Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Bathing Water Contamination: Public Health Risk Assessment

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HSE Bathing Water Training Day, March 13th 2019

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Presentation Overview

- Types of Bathing Water incidents
- Notification and response to BW incident
- In-depth Public health risk assessment (PHRA)
- Harmful Algae Blooms

Bathing Water Incident

Potential for an adverse impact on bathing water quality or the health of bathers

- Microbiological exceedances
- Sewage spill
- Proliferation of cyanobacteria
- Poisonous jelly fish
- Oil pollution
- Rodent infestation

Notification of BW Incident

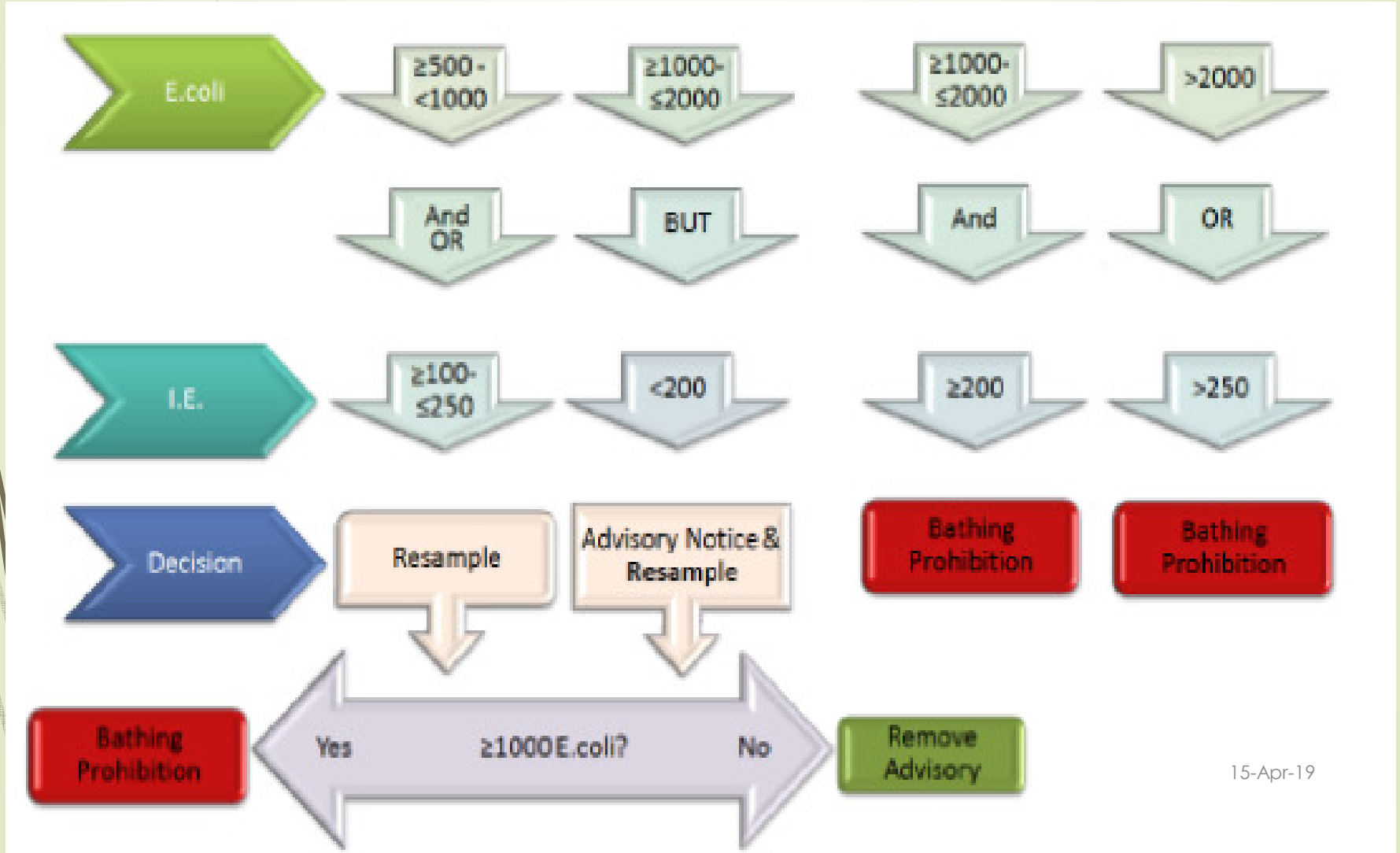
Consider

- Is the unsatisfactory water sample result unexpected?
- Is it likely that the reported contamination incident will adversely affect human health?
- Is there an on-going risk to human health, e.g. the bathing area is a popular bathing area, or there are planned events?
- Are there known recent cases of illness linked to this bathing water?

