European Spas Association

Quality Criteria of the European Spas Association (ESPA)

Adopted unanimously during the General Assembly 2006 in São Pedro do Sul (P)

## Contents

Preface					
Preamble4					
Health -	- a human-ecology balance4				
Applicat	ion5				
Local na	atural remedies5				
1 Natu	ral local remedies6				
1.1 Hea	ling waters6				
1.1.1	Characterisation6				
1.1.2	Medicinal-balneological assessment7				
1.1.2.1	Source description and hydrological characterisation7				
1.1.2.2	General prevention of water pollution8				
1.1.2.3	Protection of medicinal springs8				
1.1.2.4	Protection zones8				
1.1.2.5	Natural fluctuations of composition8				
1.1.3	Physical, chemical, biological and microbiological properties9				
1.1.4	Analysis of healing waters 10				
1.1.4.1	Minimum requirements for analyses of healing waters 10				
1.1.5	Control analysis and monitoring11				
1.2	Natural local healing gases11				
1.2.1	Medicinal-balneological assessment 12				
1.2.2 healing	Physical, chemical and microbiological properties (= analysis of gas)				
1.2.2.1	Minimum requirements for healing gas analyses				
1.2.3	Control analysis/monitoring12				
1.3	Natural peloids12				
1.3.1	Medicinal-balneological assessment 13				
1.3.2	Classification 13				
1.3.3	Extraction and storage13				

1.3.3.1	Reuse	. 13
1.3.4	Peloid analysis	. 14
1.3.4.1	Minimum requirements	. 14
1.3.4.2	Physical, chemical, biological and microbiological properties	. 14
1.3.5	Peloid control analysis	. 16
1.3.5.1	Chemical control analysis	. 16
1.3.5.2	Testing hygienic conditions	. 16
1.3.5.3	Monitoring	. 17
2	Thalassotherapy	. 17
2.1	Medicinal-balneological assessment	. 17
2.2	Hygienic requirements	. 18
2.3	Composition	. 18
2.4	Extraction points	. 19
2.5	Physical, chemical, biological and microbiological properties	. 19
2.5.1	Initial analysis of seawater	. 19
2.5.2	Seawater analysis	. 19
2.6	Monitoring	. 20
2.7	Special features of thalassotherapy	. 21
2.7.1	Criteria	. 22
2.7.2	Medicinal-balneological assessment	. 22
2.7.3	Sea/seawater products	. 22
2.7.4	Physical, chemical, biological and microbiological properties	. 22
2.7.5		
	Reuse	. 22
3	Reuse Bio-climate and air quality	. 22 . 23
3 3.1	Reuse Bio-climate and air quality Natural remedies of the climate	. 22 . 23 . 23
3 3.1 3.1.1	Reuse Bio-climate and air quality Natural remedies of the climate Basic requirements	. 22 . 23 . 23 . 23
3 3.1 3.1.1 3.1.2	Reuse Bio-climate and air quality Natural remedies of the climate Basic requirements Medicinal-climatic assessment.	. 22 . 23 . 23 . 23 . 23
3 3.1 3.1.1 3.1.2 3.1.3	Reuse Bio-climate and air quality Natural remedies of the climate Basic requirements Medicinal-climatic assessment Medicinal-meteorological report	. 22 . 23 . 23 . 23 . 23 . 23
3 3.1 3.1.1 3.1.2 3.1.3 3.1.4	Reuse Bio-climate and air quality Natural remedies of the climate Basic requirements Medicinal-climatic assessment Medicinal-meteorological report Area under review	. 22 . 23 . 23 . 23 . 23 . 23 . 23
3 3.1 3.1.1 3.1.2 3.1.3 3.1.4 3.1.4.1	Reuse Bio-climate and air quality Natural remedies of the climate Basic requirements Medicinal-climatic assessment Medicinal-meteorological report Area under review Bioclimatic pre-assessment	. 22 . 23 . 23 . 23 . 23 . 23 . 24 . 24
3 3.1 3.1.1 3.1.2 3.1.3 3.1.4 3.1.4.1 3.1.4.2	Reuse Bio-climate and air quality Natural remedies of the climate Basic requirements Medicinal-climatic assessment Medicinal-meteorological report Area under review Bioclimatic pre-assessment Climate assessment	. 22 . 23 . 23 . 23 . 23 . 23 . 24 . 24 . 24
3 3.1 3.1.1 3.1.2 3.1.3 3.1.4 3.1.4.1 3.1.4.2 3.1.4.3	Reuse Bio-climate and air quality Natural remedies of the climate Basic requirements Medicinal-climatic assessment Medicinal-meteorological report Area under review Bioclimatic pre-assessment Climate assessment Climatic analysis and assessment of the bio-climate	. 22 . 23 . 23 . 23 . 23 . 23 . 23 . 24 . 24 . 24
3 3.1 3.1.1 3.1.2 3.1.3 3.1.4 3.1.4.1 3.1.4.2 3.1.4.3 3.1.5	Reuse Bio-climate and air quality Natural remedies of the climate Basic requirements Medicinal-climatic assessment Medicinal-meteorological report Area under review Bioclimatic pre-assessment Climate assessment Climatic analysis and assessment of the bio-climate Control analysis; periodic monitoring	. 22 . 23 . 23 . 23 . 23 . 23 . 23 . 23
3 3.1 3.1.1 3.1.2 3.1.3 3.1.4 3.1.4.1 3.1.4.2 3.1.4.3 3.1.5 3.1.5.1	Reuse Bio-climate and air quality Natural remedies of the climate Basic requirements Medicinal-climatic assessment Medicinal-meteorological report Area under review Bioclimatic pre-assessment Climate assessment Climatic analysis and assessment of the bio-climate Control analysis; periodic monitoring Measurements	. 22 . 23 . 23 . 23 . 23 . 23 . 23 . 23
3 3.1 3.1.1 3.1.2 3.1.3 3.1.4 3.1.4.1 3.1.4.2 3.1.4.3 3.1.5 3.1.5.1 3.1.5.2	Reuse Bio-climate and air quality Natural remedies of the climate Basic requirements Medicinal-climatic assessment Medicinal-meteorological report Area under review Bioclimatic pre-assessment Climate assessment Climatic analysis and assessment of the bio-climate Control analysis; periodic monitoring Measurements Use of model techniques	. 22 . 23 . 23 . 23 . 23 . 23 . 23 . 23

3.2.1	General details	
3.2.2	Report on air quality	
3.2.3	Measuring areas	
3.2.4	Measuring systems	27
3.2.4.1	Number of sampling places	
3.2.5	Guide values	
3.2.6	Measurement	
3.2.7	Control analysis and quality assurance	
3.2.8	Measuring techniques	
3.2.8.1	Particulate pollutants	
3.2.8.2	PM 2.5s	
3.2.8.3	PM10s, soot	
3.2.8.4	Air particles dangerous to human health	
3.2.8.5	Gaseous air admixes	
3.2.8.6	Duration of collection and measurement	29
4	Other certified traditional local therapy techniques	
4.1	Kneipp therapy	
4.1.1	Requirements for Kneipp physiotherapy	
4.1.2 of Kneip	Medicinal-balneological assessment to ensure the high	n standard 30
4.1.3	Control analysis; periodic monitoring	
5	Other types of therapy	31
	Addresses	

#### Preface

European spas and health resorts are of outstanding importance as centres of excellence in the healthcare sector. The local remedies harboured by the ground, sea and climate as well as traditional methods of treatment (such as Kneipp, Priessnitz and Schroth) are the key factors constituting a spa treatment centre. The standards of hygiene governing the usage of a spa's resources are based on both legal and scientific principles.

