

**WAT-G-070**

**EASR Guidance: Discharges to and near bathing and shellfish waters**

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# Purpose and scope

This guidance sets out our requirements for the treatment of effluent to reduce the amount of microbes to protect bathing and shellfish waters. It applies to discharges that contain microbes into surface waters. This guidance does not cover the risks to other parts of the water environment from a discharge nor does it cover the risks from non-microbial pollutants. In this context “bathing or shellfish waters” means:

* Bathing waters designated by the Scottish Ministers under Regulation 3 of the Bathing Waters (Scotland) Regulations 2008.
* Shellfish water protected areas designated under section 5A of the Water Environment and Water Services (Scotland) Act 2003.
* Classified shellfish harvesting areas. As classified by Food Standards Scotland.

The guidance does not apply to discharges to soakaway.

# Existing discharges

* If there is no evidence of an environmental impact, SEPA will grant an application to authorise an existing unauthorised sewage discharge based on the status quo.
* Where an existing authorised or unauthorised discharge is found to be contributing to a failure to achieve the required microbial standards[[1]](#footnote-2), SEPA will require connection to sewer, discharge to soakaway or an upgrade in the treatment within a specified timescale so that the discharge meets the relevant microbial standards.
* Where an existing authorised discharge is not contributing to a failure to achieve the required microbial standards and there is compliance with the conditions of authorisation, SEPA will not normally require any further action from the discharger.

Existing sewage discharges of ≤100 population equivalent (p.e.) are contributing to the failure to achieve the required microbial standards where:

* The discharge is within the zones set out in [3.2.2](#_3.2.12_What_are) and
* The bathing water is failing to meet the sufficient standard or is at risk of deterioration (see Appendix 2); or a shellfish water harvesting area is not meeting class A (see Appendix 1); and
* SEPA has evidence, as set out in the and Bathing Water Improvement Plan or Shellfish Water Improvement Plan, that the failure is in part due to diffuse small scale sewage discharges i.e. microbial source tracking shows a human source and there are small sewage discharges into, or close to, the bathing water or shellfish water zones. The required treatment standard for discharges to or near bathing or shellfish waters ≤100p.e. is set out in [Section 3.1 and 3.2.](#_3.2_Permit_level)

For larger discharges, a site-specific assessment is required.

# New or modified discharges

A discharge can be considered modified when the effluent disposal characteristics have changed in a way that will result in:

* A change in discharge regime leading to an increased load or volume.
* A change in discharge location or end of pipe geometry
* Any change to the discharge that leads to an alteration in the dilution or dispersion pattern.

You should avoid discharging directly to, or close to, bathing or shellfish waters if possible.

For permit level discharges, you should consider alternative discharge options before pursuing a direct discharge (e.g. connection to sewer, or relocation of outfall).

We have a general presumption against discharge of chlorinated organic effluents due to the presence of chlorine and its reaction by-products. However, we recognise that chlorination of sewage effluents to achieve specified bacteriological standards in the bathing waters may be required as a short-term measure pending completion of capital works or for experimental purposes. You should consider the risk from any such discharge, including from any trihalomethanes. For discharges to shellfish waters, we have a general presumption against use of chemical forms of disinfection (with the exception of hydrogen peroxide).

If you are using an automated process to treat your effluent, you should install telemetry to warn you of failure of the equipment.

We normally require bathing season compliance for discharges to and near bathing waters and annual compliance for discharges to shellfish waters.

## 3.1 Registration level sewage discharges

There is a registration activity for the discharge of sewage effluent in bathing and shellfish water zones. There are standard conditions attached to this registration requiring treatment to protect the bathing and shellfish waters.

## 3.2 Permit level sewage discharges greater than 10 domestic properties or 50 p.e. but less than or equal to 100 p.e

If you have a discharge to, a [bathing](#_3.2.2_What_are) or [shellfish water zone](#_3.2.1_What_are), you can either:

* Treat the sewage using:
  1. a system that is designed to meet no more than 500 Escherichia coli (E.coli) per 100 millilitres of sewage effluent and 200 intestinal enterococci per 100 millilitres of sewage effluent[[2]](#footnote-3); or
  2. by a secondary treatment system and a proprietary filtration system using bio-fibrous media.
* Carry out modelling to demonstrate that the discharge will not result in non-compliance with the relevant bathing or shellfish water standards. Section 4 sets out our requirement for this assessment.

