

Dŵr Cymru Welsh Water

Southgate Effluent Pipe Repair Works

Water Framework Directive Assessment Report

Jack Whittle, Kelly Greener, Nick O'Brien

COMMERCIAL IN CONFIDENCE



Client: Dŵr Cymru Welsh Water

Address: Fortran Road
St Mellons
Cardiff
CF3 0LT

Project reference: P00016059

Date of issue: November 2024

Project Director: Dr Marc Hubble

Project Manager: Kelly Greener

Other: Nick O'Brien, Jack Whittle

APEM Ltd
Riverview
A17 Embankment Business Park
Heaton Mersey
Stockport
SK4 3GN

Tel: 0161 442 8938

Fax: 0161 432 6083

Registered in England No. 02530851

This document should be cited as: APEM. 2024. Southgate Water Framework Directive Assessment. APEM Scientific Report P000016059. Report for Dŵr Cymru Welsh Water.

Revision and Amendment Register

Version Number	Date	Section(s)	Page(s)	Summary of Changes	Approved by
1.0	25/11/2024	All	All	WFD Assessment Draft	MH

Contents

1.	Introduction	1
1.1	Introduction to the Assessment.....	1
1.2	Location and Context of the Works.....	1
1.3	WFD Assessment Objectives	4
1.4	Summary of the Proposed Works	4
1.4.1	Mobilisation	5
1.4.2	Breakout of Existing Pipe	5
1.4.3	Relining Works	5
1.4.4	Concrete Works.....	5
1.5	Embedded Mitigation.....	7
2.	Water Framework Directive Requirements	8
2.1	Water Framework Directive	8
2.1.1	Overview	8
2.1.2	Coastal Water Bodies.....	12
2.1.3	Bristol Channel Outer North	13
3.	WFD Assessment Methodology.....	13
3.1	Screening.....	14
3.2	Scoping	14
3.3	Impact Assessment.....	15
4.	WFD Assessment	15
4.1	Screening.....	15
4.2	Scoping	16
4.3	Impact Assessment.....	17
4.3.1	Protected Areas.....	17

4.3.2	Invasive Non-Native Species	19
5.	Cumulative Effects Assessment.....	20
6.	Summary.....	20
7.	References	22
Appendix 1	WFD Scoping Template	23

List of Figures

Figure 1: Proposed works in relation to coastal waterbody	2
Figure 2. Proposed work locations and approximate works boundary	3
Figure 3: WFD quality elements – Bringing all the strands of evidence together (Environment Agency 2015).	10
Figure 4: Classification hierarchy for surface waters (from Environment Agency 2023).	11

List of Tables

Table 1: Cycle 3 classifications for 2021 for the Bristol Channel Outer North coastal water body.....	13
--	----

1. Introduction

1.1 Introduction to the Assessment

This Water Framework Directive (WFD) Assessment Report considers the proposed works required for the remediation of a treated effluent pipe, which discharges into the subtidal zone of the Bristol Channel, at Foxhole Cove, Southgate, South Wales. There are multiple breaches and leaks in the pipe, therefore Kaymac Marine & Civil Engineering Ltd have been commissioned by Dŵr Cymru Welsh Water (DCWW) to conduct the remediation and protection work.

The works are required to be consented under a Band 2 marine licence issued by Natural Resources Wales (NRW) as a section of the outfall pipe where works are required is in the intertidal zone (below Mean High Water Springs (MHWS)).

This WFD assessment has been produced in support of the Band 2 marine licence application and is required to determine if the proposed works could affect the current status or future potential of associated WFD supporting elements in the Bristol Channel Outer North coastal water body (ID: GB611008590001).

1.2 Location and Context of the Works

The location of the proposed works within the Bristol Channel Outer North Coastal water body is indicated in **Figure 1**. **Figure 2** provides the approximate works boundary including landing the Kraken Marine Services Ltd (KMS) Terramare on the beach during the falling tide.

The Southgate outfall pipe is located at Foxhole Cove at the grid reference: E255341, N187076 (what3words: - ///rainwater.destroyer.wipes) with a nearest postcode of SA3 2AS. The proposed works are within the Bristol Channel Outer North Coastal water body (ID: GB611008590001).