The basic hygienic conditions regarding the application of local natural remedies concern above all the measures carried out on patients. A hygiene plan should be regarded as a means of preventing infection and has to be put in place in order to comply with for example infection protection legislation and European Union directives.

Methods and conduct complying with hygiene requirements need to be clearly specified and documented within certified quality management systems.

#### Preamble

## The natural remedies in the ground, sea and climate as well as in the natural healing factors in Kneipp physiotherapy

The use of natural remedies in the ground, the sea and the climate as well as in the natural healing factors in the Kneipp system of physiotherapy is based on experience of the beneficial effects achieved with many illnesses over the years. These positive effects have been observed at spas and health resorts for generations and can also be objectively measured thanks to modern medical advances (including balneology and spa research).

#### Health cures – systematised stimulus–reaction treatment; health resorts – ecologically organised health centres

Health cures as naturally systematised forms of stimulus-reaction treatment and health resorts as ecological and social areas for the reorganisation and stabilisation of human beings' physical, mental and social balance are becoming increasingly important within the current health system. The latest scientific research has shown just how valuable the natural stimuli of light and air, cold and warmth, rest and movement, and a balanced attitude towards their own health are for human beings seeking to stay healthy or regain their health, especially in today's technical civilisation.

#### Health – a human-ecology balance

Many scientific studies have revealed how important the relationship between human beings and their environment is for their health – and how it may also influence the development of illness. Spa medicine and human ecology define health as an individual functional-dynamic balance between

the capabilities and strengths of an organism and the person (ecological potency) and the demands of the environment and fellow humans in certain situations and ages (ecological valency). Faced by a multitude of changes throughout a lifetime such as illnesses, ageing and misfortunes of all kinds, the human-ecological balance we term 'health' has to be constantly regained and actively shaped. This view of health as a series of successful life balances subject to a constant process of organisation goes beyond today's common understanding of health that merely equates it with the status of an organism free of disease. The definition of health in a human-ecology sense always refers to the energy potential of a human being in a healthy or ill condition in correlation with the demands placed on an individual life. These balances are also depicted in society as 'social health' and have been legally established in terms such as the 'ability to work' and 'fitness for work', not to mention the goal of 'autonomy in old age'.

#### Application

Application takes the form of hygiene measures performed on spa patients based on natural remedies from the ground, sea and climate and Kneipp therapy.

#### Local natural remedies

Local natural remedies form the starting point and the very crux of spas, health resorts and sanatoriums. However, by themselves they are not enough to ensure official recognition as such. There is a wide range of local remedies, including mineral baths, saline baths, thermal baths, peloid paths, sea baths, Kneipp baths, and climatic health treatment. Formal classification of this type is not practised everywhere but is in some countries part of (state) recognition. This is an area where increased standardisation needs to be applied in order to bring about more transparency on the European market. Furthermore, other forms of treatment are available at spas and health resorts. However, given their enormous diversity and differing experience of their usage, endeavouring to achieve uniformity in this sphere is currently impractical.

#### Remedies from ground and sea

Before they can be used for therapeutic treatment, natural remedies from the ground and the sea (such as healing waters, healing gases and peloids) must be analysed in terms of their composition taking into account regional conditions. The findings also provide a basis for medicinalbalneological assessment. Natural remedies need be continuously monitored to ensure compliance with the general legal regulations in force. These rules should be regarded as minimum requirements for analysis when determining the composition of remedies and for quality assurance. In addition, other aspects may have to be taken into account in reports. Publication of the results of any kind (e.g. promotional material, labels) must be verified and approved by a qualified institute or expert. The mere presence of a natural remedy does not by itself constitute a spa, health resort or sanatorium. Moreover, local natural remedies may not be referred to as such if used outside a spa. The import of natural remedies for spa applications must be described as such and the remedies concerned are to be regarded as medicinal products rather than local remedies.

#### 1 Natural local remedies

The natural remedies in the **ground** are the most effective when used within holistic (i.e. integrated) treatment.

**Medicinal springs** whose water has been recognised for therapeutic usage are often the main reason for spas and health resorts to be recognised as such (including by the state). The water is applied internally (through drinking and inhaling) and externally (bathing, pools used for therapeutic exercises).

Healing gases may occur without being dissolved in spring water.

**Peloids** are the result of geological or biological processes, and are used in the form of compresses, packs and baths. They act physically (thermally, mechanically) or chemically depending on their composition (i.e. the size of the organic and inorganic fractions they contain).

#### 1.1 Healing waters

Natural healing waters are extracted from one or more medicinal springs which have naturally risen or have been artificially developed. Due to their chemical composition and their physical qualities, they produce therapeutic effects that can be used for prevention, curative therapies and rehabilitation. Their effectiveness has been demonstrated and is also based on medicinal knowledge and balneological experience. Natural healing waters from spas and medicinal springs are used locally, which means they have to be extracted and applied in the vicinity of the spring. However, spas may be set up at other areas if water is transported there from the spring outlet concerned through a fixed pipe.

#### 1.1.1 Characterisation

Natural healing waters can differ in their chemical content or their physical qualities. In the analysis the medical effective ionic bonds must be considered.

Healing waters are those with the following minimum standards:

	mg/l	nmol/l
Calcium (Ca <sup>2+</sup> )	500	12.5
Magnesium (Mg <sup>2+</sup> )	150	6.2
Iron bivalent (Fe <sup>2+</sup> )	20	0.2
Lithium (Li <sup>+</sup> )	2	0.29
Sulphate (SO <sub>4</sub> <sup>2-</sup> )	1,200	12.5
Bicarbonate (HCO <sup>3-</sup> )	1,300	21.3
lodine (l⁻)	1	0.01
Fluoride (F <sup>−</sup> )	1	0.05
Sulphuric sulphur (HS <sup>-</sup> , H <sub>2</sub> S, HS <sup>X-</sup> )	1	0.03
Carbon dioxide (CO <sub>2</sub> )	1,000	22.5
Radon (Rn)	666 Bq/L	
Saline water	8.5g chloride	
Natural thermal water	1Natural temperature	> 20 °C
Therapeutic sphere	Hypotherm	< 35 ℃
	Isotherm	35°–37℃
	Hypertherm	>37 ℃

## 1.1.2 Medicinal-balneological assessment

Whether a particular healing water meets the requirements for therapeutic treatment has to be demonstrated in a scientific report by a medicinalbalneological institute or a recognised expert in medicinal balneology

#### 1.1.2.1 Source description and hydrological characterisation

The report must include:

a) General information (place, subject, period of examinations etc);

b) The name and address of the medicinal-balneological institute and/or expert;

c) A list of documents on which assessment is based;

d) An evaluation of the analysis findings and any control analyses:

- Main substances, especially active agents and physical qualities

- Substances with a toxic or carcinogenic effect when used for health treatment or in permanent use;

Medical assessment of the hygienic-bacteriological results of the natural remedy

e) Comparative assessment of the natural remedy on the basis of empirical tests with similar remedies from the ground in the same area or from another health resort

f) Therapeutic use in treatment (depending on the treatment principle)

g) Indications and contraindications regarding illnesses

h) Summary and evaluation of the category the resort has applied for

## 1.1.2.2 General prevention of water pollution

Legal regulations for the general prevention of water pollution are to be regarded as the minimum requirements for the prevention of water pollution above and below ground and for the purification and disposal of sewage. The purification of sewage requires a highly efficient sewage plant

## 1.1.2.3 Protection of medicinal springs

Owing to their enormous importance, the areas around medicinal springs are subject to special protection with both qualitative and quantitative criteria.

