Guidance Note for Local Authority Management and Reporting of Bathing Water Incidents Under the 2008 Bathing Water Quality Regulations (updated May 2019)

1. Overview

Local authorities are required to notify all incidents affecting the water quality of bathing waters to the EPA via the Bathing Water Information System (BWIS) which include Short Term Pollution (STP) events, abnormal situations and certain circumstances that can have adverse impacts on bathing water quality or bathers' health. In the event of any situation that has, or could reasonably be expected to have, an adverse impact on bathing water quality or the health of bathers, local authorities are also required to notify the Health Services Executive (HSE) (Regulation 15(5)).

The principal objective is to protect bathers' health and ensure bather safety.

In the event of elevated bacterial counts, visual reports of sewage affecting the bathing water, gross malfunction or leakage in the sewerage system, local authorities are required to implement the HSE Bacterial Action Levels in Response to Microbiological Sample Results (Appendix 1) for bather warnings where applicable. The HSE bacterial action levels are the **minimum actions** that the local authorities should implement **as soon as aware.** Stricter actions may be implemented by the local authority in consultation with the HSE.

In the event of algal blooms in freshwater or marine waters, local authorities are advised to implement the HSE's interim guidance for the management of freshwater and marine water algal blooms (Appendix 5 & 6).

Timely communication of bathing water incidents and bathing restrictions is required to ensure the public is informed and protected. This requires using various communication media such as bathing restriction notices posted at **all main entrances** to the beach and, where practicable, on the beach e.g. at lifeguard stations, car parks, or other facilities; notification via the national bathing water website beaches.ie; notification via local authority's twitter account; and announcements on local radio.

This guidance note informs local authorities of the notification and management procedures to be followed, as a minimum, in response to bathing water pollution events. Procedures for each of the three types of pollution incidents specified in the Bathing Water Quality Regulations are provided in Appendix 2.

2. Notification & Management Procedures following Bathing Water Incident

The following notification and management procedures are to be undertaken by local authorities when bathing water incidents arise during the bathing season. Local authorities are also advised to develop their own bathing water incident protocols.

2.1 Communication

Communication of bathing water incidents and bathing restrictions is required to ensure the public is informed and protected. The following actions should be undertaken at the earliest practicable opportunity once an incident has been identified.

2.1.1 Bathing warning/restriction notices are to be posted at **all main entrances** to the beach and, where practicable, on the beach e.g. at lifeguard stations, car parks, or other facilities.

2.1.2 Communication of bathing warning/restrictions using different communication media including announcements on local radio, notification on local authority twitter account, etc. Local authorities are advised, if not already established, to set up a procedure with local radio station(s) whereby bathing water restrictions can be communicated to the public at regular intervals.

2.1.3 All incidents affecting the water quality of bathing waters are to be notified to the EPA via the BWIS application on the Environmental Data Exchange Network (EDEN) as soon as possible and at least **by 11am next day following the commencement of the incident.**

2.1.4 In the case of a possible STP incident, prior notification is required of the possible event (before the event has occurred) and STP events need to be reported, **at a minimum**, the day prior to the commencement of the possible event. Further information on STP incidents is available in the 'EPA Information Note on Short Term Pollution (STP) Events specified in the 2008 Bathing Water Quality Regulations (SI No. 79 of 2008)', which is available to download from the Help page of BWIS.

2.1.5 Bathing water incidents with the potential to impact on bathers' health are to be notified to the HSE.

2.1.6 Inform the public when a bathing warning/restriction is removed, and the bathing water quality is deemed acceptable again for bathing. It is important that the physical notices at the bathing waters are removed at the earliest practicable opportunity to avoid confusion on the part of the public.

2.2 HSE Bacterial Action Levels and Bathing Restrictions

To protect bathers' health, local authorities are required to implement the HSE Bacterial Action Levels in Response to Microbiological Sample Results (Appendix 1) for bather warnings and to undertake any other HSE advice proposed in the event of elevated bacterial counts or incidents affecting the bathing water quality.

2.2.1 The HSE bacterial action levels are the **minimum actions** that local authorities should implement **as soon as aware** in the event of:

- elevated bacterial counts,
- visual reports of sewage affecting the bathing water,
- gross malfunction or leakage in the sewerage system.

2.2.2 Stricter actions may be implemented by the local authority, in consultation with the HSE, based on their knowledge and experience of the normal expectation of water quality for a particular bathing water, and of other factors affecting the water quality.

2.2.3 Any gross malfunction or leakage from sewerage systems which could affect bathing water quality, or visual reports of sewage or sanitary material affecting the bathing water, requires an **immediate bathing prohibition** until the status of the bathing water quality can be verified.