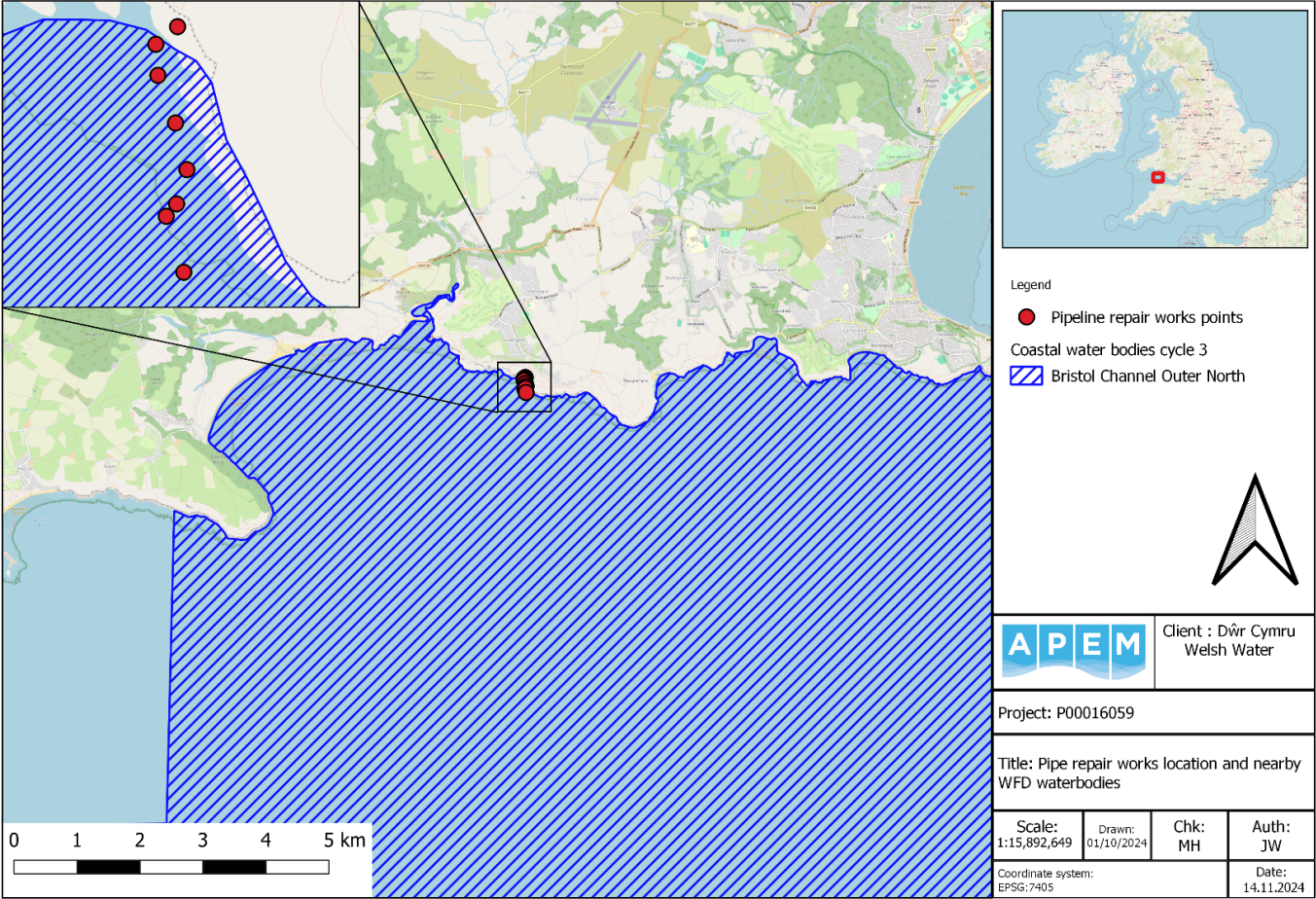


Figure 1: Proposed works in relation to coastal waterbody

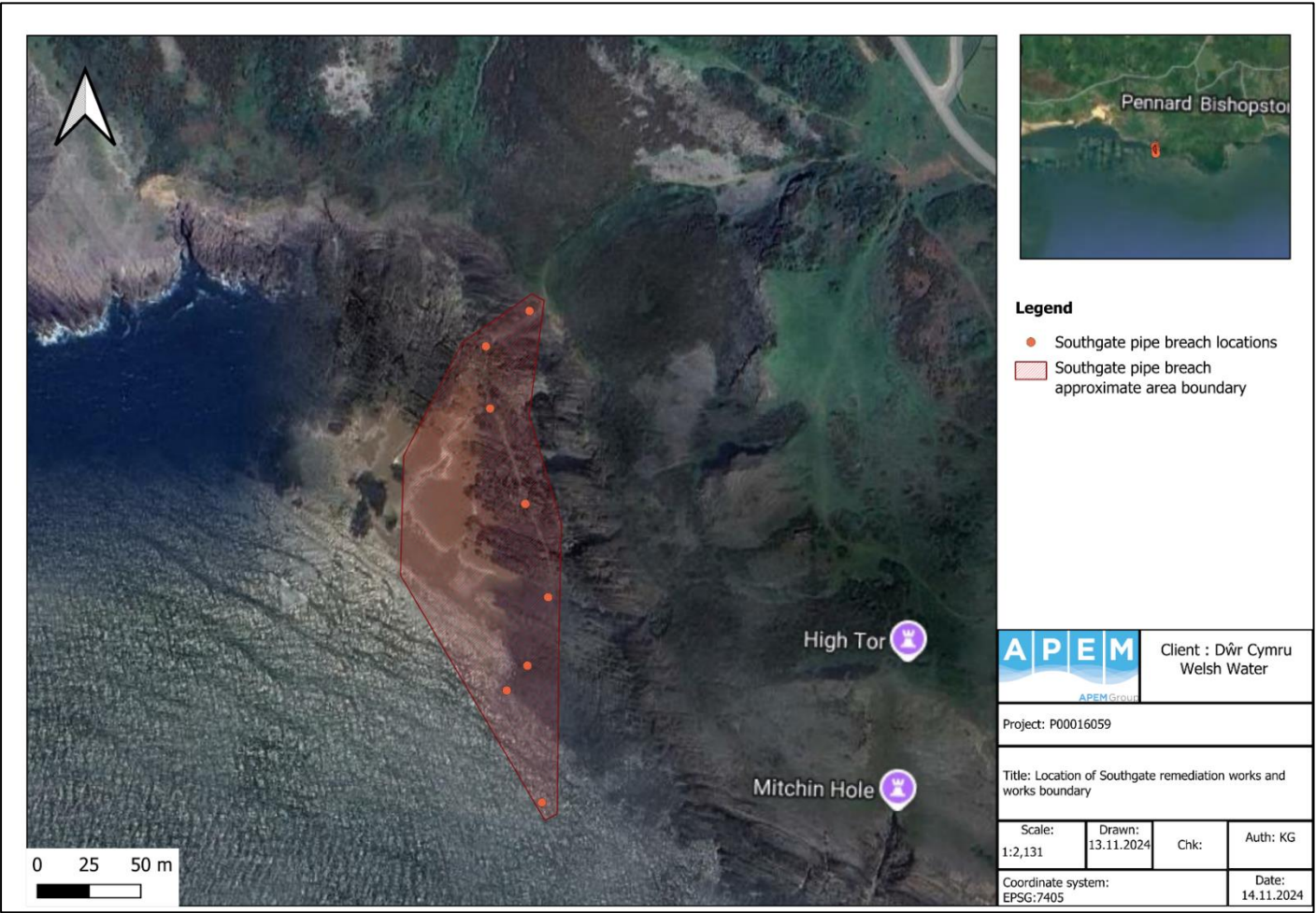


Figure 2. Proposed work locations and approximate works boundary



1.3 WFD Assessment Objectives

The objective of this assessment is to consider the available data for WFD supporting elements in the Bristol Channel Outer North coastal WFD water body in accordance with the Environment Agency's (EA) 'Clearing the Waters for All' guidance (EA, 2023), and in this context, consider the potential effects of the work on the status of the following WFD parameters:

- Ecological status
 - Biological supporting elements
 - Physicochemical supporting elements (and Specific Pollutants¹)
 - Hydromorphological considerations
- Chemical status
 - Priority substances
 - Other pollutants
 - Priority hazardous substances

1.4 Summary of the Proposed Works

A full description of the activities and methods associated with the proposed pipe remediation and protection works is provided in Kaymac's method statement (Kaymac, 2024). A summary of key aspects of relevance to this assessment is provided below.

The proposed works has a boundary of approximately 12,000 m² (0.12 km²), estimated with coordinates from the Kaymac method statement (Kaymac Ltd., 2024) and the approximate landing location of the landing craft (displayed in red in **Figure 2**). However, only an estimated 50% of the overall works footprint is within the water body due to some remediation occurring above MHWS. Therefore, the works footprint constitutes approximately 0.22% of the 900 km² total area of the Bristol Channel Outer North coastal water body (**Figure 1**).

The works are scheduled to take place in March 2025 and are expected to take approximately three weeks to complete, two weeks for Kaymac's concrete repair work and one week to insert a liner into the pipe.