Table 1: Action levels in response to microbiological sample results

Escherichia coli		Intestinal enterococci	Recommended Action *
> 2,000 E.coli	OR	> 250 I.E.	Issue of a Bathing Prohibition Notice (Appendix 8)
≥1,000 - ≤2000 E.coli	AND	≥ 200 I.E.	Issue of a Bathing Prohibition Notice (Appendix 8)
≥1,000 - ≤2000 E.coli	BUT	< 200 I.E.	Issue of a Bathing Advisory Notice (Appendix 7) and re-sample immediately
If re-sample is still ≥ 1000 E.coli			Issue of a Bathing Prohibition Notice (Appendix 8)
≥500 - <1,000 E.coli	AND/OR	≥100 - ≤250 I.E.	Monitor situation and re-sample. Decision based on evidence available/details of pollution event.
Any gross malfunction or leakage of the sewerage system or visual reports of sewage			Issue of a Bathing Prohibition Notice (until the status of the bathing water quality can be verified).
Where any results are close to HSE bacterial action levels (up to 10% below any action level) and/or not typical, a precautionary approach is advised with the issue of an appropriate bathing water notice.			

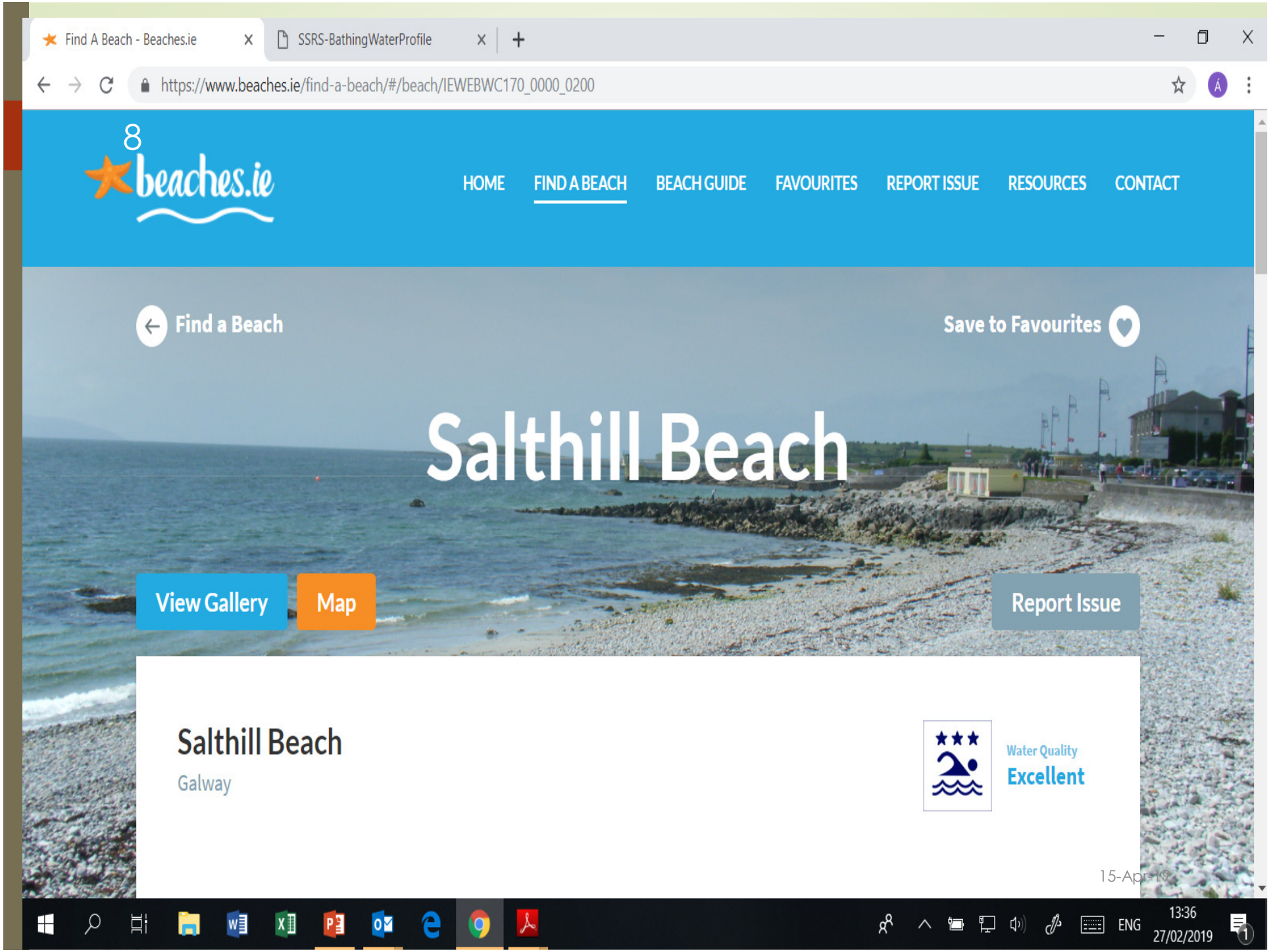
Action Levels in response to microbiological sample results



