
Category of method of analysis	
Parameter group	Chemical (trace elements)
Parameter	Barium (II) Strontium (II)
Legislative value	700 µg/l (WHO, 1998) a. 1,0 mg/l (EU 2003/40) No guideline
Monitoring	
Literature reference	Journal of Chromatography A. 1997, 767 (1-2) 303 – 310 (Macka – Miroslav, 1997) EU directive 2003/40/EC
Chemical Abstract Service	7440-39-3 7440-24-6
Cross reference	

Method number 11

Method of analysis	Isotope ratio analysis
Category of method of analysis	
Parameter group	Chemical
Parameter	H-2 (deuterium), O-18, H-3 (tritium), C-12, C-14, S-34
Legislative value	
Monitoring	
Literature reference	Isotopes in environmental and health studies. 1996, 32 (4), 387-403 (Von Storch, 1996)
Chemical Abstract Service	
Cross Reference	

Method number 12

Method of analysis	Isotope ratio mass spectrometry
Category of method of analysis	
Parameter group	Chemical
Parameter	C-13 and C-14
Legislative value	
Monitoring	
Literature reference	Food Chemistry 92 (2008) 507-514 (R. Redondo, 2008)
Chemical Abstract Service	
Cross reference	

Method number 13

Method of analysis	Gas chromatography LC/MS/MS
Category of method of analysis	
Parameter group	Chemical
Parameter	acrylamide
Legislative value	0,10 µg/l (EU); 0,5 µg/l (WHO)
Monitoring	
Literature reference	http://www.opsi.gov.uk/legislation/wales/wsi2003/20033042e.htm EU directive 98/83/EC
Chemical Abstract Service	79-06-1
Cross reference	

Method number 14

Method of analysis	Fluoride-ion selective electrode
Category of method of analysis	

Parameter group	Chemical
Parameter	Fluoride
Legislative value	5,0 mg/l (EU)
Monitoring	

Literature reference	EU directive 2003/40/EC
Chemical Abstract Service	16984-48-8
Cross reference	

Method number 15

Method of analysis	Ion selective electrode (ISE)
Category of method of analysis	

Parameter group	Chemical
Parameter	a. Nitrate b. Nitrite
Legislative value	a. 50 mg/l (EU) b. 0,1 mg.l (EU)
Monitoring	

Literature reference	EU directive 2003/40/EC
Chemical Abstract Service	7727-37-9 (N)
Cross reference	



FOOD QUALITY AND SAFETY