¹ Limited to chemicals on Environmental Quality Standards Directive (EQSD) list for WFD (as provided in EA 2017). Environmental thresholds are summarised in Defra (2015).

1.4.1 Mobilisation

The first stage of the works will involve mobilising to site using a landing craft, transporting both personnel and material / equipment. The proposed vessel is the KMS Terramare, a 26 m long multipurpose landing craft, that will travel back and forth from Swansea Marina to site. Works will be planned around the tide, with the aim of landing on the beach during a falling tide, allowing the longest working window possible. Spud legs will be used to stabilise the vessel during the falling tide.

1.4.2 Breakout of Existing Pipe

Once the mobilisation of personnel, materials and plant/equipment is complete, cutting out sections of the existing pipe will commence. Due to length of the pipe, number of bends and the fact that existing access hatches have been fused shut, the pipe must be broken and/or cut out in order for the re-lining works to be carried out. Therefore, at bends in the pipe or at 100 m intervals, the pipe will be broken out. The section of asbestos concrete pipe that is cut out will be removed from site and transported back to Swansea Marina on the landing craft and will be disposed of at a licenced facility by the contractor. This process will be carried out at a minimum of four locations along the length of the pipe.

1.4.3 Relining Works

Once DrainForce have access to the pipe, they will undertake a CCTV survey of the pipe to check for blockages/obstructions which may affect the relining operations. Once the pipe has been confirmed to be free of obstructions, DrainForce will then jet this section of pipe using a 'recycler' (Kaymac, 2024) which uses a 300 m reel hose and jets at 110 gallons per minute. Upon completion of the survey and jetting, DrainForce will begin the relining operation with a liner from the outfall location up to the furthest point of damaged pipe.

The Saetex 'S' plus liner will be inserted into the outfall of the pipe at low water and 'blown' through the pipe to achieve the required lined length. The liner will then be tied off and the Ultra Violet (UV) lining equipment will be placed inside to cure the newly inserted liner. The liner will be cured using a UV rig (Kaymac, 2024). Once the pipe has cured, all the equipment will be loaded back onto the landing craft and will be transported back to Swansea Marina to moor overnight.

1.4.4 Concrete Works

Following the relining works, concrete protection will be placed around the pipe to offer protection from tidal and wave action. Sections required for concrete protection will be measured while the breaking of the pipe and relining activities are taking place. Once

measurements have been taken, timber formwork will be made at Swansea Marina or at Kaymac Swansea Yard.

Starting from the section closest to the outfall and working back up to the furthest broken section, SoluForm bagwork will be placed and pinned along the length of the exposed section to create a base for the formwork. The fabricated timber formwork will then be placed on top of the SoluForm bagwork and secured in place. Any voids will be packed with further SoluForm bagwork of Natcem Waterstop (a rapid setting natural cement with no added chemicals) prior to placement of concrete. Concrete will be suitable for the marine environment, provided in 40 N (high strength) pre-mixed bags and water will be supplied in 1000 L IBC units transported to site on the landing craft.

Following erection of the formwork and sealing, the concrete bags will be mixed in a drum mixer in a bunded area aboard the Terramare and placed into the prepared section using a column skip with the excavator. Rapid cement will be used and a rapid additive for use underwater (Sika UCS), will also be added to the concrete mix during the mixing operation, this ensures no washout of cement fines when submerged in water and with the rapid cement it would be expected to set prior to being submerged by the tide, minimising any effect on the marine environment. The formwork will remain in place overnight and be removed at the earliest opportunity the next day.

The above operation will be carried out at all locations of exposed pipe.

The site will be demobilised upon completion of the above works and a final walkover will be carried out by Kaymac personnel to ensure the site is free from rubbish and debris.

The plant, tools, equipment and materials Kaymac require for the works are as follows:

- 14 tonnes tracked excavator (Bio-oil);
- 6 tonnes dumper (Bio-oil);
- Breaker for excavator;
- 500L column skip;
- KMS Terramare (landing craft);
- CAT4+ & genny;
- Concrete bags;
- Sika UCS underwater additive or similar;
- Shuttering materials – plywood, timbers fixings etc.;
- 1000 L IBC x 4;
- Concrete mixing equipment – petrol mixer;
- Aluminium staircase;

- Generators;
- Small tools;
- Welfare – groundhog on landing craft and welfare unit in National Trust car park;

Lining equipment and materials required for the works are as follows:

- Cured In Place Pipe (CIPP) lining equipment;
- Recycler which has a 300 m reel and 110 gallons per minute jetting;
- Portable camera system;
- UV Rig with 300m cable drum.
- CIPP lining materials
- Saetex 'S' 3 mm liner.

Pipe cutting removal equipment for the works are as follows:

- Asbestos cutting equipment;
- Asbestos licenced facility disposal route transport

1.5 Embedded Mitigation

There are several embedded mitigation measures in place to manage and mitigate the risks of accidental spills/pollution and potential introduction and spread of invasive non-native species. The embedded mitigation measures in place are as follows:

- All equipment and vessels/plant will be steam cleaned prior to mobilisation to site.
- Industry best practice will be followed to prevent the introduction and spread of invasive non-native species with check, clean, dry procedures in place for smaller plant, materials and equipment arriving on site as well as PPE. <https://www.nonnativespecies.org/what-can-i-do/check-clean-dry/>.
- No plant that is leaking fuel, lubricating oil or hydraulic fluid will be allowed on site;
- Bio-degradable hydraulic fluid will be used on all plant on site;
- Fluid and oil will be stored fully bunded to 110% of the volume stored. Delivery and vent pipes will be terminated within the bund;
- No refuelling procedures are to be carried out at sea during the works. All refuelling will take place at the satellite compound within Swansea Marina, at least 10 m away from any watercourse. All fuel/oil will be stored fully bunded which vastly reduces the risk of accidental spills. Spill kits will be immediately available for all plant and equipment.

- Any spilt fuel, hydraulic fluid or lubricating oil will be immediately contained and removed from site;
- Any small items of plant (generators, small pumps, etc.) will be placed within plant nappies/drip trays; and
- The 'Check, Clean, Dry' process will be implemented on smaller equipment and PPE to prevent the spread of invasive non-native species (INNS) and protect the local ecosystem.

2. Water Framework Directive Requirements

2.1 Water Framework Directive

2.1.1 Overview

The WFD establishes a framework for the management and protection of Europe's water resources. It is implemented in England and Wales through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (the Water Framework Regulations)². Central to the WFD is the philosophy to make water bodies better through sustainable development for the joint benefits of aquatic habitats and the human environment.

Ecological status is an expression of the quality of the structure and functioning of surface water ecosystems as indicated by the condition of a number of 'quality elements'. These include biological and chemical indicators. Where a water body is defined as a Heavily Modified Water Body (HMWB), ecological status is replaced by ecological potential.

