
FEE / Blue Flag



Note: BATHING WATER CRITERIA SPREADSHEET USER GUIDE FOR BLUE FLAG EVALUATION

TO: National Operators

FROM: International Coordination

INTRODUCTION

This document aims at helping national operators in filling in the new excel spreadsheet for the Blue Flag evaluation. If after reading this document you still have questions or are unsure about some issues, please feel free to contact the International Blue Flag Coordination (coordination@blueflag.org).

1. Filling in the sheet:

The only cells National Operators are to fill in are the **blue** ones.

Name of the beach and country:

The name of the beach should be referred to in the same way as it is on the international Blue Flag database.

Bathing season and sampling dates:

The first cells to fill in are the dates of the Blue Flag bathing season and of the sampling dates. This enables you to check if the first sample was taken within 30 days of the start of the Blue Flag bathing season, as stipulated in criterion 7 of the Blue Flag beach criteria.

7	Bathing season Year 1:	
8	Start (dd-mm-yyyy):	01-06-2010
9	End (dd-mm-yyyy):	30-08-2010
11	Sampling dates Year 1:	
12	Start (dd-mm-yyyy):	25-05-2010
13	End (dd-mm-yyyy):	25-05-2010
14	First sample gap OK?	7 OK
15		

Sampling data:

On the left hand of the blue cells, in the first column of the document, you can see that the 4 years have been spread out for you.

For the Northern Hemisphere these years refer to:

- Year 1: 2009
- Year 2: 2010
- Year 3: 2011
- Year 4: 2012

For the Southern hemisphere, these years refer to:

- Year 1: 2009-2010
- Year 2: 2010-2011
- Year 3: 2011-2012
- Year 4: 2012-2013

Column B: For each sample, please type the date when it was taken in such format **dd-mm-yyyy**. Start with the oldest sample on the first line, and write them in the order they were taken to finish with the most recent on the last line.

Only register the samples that were taken during the Blue Flag season.

Columns C and D: Please fill in the E. coli UFC/100ml and the Intestinal Enterococci UFC/100ml for each sample.

IMPORTANT: If you have less samples than there are lines in total available for the year, please do not write anything in the unused cells (columns B, C and D), or the formula will go wrong.

If a sample result is “0”, please write “1” instead of “0”, as log0 is a non valid calculation.

Enter your data here for year 1, using the specified format for the sampling dates

	Sampling date (dd-mm-yyyy)	E. Coli (no. per 100 ml.)	I.E. (no. per 100 ml.)	Frequency between samplings	Frequency OK / NOT OK
25					
26					
27					
28					
29	YEAR 1				
30	01-06-2006	2	2	1	OK
31	02-06-2006	22	5	28	OK
32	30-06-2006	104	7	1	OK
33	01-07-2006	4	2	1	OK
34	02-07-2006	2	2	26	OK
35	28-07-2006	900	22	23	OK
36	20-08-2006	26	30	7	OK
37	27-08-2006	4	2	2	OK
38	29-08-2006	4	2	-38958	OK
39				0	OK
40				0	OK
41				0	OK
42				0	OK
43				0	OK
44				0	OK
45				0	OK
46				0	OK
47				0	OK
48				0	OK
49	YEAR2				
50	01-05-2007	2	2	4	OK
	05-05-2007	2	2		

You have no more samples to add for year 1: leave the sampling dates, E. coli and I.E. empty

2. Checking the compliance with the Bathing Water criteria:

The formulas on the spreadsheet will calculate themselves based on the data you fill in the blue cells, so bear in mind it is important that you enter the right data. Once you have done so, you can check the compliance with the Bathing Water Criteria on the same sheet.

