DEVICE-SPECIFIC EMP: C-GEN ENGINEERING TIDAL ENERGY CONVERTOR

Document Control

Revision	Prepared	Reviewed	Approval
Version 1	Saul Young, META Operations Manager	C-GEN Engineering	[TBC by NRW]

Introduction

This document is being submitted under ORML1957v2 condition 3.20 to submit a device-specific EMP for approval at least 3 months prior to the commencement of works.

The approved META Project Environmental Management Plan (PEMP) and the META Project Environmental Mitigation and Monitoring Plan (PEMMP) form the minimum standard for all device developers to comply with. Developers must take account of the requirements contained within these plans when developing this device-specific EMP.

General Overview of Proposed Testing

Information required	Details
Site	Warrior Way
Type of device	Tidal Energy Convertor
Proposed location	51° 42.222' N 4° 55.61' W
Commencement of works	1st June 2025
Decommissioning	31st August 2025

Proposed parameters	Proposed	Consented	Source
	Minimum clearance between rotor blades & sea-surface: The blade tip will always be below the sea surface at a minimum of 2m depth	2m	ORML1957v2
	Length x Width: Floating platform 10m x 6m	20m x 10m	ORML1957v2
	Rotor diameter: 3m	5m	ORML1957v2
	Number of rotors: 1	3	
	Swept area: 7.07m^2	19.63m^2	ORML1957v2
	Height above surface: 3.3m	5m	ORML1957v2
	No. of devices/tests: 1	1	ORML1957v2
	Sea surface area of device: 60m^2	200m^2	ORML1957v2
	Proportion of device touching the seabed: N/a floating device	50%	ORML1957v2
	Seabed footprint: N/a floating device	200 m^2	ORML1957v2
	Rotor tip speed: 5m/s	10.5m/s	ORML1957v2
	Buffer required around device seabed footprint: none required	5m	ORML1957v2
	Lubricants and antifoulants will be EU/Internationally approved for use in marine environments.	Lubricants and antifoulants will be EU/Internationally approved for use in marine environments.	ORML1957v2
	Mooring method: Swinging mooring so barge can align with both flood and ebb tides. Mooring using 2 sinkers, each with ground chain and octoplait rope risers, attached to a large swivel and hard-shell buoy, to which the barge is then tethered using a bridle. The 2 mooring blocks will have a combined seabed footprint of ~ **8m2**	25m^2	ORML1957v2
	Mooring spread: N/a 2-point swinging mooring	22,500m^2	ORML1957v2
	No. of vessel used at any one time: 3	5	ORML1957v2
	Frequency of deployment and retrieval operations per year: 2	20	ORML1957v2
	Vessel mooring spread for installation and decommissioning activities: N/a	150m^2	ORML1957v2
	Moored/gravity base deployment duration (estimated % time device in water given in brackets): 1 month	6 months	ORML1957v2
	Number of testing activities in a 12-month period (devices): 2	4	ORML1957v2
	Frequency of O&M visits: 20/yr	104/yr	ORML1957v2
	No. of vessels utilised in O&M at any one time (including guard boat if required): 3	5	ORML1957v2

1. Gravity anchor
2. Chain
3. Mooring Line
4. Swivel connector – swinging mooring
5. Test barge with turbine attached
6. Tidal turbine and generator (enclosed yellow box)

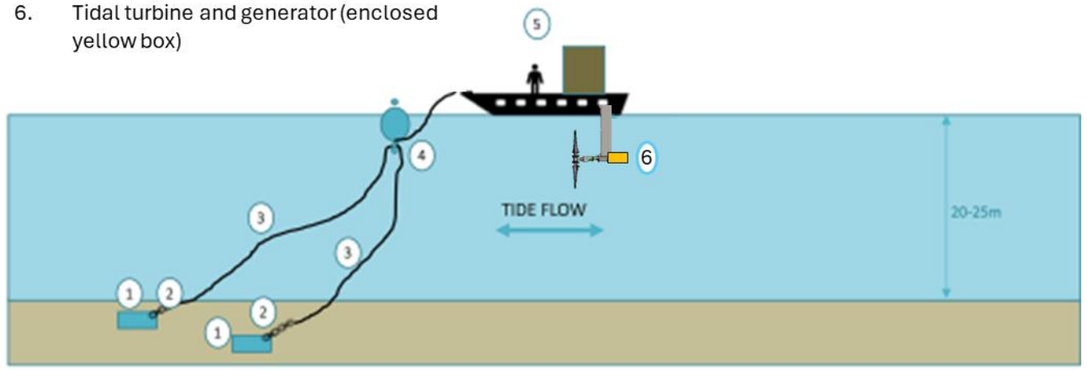


Figure 1 Illustration of device. Not to scale. Exact measurements in the table above.

Figure 2 Picture of the 10m x 6m test barge.

Roles and Responsibilities

The key roles relevant to the delivery and implementation of this device-specific EMP are presented below.

Name	Role	Company	Contact details
Saul Young	META Operations Manager	Marine Energy Wales	Saul.young@marineenergywales.co.uk 07944839332
Mike Galbraith	Test Project Manager	C-GEN Engineering	m.galbraith@c-gen.co.uk
Joe Burchell	Test Project Team	C-GEN Engineering	j.burchell@c-gen.co.uk
Thomas Lake	Test Project Team	Swansea University	T.Lake@Swansea.ac.uk
Nick Pollard	Vessel Operator Lead (Contractor)	Rudders Boatyard	info@ruddersboatyard.co.uk 07940008145

Communications and Reporting

The lines of communication between the different roles for this device-specific EMP are presented below.