Proposed developments or activities that have the potential to affect the water environment require a WFD Assessment. In this context, compliance with the WFD means prevention of deterioration (of ecological status, chemical status and supporting element status) and avoiding prevention of ability to achieve future targets. However, WFD Article 4.7 provides legislation for exemption conditions that could allow implementation of schemes that cause deterioration in ecological status, for example for reasons of overriding public interest.

The subsequent Priority Substances Directive to the WFD sets out Environmental Quality Standards (EQSs, 2008/105/EC) for priority substances which is known as the Environmental Quality Standards (EQS) Directive and there have been subsequent amendments

² At this stage, following Brexit, existing EU environmental legislation will continue to operate under the policy of "roll-over", however, decisions made by the EU will no longer be binding for courts in the UK.

(2013/39/EU, Defra, 2015 and EA, 2015). The environmental objectives of the WFD and its associated directives include the following:

- to prevent deterioration of aquatic ecosystems;
- to protect, enhance and restore water bodies to 'good' status; based on ecology (with its supporting hydromorphological and physico-chemical factors) and chemical factors for surface waters; and
- to progressively reduce pollution from priority substances and cease or phase out discharges of priority hazardous substances.

The default objective of the WFD is for all rivers, lakes, estuaries, groundwater and coastal water bodies to achieve 'good' status by 2027 at the latest. Where it is not possible to achieve this, alternative objectives can be set. The existing status, and measures required to achieve the 2027 status objective, are set out for each water body in the relevant River Basin Management Plans. The plans set out the current baseline condition of the water environment at the time of publication and provide details on the measures needed and timescales required to attain their target status.

For the following surface water bodies: rivers, lakes, estuaries and coastal waters, the overall water body status has both an ecological and a chemical component. Good 'ecological status' is defined as a 'slight variation from undisturbed natural conditions, with minimal distortion arising from human activity'. The ecological status of water bodies is determined by examining biological elements (e.g. fish, invertebrates, plants) and a number of supporting elements and conditions, including physico-chemical (e.g. metals and organic compounds), and hydromorphological (e.g. depth, width, flow, and 'structure') factors (these are WFD quality elements, also referred to as receptors for the purposes of this assessment).

A flow chart illustrating how quality elements are combined (Cycle 3) to provide an overall water body status is provided in Figure 3. The classification hierarchy for surface waters (for Cycle 2) is illustrated in Figure 4. Only biological supporting elements have classification boundaries defined for 'high' through to 'bad' (Figure 3). Chemicals supporting 'chemical status' that do not meet EQS concentrations are classified as 'Failing to achieve Good' (Figure 3).

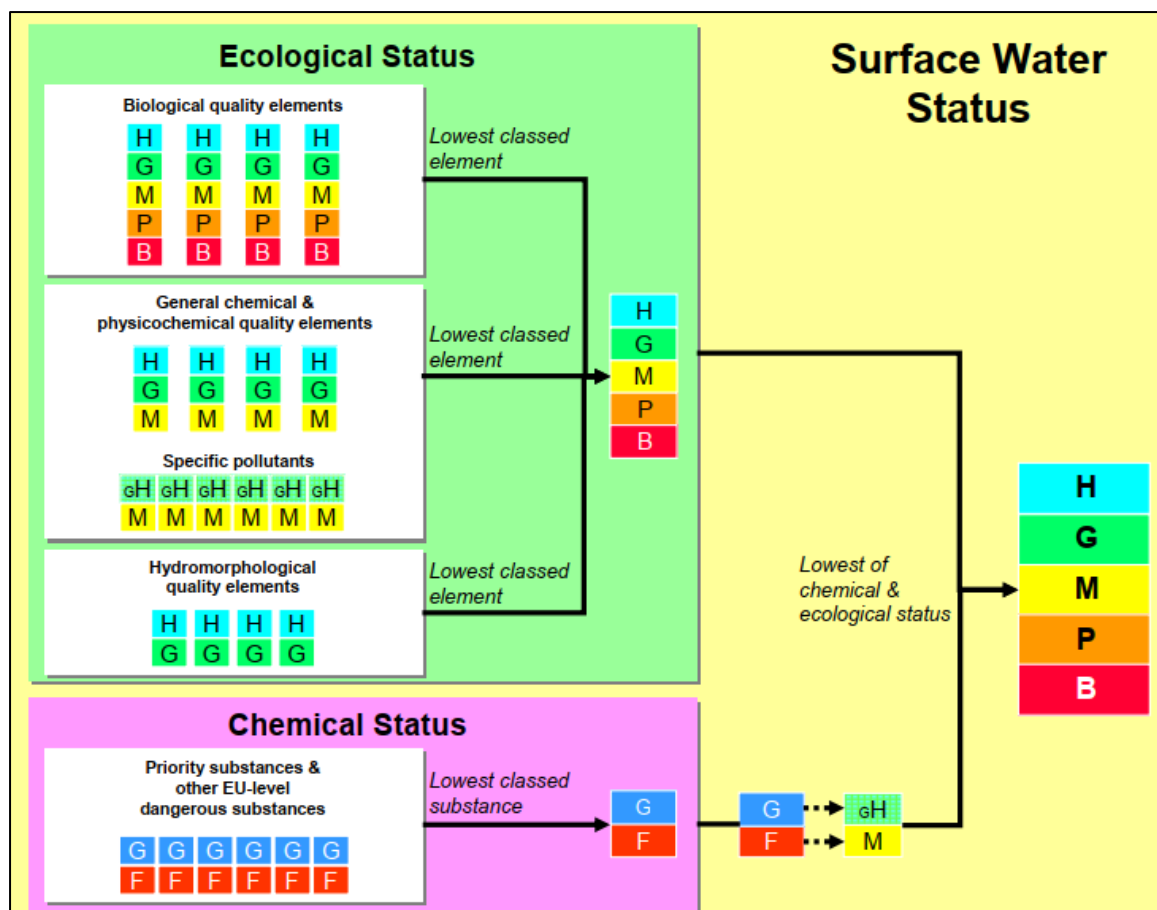


Figure 3: WFD quality elements – Bringing all the strands of evidence together (Environment Agency 2015).