- **Checking the sample frequency:**

Column G allows you to see if the frequency between two samples exceeds 30 days. If this is the case (resulting in a “NOT OK” note on the sheet), you do not comply with this criterion, and need to ask a dispensation to the international jury

- **Checking the compliance with the pre-season sample:**

The pre-season sample must be within 30 days of the start of the season. This means that if you have more than 30 days (resulting in a “NOT OK” note on the sheet) between the pre-season sample and the beginning of the Blue Flag season, this sample does not comply with the criterion. If the result is a negative number, this means that you have not taken a pre-season sample, and that you need to ask for a dispensation as you do not comply with the Blue Flag criteria.

- **Checking the sample quantity:**

At the bottom of the sheet, the cell “Check: Enough samples taken in Total 4 years?” allows you to see if you have enough samples to comply with the criterion. The minimum of samples is 20, and they should be spread on 4 years. For a new applicant, they can be spread on one season, as long as there are 20 samples in total.

No. of samplings year 1:	8	Necessary no. of samplings per year:	5
No. of samplings year 2:	6	Check: Enough samples taken in 2006-2007?	OK
No. of samplings year 3:	5	Check: Enough samples taken in 2007-2008?	OK
No. of samplings year 4:	6	Check: Enough samples taken in 2008-2009?	OK
		Check: Enough samples taken in 2009-2010?	OK
		Necessary no. of samplings for 4 years	20
		Check: Enough samples taken in Total 4 years	OK

Check: how many samples are there per year? (you can double check to be sure you did not forget to enter any samples in the table)

Check: did you take enough samples in each bathing season and in total? (minimum 5 samples per bathing season required)

- **Checking the 95th percentile compliance for each E. coli and I.E.:**

At the bottom of the sheet, the box “95th percentile Calculation” allows you to check if the data complies with the 95th percentile criterion. If the cell says “Not OK”, then the beach does not comply for I.E and/or E. coli 95th percentile method.

95th percentile Calculation			
MEAN	0.277338309	MEAN	0.189339486
Standard deviation	0.585560196	Standard deviation	0.373005832
mean+1.65*std deviation	1.243512632	mean+1.65*std deviation	0.804799109
Upper 95th percentile	17.51913392	Upper 95th percentile	6.379683141
Compliance?	OK	Compliance?	OK

Check 4: Does the beach comply with the 95th percentile calculation for E. coli and I.E.?

CONCLUSION:

If any of the check-cells display “NOT OK”, this means that the beach does not meet the Blue Flag criteria. You may send it as a dispensation case to the jury if there are any good reasons for this non-compliance, with a precise explanation of why the beach does not comply with the Blue Flag criteria.

NB: *If for a year you have more samples than the number of lines available, please do not insert lines yourself. This would add uncertainty regarding the formula and would therefore create disturbance in the 95th percentile calculation method. In this case, please contact the Blue Flag International Coordination, and ask for the number of lines that you need, and a new calculation sheet will be sent to you in accordance to your needs.*

FURTHER INFORMATION ABOUT THE PERCENTILE:

The 95th percentile is not a percentage or a probability, but a statistic:

The 95th percentile represents a statistical point below which approximately 95% of the data will fall. If this point is higher than the water quality standard set in the guidelines then the beach fails.

Therefore, it does not ensure that if all samples are below the given limits (250 cfu/100ml for E.coli and 100 cfu/100ml for Streptococci) the 95th percentile compliance will be reached. **The 95th percentile point is calculated from a set of data with many individual sample results. It provides a general risk level of using that beach over a period of time which is very different to the individual sample risk level.** Given that the 95th percentile is a statistical calculation, it is not the same as an individual sample result and many sample results just below some numerical value in a data set (for example 100 coliforms per 100ml) are likely to produce a calculated 95th percentile value over 100 coliforms per 10ml.

It has to be made clear to the applicant that complying with the given limit per sample does not guarantee compliance with the 95th percentile when many samples are analysed, as recommended by WHO.