2.2.4 In situations where analysis results for E coli or Intestinal enterococci are:

- elevated,
- uncharacteristic of the bathing water,
- and the local authority is unable to determine whether the HSE Bacterial Action Levels have been exceeded

then a precautionary approach for public health safety will be applied by the local authority with the issuing of a bathing prohibition for the bathing water.

2.2.5 In incident situations where the water quality deteriorates further, local authorities will need to re-consult the HSE Bacterial Action Levels in Response to Microbiological Sample Results

(Appendix 1) and ensure the appropriate bathing restriction is applied e.g. an advisory notice may need to be replaced by a bathing prohibition.

2.2.6 In situations where E. coli or Intestinal enterococci results are close to HSE bacterial action levels (up to 10% below the action level) and/or are not typical of the bathing water, then in addition to resampling, local authorities are recommended to apply a precautionary approach with the issuing of an appropriate bathing warning/restriction.

2.2.7 A bathing warning/restriction notice should remain in place at the bathing water until the local authority has confirmed that the bathing water is no longer affected, and the water quality is acceptable for bathing. A bathing restriction should only be removed when the local authority has a representative bathing water sample confirming the water quality is no longer impacted - E. coli **and** Intestinal enterococci results should be reviewed; hence local authorities need to wait for the Intestinal enterococci result which has a longer analysis time lag.

2.2.8 Local authorities are required to use the standard bathing warning and restriction notice (BN1, BN2 & BN3) templates (agreed by HSE and EPA). The three bathing warning/restriction notice templates are (see Appendix 3):

- Bathing Advisory Notice Temporary BN1 – Advice Not To Swim
- Bathing Prohibition Notice Temporary BN2 – Do Not Swim
- Bathing Prior Warning Notice BN3 – Possible STP event

2.3 HSE Algal Bloom Guidance

The presence of an algal bloom at a bathing water requires a timely risk assessment, and if it is likely to be a harmful algal bloom then an **immediate bathing prohibition** should be applied.

Local authorities are advised to implement the HSE interim guidance for the management of algal blooms. There is one guidance for freshwater algal blooms *'HSE Interim Fresh Water Algal Bloom Guidance'* and another guidance for marine algal blooms *'HSE Interim Marine Algal Bloom Guidance'*. This is interim guidance (March 2019) that will be revised in the future when new guidance by the WHO is published. These guidance documents are available in Appendix 5 & 6.

2.4 Lifeguard Flag and Blue Flags

With the issuing of a bathing restriction at a bathing water, local authorities are required to ensure the following actions in relation to the lifeguard flag and Blue Flag are undertaken as directed by Irish Water Safety and An Taisce respectively.

2.4.1 In the event a **bathing prohibition** is applied and where lifeguard flags are used at the bathing water then the "No swim" **Red Flag** should be raised while the prohibition is in place at the bathing water. In the case of an Advisory Notice the "No swim" Red Flag is not to be raised. Local authorities need to advise lifeguard staff of any operational incident response and of the status of any samples.

2.4.2 In the event an **Advisory Notice or Bathing Prohibition** is applied and where the bathing water is a Blue Flag bathing water then the **Blue Flag** should be lowered while the advisory notice or prohibition is in place at the bathing water. An Taisce, the national operator of the Blue Flag, must be notified when a Blue Flag is being lowered and when it is raised again.

2.5 Sampling & Analysis

2.5.1 The time required for the microbiological analysis of bathing water samples for definitive results is approx. 2-3 days. Local authorities need to establish procedures with their testing laboratory that they are notified of elevated results **immediately** to ensure issuing of bathing restriction where required as soon as possible.

2.5.2 It is strongly advised that local authorities establish a procedure with their testing laboratory whereby, in the event of any elevated bacterial counts arising from preliminary examination of samples (presumptive counts) which would trigger any HSE action level, that early notification is given to the relevant local authority bathing water personnel. Local authorities using preliminary results to initiate actions in response to the bathing water incident will ensure the public receive early notification of the incident.

2.5.3 Local authorities are required to take a sample to confirm the pollution event has ended and the bathing water no longer affected for all incident types whether the event is related to a scheduled sample or not. Confirmation that the bathing water quality is acceptable for bathing is required before a bathing warning/restriction can be removed from the bathing water.

2.5.4 Where a STP event arises, the STP sampling requirements (scheduled, confirm-end and replacement sampling) need to be followed to allow for the replacement of a scheduled

sample. This includes the requirement that the bathing water is subject to STP, which must be clearly stated in the bathing water profile, together with appropriate management measures.