For these discharges SEPA will not normally require numerical modelling to demonstrate compliance with initial dilution requirements and microbiological standards unless the site is particularly sensitive to such discharges (e.g. a discharge to a shallow enclosed bay) or there is low confidence that the standards can be achieved. WAT-G-066, EASR Guidance: Permit Activity: Assessing the impact of discharges on coastal and transitional waters provides further information.

### 3.2.1 What are bathing and shellfish water zones?

A zone to protect bathing waters means:

* Any surface water designated by the Scottish Ministers under Regulation 3 of the Bathing Waters (Scotland) Regulations 2008 as a bathing water; or
* A buffer zone around any surface water designated by the Scottish Ministers under Regulation 3 of the Bathing Waters (Scotland) Regulations 2008 as a bathing water. The buffer zone is 1500m as measured along the coast and/up the river unless they have been extended because bacteria die-off may not have sufficiently taken place. Where this is the case, it will be detailed in the bathing water improvement plan.

A zone to protect shellfish waters means:

* An area of coastal water or transitional water designated as a shellfish water protected area under section 5A of the Water Environment and Water Services (Scotland) Act 2003 (“shellfish water protected area”; or
* Watercourses that drain into the protected area up to 1500m inland of the shellfish water protected area; or
* A Classified Shellfish Harvesting area where the harvesting is for common mussels, pacific oysters, common cockles, carpet clams, pullet carpet shells or surf clams[[3]](#footnote-4). A Classified Shellfish Harvesting is classified as such by Food Standards Scotland;
* A buffer zone, as measured 1500m along the coast and/up the watercourse, from the Classified Shellfish Harvesting area where the harvesting is for common mussels, pacific oyster, common cockles, carpet clams, pullet carpet shells or surf clams.

You can ask SEPA for information on whether your discharge is within one of these zones.

## 3.3 Permit level discharges greater than 100 p.e.

You should undertake modelling of the impact of discharge if you are near a bathing or shellfish water. Near in this context needs to be determined on a site-specific basis. If you need advice on this, contact SEPA at [waterpermitting@sepa.org.uk.](https://scottishepa.sharepoint.com/sites/IntegratedAuthorisationFramework/Shared%20Documents/WS06_Water_Activities/Guidance%20docs/Point%20Source/Discharge%20of%20effluents%20to%20surface%20water/waterpermitting@sepa.org.uk.)

# Our requirements for modelling

Where you are undertaking modelling, the level of modelling should be proportionate to the environmental risk. For example, the modelling could be by a simple conceptual model supported by simple calculations. Depending on the location of the discharge, you may be able to take initial dilution into account. You should read WAT-G-066, EASR Guidance: Permit Activity: Assessing the impact of discharges on coastal and transitional waters.

Sections 4.1 to 4.3 set out the outcomes that we will require you to demonstrate via your modelling.

Before submitting an application, you should contact SEPA for advice at [waterpermitting@sepa.org.uk.](https://scottishepa.sharepoint.com/sites/IntegratedAuthorisationFramework/Shared%20Documents/WS06_Water_Activities/Guidance%20docs/Point%20Source/Discharge%20of%20effluents%20to%20surface%20water/waterpermitting@sepa.org.uk.)

## 4.1 Discharges to or near bathing waters

* Your modelling should normally consider both E. coli and Intestinal enterococci (I.E.) unless you can justify that modelling for one of these parameters provides sufficient evidence that the standards for the other parameter will be met.
* Your modelling should demonstrate compliance with sufficient standards as a minimum as detailed in Appendix 2.
* These standards must be achieved at end of pipe for direct discharges.
* Your modelling must demonstrate that the required initial dilution criteria are met to reduce to acceptable levels both the visibility of slicks and the occurrence of smell nuisance.

## 4.2 Discharges to or near shellfish water protected areas

For discharges directly to a shellfish water protected area or watercourses draining into the protected area:

* Your modelling should demonstrate compliance with 5 E.coli/100ml as a geometric mean[[4]](#footnote-5), at the mixing zone edge. This will protect the shellfish water protected area for future harvesting and will prevent deterioration of the shellfish water protected area. You can take into account any dilution in a watercourse.
* Your modelling must demonstrate that the required initial dilution criteria are met to reduce to acceptable levels both the visibility of slicks and the occurrence of smell nuisance.

For discharge to coastal and transitional waters near a shellfish water protected area or watercourses draining into this area:

* Your modelling should demonstrate compliance with 5 E. coli/100ml as a geometric mean4 at the protected area. In achieving this standard, you can take into account any dilution in a watercourse, in the coastal and transitional water outside the protected area and in a zone equivalent to the allowed mixing zones in the protected area.
* Your modelling must demonstrate that the required initial dilution criteria are met to reduce to acceptable levels both the visibility of slicks and the occurrence of smell nuisance.