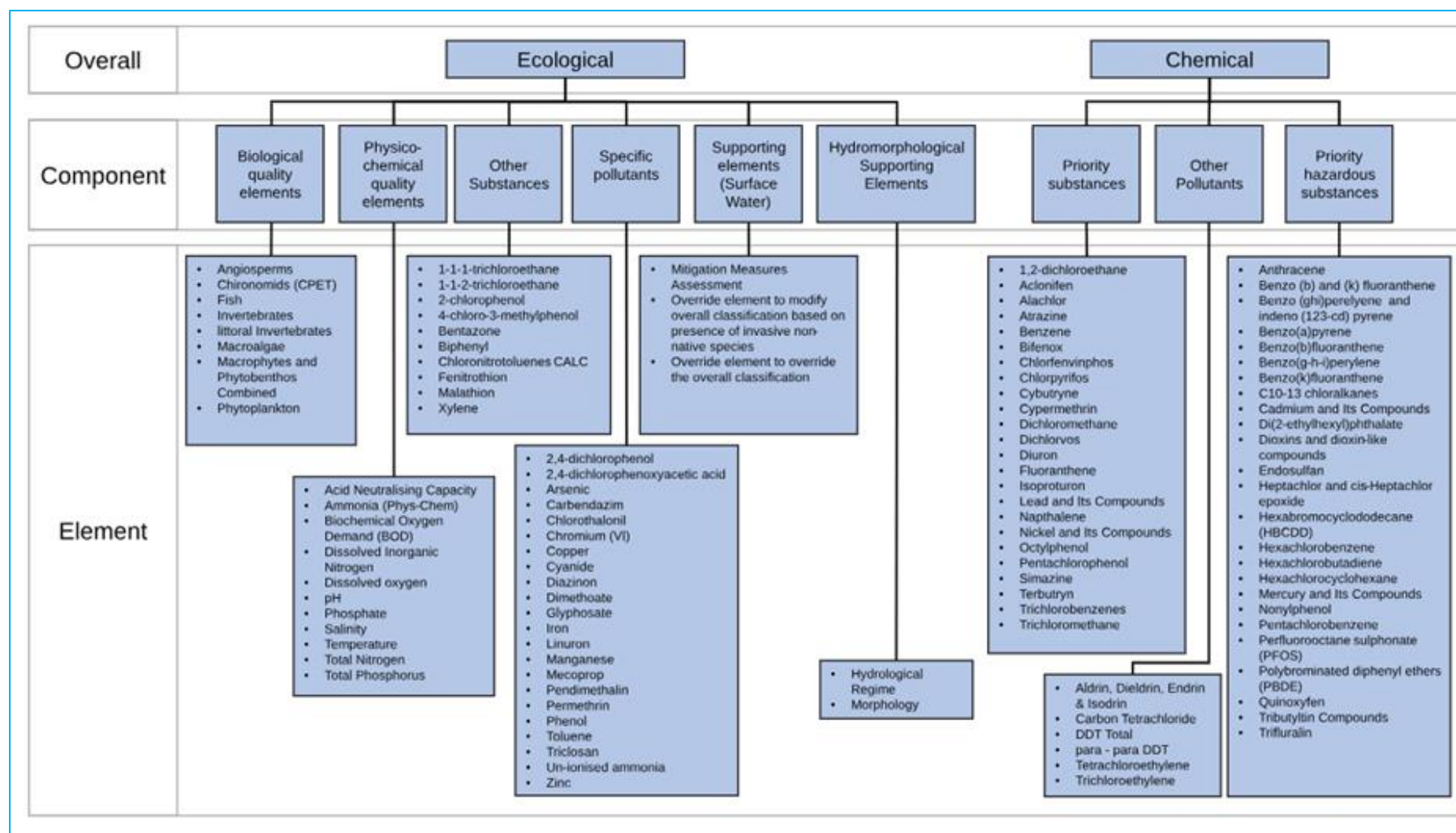


Figure 4: Classification hierarchy for surface waters (from Environment Agency 2023).

2.1.2 Coastal Water Bodies

Coastal water bodies differ from transitional water bodies in that they have no estuarine elements and are not influenced by freshwater flows. The proposed works are situated within the Bristol Channel Outer North coastal water body. The status of the water body is indicated in The latest water body characterisation information based on Cycle 3 (2021) classification data for the Bristol Channel Outer North water body is provided in Table 1 (NRW, 2024). The overall classification of the Bristol Channel Outer North water body is Moderate Status.

Table 1

Note that 'Fish' is a biological quality element to be considered for transitional WFD water bodies, but it is not considered for coastal water bodies under the WFD. Given this, and the fact that the proposed project does not have the potential to prevent or delay fish from entering any transitional water body, it was not a requirement to assess potential effects on fish.

The WFD quality elements for coastal WFD water bodies such as the Bristol Channel Outer North water body are as follows:

- Hydromorphological:
 - morphological conditions;
 - depth variation;
 - quantity, structure, and substrate of the bed;
 - dominant currents;
 - wave exposure; and
 - structure of the intertidal zone.
- Biological:
 - phytoplankton;
 - other aquatic flora; and
 - benthic invertebrates (including assessment of imposex in dog whelks)
- Physico-chemical and chemical:
 - transparency;
 - thermal conditions;
 - dissolved oxygen;
 - nutrients;
 - salinity; and
 - pollution by substances being discharged (e.g. chemicals, metals, pesticides).

2.1.3 Bristol Channel Outer North

The latest water body characterisation information based on Cycle 3 (2021) classification data for the Bristol Channel Outer North water body is provided in Table 1 (NRW, 2024). The overall classification of the Bristol Channel Outer North water body is Moderate Status.

Table 1: Cycle 3 classifications for 2021 for the Bristol Channel Outer North coastal water body.

Summary		Year
		2021
Water Body ID		GB611008590001
Water Body Area		231,429 ha
Water Body Type		Coastal Water Body
Hydromorphological designation		Natural
Overall Status		Moderate
Parameter		2021
Chemical Status		High
Priority Substances		Unknown
Priority Hazardous Substances		Unknown
Ecological Potential		Moderate
Biological Quality Elements	Angiosperms	Unknown
	Fish	Unknown
	Invertebrates	Unknown
	Macroalgae	Unknown
	Phytoplankton	Unknown
Physico-chemical Quality Elements	Dissolved Inorganic Nitrogen	Moderate
	Dissolved Oxygen	High
Specific Pollutants	Various	High

3. WFD Assessment Methodology

The assessment followed the EA's 'Clearing the Waters for All' guidance (EA, 2023), which was developed specifically to assess the effects of activities in transitional and coastal waters in relation to WFD targets. The assessment approach is based on the following three stages:

- Screening;
- Scoping; and
- Assessment.

3.1 Screening

The screening stage is used to determine if the activities for the proposed works are classed as low risk activities. The EA guidance (EA, 2023) identifies the following activities as low risk activities:

- A self-service marine licence activity or an accelerated marine licence activity that meets specific conditions;
- Maintaining pumps at pumping stations;
- Removing blockages or obstacles like litter or debris within 10 m of an existing structure to maintain flow;
- Replacing or removing existing pipes, cables or services crossing over a water body – but not including any new structure or supports, or new bed or bank reinforcement; and
- ‘Over water’ replacement or repairs to, for example, bridge, pier and jetty surfaces, if you minimise bank or bed disturbance.

