

# Drainage and Wastewater Management Plans (DWMPs)

Summary of the methodology for  
the Baseline Risk and Vulnerability  
Assessment (BRAVA) on:

## Shellfish Waters

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# 1. Introduction

## 1.1. Purpose

The purpose of this document is to provide a summary of the method for undertaking the Baseline Risk and Vulnerability Assessment (BRAVA) for the planning objective to **improve Shellfish Water quality**.

The BRAVA is an important step in the development of Drainage and Wastewater Management Plans (DWMPs). It is an assessment of current and future risks for each of the planning objectives and is undertaken for the sewer catchments that were flagged during the Risk Based Catchment Screening (RBCS).

All Water and Sewerage Companies (WaSCs) were required to complete a BRAVA and report to Water UK on the following six common planning objectives:

1. Risk of sewer flooding in a 1 in 50 year storm
2. Storm overflow performance
3. Risk of WTW compliance failure
4. Internal sewer flooding risk
5. Pollution risk
6. Sewer collapse risk

We identified two additional 'bespoke' objectives to complement the six common national objectives and have included these:

7. Annualised Flood Risk - which is the flood risk arising from sewers as a result of different severities of rainfall
8. Wastewater Treatment Works (WTW) Dry Weather Flow (DWF) Compliance – to assess our compliance with the Environment Agency (EA) permit relating to the DWF arriving at a wastewater treatment works.

We developed methodologies for conducting these eight BRAVAs and completed the BRAVAs in December 2020. The methodologies and outputs are published on our website at: <https://www.southernwater.co.uk/dwmp/baseline-risk-and-vulnerability-assessment>

We are working collaboratively with partner organisations in the development of our DWMP. Through this collaboration we identified six additional planning objectives that will help us to achieve the wider environmental outcomes that our customers expect and we want to achieve. They are:

1. Secure nutrient neutrality
2. Achieve Good Ecological Status / Potential
3. Reduce groundwater pollution
4. Improve bathing waters
5. Protect shellfish waters
6. Improve surface water management

Further information on planning objectives for DWMPs can be found on our website: <https://www.southernwater.co.uk/dwmp/planning-objectives>.

We are conducting and applying a BRAVA for each of these across our entire region. This is the methodology for the BRAVA on improving Shellfish Water quality.



## 1.2. Objective

The inclusion of a planning objective on improving Shellfish Waters in our Drainage and Wastewater Management Plans (DWMPs) is a significant step forward in **safeguarding Shellfish Waters** in the South East from pollution.

Good water quality is vital for the production of high quality shellfish for human consumption and to support local shellfish-related economies. Shellfish waters can be impacted by pollution from various sources, such as run-off from agricultural land or discharges from sewage treatment works. Over recent decades, our investment to improve final effluent quality has contributed to less microbiological contamination in designated shellfish waters.

The objective of this BRAVA is to identify which of our wastewater catchments pose a risk to the faecal standards of shellfish waters.

## 1.3. Definitions

Shellfish waters are protected areas designated under the Water Framework Directive to protect shellfish growth and contribute to a high quality product for human consumption. The Department for Environment, Food and Rural Affairs (DEFRA) is the lead across the UK.

The Shellfish Waters Directive (79/923/EEC) is designed to protect the aquatic habitat of the bivalve and gastropod molluscan species of shellfish. Species covered include oysters, mussels, cockles, scallops and clams but not shellfish crustaceans such as crabs, crayfish and lobsters. The Shellfish Waters Directive is implemented in the UK under the Shellfish Waters (Shellfish) (Classifications) Regulations 1997.

Shellfish hygiene rules set quality standards for human consumption based on faecal indicator organisms and protects human health from poor quality shellfish. These hygiene rules are the responsibility of the Food Standards Agency.

The assessment of risk for shellfish water is undertaken using the CEFAS (Centre for Environment, Fisheries, and Aquaculture Science) classifications for the harvesting areas. The CEFAS classification is undertaken by assessing faecal contamination in a shellfish. The following classification categories are applied:

**Class A** (80% of samples  $\leq$  230 E. coli/100g; all samples must be less than 700 E. coli/100g) - molluscs can be harvested for direct human consumption

**Class B** (90% of samples must be  $\leq$  4600 E. coli/100g; all samples must be less than 46000 E. coli/100g.) - molluscs can only be sold for human consumption:

- after purification in an approved plant, or
- after re-laying in an approved Class A re-laying area, or
- after an EU-approved heat treatment process.

**Class C** ( $\leq$  46000 E. coli/100g) - molluscs can be sold for human consumption only after re-laying for at least two months in an approved re-laying area followed, where necessary, by treatment in a purification centre, or after an EU-approved heat treatment process.

**Prohibited Areas** – Production or harvesting of shellfish from areas with consistently greater than 46000 E. coli/100g is prohibited.

