

Living Seawalls

North Wales Rivers Trust

Preliminary Water Framework Directive Assessment

1) Living Seawalls WFD assessment

1.1 Introduction

The Menai Strait is a unique strip of tidal water, separating the mainland in Gwynedd with the island of Ynys Môn. Stretching for over 30km from the North in Trwyn Penmon to Abermenai Point. The Menai is also a heavily urbanised environment, where much of the shoreline has been modified for human activity. Thirteen rivers also enter the Menai, nine from the mainland and four from Ynys Môn. Although the Menai is not a river, the surrounding land and close proximity of agriculture and urbanisation, means it faces many challenges similar to the adjoining rivers within the catchment, especially in habitat loss and species decline. Living Sea Walls (LSWs) are an innovative way to utilise cutting-edge technology and apply it to degraded man-made marine habitats. LSWs are 3-D printed panels which help diversify the structural habitat of degraded man-made coastal structures. These urbanised shorelines are detrimental to marine life, providing a non-porous mono-textured environment and by diversifying the structural environment, it will boost marine biodiversity and benefit the Menai. This document provides the water directive compliance assessment for the proposed living seawalls along the Menai Strait

1.2 Approach to Assessment

This assessment analyses the potential of the proposed installation of Living Seawalls on the Menai Strait.

2) Screening

See the screening method below outlining the project and location.

2.1 Project Details

Project Details	
Applicant name	North Wales Rivers Trust (NWRT)
Application reference number (where applicable)	CML2423
Name of activity	Living Seawalls
Brief description of activity	The proposed installation of Living Seawalls along the Menai Strait to boost habitat. The Living Seawalls panels will act as a pilot measuring the effectiveness of improving habitat under a variety of conditions.
Location of activity (central point XY coordinates or national grid reference)	• midpoint: SH 47087 62579 • midpoint: SH 48034 63317 • midpoint: SH 54150 70891 • midpoint: SH 58419 73209 • midpoint: SH 60627 75933 • midpoint: SH 62649 79510 • midpoint: SH 55846 71826 • midpoint: SH 47897 65262
Footprint of activity (ha) of the living seawalls on the Menai Strait	0.012
Timings of activity (including start and finish dates)	Installation to begin in Q2 2024 and end by Q3 2024.
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	Installation of living seawall panels at 8 locations. A total of around 400 panels are to be installed.
Use or release of chemicals (state which ones)	For the installation of the concrete panels, an epoxy may be used: Hilti Hiltre 5000 or Chemset 101

2.2 Baseline Information

Water body ¹	Description, notes or more information
WFD water body name	<i>Menai Strait</i>
Water body ID	<i>GB681010120000</i>
River basin district name	<i>Coastal - C16</i>
Water body type (estuarine or coastal)	<i>Coastal</i>
Water body total area (ha)	<i>NA</i>
Overall water body status (2015)	<i>Moderate</i>
Ecological status	<i>Moderate</i>
Chemical status	<i>Does not require an assessment</i>
Target water body status and deadline	<i>Good by 2027</i>
Hydromorphology status of water body	<i>Heavily Modified</i>
Heavily modified water body and for what use	<i>Heavily Modified, Shell Fisheries</i>
Higher sensitivity habitats present	<i>Yes</i>
Lower sensitivity habitats present	<i>Yes</i>
Phytoplankton status	<i>High</i>
History of harmful algae	<i>No</i>
WFD protected areas within 2km	<i>Bathing Water Directive, Natura 2000 (Habitats and/or Birds Directive), Shellfish Water Directive</i>

2.3 Protected Sites

The following WFD-protected areas have been identified within 2km of the scheme:

- Menai Strait and Conwy Bay SAC for mudflats and sandflats not covered by seawater at low tide, reefs and sandbanks which are slightly covered by seawater all the time.
- *Shellfish Water Directive*
- *Ynys Seiriol SPA*

2.4 Risk Screening

Activities that may result in an impact on WFD quality elements have the potential to take place during the installation of the seawalls. The table below details the expected activities and screens them for inclusion in the next stage of the assessment.

<i>Proposed Activity</i>	<i>Screen In/Out</i>	<i>Justification</i>
<i>Construction (Temporary) activities</i>		
<i>Works to install the living seawalls</i>	<i>In</i>	<i>Potential to temporarily disturb the ground whilst installing the living seawalls and the impact of drilling into modern seawalls</i>

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	Requires impact assessment	Impact assessment not required	<i>No pathway for the activity to affect</i>
Could significantly impact the hydromorphology of any water body	Requires impact assessment	Impact assessment not required	<i>No pathway for the activity to affect</i>
Is in a water body that is heavily modified for the same use as your activity	Requires impact assessment	Impact assessment not required	<i>No pathway for the activity to affect</i>

Section 2: Biology

Habitats

Higher sensitivity habitats ²	Lower sensitivity habitats ³
chalk reef	cobbles, gravel and shingle
clam, cockle and oyster beds	intertidal soft sediments like sand and mud
intertidal seagrass	rocky shore
maerl	subtidal boulder fields
mussel beds, including blue and horse mussel	subtidal rocky reef
polychaete reef	subtidal soft sediments like sand and mud
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	Yes to one or more – requires impact assessment	No to all – impact assessment not required	No pathway for the activity to affect
1% or more of the water body's area			No pathway for the activity to affect
Within 500m of any higher sensitivity habitat			Yes, the living seawalls are in close proximity to a higher-sensitivity habitat
1% or more of any lower sensitivity habitat			No pathway for the activity to affect