Weekly Scheduled Sampling at Bathing Water

For a confirmed STP event at a bathing water:

- where sampling is scheduled on a weekly basis during the bathing season, and
- where the sampling date of the replacement sample corresponds to the date of the next scheduled sample,

then this scheduled sample may be used as the replacement sample for the STP event.

In this situation, no additional sample is required and, as sampling is undertaken on a weekly basis, then sampling frequency requirements as per the Bathing Water Quality Regulations are adhered to. This is a pragmatic approach and is supported by advice from the European Topic Centre on Inland, Coastal and Marine Waters in relation to STP at bathing waters *'if sampling date of replaced sample corresponds with the next sample date in the monitoring calendar, no additional sample is needed*'. This situation only applies if samples are scheduled on a weekly basis and may be subject to change by the European Commission in the future.

Further information on STP incidents is available in the 'EPA Information Note on Short Term Pollution (STP) Events specified in the 2008 Bathing Water Quality Regulations (SI No. 79 of 2008)', which is available to download from the Help page of BWIS.

3. EPA Bathing Water Information System (BWIS)

BWIS (www.edenireland.ie) incorporates one generic notification form for all incident types: STP events, abnormal situations and certain circumstances that can have adverse impacts (Regulation 15s). Short Bathing Water Incident Training Videos are available to view from the Help page in BWIS.

3.1 New Bathing Water Incident

When a new bathing water pollution incident arises, the local authority is required to submit initial information on the incident such as likely source of pollution (See Appendix 4), PDF of bathing water restriction notice, incident description, etc. via the web notification form on BWIS in as near to real-time as possible, but no later than 11am next day following the commencement of the incident. In the

case of a possible STP incident, prior notification of the event to the public is required at minimum, the day prior to the commencement of the possible event.

Bathing water sample results triggering the notification of an incident are required to be reported as part of the initial notification on the web incident notification form on BWIS. In addition, any subsequent sampling in relation to the incident needs to be recorded in the incident notification form.

The initial notification of the new incident via BWIS will automatically trigger a notification of the incident to the Bathing Water Unit and the Office of Environmental Enforcement (OEE) within the EPA. In addition, the initial notification will automatically generate a tweet of the incident from @EPABeaches Twitter feed and will publish specific incident information including the bathing warning/restriction notice on the beaches.ie website to notify the public.

As part of the submission of a new incident the local authority initially proposes the incident type, i.e. STP events, abnormal situations and certain circumstances that can have adverse impacts. Following EPA assessment this will remain or may be modified depending on its meeting specified bathing water requirements. See further information on incident types in Appendix 2.

Note; all bathing water sample results (scheduled, additional & investigative) are uploaded to the EPA Monitoring Data System (MDS) on EDEN as soon as practicable. Analysis and reporting needs to be undertaken for both microbiological parameters (E. coli and Intestinal enterococci) for the sample to be considered valid.

3.2 More Information on Incident

As more information on the incident becomes available following operational investigations, monitoring, actions taken/planned, the local authority is required to submit this information and update the web incident notification form on BWIS (a lot of this will be reported in the 'Details of Incident' field). The local authority is also required to report on the notification form in BWIS whether the HSE and Irish Water (if applicable) was contacted and, if "Yes", the contact details and advice are required to be recorded in BWIS.

Where required, the EPA may request further information/actions to *be undertaken by local authorities in relation to the incident via a web request notification in BWIS.*

3.3 End of Incident

The end of an incident is when the impact on bathing water quality is over, confirmed using microbiological analysis of both E coli and Intestinal enterococci, and the bathing restriction notice has been removed from the bathing water. The end date of the incident is reported by the local authority via the incident notification form on BWIS. This will automatically generate a tweet to inform that the incident has ended from @EPABeaches Twitter feed, and the incident will be automatically removed from the www.beaches.ie website. **Until this step is undertaken, beaches.ie will continue to display the bathing restriction**. The local authority can continue to add and update the information on the web incident notification form until the EPA Bathing Water Unit closes the incident record in BWIS.

3.4 Incidents Reported with Likely Source of Pollution 'Urban Waste Water Agglomeration – EPA Licensed…' or 'Certificates of Authorisations – EPA Licensed'

When a bathing water incident is reported with 'Likely Source of Pollution' of *Urban Waste Water Agglomeration – EPA Licensed or Certificates of Authorisations – EPA Licensed*, this initiates an enforcement response from the Office of Environmental Enforcement under Urban Waste Water Regulations and, where the local authority notifies 'yes' that the bathing water incident could be linked to an Urban Waste Water Treatment Plant and/or sewer network, this is automatically notified to the relevant regional Irish Water group for their investigation and response.