Where the proposed works do not fulfil criteria for a low-risk activity, the assessment continues to the scoping stage.

3.2 Scoping

The Scoping stage is used to determine if the proposed activities pose potential risks to the following receptors based on the quality elements of the water body of concern. The EA guidance (EA, 2023) specifies consideration of the following quality elements for coastal water bodies such as the Bristol Channel Outer North WFD water body:

- Hydromorphology;
- Biology – habitats and species;
- Water quality;
- WFD protected areas; and
- Invasive non-native species (INNS).

Scoping for coastal water bodies has been undertaken by using the WFD scoping template provided in the EA guidance (EA, 2023). The WFD scoping template identifies a range of criteria against which proposed activities can be considered to determine whether they pose potential risks to receptors and, therefore, whether there is a requirement to carry out an impact assessment for those receptors. The WFD scoping template for the Bristol Channel Outer North Coastal water body is provided in Appendix 1

3.3 Impact Assessment

The impact assessment stage involves determination of the potential impacts of the proposed activities on the specific parameters that are taken forward from Scoping (EA, 2023).

The assessment involved consideration of whether the proposed activities will have a non-temporary impact on the status / potential of WFD quality elements in the Bristol Channel Outer North WFD water body. The scope of the assessment was determined following the steps in the impact assessment section of the EA guidance (EA, 2023).

This WFD assessment has also followed principles of EIA guidance where applicable in that the following aspects have been considered when assessing the potential for a change in WFD status due to impacts on WFD quality elements (CIEEM, 2018). Although these aspects have been considered, they are not necessarily referred to directly in the assessment text:

- Nature of effect i.e. beneficial / adverse; direct / indirect;
- Extent of the effect (geographical area e.g. site-wide, local, district, regional, and the size of the population affected);
- Likelihood of effect occurring;
- Value and sensitivity of receptor;
- Magnitude of effect;
- Duration; and
- Temporary or permanent effect. If the effect occurs on all of, or a proportion of, a community/population on a continual basis it can be considered to be permanent (e.g. a continual cooling water discharge). If it is not on a continual basis when considering the community / assemblage / population or habitat level, it can be described as temporary.

If it was considered that the activity would not affect the potential / status of a given WFD receptor (taking account of any embedded mitigation measures) then no further evaluation or mitigation was required for the WFD assessment for that receptor (WFD supporting element). If possible adverse effects were identified, then the next step was to identify suitable mitigation measures to address the potential effect (EA 2023).

4. WFD Assessment

4.1 Screening

The proposed activities were considered against the list of low-risk activities identified under the EA guidance (EA, 2023). It was concluded that they do not qualify as low risk activities and, accordingly, they were taken forward to the Scoping stage.

4.2 Scoping

For the Bristol Channel Outer North water body, the proposed activities were scoped for potential risks to protected areas and from invasive non-native species using the scoping templates provided in the EA guidance (EA, 2023). Details and an indication of information considered, and which receptors were scoped in and scoped out of assessment are provided in the completed Scoping template (Appendix 1), with a high-level summary provided here.

The following risks to receptors were scoped in to the requirement for more detailed assessment:

- WFD protected areas
 - The proposed works will be taking place within 2 km of the Limestone Coast of South West Wales SAC (distance of approximately 0.6 km) as well as the Swansea Bay (South) designated shellfish water (distance of 1.7 km).
- Invasive non-native species
 - Potential introduction or spread of INNS via the movements of marine vessels.

Several risks to receptors were scoped out of the requirement for more detailed assessment for the construction phase (see Appendix 1):

- Hydromorphology
 - Hydromorphology was scoped out of further assessment because the works are small-scale, temporary and will be undertaken in the intertidal zone at low tide so do not have the potential to have an impact on the hydromorphology of the water body.
- Biology – Fish
 - Assessment not required as Bristol Channel Outer North is a coastal water body as opposed to a transitional water body and works will not affect fish in a transitional water body.
- Biology – Habitats
 - Habitats were scoped out of further assessment as the footprint of the works within lower sensitivity habitats (intertidal soft sediments) constitutes less than 1% of the extent of this habitat within the Bristol Channel Outer North WFD water body, and there are no higher sensitivity habitats present within 2 km of the proposed works area.
- Water Quality:

- The potential to 'affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)' was scoped out because construction works will be undertaken solely during low tides, over a period of several weeks with limited potential to affect these water quality elements. The Terramare will secure itself using spud legs which will penetrate the sediment for stabilisation purposes. This is expected to cause temporary and localised disturbance of the sediment for very short periods on the ebb tide.
- Phytoplankton is only scoped into further assessment if it has a status of moderate, poor, or bad in the WFD water body of interest (see Section 3 of the scoping template in Appendix 1). In the Bristol Channel Outer North WFD water body, it is classed as 'high', so phytoplankton was scoped out of further assessment.
- Harmful algae were scoped out as this quality element has not been assessed for the Bristol Channel Outer North WFD water body.
- Potential to release chemicals on the Environmental Quality Standards Directive (EQSD) list was scoped out. As the works would be conducted at low tide the only potential for release of EQSD list chemicals would be through the accidental release of fuel from the landing craft or from plant. Spill kits will be immediately available for all plant and equipment. In addition, as outlined in the methods statement, no refuelling will take place at sea, only at Swansea Marina at least 10 m away from any watercourse and all fuel/oil will be stored fully bunded which vastly reduces the risk of accidental spills. When mixing the cement for the protection works, mixing will take place in a bunded area aboard the Terramare to prevent any runoff from entering the water column.
- Potential to release chemicals above CEFAS Action Level 1 was scoped out. There is limited potential for the release of contaminants from the sediment because there will be very limited sediment disturbance, primarily associated with the deployment of the Terramare's spud legs. It is also considered that the local sediment at the site is highly unlikely to be contaminated given the coarse sand nature of the sediment and the fact that there are no known sources of potential contamination in the area.

4.3 Impact Assessment

4.3.1 Protected Areas

The reason for inclusion of protected areas in the impact assessment as outlined in the WFD scoping template in Appendix 1 is that the proposed activities are:

- Within 2 km of the Limestone Coasts of South West Wales SAC; and
- Within 2 km of the Swansea Bay (South) designated shellfish water.

Assessment

Limestone Coasts of South West Wales SAC

The Annex I features that are present as qualifying features for site selection are:

- Vegetated sea cliffs of the Atlantic and Baltic Coasts [1230]; and
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]

Both of these are terrestrial features and given the localised and relatively small-scale nature of the works in the intertidal zone, there is no identified impact pathway to either of these features. Therefore, it is concluded that there will be no effects on the SAC as a result of the proposed works.