## 1.1.2.4 Protection zones

Three categories of protection zones apply.

## **Qualitative protection**

The aim of qualitative protection is to avoid pollution.

Protection Zone I:

Protection of the immediate of the extraction point

Protection Zone II:

Protection against microbiological contamination (50-day line if required)

Protection Zone III:

General protection of the rest of the catchment area

## Quantitative protection

Quantitative protection mainly concerns interventions into the hydrodynamics of the healing water. It is designed to protect the specific properties of the healing water along with its flow and abundance at the extraction point.

## 1.1.2.5 Natural fluctuations of composition

Due to natural changes in abundance, chemical composition and the physical quality of medicinal waters, natural variations may occur in water (i.e. the individual mechanical, technical and physicochemical properties of a medicinal spring). Variations of the levels of mineral substances defining the water may mostly not exceed  $\pm$  20% (carbon dioxide:  $\pm$  50%). Essential components that become effective at a relatively low concentration may also undergo higher natural variations exceeding  $\pm$  20%. This is especially true of substances which may change depending on the redox conditions (bivalent iron or sulphuric sulphur) or which are related to medicinal springs with different levels of gas (radon). In the case of fluctuation, mean values are not permitted to drop below the minimum values. Impermissible variations in composition may occur if the technical conditions of medicinal springs are not state-of-the-art or if medicinal springs are irregularly used or overused. Variations are determined on the basis of a healing water analysis. Whether variations comply with the

individual behaviour of a medicinal spring and are justifiable for reasons of water protection must be decided by the technical assessment of the spring.

If variations or changes to the chemical composition or the physical quality exceed the limits established, the owner or authorised user of a medicinal spring is obliged to determine whether the water is still fit for use. Tests must also be carried out to ascertain whether the balneological-therapeutic effects of the healing water have changed.

#### 1.1.3 Physical, chemical, biological and microbiological properties

It must be demonstrated that the healing water at the well and at the place of use is in hygienically and microbiologically pristine condition.

#### Physicochemical tests

Water temperature in °C at extraction; pH of water during sampling (electrometrical) at spring temperature; electrical conductivity of water during sampling and at spring temperature and 25 °C in µS/cm; total dry residue at 180 °C and 260 °C; redox tension of the water upon sampling against standard calomel electrode (UH value in mV); density in g/cm<sup>3</sup>; radon activity at time of sampling and residual activity after x days in Bq/l; dissolved gases (oxygen, dihydrogen sulphide, carbon dioxide); free gases (proportion of volume) such as carbon dioxide, nitrogen, oxygen, hydrogen, argon, helium, methane and homologous hydrocarbons.

Should control analysis reveal fundamental changes to a medicinal spring (see 2.1.1.5), the reasons have to be investigated and a new reference analysis must be conducted. This is also the case if a spring is newly tapped.

#### Chemical tests

Content of cations: sodium, potassium, ammonium, magnesium, calcium, manganese, iron; in salt water also lithium

 Content of anions: fluoride, chloride, iodide, nitrite, nitrate, sulphate, hydrogen phosphate, hydrogen carbonate/carbonate, hydrogen sulphide/sulphide; in salt water also bromide

– Content of undissociated substances: silicic acid as  $H_2SiO_3$  and boric acid as  $H_3BO_3$ 

- Calculation of sums of mass concentrations in mg/l, of equivalent concentrations in mmol/l, and of the equivalent proportions in mmol-%

- Content of trace elements: arsenic, cadmium, chromium, mercury, nickel, lead, antimony, selenium, barium; possibly also copper, zinc, cobalt, molybdenum, vanadium, tin, silver, aluminium and others

- Content of organic substances: dissolved organically bound carbon, oxidability with potassium manganate, phenol index as phenol, polycyclic aromatic hydrocarbons (6 main compounds), volatile halogenated organic compounds (solvents and haloforms); possibly, above all in initial tests or in the case of suspected contamination: extractable substances, organically bound nitrogen, detergents, nitrated and halogenated aromatics, pesticides

- Content of substances influencing the effect of water at the place of application

## Microbiological tests

- Healing waters:

Coliform germs in 250 ml, Escherichia coli in 250 ml, Pseudomonas aeruginosa in 250 ml, faecal streptococci in 250 ml, sulphite-reducing spore-forming anaerobic bacilli in 50 ml, number of colonies at  $20^{\circ}$ C in 1 ml after 44 ± 4hrs., number of colonies at  $37^{\circ}$ C in 1 ml after 20 ± 4 hrs

- Swimming pools and baths for therapeutic exercises:

Coliform germs in 100 ml, Escherichia coli in 100 ml, Pseudomonas aeruginosa in 100 ml at 36 °C, number of colonies at 20 °C and 36 °C in 1 ml; Legionella spec. in 1 ml (in the water of warm bubbling basins and also basins with additional aerosol-forming water circulation and water temperatures in basins > 23 °C)

– Legionella spec. in 100 ml (in filtrate with water temperature in basins >  $23^{\circ}$ C)

## The risk of Legionella

The contamination of the water system with Legionella can be largely avoided relatively simply. Since Legionella cannot survive above a water temperature of 70 °C, contamination can be prevented by making sure the water temperature of the entire system is kept above 70 °C.

Water professionals need to keep tabs on scientific findings in connection with counteracting Legionella, including regulations being tightened up in future and the impact this has on planning and documentation, as well as the chances and risks harboured by pioneering anti-Legionella systems operating on a thermal, chemical or physical basis.

#### 1.1.4 Analysis of healing waters

Healing water analysis provides information about the composition, physical and chemical qualities, and hygienic condition of a healing water. This analysis is taken as the basis for the assessment of balneological treatment and the hydrogeological and technical state of a medicinal spring. Spas and facilities of medicinal springs have to have their medicinal springs analysed every 10 years. The reference analysis, which serves as a basic instrument for evaluating a medicinal spring with respect to its use for therapeutic purposes, must meet the conditions in 1.1.4.1ff. Regular control analyses are part of the monitoring process. They take the form of chemical and hygienic tests at the medicinal spring and the place of treatment. Their extent varies depending on individual circumstances.

#### 1.1.4.1 Minimum requirements for analyses of healing waters

#### a) General details:

Purpose and initiator of the healing water analysis; type of analysis (analysis of the spring and bottling); name and address of the institute or expert; date of sampling and local tests

b) Technical and hydrological description

Description of the place of extraction (top of the well, place of application),

tapping; general location and altitude, other observations; brief description of geological conditions; details of the development of a spring or drilling (depth, diameter of the borehole, diameter and development of the pipes or other tapping); description of the technical facilities used to extract the healing water; yield in litres per second (artesian overflow or productivity of pumps, lowering and residual water-level); weather on the day of sampling, air pressure in hPa and air temperature in °C; time and measuring altitude

## 1.1.5 Control analysis and monitoring

## Physicochemical tests

Water used at spas needs to be sampled at the extraction point and the place of use at least once every two years and analysed. General hygienic tests are part of the regular monitoring process. Monthly tests are conducted at the spring. Swimming pools, pools used for therapeutic exercises, and therapy basins filled with healing water require a chemical control analysis of the treated bathwater at least every two years. Microbiological and general hygienic tests are subject to the relevant regulations. The minimum requirements equal the microbiological limits. Facilities with tubs and other types of therapy based on healing waters are to be examined in accordance with the relevant regulations.

In the case of constant extraction, **microbiological tests** have to be carried out at least every three months, and more frequently in the case of irregular use.