To ensure this process responds efficiently and appropriately, local authorities are required to only notify incidents with Likely Source of Pollution category of *Urban Waste Water Agglomeration – EPA Licensed* or *Certificates of Authorisations – EPA Licensed* where the local authority **knows or suspects** that this is the likely cause of pollution.

Following investigation where the local authority determines:

- **neithe**r of these categories is the likely cause of pollution for an incident, then the local authority is required to amend the 'Likely Source of Pollution' in BWIS without delay.
- either of these categories **is** the likely cause of pollution for an incident, then the local authority is required to notify the relevant Irish Water group of the incident, when confirmed, **and follow up with Irish Water on subsequent investigations and management measures**.

3.5 Reporting Summary of Management Measures in response to Incident

Part of the notification of bathing water incidents to the EPA via BWIS is the reporting of the 'Summary of the Management Measures' undertaken by the local authority in response to each

bathing water incident (excluding possible STP events that do not give rise to deterioration of the water quality). The 'Summary of Management Measures' provided by local authorities for each incident in the notification forms will be extracted and reported by the EPA to the European Commission as part of the December reporting commitment and may be published on beaches.ie and used for other reporting purposes.

As such it is important that the content of the 'Summary of Management Measures' provided is:

- standalone (include local authority and bathing water name, sampling dates/results, and gives an overview of the incident, outcome of investigations, main actions undertaken, etc.);
- concise (not exceeding 1000 characters including spaces) giving main actions and measures undertaken and planned by the local authority;
- written in plain text only and should not contain bullet points, numbering, line breaks, tables, graphics, etc.

The 'Summary of Management Measures' for each incident notified during the bathing season (excluding possible STP events that did not give rise to a deterioration in water quality) is required to be reported to the EPA via BWIS by **15 October** each year.

3.6 EPA Assessment of Incident

The EPA assesses the bathing water pollution and algal bloom incidents notified during the bathing season in terms of:

- compliance with bathing water legislative requirements,
- enforcement of statutory obligations and
- ensuring appropriate measures are undertaken for the protection of bathers' health and the elimination of the pollution.

The EPA also assesses the incidents to ensure local authorities adhere to the requirements specified in the Bathing Water Quality Regulations 2008 in terms of provision of information to the public, sampling and water quality assessment.

The EPA reports pollution and algal bloom incidents that arise during the bathing season, together with management measures undertaken & bathing restrictions, to the European Commission by 31 December each year.

Appendix 1: HSE Bacterial Action Levels in Response to Microbiological Sample Results

			HSE Recommended Action*
Escherichia coli		**Intestinal Enterococci**	
>2,000 E.coli	**OR**	>250 I.E.	Issue of a bathing prohibition notice
≥1,000 - ≤2,000 E.coli	**AND**	≥200 I.E.	Issue of a bathing prohibition notice
≥1,000 - ≤2,000 E.coli	**BUT**	<200 I.E.	Issue advisory notice and re-sample immediately
If resample is still ≥1,000 E.coli			Issue of a bathing prohibition notice
≥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 (until the status of 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.			
***** Based on risk assessments, the beach profile, previous sampling history, probable source of contamination, evidence of human illness etc.			

In the event of elevated bacterial counts and incidents affecting bathing water quality, local authorities are required to implement the HSE action levels for bather warnings to ensure public health safety (see table below). The HSE action levels are the **minimum actions** that the local authorities should implement **as soon as aware.** Stricter actions may be implemented by the local authority in consultation with the HSE. Should the water quality deteriorate further, then local authorities will need to ensure the appropriate bathing restriction is applied e.g. an advisory notice may need to be replaced by a bathing prohibition. Any actions undertaken need to be reported by the local authority to the EPA in the incident notification in BWIS.

Appendix 2: Process for Local Authority Management and Reporting of Bathing Water Incidents specified in 2008 Bathing Water Regulations

Short Term Pollution (STP)

Predict STP Event using:
Weather Warnings, Weather forecasts & Rainfall Index, Model

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Erect Prior Bathing Warning Notice at bathing water

↓

Prior Notification of possible STP to EPA & Public via BWIS

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Where Scheduled take Sample as per Monitoring Calendar

↓

Where Elevated Bacterial Levels Arise Consult HSE Action Thresholds & Update Bathing Notice (if app)

↓

Take Sample to confirm Impact on Water Quality (STP) ended generally *72 hours*

↓

End of STP Event

- Remove Bathing Notice
- Update End Date on BWIS

↓

If STP occurred, take New Sample to Replace Scheduled Sample (within 7 days after STP confirmed ended)