Swansea Bay (South) Designated Shellfish Waters

The proposed works are also within 2 km of the Swansea Bay (South) designated shellfish water, which is approximately 1.9 km to the east of the project site. General risks to shellfish waters include resuspension of sediment, smothering by resuspended sediment, the release of faecal bacteria or contaminants due to sediment disturbance and the use or accidental release of chemicals or fuel oils.

The works activities are not expected to cause significant resuspension of sediment with only minor disturbances expected during the deployment of the Terramare's spud legs. Sediment disturbance during the works is not expected to significantly differ from that which occurs naturally due to tidal and wave action at the site. The works activities are primarily intertidal and are not expected to cause the release of sediment bound contaminants or faecal bacteria. With the limited potential to disturb sediments, any such event would be very minor and localised and subject to immediate dilution in the marine environment. The works activities do not involve the release of chemicals into the marine environment. The fast curing cement will be mixed in a bunded area onboard the Terramare and applied during low tide periods, allowing the cement to cure before the tide floods. Embedded mitigation measures detailed in Section 1.5 will reduce the risk of potential fuel and oil spills.

Given the above, and the highly localised and intertidal nature of the works (restricted to the immediate vicinity of the pipe) and the distance of the project site from the shellfish waters, it is considered that any effects on the Swansea Bay (South) designated shellfish water would be negligible.

It is, therefore, considered that there would not be any non-temporary effects on WFD Protected Areas and the proposed works would not result in a deterioration in the status of the Bristol Channel Outer North WFD water body or prevent the water body from meeting its WFD objectives.

4.3.2 *Invasive Non-Native Species*

Introduction and transfer of non-native species (NNS) can occur by the transport and discharge of ballast water, transport of fouling organisms on vessel hulls and via the installation of artificial structures (Nall, 2014).

The main risk of introducing or spreading INNS during the works comes from the use of the Terramare marine vessel, during construction.

Assessment

The Terramare is a landing craft and its homeport is Penzance, Cornwall. The landing craft will sail from Penzance and be based at a local port during the works. This vessel will be used to deliver plant, equipment and materials to the site. The landing craft will beach itself while the tide is on ebb and spend up to 12 hours (one tidal cycle) drying out.

Due to the routine operations of landing craft, these vessels frequently dry out for up to 12 hours over a tidal cycle. This greatly reduces the potential for INNS to become established on the vessel's hull. These vessels are not slow moving and do not require ballast water exchange, which also significantly reduces the potential for the introduction and spread of INNS.

All plant and equipment will be steam-cleaned prior to use on site and any items of equipment that are sufficiently small will be placed in drip trays after use.

Industry best practice will be followed to prevent the introduction and spread of invasive non-native species with check, clean, dry procedures in place for smaller plant, materials and equipment arriving on site as well as PPE. <https://www.nonnativespecies.org/what-can-i-do/check-clean-dry/>

Given the operational nature of landing craft such as the Terramare, and with the above embedded mitigation measures in place, it is considered that there is minimal risk of the introduction or spread of INNS due to the proposed works.

As such, it is concluded that there are not expected to be any non-temporary effects in relation to INNS at water body level, and the proposed works would not prevent the Bristol Channel Outer water body from meeting its WFD objectives for INNS.

5. Cumulative Effects Assessment

The identification of plans and projects to include in the cumulative effects assessment may include:

- Approved plans;
- Constructed projects;
- Approved but as yet unconstructed projects; and
- Projects for which an application has been made, and currently under consideration and will be consented before the proposed activities begin.

The cumulative effects assessment considers the effects of the proposed activities on the Bristol Channel Outer North WFD water body supporting elements when combined with the effects of other plans and projects in the area.

To identify the plans and projects the following data sources were used: Wales Marine Planning Portal, the NRW public register and the Swansea Council Planning Portal.

Taking account of the scale of the project, only plans and projects within a 2 km radius that have the potential to interact with the water column were considered further.

In searching the above data sources, no plans or projects were found that could have cumulative effects with the proposed works. As such, no further assessment has been undertaken.

6. Summary

This assessment has considered the potential effects of the proposed works on WFD quality elements in the Bristol Channel Outer North coastal WFD water body.

The receptors that were scoped out of further assessment, were:

- Biology – Fish

- Hydromorphology
- Biology - Habitats (higher sensitivity)
- Biology - Habitats (lower sensitivity)
- Water quality – Physicochemical parameters and release of chemicals on the EQSD list
- Water quality - Chemicals above Cefas Action Level 1
- Water quality – Phytoplankton status
- Water quality - Harmful algae

The receptors that could not be scoped out and were taken forward to the impact assessment stage were:

- WFD Protected Areas; and
- INNS

The assessment has taken into account the embedded mitigation measures outlined in Section 1.5 which would be implemented in line with best practice:

Overall, it was concluded that with the appropriate mitigation/avoidance measures in place, the proposed works are not expected to produce non-temporary effects on the biological, hydromorphological and chemical quality elements of the Bristol Channel Outer North Coastal WFD water body and are not expected to prevent the water body from meeting its WFD objectives.

7. References

CIEEM 2018. Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

DataMapWales 2023. Available at: <https://datamap.gov.wales/>

Defra 2015. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

Environment Agency 2015. Rules for assessing Surface Water Body Status and Potential; Decision document for 2015 new building block (cycle 2) Water Framework Directive classifications, Version 2.0 (updated October 2015).

Environment Agency, 2018. Catchment Data Explorer website; available online at <https://environment.data.gov.uk/catchment-planning/help#help-surface-waters-classification-hierarchy> (accessed August 2018).

Environment Agency 2023. Water Framework Directive: Estuarine and Coastal Waters 'Clearing the waters for all' <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters> (update October 2023).

Kaymac Ltd. (2024) Risk Assessment Methods Statement: Southgate Outfall Repairs 2024. Document no. GL/KM/DCWW-SOR/SEPT24/1.

Nall C. 2014. Power from the sea: stepping stones for non-native species? Pg. 16 Available: https://plymsea.ac.uk/id/eprint/8216/1/TMB_02_final_online.pdf. Accessed Nov 2024.

