

Device Installation Operation and Method Statement (DIOMS): Micro tidal turbines deployment at Warrior Way

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Introduction

This document has been drafted to comply with Marine Licence ORML1957v2 Condition 3.30:

“The Licence Holder must submit a Device-specific Installation and Operation Method Statement (DIOMS) to the Licensing Authority for written approval. The DIOMS must detail how all the Project EMMP requirements (condition 3.27) have been incorporated and consider:

- *Review of device design (for minimisation of ingress for WEC devices, minimum blade clearance at Warrior Way and maximum dimension devices (triggering further monitoring requirements) at East Pickard Bay)*
- *Marine Mammals collision risk/entanglement protocols*
- *Decommissioning*

Works must be carried out in line with the approved DIOMS. Any proposed changes to the DIOMS must be submitted to and agreed in writing by the Licensing Authority prior to any changes being enacted.”

Device design, operation and test aims

META would like to deploy 3 micro tidal turbines designed to provide 24/7 power to environmental monitoring equipment at the **META Warrior Way site for 6 months from 19th January 2027 to the 19th July 2027.**

Each turbine be deployed on a bedframe on the seabed. Each turbine will have a diameter of 1m and a maximum rip speed of 4 m/s. Each bedframe will be 1.33m (W) x 1.65 (L) x 2.5m (H) and with the turbine weigh 655kg. The bedframes they will be recovered using an acoustic release system. A data buoy will be deployed nearby within the Warrior Way site boundary to remotely collect data from the turbines and mark the site.

The aim of the test is to prove micro tidal turbines can provide enough power to keep environmental monitoring equipment or other subsea systems operational 24/7. Please see figures below.

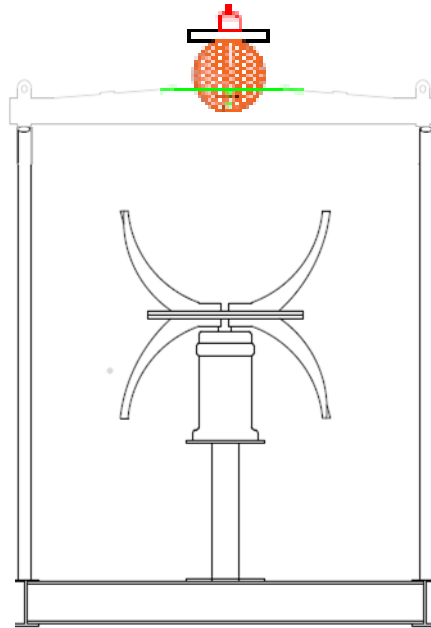


Figure 1 Micro tidal turbine designed to provide 24/7 power to environmental monitoring equipment and subsea systems. Turbine diameter is 1m. The frame is 1.33m (W) x 1.65 (L) x 2.5m (H). The frame and turbine combined weight is 655kg. On top of the frame is an acoustic release system for recovery.

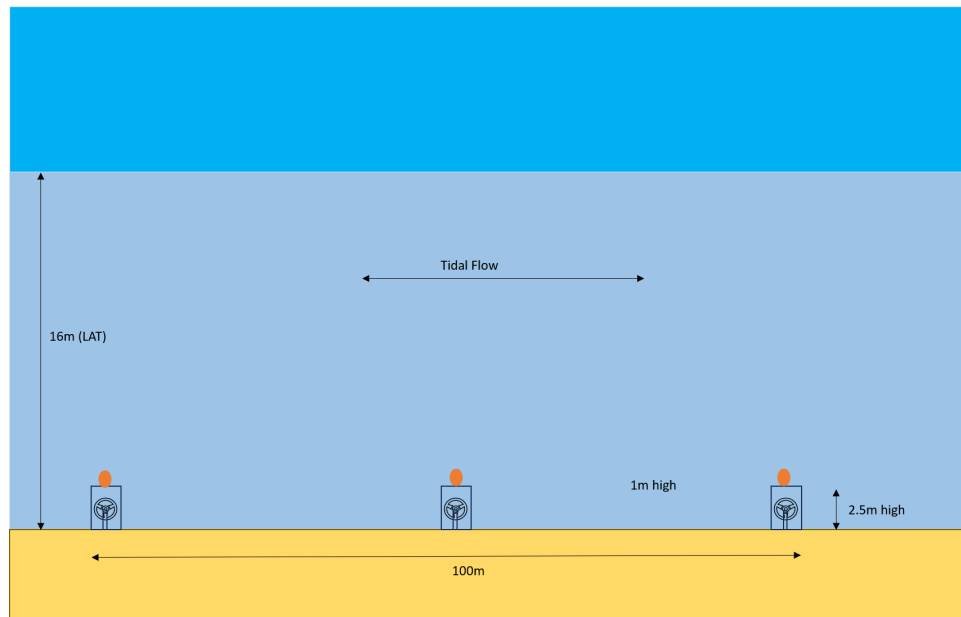


Figure 2 Three micro tidal turbine bedframes will be deployed on the seabed at the META Warrior Way test site in a line parallel to the tidal flow / channel in approximately 16 – 20m water depth LAT. Drawing not to scale.



Figure 3 A data buoy like this one pictured will be moored nearby within the Warrior Way site on a single point mooring to remotely collect data from the turbines and mark the site.

Consideration of blade clearance at Warrior Way

With reference to considerations required by ORML1957v2 condition 3.30 the tidal energy convertor blade has been designed to be submerged at all times with a minimum clearance of 2m from the sea surface to mitigate any risk to local diving birds i.e. Little Grebe.