#### Regular inspection of facilities for monitoring purposes

The following parameters or substances are subject to regular checks: yield or extraction quantity and lowering, electrical conductivity, pH, smell, taste, colour, ammonium, nitrite, number of colonies of Escherichia coli, coliform germs, pseudomonas.

## 1.2 Natural local healing gases

Natural healing gases are part of the natural remedies that mainly stem from deep down in the earth. They come from gas deposits which have reached the surface naturally or been artificially tapped. Carbon dioxide, radon and hydrogen sulphide are the healing gases currently used for therapeutic purposes. Carbon dioxide may escape in a dry state (mofettes), be developed artificially, or be extracted from healing waters rich in carbon dioxide. Due to its dilatory effects on the capillary vessels in the skin, CO<sub>2</sub> baths are mainly applied for cardiovascular illnesses. Radon is a ubiquitous noble gas. In balneological treatment, this alpha-emitting product is used in the form of baths containing radon or inhalation. Hydrogen sulphide is a component of natural healing waters. Therapeutically, it is mainly applied for rheumatic/degenerative symptoms as well as skin diseases.

The composition of healing gases to be applied for therapeutic treatment in balneology has to be demonstrated by means of gas analyses and must be verified by control analysis.

## 1.2.1 Medicinal-balneological assessment

Whether gases are suitable for use in therapy has to be ascertained in a scientific report by a medicinal-balneological institute or a recognised expert.

# 1.2.2 Physical, chemical and microbiological properties (= analysis of healing gas)

A healing gas analysis examines the composition of the gas and serves as the basis for the assessment of balneological treatment as well as the geological and technical conditions.

## **1.2.2.1** Minimum requirements for healing gas analyses

a) General details: Purpose and initiator of the healing gas analysis; type of analysis; name and address of the institute or the responsible expert; date of sampling and local tests; marking of the place of extraction or tapping (top of the well, application area); sampling procedure (collection of gas); general location and altitude, other observations; brief description of the geological conditions; details on the development of the spring; drilling or mofette (depth, diameter of the borehole, diameter and development of the pipes or other edgings); description of the technical facilities to extract the healing water; quantity of the extracted healing gas; weather on the day of sampling, air pressure in hPa and air temperature in °C; time and measuring altitude.

- b) Sensory examination
- c) Temperature of gas
- d) Chemical tests

Content of carbon dioxide, carbon monoxide, oxygen, nitrogen, hydrogen, methane and homologous hydrocarbons, hydrogen sulphide, noble gases such as radon; harmful substances such as chlorinated hydrocarbons, nitrogen monoxides and sulphur dioxide

- e) Calculation of sum parameters
- f) Quantity of components important for the gas's effects at the place of application
- g) Quantity of microorganisms in gas
- h) Definition and evaluation of gas

## 1.2.3 Control analysis/monitoring

A healing gas analysis has to be repeated as least every ten years. Essential substances have to be checked once a year. The main active substances have to be determined every year in a control analysis.

## 1.3 Natural peloids

Peloids are inorganic or organic mixtures produced in geological and/or biological processes, and which have a fine-grained consistency (either by nature or because they have been crushed in a simple process). With

medicinal treatments they are used for baths and packs as mud or paste. Peloids may contain water and also exist in dry form.

## 1.3.1 Medicinal-balneological assessment

Scientific reports by a medicinal-balneological institute or by a recognised expert for medicinal balneology (4.1) have to demonstrate the effects of peloids for curing, relieving and preventing illnesses. Like healing waters and gases, peloids must also have been tried and tested as having a positive effect on the human organism.

## 1.3.2 Classification

Peats and muds used for balneological treatment belong to the group of 'peloids'. In a geological-genetic context, muds belong to the groups of unconsolidated and consolidated rocks. Peats are mainly humified sediments of biological origin.

Type of peloid	Geological-genetic group
Unconsolidated rocks (EU peloids)	
Peat (high moor peat, low moor peat, moorland)	Sedentary peloids
'Lebermudde', peaty silt, diatomaceous earth	Limnic peloids
Marine mud (salt water mud), sapropel, liman	Marine peloids
Mud-like swelling sediments (sulphide mud, sulphuric mud, ochreous mud)	Crenogenic peloids
River mud	Fluviatile peloids
Loess	Aeolian peloids
Loam, clay	Pedogenic peloids
Consolidate tuffite*	Volcanogenic peloids
Consolidated rocks (Para peloids)	
Clay stone*, clay slate*	Clay stone peloids
Marl, chalk, lime, dolomite	Limestone peloids
Tuff*, phonolite	Volcanic peloids

Tab. 2: Types of peloids

\*Oten referred to in balneological treatment as 'fango'

## 1.3.3 Extraction and storage

Peloids have to be extracted and stored such that their composition does not become altered. They have to be in perfect hygienic condition.

## 1.3.3.1 Reuse

Peloids in principle can be reused. Before the peat is reused, peloid analysis is required to ensure any doubts can be dispelled. A reuse of non-organic peloids after a thermal disinfection is possible. The perfect hygienic condition must be proved with a study.

To protect dwindling moor deposits, peat that has already been used for bathing treatment can be reused after being stored for at least five years in its original deposit or in a special regeneration basin. An analysis is necessary. If the peat can be reused, the peloids have to be mixed in equal quantities of fresh peat and used peat for new packs and bathing treatment. Careful blending must be ensured for each individual application. Organic/inorganic mixed peloids are governed by the same regulations as organic peloids. The same peloid bath may not be used for **different** people. Moreover, non-organic peloids or silt must not be reused.

## 1.3.4 Peloid analysis

The chemical composition of peloids and their physical properties are determined using peloid analysis and verified in control analysis.

Peloid analysis provides an overview of the composition of the peloid and provides the basis for assessing its balneological application and conditions prevailing in the deposit.

## 1.3.4.1 Minimum requirements

A peloid analysis includes the following features:

– General details: Name and address of the institute or expert conducting the analysis; date of sampling and local tests; weather on the day of sampling and air temperature in  $^{\circ}$ C, air pressure in hPa; relative air humidity in per cent; details of previous weather conditions (in order to assess humidity conditions in the peloid deposit, etc)

- Brief geographical and geological description of the peloid deposit (structure and size) with exact description of the place of sampling (easting, northing, height above mean sea level) and an accurate plan of the terrain; description of the surroundings of the deposit including possible anthropogenic influences on the deposit; surface vegetation; definition of the peloid (e.g. high moor peat or low moor peat; consolidate tuffites)

- Hydrological data (e.g. availability of springs, groundwater level at the time of sampling, draining proportion; type of sampling (e.g. ground cut by spade, drilling probe, excavator)

– Depth of the extraction layer below the surface; mixed or individual sampling; quantity of the deposit contents, thickness, structure of layers and composition of subsoil at the place of sampling; cultivation activities, protection of the countryside, ownership; description of technology for the use and disposal of peloids (extraction, transport, temporary storage, processing, removal, depositing)

- Details on the previous use of the deposit or the peloid

# 1.3.4.2 Physical, chemical, biological and microbiological properties

- Density at normal and/or packing consistency
- pH in naturally humid conditions and normal and/or packing density
- Water capacity
- Sediment volume
- Degree of swelling rate

 Ratio of dilution needed to produce a peloid-water mixture of normal and/or packing density - Heat conservation according to 'ball' method

#### **Chemical tests**

The results of chemical analysis are to be determined as a percentage of dry mass as well as of the medium used for bathing at normal consistency (e.g. bathing peat). If the peloid is to be mixed with mineral water, the watery phase (water-soluble substances) has to be tested using material ready for baths.

