Development of symbols to inform about water quality under the EU Bathing water Directive 2006/7EC

Report on research by the
Royal Society for the Prevention of Accidents

European
Commission

Table of Contents

Executive Summary

As a result of some of the requirements of EU Bathing Water Directive 2006/7EC RoSPA were commissioned by EC Directorate-General Environment to review and develop a set of logos to inform beach users of water quality, both the classification of water quality found at a designated bathing beach and warnings about reductions in that level of quality typically as a result of heavy rain. This would be a 3 stage project comprising of:

- logo/symbol development
- comprehension testing and analysis
- and through the presentation of results some recommendations

Development
After a review of previous design work ostensibly that produced for the EU Workshop on Signs and Symbols in Pisa, Italy, signage currently used for similar situations and a search for suitable ISO or CEN standardised graphical symbols already in use and potentially adaptable for water quality purposes. RoSPA commissioned a graphical designer to design images complying with ISO 3864-1, ISO3864-3 and ISO 17724 that could subsequently be tested. A question set, framework and research protocol was developed into which the graphical symbols could be fitted.

Testing and Analysis
The developed graphical symbols were tested where appropriate in accordance with ISO 9186 in 3 separate beach locations as per the contract requirements. The beach location testing also complied with the standard requirements of ensuring a range of age, gender (sex), ethnic background and varying educational levels were found within the testing participants. This testing was undertaken in 1 northern European Country (in the UK) beach location and 2 southern European Country beach locations (Crete-Greece and Fuerteventura-Spain).

Conclusions and Recommendations
Only one of the specifically designed symbols met the comprehension testing requirement and this particular design may not necessarily be required as the already standardised and tested image had similar if not better results.

Supplementary text and other systems (such as the red beach safety flag) for communicating the messages about the water quality classification, prohibition of swimming and signage to indicate a lowering of water quality are required. Stand alone symbols were not comprehended enough to work in isolation. Through the use of text an increased understanding will occur as the symbols use becomes more widespread.

Report from the Royal Society for the Prevention of Accidents

The development of symbols to inform about the EU Bathing Water Quality Directive 2006/7 EC for the European Commission

Peter Cornall[1], David Walker[2], Wendy Wilsher[3]

1 RoSPA, Head of Leisure Safety, RoSPA, RoSPA House, Edgbaston Park, 353 Bristol Road, Birmingham, B5 7ST

2 RoSPA, Leisure Safety Research Manager, RoSPA, RoSPA House, Edgbaston Park, 353 Bristol Road, Birmingham, B5 7ST

3 Typographic and graphic design, Wilsher Design 233 Harding Avenue CA 95030 Los Gatos (USA)

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List of Images

Abbreviations

BSI	-	British Standards Institute
CEN	-	European Committee for Standardisation (Central European Norm)
DEFRA	-	Department of Environment Framing and Rural Affairs
DTI	-	Department of Trade
EU	-	European Union
FEE	-	Federation of Environmental Education (Blue Flag Org)
ILSE	-	International Life Saving Organisation (Europe)
IMO	-	International Maritime Organisation
ISO	-	International Standards Organisation
TC	-	Technical Committee of ISO
RNLI	-	Royal National Lifeboat Institution
WG	-	Working Group of ISO

1.0 Introduction and Background

The requirements of EU Bathing Water Directive 2006/7EC[1] lays down provisions for the monitoring and classification of bathing water quality; the management of bathing water quality and the provision of information to the public on bathing water. Previously this has been at designated beaches the display of water quality information during the bathing season. The format of this information has been in either block shading of results or more illustrative in the use of red, orange/yellow and green smiley faces. In order that beach operators can provide better information for beach users on bathing water quality the directive will require them to display a classification of the bathing water quality based on the previous year's test results and to display warnings and or prohibitions when water quality is likely to be lower than the classification usually as a result of rainfall affecting the water quality.

To ensure standardization of this information the EC has set up a programme to develop the graphical symbols for use by beach operators. This process was started by a workshop on Signs and Symbols (EU Bathing Water Directive 2006/7EC) held in San Rossore, near Pisa, Italy on 11th and 12th June 2007. The outcomes from this workshop were then used in briefing the graphic designer chosen to carry out this project. Several existing water quality warning signs were found but none were deemed to be suitable, in terms of looking or adhering to requirements of ISO safety signage design. The current three classifications of actual water quality testing is one less than the overall seasonal classification for a particular bathing beach. This has the potential to cause problems in understanding any new signage. The only current information system that is ISO standardised is that for beach safety flags (ISO 20712-1:2008). The current red flag is used to advise against entering the water.