In-depth Risk Assessment

- Probable source of contamination
- Take into account beach profile
- Previous sample history
- Period of exposure
- Potential population exposed
- Evidence of human illness

Review the Information Checklist in Table A 2.1 in Appendix 2


Find A Beach - Beaches.ie
SSRS-BathingWaterProfile
https://www.beaches.ie/find-a-beach/#/beach/IEWEBWC170_0000_0200
8
beaches.ie
HOME
FIND A BEACH
BEACH GUIDE
FAVOURITES
REPORT ISSUE
RESOURCES
CONTACT
Find a Beach
Save to Favourites
Salthill Beach
View Gallery
Map
Report Issue
Salthill Beach
Galway
Water Quality
Excellent
15-Apr-19
ENG
13:36
27/02/2019

Historical Water Quality

Excellent

Galway City Council

Sampled on 10/09/2018

Historical Results

The water quality of each sample is assessed as either 'Excellent', 'Good', 'Sufficient' or 'Poor'.

Sample Date	E. coli	Intestinal Enterococci	Water Sample Quality Status
10/09/2018	10	3	Excellent
27/08/2018	63	3	Excellent
13/08/2018	10	7	Excellent
30/07/2018	10	2	Excellent

Predictions Choose a date

Lifeguard Information

Click here to view lifeguard information

Download Beach Profile

PHRA –continued

Surveillance

- Recent notifications of possible waterborne origin
- May need to undertake active surveillance

Control

- Investigate any potential links as per ID Regs 1981
- Ensure any remaining threat to public health is controlled

Harmful Algae Blooms

- Algae are natural inhabitants of water
- *"Harmful algae blooms are excessive accumulations of microscopic photosynthesizing aquatic organisms that produce biotoxins or otherwise adversely affect humans, animals and ecosystems"**
- Cyanobacteria or blue-green algae can produce toxins which are harmful to humans and animals–hepatotoxins, neruotoxins and endotoxin

*Hillborn ED, Roberts VA, Backer L, DeConno E, Egan J, Hyde JB et al. Algal-bloom associated disease outbreaks among users of freshwater lakes, United States, 2009-2010. MMWR 10/1/2014 Vol 63, 1

PHRA –Possible Harmful Algae Bloom

1.Assessment of water body characteristics and use

- Type and size of water body
- Type of water use - Higher risk from immersive/swallowing exposure to lower risk from non-contact uses
- Reports of human or animal illness, dead fish, etc

2. Assessment of nature and intensity of bloom

- History – occurrence, duration, size
- Presence and size of bloom, presence of scum on surface or shoreline
- Location of bloom or scum in relation to human / animal exposure
- Wind direction – may move scum, bloom