#### General composition of the naturally humid peloid

- Water content (105℃)
- Mineral substances (800 °C)

- Loss on ignition/LOI (organic substances, water of crystallisation and other volatile substances)

#### **Composition of mineral substances**

- Acid-soluble proportion
- Acid-insoluble proportion

 Qualitative chemical determination of inorganic substances for a proportion of mineral substances above 5% of dry mass

 Quantitative chemical determination of inorganic substances (for peloids with a main proportion of mineral substance)

#### Composition of organic substances in peats

- Bitumen (fats, waxes, resins etc);
- Woluble carbohydrates, pectins etc.; cellulose and hemicelluloses; alkali soluble and acid-precipitable humic acids; lignins and humins.

## Composition of organic substances in peloids with a higher organic proportion

- Bitumen (fats, waxes, lipoids etc.)
- Colouring and other alcohol-soluble components
- Cellulose and hemicelluloses
- Content of nitrogen (total)

## Composition of substances dissolved in water at normal and/or packing consistency

- Total content; content of inorganic substances; content of organic substances

Quantitative determination of inorganic substances (only for more than 1 g/l mineral substances or substances affecting the balneotherapeutical values, e.g. sulphuric sulphur or iodide)

 In the case of environmentally relevant impact on peloid deposits: anthropogenically harmful substances e.g. heavy metals, pesticides, halogenated organic compounds, etc

The biological tests are mainly carried out to check the hygiene aspect. The main concerns regarding the peloid's microbiological properties are the presence of pathogenic bacteria and any mould known to be pathogenic. Certain quantities of other microorganisms which are classified as harmless are permitted.

Pathogenic germs which are the cause of concern include:

- Pseudomonas aeruginosa
- Staphylococcus aureus
- Escherichia coli (guide value 100/100ml limit 2,000/100ml)
- Coliform bacteria (guide value 500/100ml limit 10,000/100ml)
- Salmonella
- Candida albicans
- Aspergillus niger

#### Microbiological tests for determining hygienic conditions

- Number of colonies at 20 ± 2 ℃
- Escherichia coli at 36 ± 1 ℃
- Coliform germs at  $36 \pm 1 \degree$ C
- − Staphylococcus aureus at 36 ± 1 °C
- Pseudomonas aeruginosa at 36 ± 1 ℃
- Candida albicans at  $36 \pm 1 \degree C$

- pH, water content (105  $^{\circ}\mathrm{C}$ ) and temperature (at the time of sampling) of the samples used for microbiological tests

#### Characterisation

 Colour, smell, consistency, homogeneity, intercalations; determination of particle sizes using methods of mechanical soil analysis with inorganic peloids, decomposition of peats according to 'von Post's scale'

#### 1.3.5 Peloid control analysis

A peloid analysis usually has to be carried out every ten years. However, this period may be extended if control analysis indicates that the deposits and the peloid have not changed significantly. On the other hand, if considerable variations are found in these control analyses, a new peloid analysis has to be carried out.

#### 1.3.5.1 Chemical control analysis

Peloids require a control analysis no more than every five years. Apart from the general composition (water content  $105 \,^{\circ}$ C, mineral substances  $800 \,^{\circ}$ C and the resultant loss on ignition), the water capacity and other characteristic parameters (e.g. humic acids, distribution of particle sizes) have to be determined to find out whether the quality of the peloid has changed. The analysis report has to include when the next peloid analysis is due.

#### 1.3.5.2 Testing hygienic conditions

Peloids are subject to annual examination with respect to their hygienic state. Testing must include at least the following:

 Site inspection and examination of the hygienic conditions of all facilities used for the extraction, processing, storage, application and disposal of the peloid

- Special forms:

Generally valid European hygiene standards, framework conditions (e.g. 'psoriasis' fishbowls)

## 1.3.5.3 Monitoring

Peat and other peloid spas as well as peloid operations must apply continuous monitoring. The long-term availability from appropriate deposits has to be demonstrated for natural peloids. Technical facilities used to prepare and properly apply peloids for baths and packs along with the system for temporary storage and subsequent reusage and disposal meeting environmental standards must be state-of-the-art.

The general hygiene measures and monitoring of treatment facilities must be observed.

## 2 Thalassotherapy

#### Natural remedies from the sea

Seawater which is used for therapeutic purposes is a natural remedy from the sea. Depending on its intended use and the relevant legal regulations, it may be used for medicinal purposes or distributed among consumers.

Naturally, the **sea** always forms the heart of thalassotherapy. Harnessing its beneficial effect involves being right next to the sea and soaking up the local climate (e.g. salinity in the air and the possibility of bathing in seawater).

#### 2.1 Medicinal-balneological assessment

If seawater is used for bathing in tubs, therapy basins, inhalation or drinking cures, scientific reports by a medicinal-balneological institute or a qualified expert must be compiled to demonstrate its suitability for healing purposes.

Scientific reports are needed in order to classify resorts in terms of the therapeutic effects of the local seawater. Medicinal-balneological reports are produced by medicinal-balneological institutes or health resort doctors who are qualified to act as experts.

The report must contain:

- a) General information (place, subject, period of examinations etc)
- b) Name and address of the medicinal-balneological institute or expert
- c) List of documents forming the basis for assessment
- d) Evaluation of the results of seawater analysis and/or control analysis

- e) Medical assessment of the hygienic-bacteriological results
- f) Summary and approval (or not) of the category the resort has applied for

In order to be officially recognised, the local bio-climate and the air quality must be suitable. The air quality has to meet high standards in order to be designated beneficial for respiratory diseases.

## 2.2 Hygienic requirements

Seawater used as a remedy in tub baths and baths for swimming, exercise and other types of therapy as well as for inhalation and drinking cures (as medicinal water) has to comply with the general hygienic and microbiological requirements governing the type of treatment concerned. (Technical requirements include no backflow into the reservoir.)

The generally valid regulations and procedures are to be observed regarding hygiene demands in seawater applications and therapies.

The individual departments of a thalassotherapy centre should be regarded as a single unit. They include for example the waiting room, changing room, swimming baths, showers, rest areas, doctors' surgeries, nurses' rooms, and technical facilities. Floors and walls must be easy to clean and disaffect. A sufficient number of toilets must be on hand. Rooms must have adequate lighting and ventilation.

In order to protect the sea and to enable the cleaning and discharge of sewage, the legal regulations in force should be regarded as the minimum requirements. The purification of sewage requires a highly efficient sewage plant.

#### 2.3 Composition

Seawater analysis requires the same standards as the analysis of healing water. However, analysis must include parameters at the place of application or other factors relevant to a drinking cure (e.g. the taps and vessels used).

As well as enabling comparison with known salinity values, analysis should also determine the levels of main constituents and known trace substances in the seawater. If seawater is also used for swimming at the sections of beach concerned, it will be subject to the EU bathing water quality directive (8 December 1975) and the subsequent regulations of the regional authorities responsible. The same applies to beach hygiene.

The recommendations of the European Parliament and Council regarding the implementation of a strategy for the integrated management of coastal zones in Europe (2002/423/EC dated 30 May 2002) also apply. Integrated coastal zone management is defined as a dynamic, continuous and iterative process enabling decisions to be reached regarding the sustainable usage, development and protection of coasts, including their resources. (Source: Integrated Coastal Zone: Towards a European Integrated Coastal Zone Management (ICZM) Strategy – General Principles and Policy Options. Luxemburg 1999)

## 2.4 Extraction points

Seawater is extracted using:

- Deep wells (usually from shore filtrate)
- Horizontal filter pipes from the filtrate of the sea sediment (seabed)
- Direct open extraction from the sea

The type of extraction to be preferred depends on local factors affecting quality such as current, surf and tidal drop as well as regional risks stemming from industry, shipping and tourism.