1.1 Purpose and Objective

Development of the graphic design of the logos for the different levels of bathing water quality (excellent, good, sufficient and poor) and for prohibition of / advice against bathing.

1.2 Scope

This research and symbol development has been undertaken by The Royal Society for the Prevention of Accidents (RoSPA). It is intended to provide guidance for the future development of water quality signage by the EU.

The sole intention is to review current signage symbols and systems and the subsequently design new or adapt existing ones to meet the needs of EU Bathing Water Directive 2006/7EC. In order to achieve compliance in the future with ISO standards the designs in some cases have been comprehension tested. From this the report aims to produce recommendations to assist in adoption of these symbols.

The research project has been undertaken by the RoSPA leisure safety team. It has been supplemented by a technical expert in recreational boat safety design and buoyancy. See Appendix one for a summary of their respective expertise.

1.3 Terms of Reference

The original terms of reference were drafted by EU commission DIRECTORATE-GENERAL ENVIRONMENT DIRECTORATE D – Water, Chemicals and Cohesion ENV.D.2 Water Protection and Marine Environment.

1.4 Limitations, Exclusions and Definitions

In carrying out this safety review RoSPA would point out that audits and reviews are by nature a sampling exercise, therefore the reviewer cannot guarantee to identify all safety hazards within the scope of work. The testing to ISO standard was only carried out on the graphical symbols that fall within the scope of the current water safety signs and symbols, water quality classifications are deemed to be within the realm of public information and so doing not need to comply with the safety information requirements. Swimming and bathing are often confused, for the purposes of this report, swimming will be defined as the physical act where as bathing will be entering the water to paddle or swim.

[1] Directive 2006/7/EC of the European Parliament and of the Council concerning the management of bathing water quality and repealing Directive 76/160/EEC (Official Journal L64 of 4.3.2006, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:064:0037:0051:EN:PDF


CAROUSEL
AMUSEMENTS
WELCOME TO WESTWARD HO! BEACH
FOR YOUR SAFETY...
999

1


CAUTION
DURING PERIODS OF
HEAVY RAIN
THE RED RIVER MAY
BECOME POLLUTED
REN UNSUPERVISED ON THE BE

2


Beach
Promenade
authorised users only and strictly no parking

3

2.0 Development and Design Methodology

2.1 Designing a Successful Symbol

Symbol designs fall into two categories: those which are successful because they are representative of the message being conveyed, and those which are more abstract, but they have become known for their meaning over time. When designing a new symbol for an intended audience thought should be given to the meaning being represented and the users' expected reaction upon reading the symbol.

Be read faster than text and can be multi-lingual. If a symbol contains too many small details it can hinder the distance from which the symbol can be read and understood. As such, solid areas work better on symbols than using lines.

Some existing graphical symbol elements are well understood and it can be counter-productive to introduce a new element with an identical or similar meaning.

Symbols can easily fail if they do not convey enough information and also if they convey too much information. Symbols are useful tools in conveying information as they can often

2.2 Displaying the Symbols

The use and display of the symbols should be considered. A colour contrast between the symbol and the background upon which it is placed will help the symbol to be seen and be legible. The language and relative position of the supplementary text will affect the success of conveying the meanings.

2.3 Terminology of Supplementary Text

The terms 'excellent', 'good' 'satisfactory' are clear in their meanings and should be understood by the public with confidence. However, understanding the term 'poor' is challenging.

When designing symbols and their meanings it is important to think about the anticipated public reaction. Upon visiting a beach and reading that the water quality is/was 'poor', would it be expected that the visitor feel that the water was safe to bathe in?

The word 'poor' is defined as 'inadequate' in the English language. If the water quality is 'inadequate' this would imply the water is not clean enough to bathe in. However, if 'poor' means the water quality is safe to bathe in, then 'poor' is a negative term for this somewhat positive meaning? It must be clear whether a positive or negative message is to be conveyed.

If the water is does not meet quality bathing standards, a bathing prohibition symbol should be displayed.