## 4.3 Discharges to or near classified shellfish harvesting areas

For discharges directly into classified shellfish harvesting areas, to coastal and transitional waters near a classified shellfish harvesting area or watercourses draining into these areas:

* Your modelling should demonstrate compliance with 5 E. coli/100ml as a geometric mean4 in the classified harvesting area.
* You can take into account any dilution outside of the classified shellfish harvesting areas if the discharge is outside of a classified shellfish harvesting area.
* Your modelling must demonstrate that the required initial dilution criteria are met to reduce to acceptable levels both the visibility of slicks and the occurrence of smell nuisance.
* You can’t use initial dilution to meet the required microbiological standards for direct discharges to classified harvesting areas. These standards must be achieved at end of pipe for direct discharges.
* In determining the impact, you can take into account the degree of impact on the classified shellfish harvesting area. Where harvesting is dispersed, the impact is likely to be low.

## 4.4 Sewage model input parameters

You can use these values for E. coli numbers in sewage and E. coli die off rates in your model. These are guideline values and, in some cases, it may be more appropriate to use site-specific values.

### 4.4.1 Mean E. coli numbers in sewage

* Raw sewage E. coli /100ml is 2 x 107
* Septic tank effluent E. coli /100ml is 1 x 107
* Secondary treated effluent E. coli /100ml is 1 x 105
* Subsurface flow wetlands E. coli /100ml is 4 x 103
* Other reedbeds and wetlands E. coli /100ml is 4 x 104
* CSO discharges E. coli /100ml is 1 x 106

### 4.4.2 E. coli die off rates

* In coastal waters, time taken for 90% of E. coli to die off (T90) is 15 hrs.
* In transitional waters time taken for 90% of E. coli to die off (T90) is 20 hrs.

# Your permit

We will include numerical standards for microbes on your permit where treatment of effluent is required to reduce the number of microbes. The standards will normally be for intestinal enterococci or E. coli or both. We may also include a standard for any other indicator or pathogenic micro-organism which may be relevant to a specific situation. The numerical standards for continuous discharges will be two-tier:

* A lower tier set for 95 percentile compliance. This will be set at the model discharge output needed to meet the required standards in the bathing or shellfish water.
* An upper tier set as an absolute limit. Given the nature of the discharge and likely variability in the effluent the upper tier this should then be set as 10 times the lower tier.

We may also include a condition that telemetry must be installed where an automated process is used to treat your effluent

# Sewer overflows

We have a presumption against combined sewer overflow and emergency overflow discharges to or near bathing and shellfish waters. You be required to demonstrate that alternative discharge location options (e.g. relocation of outfall out with the identified water) have been considered when applying for discharge to or near these waters.

You should read WAT-G-058, EASR Guidance: Permit Activity: Sewer Overflows[.](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-RM-07)

## 6.1 Emergency overflows

Where you have to discharge to or near a bathing or shellfish water, you need to provide storage to minimise the risk of the discharge. We normally require a minimum storage capacity equivalent to 1-2 hours storage at 3DWF (3PG + I + 3E). This comes from UWWTR Guidance Note[.](http://stir-app-qpl01/QPulseDocumentService/Documents.svc/documents/active/attachment?number=WAT-RM-07)

However, the storage capacity needed at a site will depend on remedial measures provided by the applicant (e.g. standby pump, stand-by power generator etc) and response times to emergencies. You may need to provide greater storage times depending on these factors and the risk to the receiving water.

## 6.2 Combined sewer overflows

You should read WAT-G-058, EASR Guidance: Permit Activity: Sewer Overflows for further information.

# Appendix 1: Legislative background

Both shellfish water protected areas and bathing waters are protected areas under The Water Environment and Water Services (Scotland) Act 2003.

## A.1 Bathing Waters

The Bathing Waters (Scotland) Regulations 2008 require Scottish Ministers to designate bathing waters. These are areas where bathing is traditionally practised by a large number of bathers and where bathing is not prohibited. Scottish Ministers determine the length of the bathing season. It normally runs from June 1st to September 15th. These waters are monitored by SEPA.

The Bathing Waters (Scotland) Regulations 2008 requires SEPA to exercise its relevant functions to ensure that bathing waters are classified as sufficient as a minimum. The regulation set out the standards for excellent, good and sufficient bathing waters as measured by *Escherichia coli* (*E. coli*) and Intestinal enterococci (IE).