↓

Complete Incident Notification on BWIS & upload all samples on EDEN

Certain Circumstances Impact BW Quality & Bathers Health (*Reg 15)*

1) Any Gross Malfunction or Leakage of the Sewerage System or Visible Report of Pollution:

- Erect Bathing Prohibition Notice at bathing water & Consult HSE
- Take Sample to find out water quality status

2) Elevated Bacterial Levels & Impact on Bathers' Health:

- Consult with HSE & Post Bathing Notice at bathing water as per HSE Action threshold

↓

Notification of Incident to EPA & Public via BWIS

↓

Undertake inspections, corrective/preventative actions

↓

Monitoring Calendar Continues

↓

Undertake Additional Sampling to assess water quality, update Notice (if app) & check when incident over

↓

End of Pollution Incident

- Remove Bathing Notice
- Update End Date on BWIS

↓

Complete Notification on BWIS

Abnormal Situations *(Reg 8)*

Post Public Notice of Incident at bathing water: (*nature, duration, bathing restrictions*)

↓

Notification & Provision of Evidence of abnormal situation to EPA via BWIS

↓

Consult with HSE
(if bather health issues)

↓

Where Approval Granted by EPA Suspend Monitoring Calendar

↓

Confirm Impact on Water Quality has ended
(Advice to take confirmation sample)

↓

End of Abnormal Situation

- Remove Public Notice
- Update End Date on BWIS
- Resume Monitoring Calendar

↓

Take New Samples to Replace any missing samples scheduled in monitoring calendar

↓

Complete Incident Notification on BWIS & upload all samples on EDEN

Proliferation of Cyanobacteria, Macro-algae, Marine Phytoplankton *(Reg 15) – see HSE Interim Guidance 2019 (Appendix 5 & 6)*

Consult with HSE and Marine Institute

↓

Timely risk assessment determines likely to be Harmful Algal Bloom

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Erect Bathing Prohibition Notice at bathing water

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Notify Incident to EPA & Public via BWIS

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Monitoring Calendar continues

↓

Undertake inspections, corrective/preventative actions as appropriate

↓

End of Incident when no presence of algal bloom and water deemed not harmful

- Remove Bathing Notice
- Update End Date on BWIS

↓

Complete Incident Notification on BWIS & upload all samples on EDEN

Appendix 3: Standard Bathing Warning/Restriction Notices to be issued for Bathing Water Incidents

Please note the bathing warning/restriction notices, provided by the EPA, are to be used during the bathing season and are available in A3 size with English and Irish versions.

Bathing Prior Warning Notice BN3 – Possible STP event

<ENTER B WATER NAME HERE>

<ENTER LOCAL AUTHORITY LOGO HERE>

BN3 Bathing Prior Warning Notice
<ENTER NOTICE DATE HERE>

PRIOR WARNING

Bathers are advised of the possibility of an increase in the levels of bacteria in the bathing water over the coming days due to <enter reason here>.

To reduce the risk of illness, beach users should take the following precautions:
- **Avoid swallowing or splashing water**
- **Wash your hands before handling food**
- **Avoid swimming with an open cut or wound**
- **Avoid swimming if you are pregnant or have a weakened immune system.**

Higher levels of bacteria are usually short-lived and most bathers are unlikely to experience any illness.

LIKELY CAUSE:

EXPECTED DURATION:

ACTIONS TAKEN/PROPOSED:

For further information please contact: <enter LA contact details here> Tel: <enter tel no>
Visit: https://www.beaches.ie/ or <enter the LA website details here>

Bathing Advisory Notice Temporary BN1 – Advice Not To Swim

BN1 Bathing Advisory Notice Temporary

<ENTER B WATER NAME HERE>

<ENTER LOCAL AUTHORITY LOGO HERE>

<ENTER NOTICE DATE HERE>

ADVICE NOT TO SWIM

Bathers are advised not to swim at this bathing water due to an increase in the levels of bacteria found in bathing water sample taken on dd/mm/yyyy.

To reduce the risk of illness, beach users should take the following precautions:

- **Avoid swallowing or splashing water**
- **Wash your hands before handling food**
- **Avoid swimming with an open cut or wound**
- **Avoid swimming if you are pregnant or have a weakened immune system.**

Higher levels of bacteria are usually short-lived and most bathers are unlikely to experience any illness.