2.4 Quality or Classification Rating System

The classification of water quality can be considered as a rating or grading system.
A rating system can be defined as an indication of quality; a higher rating is an indication of a higher quality.

Using the terms 'excellent', 'good' 'satisfactory' and 'poor' lends itself to a rating of one to four, with a higher rating indicating a higher quality. Rating systems are familiar

internationally, whether it's a rating for a hotel, business service or movie review, the quality rating principal is familiar.
There are different ways of graphically representing a rating system. The graphic presentation chosen should complement the subject matter and the intended meaning.

If bathing in 'poor' water is not recommended, it should be considered that 'poor' be excluded from the rating system.

Water quality can be thought of in terms of 'cleanliness'. 'Cleanliness' is a concept in this scenario as often, to a regular member of the public, the differences between a high water quality and a low water quality may not be visible to the naked eye. There are a number of different contaminants which may reduce water quality; creating a graphical element which conveys this concept successfully is challenging.

2.5 Use of Colour

Colour as a tool

The use of colour must be considered and controlled. Colour can be a useful tool; however, existing colour associations should be explored as colours can provoke different reactions in people of different cultures.

Colour associations/symbolisms

Red is widely recognised as a negative meaning, whether a prohibition, a danger or a traffic stop light. Green is widely recognised as a positive meaning, whether a safe condition, fire exit route or a traffic light signalling to go.

Thinking back to the rating terms: the highest quality could be represented using the colour green (positive) the lowest quality using the colour red (negative). The Natural Colour Circle is a descriptive system based on the four chromatic elementary colours: red, yellow, green and blue. As you travel around the circle from red to green, the colour changes from red to orange to yellow to green. Due to this the colours orange and yellow are sometimes used to represent the ratings in between the highest (green) and lowest (red). These colours carry a meaning when used in a series, for example red to orange to yellow to green. However, when used alone orange and yellow do not convey a strong meaning and should not be relied upon for the conveyance of safety related water quality information.

White often conveys a feeling of purity, peace or cleanliness. White can be associated with death in some non-European cultures. Blue often symbolises water, oceans, and seas. It also used to represent cold/coolness.

Colour and visual impairments

The effects of visual impairments must be considered as they can affect the way a person sees a colour and what decisions the colour encourages them to make. Colour blindness can often result in a person having difficulties distinguishing between colour hues; between red and green in particular, with many people having confusion when colour brightness is similar. Due to this colour should not be used alone to differentiate between information. For example, red and green are used in traffic lights, but the stop/go information is not conveyed by colour alone, but also by light positioning - red at the top, green at the bottom. It is important that a series of symbols related to safety (bathing water quality) respects the needs of colour blind people.

Colour summary

Colour can play an important role in symbol design as way of differentiating between the types of message being conveyed. However, the colour should be appropriate to the message and it should reinforce the message but it should not be used as a single differentiating tool.

3.0 Bathing Water Quality Symbols

3.1 Symbol Design Examples

A number of graphical symbol elements and formats have been considered in relation to the meaning 'bathing water quality' and rating system. A series of informal workshops have been conducted to gain public feedback on these elements. The following examples show pro's and con's of elements and formats.

3.2 Designs

Set 1a

Advantages

- Ticks are considered positive.
- Green symbolises safe.
- 1/4 ticks implies a positive meaning - the water quality is clean enough to bathe.
- National and international standards commonly use two wavy lines to depict water.
- Familiarity with water depicted in blue.
- Colour is used as a reinforcement of the message, it is not relied upon.

Disadvantages

- Water should never be conveyed as safe.
- 1/4 ticks might mean 'bathing is not recommended' which is a negative meaning.
- The inclusion of a swimmer will make some people think the symbol indicates quality of swimming.

Set 1b

Advantages

- As set 1a, plus:
- Orange ticks may imply positive, but not great quality.

Disadvantages

- As set 1a, plus:
- Challenging to achieve acceptable colour contrast between the orange and the background.


CAUTION
UNTREATED SEWAGE SOMETIMES DISCHARGES AT THIS POINT
Enquiries to
South West Water
0800 1691144
or
Teignmouth Environmental Health Dept.
01626 361101

4


WARNING
Possible Sewage Overflows
During and Following Heavy Rain

5


DANGER!
PUBLIC HEALTH WARNING NOTICE
YOU ARE URGED NOT TO SWIM OR PADDLE IN THIS AREA UNTIL FURTHER NOTICE
DANGER!