First example – compliance:

<i>t</i>	E. Coli (no. per 100 ml.)	I.E. (no. per 100 ml.)
8		
9		
10		
11	500	600
12	2	10
13	5	5
14	15	15
15	15	15
16	15	10
17	15	10
18	10	10
19	5	15
20	20	15
21	10	15
22	10	15
23	10	15
24	15	15
25	15	15
26	15	15
27	500	15
28	100	150
29	100	15
30	100	15
31		
32		
33		
34		
35		
36		
37		
38		

E. Coli (max 250 cfu/100 ml)		IE (max 100 cfu/100 ml)	
OK or exceeding?	log 10	OK or exceeding?	log 10
exceeding	2,698970004	exceeding	2,77815125
OK	0,301029996	OK	1
OK	0,698970004	OK	0,698970004
OK	1,176091259	OK	1,176091259
OK	1,176091259	OK	1,176091259
OK	1,176091259	OK	1
OK	1,176091259	OK	1
OK	1	OK	1
OK	0,698970004	OK	1,176091259
OK	1,301029996	OK	1,176091259
OK	1	OK	1,176091259
OK	1	OK	1,176091259
OK	1	OK	1,176091259
OK	1,176091259	OK	1,176091259
OK	1,176091259	OK	1,176091259
OK	1,176091259	OK	1,176091259
exceeding	2,698970004	OK	1,176091259
OK	2	exceeding	2,176091259
OK	2	OK	1,176091259
OK	2	OK	1,176091259

95th percentile Calculation			
MEAN	1,331528941	MEAN	1,247119944
Standard deviation	0,630465264	Standard deviation	0,448234663
mean+1.65*std deviation	2,371796627	mean+1.65*std deviation	1,986707138
Upper 95th percentile	235,3946711	Upper 95th percentile	96,98557351
Compliance?	OK	Compliance?	OK

In this first case, two samples have exceeded the limit both for E.coli and for IE, reaching very high value. However, the other 18 samples of the data set are very low. Thus, the probability to have another high sample is low.

Second example – non compliance:

<i>t</i>	E. Coli (no. per 100 ml.)	I.E. (no. per 100 ml.)
8		
9		
10		
11	100	80
12	50	60
13	100	80
14	20	90
15	100	50
16	50	50
17	100	90
18	200	20
19	150	30
20	200	10
21	200	15
22	200	15
23	200	15
24	20	15
25	200	15
26	150	15
27	150	15
28	100	15
29	100	15
30	100	2
31		
32		
33		
34		
35		
36		
37		
38		

E. Coli (max 250 cfu/100 ml)		IE (max 100 cfu/100 ml)	
OK or exceeding?	log 10	OK or exceeding?	log 10
OK	2	OK	1,903089987
OK	1,698970004	OK	1,77815125
OK	2	OK	1,903089987
OK	1,301029996	OK	1,954242509
OK	2	OK	1,698970004
OK	1,698970004	OK	1,698970004
OK	2	OK	1,954242509
OK	2,301029996	OK	1,301029996
OK	2,176091259	OK	1,477121255
OK	2,301029996	OK	1
OK	2,301029996	OK	1,176091259
OK	2,301029996	OK	1,176091259
OK	2,301029996	OK	1,176091259
OK	1,301029996	OK	1,176091259
OK	2,301029996	OK	1,176091259
OK	2,176091259	OK	1,176091259
OK	2,176091259	OK	1,176091259
OK	2	OK	1,176091259
OK	2	OK	1,176091259
OK	2	OK	0,301029996

95th percentile Calculation			
MEAN	2,016722688	MEAN	1,377737941
Standard deviation	0,306894636	Standard deviation	0,41467267
mean+1.65*std deviation	2,523098836	mean+1.65*std deviation	2,061947847
Upper 95th percentile	333,5023022	Upper 95th percentile	115,331475
Compliance?	NOT OK	Compliance?	NOT OK

In this second case, no samples have exceeded the limit for both parameters. However, all samples are very close to the limit, thus the probability of having a sample exceeding the limit is high.