LIKELY CAUSE:

EXPECTED DURATION:

ACTIONS TAKEN/PROPOSED:

For further information please contact: <enter LA contact details here> Tel: <enter tel no>
Visit: https://www.beaches.ie/ or <enter the LA website details here>

Bathing Prohibition Notice Temporary BN2 – Do Not Swim

<ENTER B WATER NAME HERE>

<ENTER LOCAL AUTHORITY LOGO HERE>

BN2 Bathing Prohibition Notice Temporary
<ENTER NOTICE DATE HERE>

DO NOT SWIM

SWIMMING IN THIS WATER MAY CAUSE ILLNESS

BATHING IS PROHIBITED DUE TO:

LIKELY CAUSE:

EXPECTED DURATION:

ACTIONS TAKEN/PROPOSED:

For further information please contact: <enter LA contact details here> Tel: <enter tel no>
Visit: https://www.beaches.ie/ or <enter the LA website details here>

Appendix 4: Updated Lists of categories for BWIS 'Likely Source of Pollution' and 'Incident Description'

As part of the notification of bathing water incidents via the EPA Bathing Water Information System (BWIS), the 'Likely Source of Pollution' is needed to allow the incident to be automatically directed for assessment by the appropriate EPA team ('Likely Source of Pollution' is not published on beaches.ie). The 'Incident Description for beaches.ie' is reported to inform the public of the known or 'suspected' cause of the incident. The current lists of categories for 'Likely Source of Pollution' and 'Incident Description for beaches.ie' are provided below, grouped for easy reference.

Likely Source of Pollution Categories in BWIS

1. Agricultural Diffuse Pollution
2. Certificates of Authorisations - EPA Licensed
3. Contamination from Animals/Birds
4. Contamination of Surface Waters (misconnections/urban run-off)
5. Dredging (sediment disturbance)
6. Industrial discharges (S16 discharges to sewer)
7. Natural Event (e.g. landslide, sand dune collapse etc.)
8. Pollution from Boats (leisure/marine)
9. Presence of jellyfish
10. Private Waste Water Treatment Plant - LA Licensed (S4 discharges to surface water)
11. Proliferation of Cyanobacteria/Macro-algae (Lakes)
12. Proliferation of Cyanobacteria/Macro-algae/Marine Phytoplankton (Marine & Estuaries)
13. Septic Tanks/Domestic Waste Water Treatment Systems
14. Urban Waste Water Agglomeration - EPA Licensed (any discharge/spill from known point of the urban waste water collection system including CSOs)

Incident Description for beaches.ie Categories in BWIS

<u>Predicted</u>

- Risk of deterioration in water quality due to discharges (breaching limits) from waste water treatment plant
- Risk of deterioration in water quality due to emergency sewage overflow (in the event of mechanical or electrical breakdown)
- Risk of deterioration in water quality due to expected heavy rainfall
- Risk of deterioration in water quality due to planned engineering works at the bathing water
- Risk of deterioration in water quality due to severe weather warning
- Risk of deterioration in water quality due to storm water overflow

Waste Water

- Water quality deteriorated due to suspected storm water overflow
- Water quality deteriorated due to suspected emergency sewage overflow (in the event of mechanical or electrical breakdown)
- Water quality deteriorated due to suspected sewage discharge from waste water treatment plant/sewer network/CSO
- Water quality deteriorated due to suspected contamination from septic tank/domestic waste water treatment system

Industrial

- Water quality deteriorated due to suspected industrial discharge

Urban/Boats

- Water quality deteriorated due to suspected contamination of urban surface waters discharging into bathing water
- Water quality affected by the presence of waste materials/visible detritus (e.g. tarry residues, plastic)
- Water quality affected due to suspected pollution from boats

Agricultural

- Water quality deteriorated due to suspected agricultural activities/runoff

Hydro-morphological/Natural

- Water quality deteriorated due to suspected contamination from extreme flooding
- Water quality deteriorated due to suspected contamination from natural event (e.g. landslide, sand dune collapse, etc.)
- Water quality deteriorated due to suspected contamination from dredging (sediment disturbance)

Biological

- Water quality affected due to the presence of algal bloom
- Water quality deteriorated due to suspected impacts from animals/birds
- Water affected due to presence of jellyfish

Combination Type

- Water quality deteriorated due to suspected impacts from animals/birds and contamination of urban surface waters discharging into bathing water
- Water quality deteriorated due to suspected contamination from agriculture and septic tanks

Appendix 5: HSE Interim Fresh Water Algal Bloom Guidance 2019

1. *About algal blooms*

"**Harmful algal blooms** (HABs) are excessive accumulations of microscopic photosynthesizing aquatic organisms that produce biotoxins or otherwise adversely affect humans, animals and ecosystems"[7].

Algae are natural inhabitants of fresh water such as in lakes and reservoirs. When conditions are very suitable for growth – shallow, warm, slow-moving or still water - an algal bloom can occur.