## 1.4. Scope

The scope for this risk assessment is to identify a link between shellfish waters and our wastewater catchments so we can examine whether the performance of our systems or the quality of the discharges may cause a deterioration of the quality of a shellfish water.

We are not sampling and testing the shellfish health as part of this risk assessment.

## 1.5. Reporting Requirements

We are not required to report the BRAVA outcomes for our bespoke and additional planning objectives to Water UK. However, we will publish the results on our website for consideration by our customers and partner organisations.

# 2. Data Sources

The following provides a short description of the data that has been used and where it has been obtained from.

## 2.1. Outfalls to Shellfish Waters

This is a list of outfalls from our wastewater systems that discharge into designated Shellfish Waters. It was supplied by our environmental team.

## 2.2. Overflow Event and Duration Monitoring

Event and Duration Monitoring (EDM) data is recorded by instruments installed in our sewer network to record and monitor any discharges from combined sewer overflows (CSOs). The data is used to assess the performance of these storm overflows and determine the frequency of the discharges.

A '12 / 24 hour event counting' method is used to count the number of spills per year. The 12hr / 24hr event counting criteria is performed as follows:

- event counting starts when the first discharge occurs
- any discharge(s) in the first 12 hour block is counted as 1 spill
- any discharge(s) in the next and subsequent 24 hour blocks are each counted as 1 additional spill per block
- this counting continues until there is a 24 hour block with no discharge
- for the next discharge after a 24 hour block with no discharge, the sequence begins again.

The results of the storm overflow performance planning objective is compared with the initial BRAVA results for the Shellfish Water to explore whether there could be a risk from high-spilling CSOs.

## 2.3. CEFAS Shellfish Harvesting

This is a data set showing the CEFAS Shellfish Harvesting areas and their classification. This data is available to freely download from the [CEFAS website](#).

## 2.4. Wastewater Treatment Works with Ultraviolet Plant

We have installed additional treatment processes at some of our WTWs including ultraviolet (UV) equipment. This additional process further disinfects the final effluent before it is discharged to the environment. The disinfection process kills bacteria and reduces impact of the final effluent discharge to the environment, so the risks of pollution or contamination from these systems will be low.

Where the only discharge to a shellfish water is from one of our wastewater treatment works with a UV plant disinfection system, we have moderated the initial risk banding to take into account the positive impact that the UV plant has in reducing the bacteria count in the final effluent discharge. The method of assessment is described in section 3 below.

# 3. Method of Assessment

The following risk assessment methodology has been developed to assess the risk to shellfish water quality from our wastewater systems.

## 3.1. Process for the 2020 Baseline Assessment

The first step is to identify which of our outfalls discharge into shellfish waters and match these with the designated shellfish water protected areas and our wastewater systems. We then mapped the nearest CEFAS harvesting area to each of the outfalls and assigned the associated CEFAS classification.

Where a wastewater system was identified as discharging to a shellfish water, we counted the number of outfalls in that system. The number of outfalls within the different CEFAS classifications were then identified and the worst case outfall classification attached to that catchment. A banding was then assigned to the catchment based on the CEFAS classification. As stated above, if a UV plant is known to be on all of the outfalls discharging to shellfish waters in that catchment, the risk banding was reduced down one band.

Proximity is also a consideration in terms of the potential impact on shellfish water quality. Where a wastewater catchment is in hydraulic connection with a shellfish water but further away from a

harvesting area (or greater than approximately 5km), microbes or bacteria from the wastewater will either die or their impact will be dissipated before they reach the shellfish water. For this reason, any wastewater catchments more than 5km from the shellfish water are considered as Band 0 or 'not significant'.