6

7

8

9

10

11

Set 2a

Advantages

- Stars are an established indication of quality.
- 1/4 stars implies a positive meaning - the water quality is clean enough to bathe.
- National and international standards commonly use two wavy lines to depict water.
- Dark blue is water-related and looks credible.
- Subject matter is water alone, no swimmer.

Disadvantages

- 1/4 stars might mean 'bathing is not recommended' which is a negative meaning.
- The use of a circle could make the symbol look like a badge/award, which may affect a person's response.

Set 2b

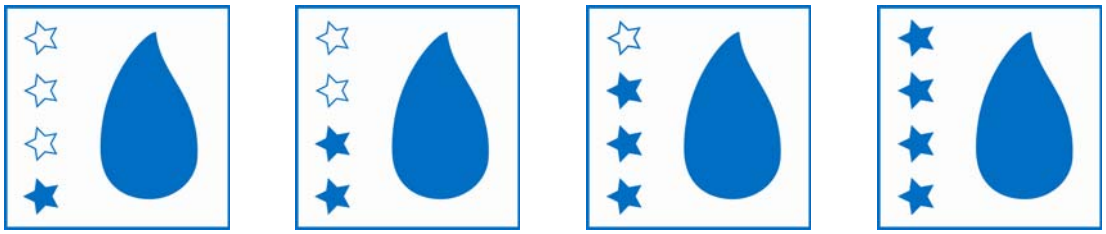
Advantages

- As set 2a, plus:
- Golden yellow stars can imply an award.
  Similar to the EU logo - credibility

Disadvantages

- As set 2a, plus:
- Challenging to achieve acceptable colour contrast between the gold and the background.

Set 3a



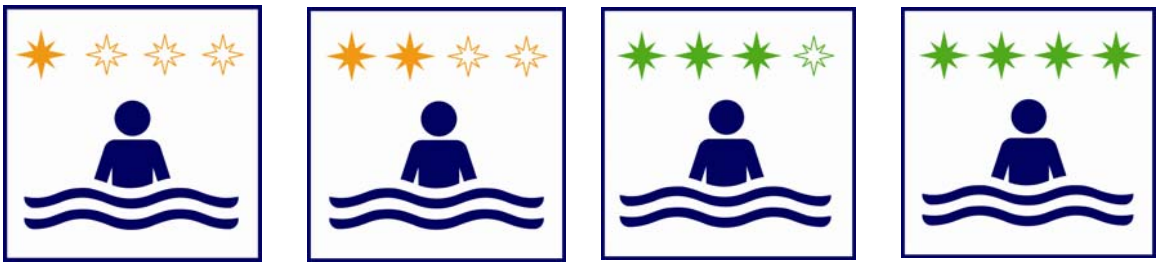
Advantages

- Stars are an established indication of quality.
- 1/4 stars implies a positive meaning - the water quality is clean enough to bathe.
- The use of a water droplet to convey water.
- Blue is water-related and looks credible.
- Subject matter is water alone, no swimmer.

Disadvantages

- 1/4 stars might mean 'bathing is not recommended' which is a negative meaning.
- Water droplet may be misinterpreted as 'drinking water' or 'rain' outside of context.

Set 3b



Advantages

- More pronounced star design.
- Introduction of a figure in water, not a swimmer.
- Supplementary colour code.

Disadvantages

- Concerned about interpretation of the colour orange.
- Inclusion of a figure could imply water conditions are safe for bathing/wading, as opposed to water quality.
  Challenging to achieve acceptable colour contrast between the orange and the background

Set 4a and 4b

Advantages

- Option of a more pronounced star design.
- 1/4 stars implies a positive meaning - the water quality is clean enough to bathe.
- The use of white implies a purity/cleanliness.
- Blue is water-related and looks credible.
- Subject matter is water alone, no swimmer.
- Stars relate directly to the water.
  Symbol is generic for water quality, so could also be used in water sports areas where it is useful to know the quality of the water as well

Disadvantages

- 1/4 stars might mean ‘bathing is not recommended’ which is a negative meaning.

3.3 Recommendations

Water quality in terms of cleanliness is a concept. Concepts are more challenging to convey graphically. Conceptual symbols are usually supported with supplementary text until they become established and recognised.