Natural Resources Wales (NRW). 2015. Dee River Basin Management Plan 2015-2021. Available online at: <https://cdn.cyfoethnaturiol.cymru/media/685098/deerbdsummary.pdf?mode=pad&rnd=131705195500000000>

Natural Resources Wales. 2024. Cycle 3 (2021) WFD Water Body Classification v1.3 https://datamap.gov.wales/layergroups/geonode:nrw_wfd_cycle_3_classifications

Appendix 1 WFD Scoping Template

Your activity	Description, notes or more information
Applicant name	APEM Ltd
Application reference number (where applicable)	Not applicable
Name of activity	Southgate outfall pipe repair and replacement works
Brief description of activity	Repair and relining of treated effluent outfall pipe in Foxhole Cove, Southgate, South Wales.
Location of activity (central point XY coordinates or national grid reference)	OS Grid Reference: SS 55341 87076 (E255341,N187076)
Footprint of activity (ha)	0.1
Timings of activity (including start and finish dates)	Monday 17th March 2025 - Approx. 4 Weeks - TBC; Planned Completion Date: - Friday 11th April 2025 - TBC. Working hours are to be confirmed
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	0.1 ha approximate footprint. Three weeks of continuous works.
Use or release of chemicals (state which ones)	Not applicable

Water body	Description, notes or more information
WFD water body name	Bristol Channel Outer North
Water body ID	GB611008590001
River basin district name	Western Wales
Water body type (estuarine or coastal)	Coastal
Water body total area (ha)	231,429
Overall water body status (2015)	Moderate
Ecological status	Good
Chemical status	High
Target water body status and deadline	Good by 2027
Hydromorphology status of water body	Not high
Heavily modified water body and for what use	Natural
Higher sensitivity habitats present	None
Lower sensitivity habitats present	Intertidal sandflats, intertidal rock
Phytoplankton status	Good
History of harmful algae	Not monitored
WFD protected areas within 2km	Limestone Coasts of South West Wales SAC and Swansea Bay (South) designated shellfish water

Section 1: Hydromorphology

Consider if your activity:	Yes	No	Hydromorphology risk issue(s)
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status		✓	The works are temporary and short term and will primarily be conducted at low tide. The area in which the works will take place is an exposed rocky shore, Foxhole Cove, and the hydromorphological nature of this area is not anticipated to change as a result of these works. The water body in which the works will be taking place (Bristol Channel Outer North) is also not designated as 'High'.
Could significantly impact the hydromorphology of any water body		✓	The works are temporary and short term and will primarily be conducted at low tide. The area in which the works will take place is an exposed rocky shore, Foxhole Cove, and the hydromorphological nature of this area is not anticipated to change as a result of these works.
Is in a water body that is heavily modified for the same use as your activity		✓	This water body is classified as 'Natural' and as such does not require an impact assessment.

Section 2: Biology

Habitats

Higher sensitivity habitats ²	Lower sensitivity habitats ³
chalk reef	Intertidal rock – Present, but the works footprint constitutes less than 1% of the habitat area
clam, cockle and oyster beds	Mudflats – Present, but the works footprint constitutes less than 1% of the habitat area
intertidal seagrass	
maerl	
mussel beds, including blue and horse mussel	
polychaete reef	
saltmarsh	
subtidal kelp beds	
subtidal seagrass	

² Higher sensitivity habitats have a low resistance to, and recovery rate, from human pressures.

³ Lower sensitivity habitats have a medium to high resistance to, and recovery rate from, human pressures.

Consider if the footprint ⁴ of your activity is:	Yes	No	Biology habitats risk issue(s)
0.5km ² or larger		✓	No – works are roughly 0.01 km ²
1% or more of the water body's area		✓	No – works are less than 1% of water body area
Within 500m of any higher sensitivity habitat		✓	No – no higher sensitivity habitats present within 500 m
1% or more of any lower sensitivity habitat		✓	No – the works area does not constitute 1% of the area of the lower sensitivity habitats present

⁴ Note that a footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.

Fish

Consider if your activity:	Yes	No	Biology fish risk issue(s)
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary		✓	The works are not located within an estuary
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)		✓	Unlikely to provide any obstacle to fish behaviour such as movement or feeding.
Could cause entrainment or impingement of fish		✓	Not potential to cause entrainment or impingement of fish

Section 3: Water quality

Consider if your activity:	Yes	No	Water quality risk issue(s)
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)		✓	The potential to 'affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)' was scoped out because construction works will be undertaken during low tide. No refuelling will take place within 10 m of the water course and all fuel/oil will be stored fully bunded which vastly reduces the risk of accidental spills.
Is in a water body with a phytoplankton status of moderate, poor or bad		✓	Impact assessment not required
Is in a water body with a history of harmful algae		✓	Impact assessment not required – history of harmful algae not measured.
If your activity uses or releases chemicals (e.g., through sediment disturbance or building works) consider if:	Yes	No	Water quality risk issue(s)
The chemicals are on the Environmental Quality Standards Directive (EQSD) list		✓	Chemicals are not intended to be used apart from fuel for vessels/plant – asbestos is mentioned as being present in some of the concrete on site but asbestos is not on the EQSD list. No refuelling will take place within 10 m of the water course, only at the Marina and all fuel/oil will be stored fully bunded which vastly reduces the risk of accidental spills.
It disturbs sediment with contaminants above Cefas Action Level 1		✓	The works do not involve the disturbance of any sediments.
If your activity has a mixing zone (e.g., a discharge pipe or outfall) consider if:	Yes	No	Water quality risk issue(s)
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list		✓	There is no mixing zone associated with the proposed works.

Section 4: WFD protected areas

Consider if WFD protected areas are at risk from your activity. These include:

- Special areas of conservation (SAC)
- Special protected areas (SPA)
- Shellfish waters
- Bathing waters
- Nutrient sensitive areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2 km of any WFD protected area ⁶	✓		The works area is within 2 km of the Limestone Coast of South West Wales SAC and the Swansea Bay (South) Shellfish Water.

Section 5: Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	✓		A vessel is being used however all vessels/plant will be cleaned prior to mobilising to the site and so the risk of introducing INNS will be significantly reduced.

Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	Due to the small-scale and temporary nature of the works there will be no impact on the hydromorphology of the water body. The works are not related to activities for which the water body is classed as heavily modified.
Biology: habitats	No	The works footprint only falls within lower sensitivity habitats and also constitutes less than 1% of the area of these habitats. It is also not within 500 m of any high sensitivity habitats.
Biology: fish	No	The works will be undertaken in the intertidal zone at low tides, they will not inhibit passage of fish and there will not be any physical obstruction to fish movement or migration.
Water quality	No	The potential to 'affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)' was scoped out because construction works will be undertaken during low tide. No refuelling will take place at sea, and any refuelling will happen at Swansea Marina at least 10 m away from any watercourse and all fuel/oil will be stored fully bunded which vastly reduces the risk of accidental spills.
Protected areas	Yes	The proposed works are within 2 km of the Limestone Coasts of South West Wales SAC as well as the Swansea Bay (South) designated shellfish waters.
Invasive non-native species	Yes	The risk of the landing vessel introducing or spreading INNS can occur with the movement of vessels, however embedded mitigation including check, clean, dry will be implemented.