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	Continue with questions	Go to next section	<i>No pathway for the activity to affect</i>
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)	Requires impact assessment	Impact assessment not required	<i>No pathway for the activity to affect</i>
Could cause entrainment or impingement of fish	Requires impact assessment	Impact assessment not required	<i>No pathway for the activity to affect</i>

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)	Requires impact assessment	Impact assessment not required	<i>No pathway for the activity to affect</i>
Is in a water body with a phytoplankton status of moderate, poor or bad	Requires impact assessment	Impact assessment not required	<i>No pathway for the activity to affect</i>
Is in a water body with a history of harmful algae	Requires impact assessment	Impact assessment not required	<i>No pathway for the activity to affect</i>

Consider if water quality is at risk from your activity through the use, release or disturbance of chemicals.

If your activity uses or releases chemicals (for example 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	Requires impact assessment	Impact assessment not required	Yes, one of the chemicals that may be used to install the living seawalls is on the EQSD list
It disturbs sediment with contaminants above Cefas Action Level 1	Requires impact assessment	Impact assessment not required	<i>No pathway for the activity to affect</i>

If your activity has a mixing zone (like a discharge pipeline or outfall) consider if:	Yes	No	Water quality risk issue(s)
The chemicals released are on the Environmental Quality Standards Directive (EQSD) list	Requires impact assessment	Impact assessment not required	<i>No pathway for the activity to affect</i>

Section 4: WFD protected areas

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

- special areas of conservation (SAC)
- Special Protection areas (SPA)
- shellfish waters
- bathing waters
- nutrient sensitive areas

Consider if your activity is:	Yes	No	Protected areas risk issue(s)
Within 2km of any WFD protected area	Requires impact assessment	Impact assessment not required	Yes- multiple sites are within protected areas including SAC, SPA and shellfish waters

Section 5: Invasive non-native species (INNS)

Consider if your activity could:	Yes	No	INNS risk issue(s)
Introduce or spread INNS	Requires impact assessment	Impact assessment not required	The living seawalls provide habitats that may increase the spread of INNS

Summary

Receptor	Potential risk to receptor?	Note the risk issue(s) for impact assessment
Hydromorphology	No	<i>No pathway for the activity to affect</i>
Biology: habitats	No	<i>No pathway for the activity to affect</i>
Biology: fish	No	<i>No pathway for the activity to affect</i>
Water quality	Yes	A chemical used to install the living seawalls is on the EQSD list
Protected areas	Yes	In close proximity to protected areas
Invasive non-native species	Yes	The Living Seawalls have the potential to encourage INNS

3. Detailed Compliance Assessment

3.1 Embedded Mitigation

<i>Proposed Activity</i>	<i>Quality element and description of potential impact(s)</i>	<i>Mitigation Measure(s)</i>	<i>Assessment Outcome</i>
<i>Construction (Temporary) activities</i>			
<i>Works to install the living seawalls</i>	<i>Element:</i> <i>proximity to protected Areas</i> <i>Potential Impact:</i> <i>Potential indirect impact on the protected areas during construction</i>	<i>The selected sites of the living seawalls are to take place on pre-existing concrete structures to reduce the impact on the protected sites including the mudflats and sandflats.</i> <i>No pathway for the activity to affect the SAC, SPA and shellfish waters</i>	<i>No pathway for the activity to affect the SAC, SPA and shellfish waters from the installation of the living seawalls as they pose minimal risk to the protected areas.</i>
	<i>Element:</i> <i>Invasive Non-Native Species</i> <i>Potential Impact:</i> <i>Potential for construction works to introduce or spread INNS.</i>	<i>All equipment and footwear will be cleaned thoroughly before entering the site with a suitable disinfectant. In addition, all equipment and footwear will be thoroughly cleaned and disinfected when leaving the site. No works will be undertaken within 7m of any INNS, where this is unavoidable INNS management as per the EAP will be required</i>	<i>Provided the mitigation measures listed are implemented, these activities pose a minimal risk to the quality elements. This activity is determined to not result in a decline in any WFD quality elements or prevent them from attaining Good status or potential in the future.</i>
	<i>Element: Specific Pollutants and/or Priority Substances.</i> <i>Potential impact(s):</i> <i>Potential for construction works to disturb contaminated material or introduce pollutants as a result of spillage.</i>	<i>Contractor to implement best practice for working near to water (e.g. GPP5) to reduce the risk or impact of accidental spillage. For example, drip trays/bunds and providing spill kits.</i>	<i>Provided the mitigation measures listed are implemented, these activities pose a minimal risk to the quality elements. This activity is determined to not result in a decline in any WFD quality elements or prevent them from attaining Good status or potential in the future.</i>

Permanent Activities			
Living Seawalls	<i>Element: Invasive Non-Native Species</i> <i>Potential Impact: Potential for the living seawalls to promote INNS</i>	<i>Continuous monitoring should be adhered to and no works will be undertaken within 7m of any INNS, where this is unavoidable INNS management as per the EAP will be required.</i>	<i>Provided the mitigation measures listed are implemented, these activities pose a minimal risk to the quality elements. This activity is determined to not result in a decline in any WFD quality elements or prevent them from attaining Good status or potential in the future.</i>

3.2 In combination impacts

The accumulated impact of the various activities that form the will be minimal, provided the proposed mitigation measures to avoid or reduce impacts are included in the design and construction of the scheme.