Suggest Sets 4a and 4b may produce the best comprehension results for water quality.

Suggest quality rating 1/4 poor bathing quality is accompanied with a 'No swimming' prohibition symbol and supplementary text stating that 'water quality is poor, swimming and wading are not recommended'.

Suggest a water quality of below 1/4 is shown as a 'No swimming' prohibition symbol.

3.4 Prohibition Signs

Currently one prohibition of swimming sign has been standardised via ISO that is in use (A1) and a further design was developed to prohibit entering the water (A2).

Swimming prohibition symbol example

A1

Design for 'do not enter the water'

A2

3.5 Warning About Bathing in Poor Water Quality Likely After Rainfall Symbol

Understanding
Rainfall can reduce the quality of water. Bathing following rainfall can sometimes be hazardous. Unless water quality testing is done immediately, the coastal owner/operator will not be sure if the water quality is adequate.

A safety hazard symbol would alert the public to the fact that following rainfall, bathing may be a hazard.

The graphical symbol element depicting a swimmer in water is a highly successful and understood internationally. However, it does imply 'swimming' rather than the more generalised 'swimming and wading'.

The symbol should be accompanied by supplementary text, for example 'Beware of water quality after rainfall'. The subject is challenging as after a given rain storm we do

not know precisely what the water quality will be. The symbol is displayed to tell people to be *aware* that the water quality *might* be hazardous after rainfall

Existing symbols

From research there were three symbols shown below that had a reference to water quality or could be incorporated into a symbol.

Beware of effluent/outfall

Beware of toxic material

Beware of biological hazard

Design options for warning

The above symbols were then incorporated in some instances to develop the warning about water quality. Eight of these were based on traditional yellow and black hazard triangles, one was based on a variation of the water quality symbols.

A6

A7

A8

A3

A4

A5

A9

A10

4.0 Comprehension Testing Methodology

4.1 Summary

The objective was to comprehension test the signs and any resulting subsequent supplementary text for EU Bathing water directive requirements, ensuring that they are suitable where appropriate for inclusion in relevant ISO standard and so that they are also tested to **ISO 9186-1:2007** Graphical symbols-Test methods-Methods for testing comprehensibility.

We would ensure compliance with ISO 9186-1:2007 by carrying out testing that included a minimum of 50 people with a spread of age, sex, occupation and general academic achievement for each variant symbol. Each individual would look at no more than 15 symbols and would view only one symbol for any one meaning. The test would be carried out in 3 countries including UK. See appendix two for a sample of the test card.

4.2 Test Procedure

The ISO 9186: 2007 procedure for testing graphical symbols allows for two tests, a (Comprehensibility) judgement test and a comprehension test, both of which can be administered using either printed materials or computer presentation. In the comprehension test, respondents are presented with the graphical symbol and a statement of the context in which it would be seen, and asked to indicate what they think it means.

The 2007 version of the standard specifies a method; a single judge allocates responses to one of three categories: correct, wrong, "don't know". Responses classified as wrong are subdivided, with those which indicate an interpretation opposite to that intended being listed separately so that it can be seen how frequently this type of misinterpretation is made.

Printed versions of the material were prepared. According to the revision of ISO 9186, each respondent should be tested on no more than 15 variants but experience has shown that 10 or 11 is better: with more than this, respondents appear to treat the last ones in the set less carefully than the earlier ones.

Following the procedure laid down in ISO 9186, each booklet had three initial pages: an instruction page, an identification page and an example page. The instruction page told the respondent to enter in the space below the graphical symbol the answer to the question: "What do you think this symbol means?" and if he/she felt unable to assign a meaning to the graphical symbol to enter in the response "Don't know". It also told the respondent to enter, in the second space below the graphical symbol, an answer to the question: "What action would you take in response to this symbol?" In the current test series, the instruction page also informed the respondent that symbols on a yellow background are warning symbols, symbols on a blue background indicate an instruction and symbols on a green background indicate a safety message.

The identification page had the format of a questionnaire asking the date of the test session, name of the person conducting the test, the respondent's age (defined by age groups: between 15-30, between 31-50, over 50), sex, educational level, occupation, cultural background and whether the respondent had any physical disability.