PHRA –Possible Harmful Algae Bloom

3. Cyanobacterial characterisation (species and cell count confirmation)

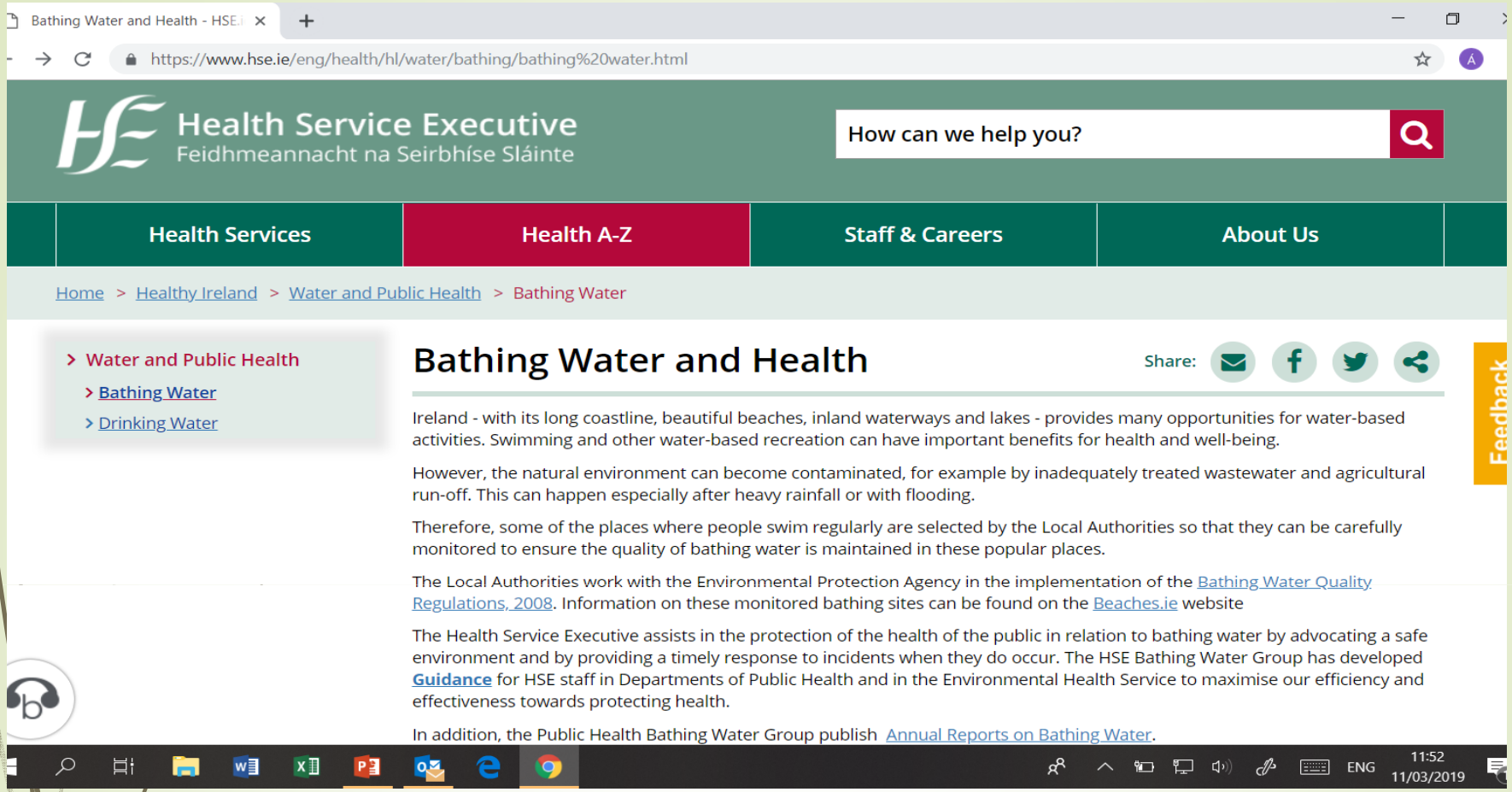
- Confirmation, speciation
- Count per ml/ micrograms of chlorophyll-a per litre as per Table A2.2

4. Comparison of cell count with WHO guidance levels – see Table A2.2

- If there is a concern about exposure risk and no lab results, safest to assume toxicity initially and prohibit water use

Table A2.2 - WHO Guidelines for safe practice in managing bathing waters which may produce or contain cyanobacterial cells and/or toxins[1]

Guidance level or situation	How guidance level derived	Health risks	Recommended action
Cyanobacterial scum formation in bathing areas	Inference from oral animal lethal poisonings Actual human illness case histories	Potential for acute poisoning Potential for long-term illness with some cyanobacterial species Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness	Immediate action to prevent contact with scums; possible prohibition of swimming and other water-contact activities Public health follow-up investigation Inform relevant authorities and services
100,000 cells cyanobacteria per ml or 50 µg chlorophyll a per litre with dominance of cyanobacteria	From provisional drinking water guideline for microcystin-LR, and data concerning other cyanotoxins	Potential for long-term illness with some cyanobacterial species Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness	Watch for scums Restrict bathing and further investigate hazard Post on-site risk advisory signs Inform relevant authorities and services
20,000 cells cyanobacteria per ml or 10 µg chlorophyll a per litre with dominance of cyanobacteria	From human bathing epidemiological study	Short-term adverse health outcomes, e.g. skin irritations, gastrointestinal illness, probably at low frequency	Post on-site risk advisory signs Inform relevant authorities and services



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https://www.hse.ie/eng/health/hl/water/bathing/bathing%20water.html