Seawater usually has to undergo purification.

## 2.5 Physical, chemical, biological and microbiological properties

#### 2.5.1 Initial analysis of seawater

Although initial analysis is largely the same as the analysis of any other healing water, the manner of extraction also plays a part. If water is directly extracted from the sea, the lack of any sort of natural protection at the extraction point presents a risk. Therefore the following parameters need to be measured and assessed once a month for a year before startup:

- Temperature
- Conductivity
- Ammonium, nitrate/nitrite
- Coloration
- Smell

#### **Microbiological parameters**

- Colony count at 20  $^{\circ}$ C (after 44 ± 4 hours max. 100/ml)
- Colony count at 37 °C (after 20 ± 4 hours (max. 100/ml)
- Coliform germs
- Escherichia coli
- Pseudomonas aeruginosa
- Faecal streptococci/Enterococcus
- Salmonella
- Enteroviruses

- Risk parameters in hot summer months e.g. cyanobacteria and cyanotoxins

#### 2.5.2 Seawater analysis

#### a) Physicochemical properties

Seawater analysis requires the same standards as the analysis of any other healing water and must be performed at least once every five years.

Unlike the analysis of healing water, the following parameters need not be determined:

- Radon activity

- Free gases (proportion of volume) such as carbon dioxide, nitrogen dioxide, oxygen, hydrogen, argon, etc.

If there are justified doubts, tests can be extended to cover risk parameters especially prevalent in the summer months such as cytobacteria, extractable substances and the hydrocarbon index, detergents, nitrated and halogenated aromatic compounds, crop protectants and pesticides.

#### b) Microbiological properties

For microbiological parameters, see table below. If seawater is to be used for swimming baths or exercise therapy, the same requirements governing healing water analysis apply.

#### 2.6 Monitoring

#### **Documentation of seawater properties**

- Temperature, coloration, clarity, smell, pH, conductivity, ammonium, nitrite

If inhalation is performed, documentation should also include integrity testing and sterilisation parameters (temperature, pressure, holding time).

## Documentation: every 14 days (or monthly if the findings are constant).

	Tab.	3:	Docum	entation	of	seawater	parameters
--	------	----	-------	----------	----	----------	------------

	Germs	Limits
	Total coliform	<=500/100 ml
<b>-</b>	E. coli	<=100/100 ml
Extraction point	Faecal streptococci	<=100/100 ml
	Salmonella	0/11
	Enteroviruses	0/10
	Colony count at 20℃ (after 44 ± 4 hours – max. 100/ml)	100/ml
	Colony count at 37 $^{\rm C}$ (after 20 $\pm$ 4 hours (max. 100/ml)	100/ml
	Total coliform	<=50/100ml
Baths/tub	E. Coli	<=10/100ml
	Faecal streptococci	<=10/100ml
	Staphylococcus aureus	0/100ml
	Pseudomonas aeruginosa	0/100ml
	Colony count at 20℃ (after 44 ± 4 hours – max. 100/ml)	100/ml
	Colony count at 37 $^{\circ}\!\!\mathrm{C}$ (after 20 ± 4 hours (max. 100/ml)	100/ml
Drinking	Total coliform	0/100ml
	E. Coli	0/100ml
	Faecal streptococci	0/100ml
	Pseudomonas aeruginosa	0/100ml
	Colony count at 20℃ (after 44 ± 4 hours – max. 100/ml)	0/ml
	Colony count at 37 °C (after 20 $\pm$ 4 hours (max. 100/ml)	0/ml
Inhalation/	Total coliform	0/100ml
irrigation	E. coli	0/100ml
	Faecal streptococci	0/100ml
	Pseudomonas aeruginosa	0/100ml

#### **Physicochemical properties**

Colour, smell, clouding, pH, electrical conductivity at 25°C, ammonium, nitrite and nitrate. If suspicions are justified, tests can be extended to cover cyanotoxins in the summer months, extractable substances and the hydrocarbon index.

#### Six-monthly documentation

Legionella in 100 ml, TOC and manganese.

## 2.7 Special features of thalassotherapy

#### Criteria for definition by the ESPA (European Spas Association)

One of the aims of the following criteria is to give 'thalassotherapy' a uniform definition throughout Europe in order to guarantee high quality and to establish the term as a brand. Another aim is to counteract the inflationary usage of the term 'thalassotherapy'. Thalassotherapy covers a broad field ranging from the medicinal treatment of chronic diseases (e.g.

respiratory and skin diseases) to prevention in healthy people as well as part of wellness programmes. In these cases, the indication comprises fortifying physical performance ('roboration').

## 2.7.1 Criteria

The term 'thalassotherapy' may only be used if the following criteria are met:

- 1) A therapeutic strategy is applied for defined indications under medical care
- 2) Treatment takes place at the sea so that patients are directly exposed to the sea climate
- 3) Seawater is used to inhale and/or bathe in, e.g. in tub baths and swimming baths as well as natural sea baths
- 4) Sea products such as silt or algae are used for various applications
- 5) Heliotherapy the primary usage of natural sunlight (augmented by artificial UV lighting during poor weather)
- 6) Low-allergen, clean sea air is used, with patients spending protracted periods outdoors
- 7) Timetable of climatic exposure and exercise therapy near the shore
- 8) Other health measures are carried out at the same time

The emphasis is on relaxation, nutritional change and physical activity.

#### 2.7.2 Medicinal-balneological assessment

Whether seawater meets the requirements for therapeutic treatment has to be demonstrated in a scientific report by a medicinal-balneological institute or a recognised expert in medicinal balneology

#### 2.7.3 Sea/seawater products

The term 'sea/seawater products' includes aerosols, algae, mud and baths.

The definition/specification of sea/seawater products and the specificities must be controlled by a body of experts.

## 2.7.4 Physical, chemical, biological and microbiological properties

See 2.5.1 and 2.5.2.

#### 2.7.5 Reuse

Seawater may not be reused.

## 3 Bio-climate and air quality

## 3.1 Natural remedies of the climate

The bio-climate can only be used as an independent element of a health cure if it is able to relieve or stimulate body functions.

## 3.1.1 Basic requirements

The human organism is constantly exposed to the atmosphere and climate, and has to constantly strive to be in tune with its surroundings. Adaptation to changing climatic conditions is part of therapeutic treatment in health and holiday resorts to train the regulatory mechanisms occurring naturally in the body. Depending on the therapeutic objective, atmospheric pollution needs to be minimised and the patient is exposed to the stimulation of an unfamiliar climate. Therefore, climatic information is collected to create a picture of the local climate's healthy and unhealthy aspects. The report on bio-climatic conditions serves as a basis for wellmeasured therapeutic treatment using climatic stimuli as independent elements of a climatic health cure.

## 3.1.2 Medicinal-climatic assessment

The medicinal-climatic assessment of the climate with respect to regeneration and relaxation describes the influences climatic conditions have on spa patients and those seeking relaxation. It also describes the climate's effect described on the basis of climatic-physiological findings and includes proposals on how the climate and the landscape can be used for therapeutic treatment. The report is to be drawn up by a non-local doctor experienced in the field of climatic therapy or a recognised scientific institute. A medical assessment has to meet the requirements outlined below.