## A.2 Shellfish Waters

The Water Environment and Water Services (Scotland) Act 2003 requires the designation of shellfish water protected areas.

The [Water Environment (Shellfish Water Protected Areas: Designation) (Scotland) Order 2016](http://www.gov.scot/Topics/Environment/Water/15561/ShellfishWaters) identifies Scotland’s Shellfish Water Protected Areas (SWPAs).

The Water Environment (Shellfish Water Protected Areas: Environmental Objectives etc.) (Scotland) Regulations 2013 sets out the objectives which should be met in relation to shellfish water protected areas. This is to prevent deterioration and protect and improve each Shellfish Water Protected Area with the aim of achieving good shellfish water quality. There is a similar requirement in regulation 5 of [The Water Environment (Shellfish Water Protected Areas: Objectives and Classification etc.) (Solway Tweed) Directions 2021](https://www.gov.scot/publications/the-water-environment-shellfish-water-protected-areas-objectives-and-classification-etc--solway-tweed-directions-2021/).

The Scotland River Basin District (Quality of Shellfish Water Protected Areas) (Scotland) Directions 2021 sets out microbiological standards for:

* Good: ≤4600 most probable number of E. coli per 100g of shellfish flesh and intervalvular liquid as a 90-percentile; and
* Excellent, ≤230 as most probable number of E. coli per 100g of shellfish flesh and intervalvular liquid as a 90-percentile levels.

Separately, classified shellfish harvesting area(s) are designated and classified by Food Standards Scotland (FSS). FSS are required to monitor E. coli in shellfish to determine the level of treatment required prior to shellfish going for human consumption. Class A, equates, in part, to 80% of samples ≤230 E. coli/100g of flesh and intervalvular liquid. SEPA needs to take account of the impact on these water users when authorising discharges. Many of these classified shellfish harvesting areas are much smaller than the shellfish water protected area and some of these classified shellfish harvesting areas are not within shellfish water protected areas.

The River Basin Management Plan for Scotland, 2021 to 2027 states that SEPA’s aim is to target efforts within SWPAs, in consultation with the sector, to focus on prioritised Shellfish Production Areas that require improvements to help secure a consistent FSS ‘A’ class.

# Appendix 2: Bathing water standards[[5]](#footnote-6)

**Table 1: Microbiological standards for classification of inland waters**

| **Parameter** | **Excellent** | **Good** | **Sufficient** |
| --- | --- | --- | --- |
| Intestinal enterococci | 200/100ml as a  95%ile | 400/100 ml as a  95%ile | 330/100 ml as a  90%ile |
| Escherichia coli | 500/100ml as a  95%ile | 1000/100 ml as a  95%ile | 900/100 ml as a  90%ile |

**Table 2: Microbiological standards for classification of coastal and transitional waters**

| **Parameter** | **Excellent** | **Good** | **Sufficient** |
| --- | --- | --- | --- |
| Intestinal enterococci | 100/100ml as a  95%ile | 200/100 ml as a  95%ile | 185/100 ml as a  90%ile |
| Escherichia coli | 250/100ml as a  95%ile | 500/100 ml as a  95%ile | 500/100 ml as a  90%ile |

## A2.1 Modelling standards for bathing waters

For those standards assessed for classification at a 90%ile they should be modelled for achievement at the 94%ile and likewise for those standards requiring 95%ile compliance these should be modelled to achieve the standard at a 97.5%ile to ensure the required level of confidence.

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1. For existing discharges to or near shellfish waters, the microbial standards referred to only applies to the protection of shellfish harvesting areas within shellfish water protected areas to help secure a consistent FSS ‘A’ class. [↑](#footnote-ref-2)
2. Once a small amount of dilution is taken into account, this treatment should meet:

   * Bathing water standards;
   * Standards for good and excellent shellfish water protected area classification; and
   * Food Standards Scotland Class A.

   [↑](#footnote-ref-3)
3. As small sewage discharges are likely to have a localised impact, it is the intensity of shellfish production which determines the likely economic impact. Where the harvesting is dispersed over a large area, the risk to classified shellfish harvesting areas from small discharges (≤100 p.e) is small. [↑](#footnote-ref-4)
4. This is our operational standard to protect shellfish to class A standard. This is from [Faecal contamination challenges for the water environment.](https://www.gov.uk/government/publications/faecal-contamination-challenges-for-the-water-environment) [↑](#footnote-ref-5)
5. From The Bathing Waters (Scotland) Regulations 2008 [↑](#footnote-ref-6)