Cyanobacteria or 'blue-green algae', a type of blooming algae, can produce toxins. These toxins can kill wild animals, livestock and pets. They can also harm people. Toxins include hepatotoxins, neurotoxins and endotoxins which cause human health effects[6] such as:

- Skin – rash, irritation, swelling, sores
- Gastrointestinal – nausea, vomiting, abdominal cramps, diarrhoea, anorexia
- Respiratory – nasal congestion, cough, congestion, wheeze, shortness of breath, chest tightness, sore throat
- Neurological – confusion, tingling, headache
- Eye/ear – watery eyes, eye irritation, visual disturbance, earache
- General – dizziness, muscle aches, fatigue, fever, malaise, back pain, weakness

Planktonic cyanobacteria often form obvious algal scums on lake surfaces and shorelines. However, some 'benthic cyanobacteria' (e.g. Oscillatoria, Phormidium) have also been directly attributed to or implicated in animal poisonings, with documented cases of fatal canine neurotoxicosis in several Irish lakes. These scums are less conspicuous, yet they produce very potent toxins (e.g. Anatoxin-a & Homoanatoxin-a). Their musty taste and odour may be attractive to dogs scavenging along lake shores, although other mammals and livestock are susceptible. Veterinary intervention often proves unsuccessful with death occurring quickly, e.g. 15-20 minutes after ingestion of relatively small doses. Benthic mats of cyanobacteria are also prevalent in remote oligotrophic freshwaters not normally anticipated to suffer from water quality problems and are widespread in rivers.

2. *What to do if there is a suspected or confirmed algal bloom/ cyanobacteria incident?*

Recognising a bloom

During an algal bloom water becomes less clear and may look green, blue-green or greenish-brown. Scums can form during calm weather when several bloom forming species rise to the surface. This can look like paint, mousse or small clumps – see photos.

Actions

Should an incident occur in a freshwater bathing site that gives cause for concern, the Local Authority will assess risk and bring the incident to the attention of the HSE. The following steps for the Local Authority are suggested;

1. Determine extent of suspect bloom (size of area involved, presence of scum in bathing location) and eliminate obvious cause (turbidity/discolouration due to weather/wave action/localised activity) which could give rise to such characteristics
2. Take a photograph of suspected bloom in situ.

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[6] WHO is updating its international guidance and this document will be revised at that point – For more information please see **Toxic Cyanobacteria in Water: A guide to their public health consequences, monitoring and management**
http://apps.who.int/iris/bitstream/handle/10665/42827/0419239308_eng.pdf;jsessionid=5D41342969592B97C8FF911FFBECD9C9?sequence=1

[7] 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

3. Get a preliminary laboratory analysis if possible to confirm biological agent rather than suspended matter (suspended sediment, broken up seaweed, detritus, wastewater overflow etc). Local authorities will either use their own laboratory or a private laboratory to test the sample microscopically for species.
    a. Actual toxicity testing can be carried out through a Scottish laboratory with expertise in this area. [Scottish Water, PO Box 8855, Edinburgh, EH10 6YQ 0345 ph 00443456018855; e mail: scientific@scottishwater.co.uk]
    b. Kerry County Council has a lot of experience of monitoring and dealing with algal blooms and might be able to provide expertise in this if required

The following table may be helpful in guiding actions.

TableA5.1 - WHO Guidelines for safe practice in managing bathing waters which may produce or contain cyanobacterial cells and/or toxins[8]

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
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 health authorities
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

4. If confirmed as a Harmful Algal Bloom (HAB), bathing and exposure to contaminated water must be prohibited and the suggested standard warning signs should be erected. Depending on the nature and extent of the HAB the suggested standard warning may be supplemented with further advice to the public. Table 1 is helpful but if laboratory results and a detailed risk assessment is not possible/delayed and there is a concern about exposure risk, it may be safest to assume toxicity initially and bathing and exposure to contaminated water must be prohibited (See suggested standard warning sign below).