## 3.1.3 Medicinal-meteorological report

The purpose of the medicinal-therapeutic report is to describe the therapeutic influences of the climate and air quality, and to evaluate their therapeutic effects from a medicinal point of view on the basis of therapy forms tested in the resort. It should document and evaluate a medicinal-climatic health cure strategy and its practical application. If possible, the report should be drawn up either by a non-local doctor experienced in the field of medicinal climatology or an institute recognised for its experience of climato-therapy. The report must contain the following information:

- a) General information (place, subject, period of examinations etc)
- b) Name and address of the institute and/or the expert
- c) List of documents and papers forming the basis of assessment
- d) Site inspection
- e) Medicinal-climatic assessment of the climate and measurements of air quality
- f) Consequences for sick and healthy people

- g) Evaluation of a change in the climate by changing location
- h) Indications and contraindications;
- i) Conclusions regarding the therapeutic use of the climate

## 3.1.4 Area under review

According to the definition of 'spas', the area under review is the area to be classified or recognised. It always includes the entire area frequented by guests with particular emphasis on those places planned and used for climate therapy as well as all spa facilities with surroundings planned for spending time in the fresh air. The effects of the local terrain on bioclimatic factors of influence have to be examined for the whole area under review.

## 3.1.4.1 Bioclimatic pre-assessment

The bio-climate is pre-assessed on the basis of a site inspection and by means of model calculations. The purpose of a site inspection is to evaluate the adaptation of the macroclimate due to local topographic conditions including vegetation and buildings. Positive factors of influence to be determined include the effects on aeration and radiation conditions as well as cooling in the evening. The thermal stimulation intensity has to be evaluated in the annual cycle and on the basis of the average number of days with thermal loading.

#### 3.1.4.2 Climate assessment

The purpose of a report on the climatic conditions is to determine the privileged location of a health resort with respect to its bio-climate. Basic requirements for an assessment of the climate include results achieved by a site inspection, model calculations, representative data on the climate, and surveys on air quality. The report includes:

- Description of the regional climate
- Description of climatic features in the individual resort
- Evaluation of thermal conditions
- Pre-assessment of the air quality

## 3.1.4.3 Climatic analysis and assessment of the bio-climate

The basis for a climatic analysis is a collection of those factors influencing the bio-climate with respect to time and place. A climatic analysis therefore gives a detailed survey of the terrain to be examined (windward, lee, summit, pass, slope or terraced slope) and also analyses how these factors influence wind protection, air circulation and a change of the macroclimate. The purpose of the climatic analysis is to examine whether the climate in a resort makes it appropriate for therapeutic treatment and whether a resort has an appropriate location and rainfall.

A bio-climatic assessment of the climate is to be conducted on the basis of beneficial, stimulating and harmful factors. Special emphasis has to be placed on the thermal strength of the stimuli in the annual cycle, the influence of heat considering cooling in the evenings, and the radiation conditions. The intensity and effects of local wind systems also play an important role in this assessment. If the climate is used for therapeutic treatment in climatic health resorts, a more detailed climatic analysis is necessary. Additional elements here include the ability to scale the factors that influence the bio-climate in the area under review and the development of selected meteorological parameters in the annual cycle. Weather conditions that have proved especially effective with respect to the bio-climate are also to be described.

In order to apply the stimuli of the climate in climatic health resorts in a well-measured way, current meteorological data should be made available to therapists and spa guests. Guidelines for selected types of climates are currently being developed and will be announced by the German Spas Association.

## 3.1.5 Control analysis; periodic monitoring

Due to changes in land utilisation, expansion and building density, which could in turn affect aeration, the bio-climatic conditions may change. Therefore, whether the conditions determined in a climatic analysis or an assessment of the climate are still valid must be reviewed every ten years in a control report. During a site inspection, the above-mentioned factors which might influence the climate and their positive effects have to be assessed. The control report recommends whether the bio-climatic conditions for the category awarded are still met. The report also includes suggestions on how to improve and develop treatment using the climate as a natural remedy by means of activities in urban planning and traffic calming. Should it be reasonable to assume that relevant changes to the air quality and bio-climate have occurred since the last assessment, the local bio-climatic conditions in holiday resorts and seaside spas have to be examined.

#### 3.1.5.1 Measurements

In order to determine the necessary climatic information by means of measurements at a local climate station, the following parameters are to be measured at least every two years: air temperature, air humidity, duration of sunshine or global radiation as well as wind direction and wind speed.

Particular topographic conditions in the area under review or certain objectives may make it necessary to examine or observe more parameters. The climatic data determined during the measurements at a climate station in a health resort have to be compared to corresponding data of at least one climate station representative for the area under review. In order to operate on a reliable basis, these data must have been determined during a sufficiently long period (in climatic health resorts and seaside spas usually 30 years).

#### 3.1.5.2 Use of model techniques

By using model techniques, climatic data can be edited in a twodimensional graph. GIS techniques are normally used to consider the influence of climatic factors such as latitude, altitude above mean sea level, orography, oceanity-continentality and land utilisation.

## 3.2 Air quality

## 3.2.1 General details

Air quality is impaired by the presence of undesired admixes in the surrounding air. According to these definitions undesired air pollution exists when admixes in the surrounding air are highly concentrated and are to be observed over a longer time so that patients in a health cure and spa guests are no longer relieved from the high pollution that they experience in big cities and built-up areas.

Legally defined long-term limits to protect people from damage to health usually have to be below 60% (preventive value) throughout the health resort in order to guarantee relief for patients and spa guests. Health resorts have to guarantee air quality beneath this limit to prevent adverse health effects or impairment through air admixes caused by anthropogenic influences.

Natural air admixes that impair health, especially pollen, are unavoidable. Seaside spas or resorts in high mountain areas with a low concentration of allergens and health resorts where pollen does not occur due to regional or seasonal reasons, however, can be used for therapeutic treatment.

In order to evaluate air quality, certain key compounds are regularly measured to analyse the current status of pollution through air admixes in the health resort. By observing the guidelines established in 3.2.2.6, local remedies are not impaired by unhealthy side-effects.

## 3.2.2 Report on air quality

The purpose of such a report is to evaluate a health resort with respect to its air quality. In addition, the report has to describe the state of pollution. By considering variations caused by seasonal influences and weather conditions, contributions by the individual groups of emitters may be estimated. The report includes scientifically based conclusions on the reasons for the emissions and proposals on how to minimise them from a meteorological point of view.

When assessing maximum values of pollution, an expert has to consider natural factors of influence and error tolerance doses with respect to the different measuring methods. These must be included in the overall assessment so that the results can be completed or modified accordingly. Those factors leading to modified assessment must be explained in detail in the report.

#### 3.2.3 Measuring areas

The places for measuring air quality have to be chosen in the spa area with respect to their individual use. The purpose of measurement is to provide experts with representative results in order to assess:

a) The background concentration, especially at those places where treatment is carried out

- b) The influence on the most densely built-up areas without the direct impact of traffic
- c) The impact at busy places with high traffic in the town centre

The locations and number of measuring places should be determined depending on the range of treatment at a health resort, the places where spa guests usually stay, and the size of the area under review. More details are contained in an annex to these definitions.

## 3.2.4 Measuring systems

In order to evaluate air quality in the different areas of a resort, sampling places have to be established in the following areas:

- a) Spa areas (i.e. the area where treatment is applied) to determine possible background impact
- b) Town centre to determine additional impact occurring without the direct influence of traffic pollution
- c) Places with high traffic to determine its influence

Note that the location of measuring instruments must not be exposed to pollution from direct permanent and temporary sources which might impair the representative results.

In order to measure and assess air quality in healing galleries, sampling points need to be set up underground in both therapy and non-therapy areas. Above ground, the general regulations regarding execution and guide values apply.