Participants

The comprehension test for each variant has to be conducted with at least 50 respondents who can be expected to be familiar with the referent. ISO 9186 states that the groups presented with each set of materials should be similar to each other in age, sex, occupation and general academic achievement by randomly allocating the sets of materials to individuals in the total sample of respondents.

5.0 Test Results – Participants

The tests were carried out in 3 resorts on and around the beach and its hinterland to aid calculations 100 people were tested. Each test took between 15 and 30 minutes to carry out. Thirty-eight people were tested in Torquay in the UK; twenty-eight people in Sissi, Crete part of Greece and thirty-two people in Corralejo, Fuerteventura part of Spain. The beaches in Spain and Greece were both Blue Flag Beaches whilst the one in the UK holds a Quality coast award as it does not meet the Blue flag water quality standard. Of the 100 participants 4 had a physical disability all being colour blind especially red/green.

Table 1. --- Participants or Respondents Residency

Country of Residence	Number
UK	60
Spain	8
Germany	12
Italy	2
France	1
Greece	6
Ireland	2
Switzerland	2
Austria	2
Sweden	2
Canada	1

Table 2. Ethnicity

Ethnicity	Number
White British	55
White European	31
Chinese	6
Black British	2
Indian	2
Bangaldeshi	1
White other	1

Table 3. Age, Gender and Educational Level

Age		
	15-30	42
	31-50	38
	50+	28
Sex		
	male	52
	female	48
Educational level		
	School leaver 16 +	20
	Post school no degree 18+	41
	Degree21+	39

5.1 System for Giving Information about Water Quality

The eight variants were tested comprising the systems of 1a, 1b, 2a, 2b, 3a, 3b, 4a, 4b.

Table of Results

System	Preferred choice
1. four b	5
2. one b	22
3. one a	16
4. two a	2
5. two b	13
6. three b	15
7. three a	15
8. four a	12

These were not all tested individually for a comprehension, as they convey information rather than a safety meaning and so would not be included within ISO safety signage standards. The respondents were asked what, they thought individual signs meant and which system they found conveyed a water quality classification the best. System one b was often understood to relate to water quality for swimming and was the system that was the preferred the most with 22% of respondents, this however is not that high.

5.2 Prohibition of Swimming or Do Not Enter the Water

Table of Results

Symbol	What do you think this symbol means and response	What action would you take
A1 No swimming	No swimming	Would not enter water or swim
	100	100
A2 Do not enter the water	No swimming	Would not enter water or swim
	43	99
	Do not enter the water	
	44	
	No children swimming	Would not allow children in the water
	1	1
	No paddling	
	1	
	No bathing	
	10	
	Do not stand in the water	
	1	

Both of these symbols pass the comprehension test with only 2 respondents not giving a correct answer in defining what the sign meant and all bar 1 behaving in the desired manner.

5.3 Symbol for Warning about Lower Water Quality

Eight variants were comprehension tested A3, A4, A5, A6, A7, A8, A9, A10.

Table of Results

Symbol	What do you think this symbol means and response	What action would you take
A3	Untreated water	Would not go swimming
	8	8
	Flooding sea level rising	Would not enter the water
	4	4
	Storm drain	Would not enter the water
	12	12
	Sewage hazard when raining	
	23	23
	Don't swim near sewage outfall	
	20	20
	Hazard when raining	
	10	10
	Don't know	Don't know
	23	23
A4	Water/effluent outlet on beach	Would not enter the water
	12	12
	Chemicals on beach	
	11	11
	Chemicals in water	
	10	10
	Chemicals likely to be dumped on beach	
	9	9
	Sewage	
	30	30
	Pollution possible	
	5	5
	Stay away from pipes	Would stay away from pipes
	3	3
	Don't know	Don't know
	20	20
A5	Water level rising after rain	Would be careful swimming
	5	5
	After rain water quality is poor only 1*	Would not enter water
	12	12
	Bad weather do not swim	Would not enter water
	24	24
	Quality of water is 1*	
	13	13
	During rain water quality is poor 1*	
	12	12
	Poor water quality	