5. The decision as to when to remove restrictions should take into account a variety of factors including the species toxicity, presence of scum and will be dependent on obtaining a favourable environmental risk assessment including;
    - 2 clear samples if possible, ideally a week apart
    - No obvious evidence of algae present
    - No weather and environmental conditions which could cause recurrence of the bloom

[8] 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

Examples of Blue Green Algae[9]

3. Suggested standard warning sign

WARNING

- This water contains high levels of blue-green algae which may cause illness in humans and animals including pets
- Avoid contact with scum, visible algae and surrounding water
- Do not swim in water near visible algae
- Do not touch scum on the shore
- Wash hands if you touch the algal material
- Keep children and pets away from the water's edge
- Do not let pets drink the water. Wash pets if they come into contact with water

4. Minimising future algal bloom

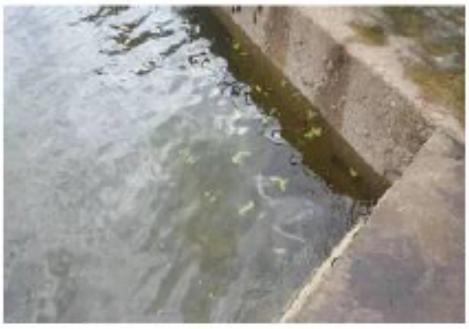
Minimising future algal bloom should be considered based on environmental conditions (and those predicted with climate change) and importance of the water body for ecology and human use. Algal blooms block sunlight from reaching other plants in the water. They also use up oxygen in the water at night which can suffocate fish and other creatures. Oxygen is also used up when the bloom decays. For example, increasing shade and reducing nutrients in the water can control algae.

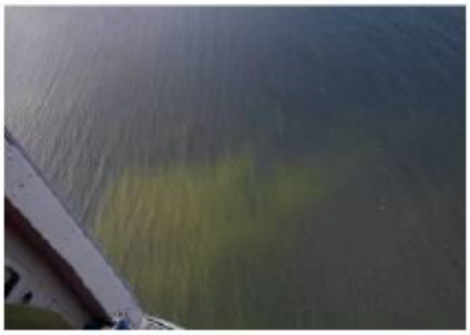
[9] Water Quality Guidance for Open Water Events and Training Sessions. (2018). [ebook] British Triathlon, Royal Life Saving Society UK, p.11. Available at: http://www.triathlonscotland.org/wp-content/uploads/2017-Water-Quality-Guidance.pdf [Accessed 5 Apr. 2018].

Appendix 6: HSE Interim Marine Algal Bloom Guidance 2019

Algal Blooms in Marine Bathing Areas (not freshwater lakes or rivers, this only refers to saline waters)

- The Marine Institute run a comprehensive national marine phytoplankton monitoring system, for Harmful Algal Blooms (HABs) intended to complement the national shellfish safety programme. This programme analyses in near realtime (2 day turnaround) suite of samples from all coastal areas in Ireland and is year round. https://www.marine.ie/Home/site-area/areas-activity/marine-environment/phytoplankton-monitoring
- This current programme provides a sentinel system for a HAB that might have significance in marine bathing water / water for recreational use.
- In general, blooms occurring in the sea in Ireland are not harmful for bathers. There are some species associated with fresh water that may be harmful but these generally only are detected in marine areas following exceptional freshwater runoff. To date there have been no experiences of such a HAB in coastal bathing areas (bloom in Inner Galway Bay last year – identified subsequently to be a non-harmful microcystis species).
- Should an event occur in a marine BW site, that gives cause for concern, the following steps are suggested;
  1. Determine extent of suspect bloom (size of area involved, presence of scum in bathing location) and eliminate obvious cause (turbidity/discolouration due to weather/wave action/localised activity) which could give rise to such characteristics
  2. Get a preliminary laboratory analysis if possible to confirm biological agent rather than suspended matter (suspended sediment, broken up seaweed, detritus, wastewater overflow etc)
  3. Take a photograph of suspected bloom in situ and submit to joe.silke@marine.ie See photos below.





Examples of Blue Green Algae

4. If required, dispatch sample, at least 50ml for analysis, preserved with *lugols iodine* and if possible a second unpreserved sample to Mr Joe Silke, Section Manager, Marine Institute, Rinville, Oranmore, Co. Galway. H91 R673 091 387200 (or his deputy).

5. If confirmed as a Harmful Algal Bloom (HAB), bathing and exposure to contaminated water must be prohibited and the suggested standard warning signs should be erected. Depending on the nature and extent of the HAB the suggested standard warning may be supplemented with further advice to the public.

6. The decision as to when to remove restrictions should take into account a variety of factors including the species toxicity and presence of scum, and will be dependent on obtaining a favourable environmental risk assessment including;
   - 2 clear samples if possible, ideally a week apart

- No obvious evidence of algae present
- No weather and environmental conditions which could cause recurrence of the bloom

Suggested standard warning sign

WARNING

- This water contains high levels of blue-green algae which may cause illness in humans and animals including pets
- Avoid contact with scum, visible algae and surrounding water
- Do not swim in water near visible algae
- Do not touch scum on the shore
- Wash hands if you touch the algal material
- Keep children and pets away from the water's edge
- Do not let pets drink the water. Wash pets if they come into contact with water