#### 3.2.4.1 Number of sampling places

The number of sampling places is determined by the purpose of measurement. Measuring air admixes in the form of particulate and NO<sub>2</sub> requires one sampling point at each of the three places mentioned above. Benzenes should only be measured at areas of traffic and only if indicated by pre-assessment. Additional sampling places have to be established if:

- a) There are any peculiarities about local pollution and distribution;
- b) There are any peculiarities regarding local pollution in terms of number, type and intensity of sources.

#### 3.2.5 Guide values

Guide values are defined with respect to their individual use. The air quality needs in particular to be protected at all areas applying treatment etc, while the accommodation of spa guests has to meet the same high standards. Less stringent requirements apply in shopping areas where spa guests spend relatively short periods of time and where traffic is encountered. Health resorts for certified respiratory illnesses have to meet higher standards of air quality. The relevant guide values are minimum requirements which may also be used for the assessment of air quality in holiday resorts. More details on regulations are to be found in an annex to these definitions.

## 3.2.6 Measurement

To assess the air quality in health resorts, key compounds contributing to pollution are measured at regular intervals. These key compounds are announced in an annex based on a recommendation by the Spa Science Committee of the German Spas Association.

Air quality has to be measured in at least at three places in the area under review depending on use. Measurements should provide representative values taken at difference times and places.

The aim of measuring key compounds is to define a general degree of pollution in the health resort or its surroundings. Other air admixes (including natural ones) may have to be determined if indicated.

## 3.2.7 Control analysis and quality assurance

Measuring pollution in health resorts requires measuring techniques able to detect and reproduce concentrations of pollution typical of health resorts. The principles of procedures, values and methods have to be described in detail, e.g. in guidelines produced by the European Committee for Standardisation (CEN). The European Spas Association then decides whether measuring techniques are suitable. Moreover, an independent test institute may be asked for an assessment. If a number of service-providers are involved in measurement, inter-laboratory tests have to be carried out at least every five years to ensure the results are comparable.

#### 3.2.8 Measuring techniques

The following measuring techniques are allowed for determining air quality over time and space as a requirement for classification as a health resort.

#### 3.2.8.1 Particulate pollutants

The guide and test values contained in Tables 4 and 5 should be consulted in order to assess measurement results.

Tab. 4: Guide values (annual means) and loads used to assess air quality in healing galleries pursuant to 2.3 (all figures in  $\mu g/m^3$ )

ltem Load	Fine dust (PM2.5)	Coarse dust (> 2.5 μm)	Nitrogen dioxide (NO <sub>2</sub> )
Hardly polluted	Mean < 2.0	Mean < 2.0	Mean < 2.0
Slightly polluted	2.0 ≤ mean < 4.0	2.0 ≤ mean < 5.0	2.0 ≤ mean < 3.0
Moderately polluted	4.0 ≤ mean < 6.0	5.0 ≤ mean < 9.0	.3.0 ≤ mean < 5.0
Guide value	6.0	9.0	5.0

Tab. 5: Air quality requirements in healing galleries pursuant to 2.3

Item	Test value
Soot	< 1 [µg/m³]
Radon	Pursuant to radiation protection regulations for mines and caves open to the public
Pollen	Not detectable

## 3.2.8.2 PM 2.5s

Fine dust with a particle size  $\leq 2.5\mu m$  ('PM 2.5') will be measured as soon as a suitable reference procedure has been announced by the EU. The concentrations of PM2.5s in healing galleries is determined using a minivolume collector (0.1m<sup>3</sup>/h). To assess the measurements, the air quality guide values in Table 4 should be consulted.

## 3.2.8.3 PM10s, soot

Soot can be determined thermographically from the filters as elementary carbon in fine dust (PM10s) in accordance with VDI directive 2465, sheet 1 or 2. Once a reference procedure has been introduced by the EU, soot will have to be determined in the PM2.5 fraction. The soot level in healing galleries is determined using the immersion procedure on the impinged filters in the PM2.5 fraction. The test values in Table 5 should be consulted in order to assess the measurements.

## 3.2.8.4 Air particles dangerous to human health

If necessary, saline aerosols from the sea and inland salt water as well as pollen should be determined by means of adequate procedures.

## 3.2.8.5 Gaseous air admixes

The fractions of nitrogen dioxide (NO<sub>2</sub>) and possibly benzenes in the air have to be determined by integrated measuring procedures using diffusion tubes. Batch collectors are not suitable. NO<sub>2</sub> has to be determined by means of diffusion tubes according to Palmes; benzenes by means of diffusion tubes by Perkin, Elmer (PE) or Dräger (ORSA), or equivalent passive collectors. Measuring instruments have to be protected from poor weather, especially wind and rain.

## 3.2.8.6 Duration of collection and measurement

The collection period usually is 14 days.

A series of measurements usually takes one year. Assessments must be based on at least 22 14-day means; if not, the series of measurements has to be extended.

A collection period of four weeks (28 days) has proved suitable for sampling the air admix in healing galleries. In the case of high dust loads, the collecting time can be reduced accordingly to avoid collecting too much dust. Assessment must be based on at least ten four-week means, including at least six taken in the period between April and October ('summer half-year') and three in the period between November and March ('winter half-year').

## 4 Other certified traditional local therapy techniques

## 4.1 Kneipp therapy

## 4.1.1 Requirements for Kneipp physiotherapy

Kneipp treatment entails the 'five healing factors of Kneipp physiotherapy':

- a) 'Ordnungstherapie' (holistic medicine/ milieu therapy)
- b) Nutritional therapy
- c) Hydrotherapy
- d) Therapeutic exercise
- e) Phytotherapy

# 4.1.2 Medicinal-balneological assessment to ensure the high standard of Kneipp treatment

Kneipp spas and resorts are officially classified as such if they meet the requirements (see definitions) and a report has been drawn up by a spa doctor familiar with Kneipp physiotherapy or a medicinal-balneological institute.

The report must contain the following:

- a) General information (place, subject, period of examinations)
- b) Name and address of the expert/medicinal-balneological institute

c) Qualified statements on whether therapeutic treatment in line with Kneipp physiotherapy and the procedures of general physical therapy can be provided to the standard of quality required

d) Assessment of the classification the resort has applied for

## 4.1.3 Control analysis; periodic monitoring

No regulations exist.

#### 5 Other types of therapy

Other types of therapy are governed by the rules of application of the relevant professional associations.

#### Addresses

Int. Schrothverband e.V., Postfach 80, 87534 Oberstaufen, Tel: +49 (0) 8386 93000 • Fax: +49 (0)8386 930020

Deutscher Schrothverband e.V. Hugo-von-Königsegg-Str. 8 D-87534 Oberstaufen Tel: +49 (0) 8386 93000 Fax: +49 (0) 8386 930020 info@deutscher-schrothverband.de

## Naturheilbund (Prießnitz-Bund) eV, Verbund deutscher

Naturheilvereine Kreuzbergstr. 45 74564 Crailsheim Tel: +49 (0) 7951 5504 Fax: +49 (0) 7951 45568

#### Ärztliche Gesellschaft für Naturheilverfahren – Kneippärztebund e.V.

Baumgartenstr. 4 86825 Bad Wörishofen Tel: +49 (0) 8247 90110 Fax: +49 (0) 89 90111

#### Internationale Gesellschaft der Mayr-Ärzte

Iglerstrasse 51-53 A-6080 Igls Tel. +43 (0) 664 922 8294 Fax +43 (0) 512 379225 Email: <u>office@fxmayr.com</u>