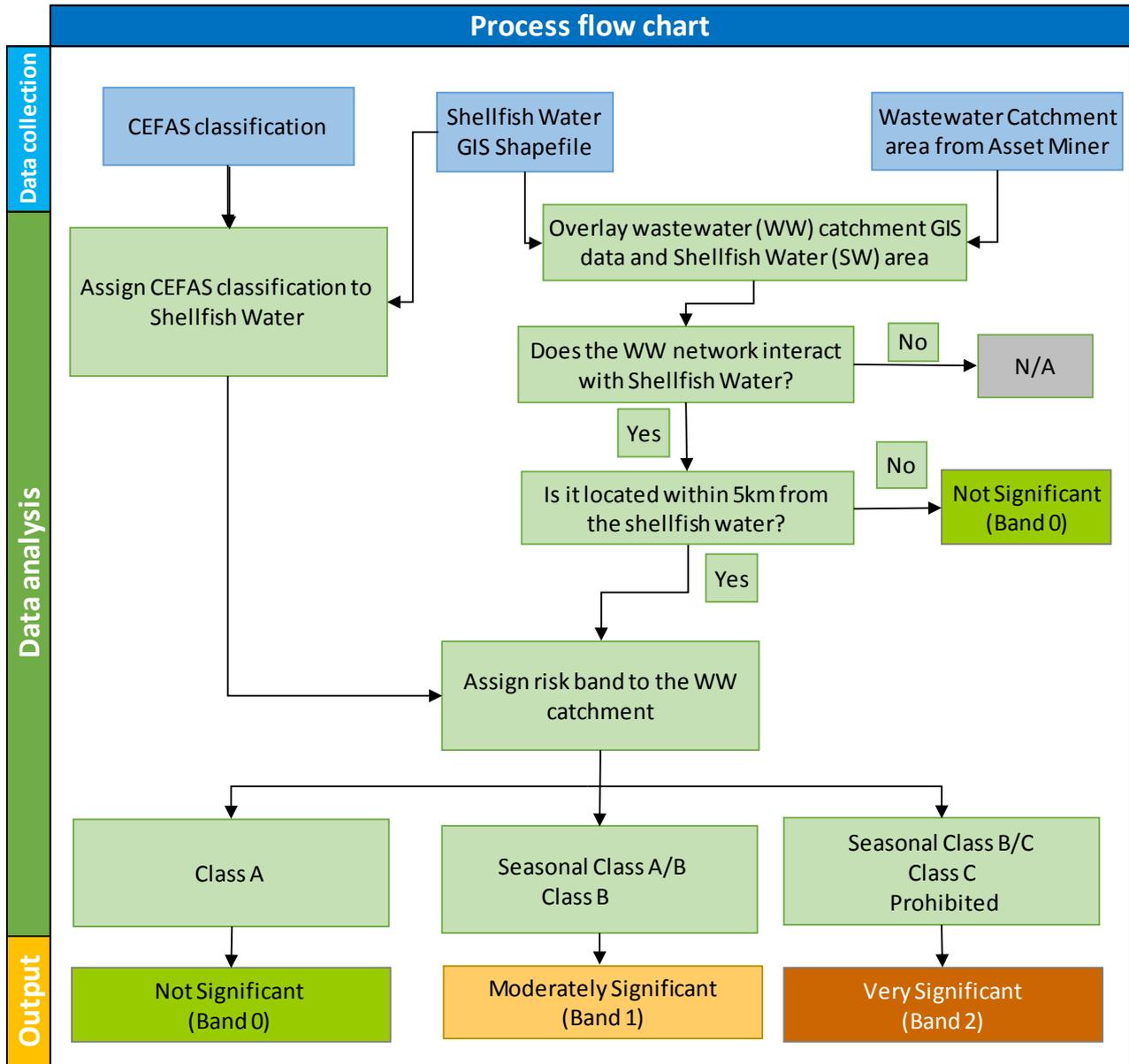
We recognise that there is an agglomerated, or cumulative, impact of assets that discharge into a given shellfish water. The agglomerated impact assessment requires a detailed understanding of the frequency of spills of individual assets and establishing the aggregated frequency of the spills for all assets contributing to a specific shellfish water. This requires analysing not only the spill frequencies but the time when each spill occurs. In any period, a spill at any of the assets that outfall to a specific shellfish water counts towards the spills across the agglomeration. If the spills from different assets occur at the same time then that is counted as single event.

The assessments undertaken to date focuses on identifying the shellfish water areas that have classifications other than A and linking those with our wastewater systems with a view to identify the main contributing systems. During the problem characterisation stage of DWMP we will assess if the low classification for a given shellfish water is due to a high spill frequency from a single asset or due to an aggregated effect of spills from multiple assets, or other sources of pollution.

## 3.2. Process Flowchart

The process flow chart below describes the steps and procedures followed in assessing the risk to shellfish waters from our wastewater systems.

Figure 1 – Process flow chart for Improving Shellfish Waters Methodology



### 3.3. Thresholds and Bands

We have defined the thresholds for each of the risk bands using the CEFAS classifications. Table 1 shows how these CEFAS classifications have been assigned to the different risk bands.

**Table 1: Shellfish water BRAVA risk banding**

CEFAS Classification	Description	Band
1	Class A - (80% of samples must be $\leq$ 230 E. coli/100g; all samples must be less than 700 E. coli/100g) - molluscs can be harvested for direct human consumption	0
2	Class B - (90% of samples must be $\leq$ 4600 E. coli/100g; all samples must be less than 46000 E. coli/100g) - molluscs can be sold for human consumption: after purification in an approved plant, or after re-laying in an approved Class A re-laying area, or after an EC-approved heat treatment process.	1
3	Class C - molluscs can be sold for human consumption only after re-laying for at least two months in an approved re-laying area followed, where necessary, by treatment in a purification centre, or after an EC-approved heat treatment process.	2
4	Prohibited (Areas with E.coli count consistently $>$ 4600 E. coli/100g)	2
5	Long Term Class B ( As per Class B)	1
6	Seasonal Class B/Class C	2
7	Seasonal Class A/Class B	1