Name	Role	Responsibility	Reporting to
Nick Pollard	Vessel Operator	Performing O&M tasks	Mike Galbraith
Mike Galbraith	Test Project Manager	Project Lead	META (Saul Young)
Saul Young	META Operations Manager	Oversee Project and Consents	MHPA, NRW, TCE and other authorities

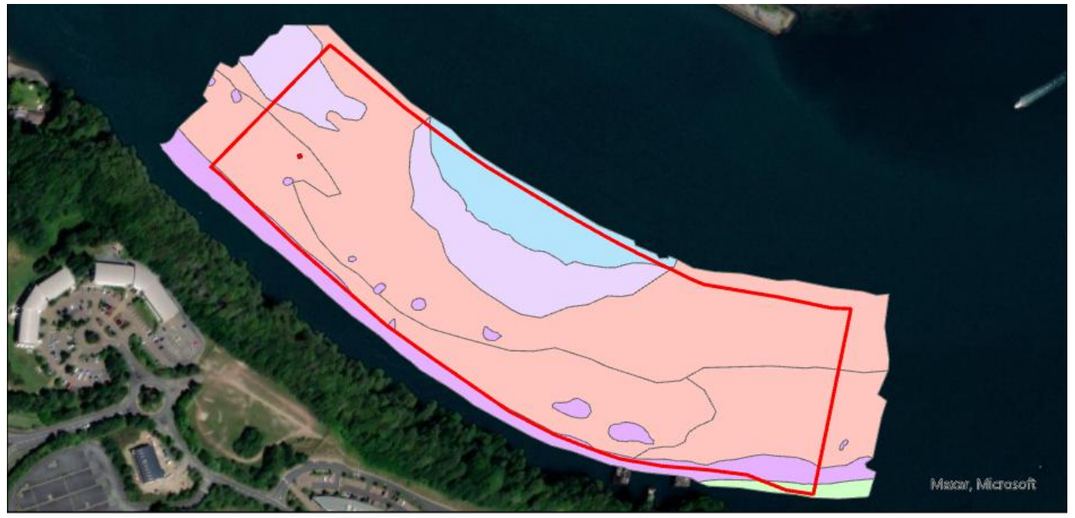
Device Specific Mitigation and Monitoring

This section translates the mitigation and monitoring measures identified within the META Environmental Statement (ES) into a format which can be developed into practical implementation by device-developers. The mitigation and monitoring measures have been captured within the META PEMMP. Mitigation and monitoring commitments relevant to the specific site and device are presented here.

Receptor	Mitigation/ Survey / Monitoring	Description	Mechanism for Implementation
All birds	Mitigation	Best practice measures to reduce disturbance from vessels and to reduce the potential for pollution incidents.	PEMP (Annex 7), Section 4.2.2
All birds	Mitigation	Implementation of a Marine Pollution Contingency Plan (MPCP) to manage the risk of accidental pollution in the marine environment	PEMP (Annex 7), Section 4.2.1
Diving birds	Mitigation	A minimum distance of 2 m will be maintained between the tip of operational turbine blades and the sea surface.	PEMP (Annex 7), Section 4.2
All marine mammals, basking shark and otter	Mitigation	Implementation of a MPCP in order to manage the risk of accidental pollution in the marine environment	PEMP (Annex 7), Section 5.2.1
All marine mammals, basking shark and otter	Mitigation	Best practice measures to reduce disturbance and collision risk from vessels	PEMP (Annex 7), Section 5.2.2
Otter	Device-specific survey	Walkover surveys to determine species presence and site use to determine whether a European Protected Species (EPS) licence will be required	PEMP (Annex 7), Section 5.4.1
Otter	Monitoring	Monitoring of the first deployment (installation, operation and decommissioning phases) to determine any change in use due to device deployment	PEMP (Annex 7), Section 5.5
All fish and shellfish	Mitigation	Implementation of a MPCP to manage the risk of accidental pollution in the marine environment	PEMP (Annex 7), Section 6.2.1
Benthic habitats and species	Mitigation	Invasive Non-Native Species Management Plan	PEMP (Annex 7), Section 7.2.3
Sensitive habitat and species	Mitigation	Micro-siting of devices or components on the seabed	PEMP (Annex 7), Section 7.2.2
Benthic habitats and species	Mitigation	Implementation of a MPCP in order to manage the risk of accidental pollution in the marine environment	PEMP (Annex 7), Section7.2.1
Archaeological receptors	Mitigation	Micro-siting to avoid impact on marine archaeology receptors	PEMP (Annex 7), Section 8.2

Seabed Habitat Risk Assessment

In 2023 Ocean Ecology Limited (OEL) designed and conducted benthic habitat mapping surveys at the META Warrior site using drop-down camera (DDC) and multibeam echosounder (MBES) methods, with the aim to identify and understand the habitat present. The habitat map produced for Warrior Way is presented below and includes the proposed position of the C-GEN Tidal Energy Convertor mooring blocks. The proposed position is micro-sited on coarse sediment (Eunis Classification A5.1) away from sensitive habitats (e.g. Annex 1 reef).



Probability / Severity	Very Low (1)	Low (2)	Medium (3)	High (4)
Major (4)	4	8	12	16
Significant (3)	3	6	9	12
Minor (2)	2	4	6	8
Very Minor (1)	1	2	3	4

Hazard	Possible impacts	Mitigation	Residual risk
2 mooring blocks with a combined seabed footprint of 8m^2	Damage or disturbance to sensitive benthic habitat	Mooring blocks micro-sited on coarse sediment (Eunis Classification A5.1) away from sensitive habitats (e.g. Annex 1 reef)	Probability (1) x Severity (2) = Minor (2)