Symbol	What do you think this symbol means and response	What action would you take
	3	3
	Don't Know	Don't know
	31	31
A6	Radiation in water	Would not enter water
	5	5
	Electricity hazard	
	3	3
	Pollution underwater	
	18	18
	Strong currents	
	8	8
	Bio-hazard in water	
	22	22
	Debris dangerous to wildlife	Would be careful
	1	1
	Don't know	Don't know
	43	43
A7	Bio-hazard after rain	Would not enter water
	8	8
	Pollution after rain	
	18	18
	Bio-hazard	
	9	9
	Toxic rainfall	
	16	16
	Strong currents	
	8	8
	Storm-water outlet	
	1	1
	Weather dangerous	
	2	2
	Don't dump rubbish	Wouldn't dump rubbish
	4	4
	Chemicals in water	Wouldn't enter water
	10	10
	Don't know	Don't know
	24	24
A8	Lethal conditions	Wouldn't enter water
	4	4
	Poison on beach	
	16	16
	Poison in water	
	23	23
	Toxic waste	
	17	17
	Water dangerous	
	8	8
	Unknown danger	

Symbol	What do you think this symbol means and response	What action would you take
	2	2
	Don’t go onto beach	Would not go onto beach
	4	4
	Don’t know	Don’t know
	26	26
A9	Weather warning	Caution when entering water
	25	2
		Would not enter water
		23
	Bad weather	Would not swim
	17	17
	Take care during stormy weather	Caution when entering water
	11	5
		Would not enter water
		6
	Don’t swim if raining	Would not swim
	8	8
	Weather affecting water	Caution when entering water
	19	19
	Don’t know	Don’t know
	20	20
A10	Warning about stormy weather	Would think before entering water
	21	11
		Would not enter water
		10
	Weather affecting water	
	19	19
	Don’t enter sea	
	7	7
	Don’t go on beach	
	6	6
	Bad weather	Would think before entering water
	17	7
		Would not enter water
		10
	Caution when swimming in rain	
	8	8
	Caution when swimming in thunder storms	
	6	6
	Don’t know	Don’t know
	16	16

12

13


2007-08
La Oliva
PLAYA CON BANDERA AZUL
BEACH WITH BLUE FLAG
TODOS LOS DIAS
HORARIO DE

14

15


CORRALEJO GRANDES PLAYAS
La Oliva
HORARIO DE VIGILANCIA
LIFEGUARD SERVICE
1 - 31 Enero (January)
1 - 14 Febrero (February)
10:00 a 15:00h
15 - 28 Febrero (February)
1 - 31 Marzo (March)
10:00 a 16:00h
1 - 15 Abril (April)
1 - 31 Mayo (May)
10:00 a 17:00h
1 - 30 Junio (June)
1 - 31 Julio (July)
1 - 31 Agosto (August)
1 - 30 Septiembre (September)
10:00 a 18:00h
1 - 31 Octubre (October)
1 - 14 Noviembre (November)
10:00 a 17:00h
15 - 30 Noviembre (November)
10:00 a 16:00h
1 - 31 Diciembre (December)
10:00 a 15:00h
S.O.S.
112
INFORMACION SANITARIA
SANITARY INFORMATION
COLIFORMES
COLIFORMES
ESTREPTOCOCOS
CALIDAD EXCELENTE U ÓPTIMA
APTAS PARA EL BAÑO
APTAS PARA EL BAÑO

16

6.0 Conclusions

None of the variants designed or currently available to warn about a lowering of water quality received anywhere near the required comprehension test score to be used on its own without supplementary test, although many of the signs although not understood in terms of meaning would however promote the correct behavioural response in entering the water this is due to the general understanding of hazard signs and that these would be found on or near to a beach. The general scary nature of the hazards would preclude access into the water and on seeing many would not just not enter on that day but would be very wary of entering the water ever again at that location.

This view is likely to be detrimental to encouraging informed access to the water and would deter beach operators from supporting the provision of such information.

6.1 Signage and Systems currently in use.

No systems for giving information about water quality were sufficiently well designed or compliant with ISO requirements for ISO adoption or use at beaches.

6.2 System to give information about water quality classification

System one b was the preferred choice and although using a swimming person image, it was perceived to be the best overall system and did not confuse water quality for bathing, swimming, immersion water sports with potable or drinking water. Supplementary text to reinforce the symbols would be required.

6.3 Prohibition of swimming or do not enter the water.

The current ISO standard symbol for the prohibition of swimming (A1) and the symbol specifically designed to convey the message of not entering the water (A2) both had very good comprehension test results. As a result neither would require supplementary text.

6.4 Symbol for warning about lower water quality.

None of the variants designed or currently available to give such a warning achieved anywhere near the required comprehension test score to be used on its own without supplementary text. Although the signs were not understood in terms of meaning they would promote the correct behavioural response ‘in not entering the water’. This is due to the general understanding of hazard signs and that these particular examples would be found at a beach location. The general scary nature of the perceived hazards would have the desired effect of precluding access into the water by the respondents. However on seeing such signs many would not just not enter the water on that day but would be very wary of entering ever again at the location where the sign was seen. This potential reaction could be detrimental to informed access to the water and might deter beach operators from supporting the provision of such information.

17

7.0 Recommendations (Proposals and Options)

The recommendations of the report are divided into three specific areas these being:

- Requirements for alternative designs and subsequent testing
- Requirements for further consultation
- Specific requirements for the use of signs and symbols

7.1 Requirements for alternative designs and subsequent testing

Although the results for comprehension and suitability for use were mixed it is not felt that there would be any significant benefit from getting a new set of symbols designed and tested. The demands are considered too complex to be easily portrayed in one symbol, that is understood without supplementary text. From the results of the current tests it is extremely unlikely that any other designs would score significantly higher.

7.2 Requirements for further consultation on designs developed so far

To get a greater acceptance it is suggested that this document is circulated to a number of organizations for comment such as FEE and ILSE.

7.3 Specific requirements for use of proposed signs and symbols

- That supplementary text is used to underpin all symbols
- That the red beach safety flag with an explanation is used to prohibit and warn against bathing when appropriate
- That when water quality has lowered to an extent that bathing is prohibited or warned against that this sign is used in tandem with the chosen hazard sign.
- That both variants to prohibit or warn against swimming are available for use by beach operators

Appendix One – Principal Authors Researchers and Designers

Peter Cornall – Head of Leisure Safety
Peter Cornall has been in this role for nine years. In this role, he manages the provision of safety expertise and technical information in the field of water, leisure and plays safety, and facilitates the development and promotion of safety policy and research.

Prior to this appointment, Peter worked for 16 years both in outdoor recreation and outdoor education roles, including managing water sports centres which provided rowing as one of their activities, outdoor and adventurous activity teaching and instruction, sports development and country park ranger roles, primarily for local authority education departments and for leisure services departments.

Currently Peter chairs a BSI Standards Development committee that has developed water safety signage and is currently developing a standard for beach safety flags and a code of practice for their use. This work has been the basis for the formulation of an international committee that has developed world ISO standards in the same area. Peter has been nominated the UK expert for that panel and currently is a member of the UK's FEE Blue Flag and Quality Coast Award jury.

David Walker - Information Manager
David is responsible for undertaking and managing the day-to-day aspects of RoSPA's information gathering and publication services. Notably he is responsible for the RoSPA / RLSS drowning database and dealing with the associated requests for technical water safety and research information.

Previously to working at RoSPA, David has worked in outdoor centres and for the Duke of Edinburgh's award. He holds several coaching awards including MLTE, BCU, and RYA. He is a keen kayaker and climber.
David has a HND in Leisure Management, and a first degree in Business Information. Previous roles have included a research consultant for Knight, Kavanagh & Page (KKP), whilst at KKP he was involved in a wide variety of research projects for both private and public clients, who included: Sport England, DCMS, The Manchester 2002 Commonwealth Games and several Local Government Authorities.

Wendy Wilsher- Graphic Designer
Wendy holds a BA Hons Typography and Graphic Communication and currently owns a small company specialising in typography and graphic communication.

Expertise includes sign design, symbol design, way finding, information graphics, map design and print design. Previously she worked for a number of Graphical design companies that specialised in managing signing/way finding and print design projects.

Wendy has and is a member of several BSI Standards Development committees specialising in graphical symbols. Wendy was the lead designer on the RNLI Guide to beach safety signs, flags and symbols.

Appendix Two

Instructions

Write down on the line below the graphical symbol, your answer to the question: “What do you think this symbol means?”

If you are unable to assign a meaning to the symbol then write “Don’t Know”

In the second space below the symbol, write down your answer to the question: “What action would you take in response to this symbol?”

Seen at the beach

What do you think this symbol means?

Sudden Drop

What action would you take in response to this symbol?

Be careful entering the water.

A1