Consideration Marine Mammals collision risk/entanglement protocols

With reference to considerations required by ORML1957v2 condition 3.30 best practice measures will be undertaken by vessel operators in the presence of marine mammals, following the published guidelines that are available from the [Pembrokeshire Marine Code](#). Collision risk and entanglement have been assessed as negligible minor and minor adverse respectively in the META Environmental Impact Assessment (based on the maximum scenario which this specific device is notably less than). This is not significant in EIA terms, therefore specific collision risk and entanglement protocols have not been developed. In the very unlikely circumstance, an incident of this nature occurs META PEMP Annex 9 Environmental Incident Reporting procedure will be followed.

Key Locations

The bedframes and data buoy will be located at the following co-ordinates:

Table 1 Device and mooring positions

	Latitude:	Longitude:
Micro Turbine 1	51° 42.2255'N	4° 55.6638'W
Micro Turbine 2	51° 42.2072'N	4° 55.6298'W
Micro Turbine 3	51° 42.1889'N	4° 55.5983'W
Data Buoy	51° 42.1111'N	4° 55.4275'W

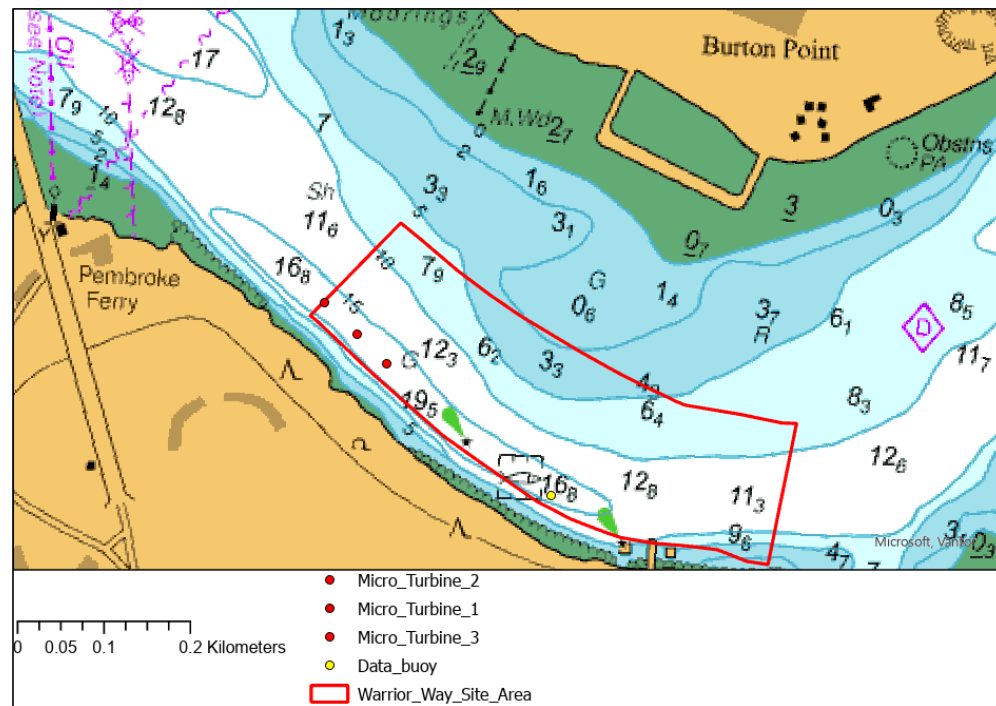


Figure 4 Chart showing the proposed location of the three micro tidal turbines and the data buoy within the META Warrior Way test site area.

Overview of Method Statement and PEMMP Measures

An overview of the method for installation, operations and maintenance and decommissioning is presented in Table 2. In accordance with ORML1957v2 condition 3.30 it references the approved META Project Environmental Mitigation and Monitoring Plan (PEMMP) measures (Table 3) that will be implemented when completing each task.

Table 2 Overview of the method for installation, operations and maintenance and decommissioning

Installation		
Task	Description	Relevant PEMMP measures
1	Equipment loaded onto the Dale Sailing Kitcat in Neyland and transported to the Warrior Way site (less than 1km away).	Best practice measures to reduce disturbance and collision risk from vessels and to reduce the potential for pollution incidents. META Invasive Non-Native Species Management Plan measures, for example using local vessels and ensuring device components are either new or thoroughly checked and cleaned before they are deployed. Implementation of a META MPCP in order to manage the risk of accidental pollution in the marine environment, including spill kits available on vessel.
2	Equipment will be deployed at the proposed locations away from any sensitive habitats / species identified during the Warrior Way Benthic Habitat Mapping by Ocean Ecology (See Device-specific EMP and pre-deployment monitoring report for more details)	Best practice measures to reduce disturbance and collision risk from vessels and to reduce the potential for pollution incidents. Pre-deployment benthic survey to inform micro-siting as detailed in the pre-deployment monitoring plan. META Invasive Non-Native Species Management Plan measures, for example using local vessels and ensuring device components are either new or thoroughly checked and cleaned before they are deployed. Implementation of a META MPCP in order to manage the risk of accidental pollution in the marine environment, including spill kits available on vessel.

Operations and Maintenance		
Task	Description	Relevant PEMMP measures
1	Performance data from the turbines will be sent to the data buoy using an acoustic modem. Data will then be sent to shore using a satellite connection. In the event of the data buoy detecting a turbine malfunction during the deployment it will be recovered, repaired and redeployed in the same position.	Pre-deployment benthic survey to inform micro-siting as detailed in the pre-deployment monitoring plan. META Invasive Non-Native Species Management Plan measures, for example using local vessels and ensuring device components are either new or thoroughly checked and cleaned before they are deployed.
Decommissioning		
Task	Description	Relevant PEMMP measures
1	Once testing is complete, the recovery vessel will transit to site, and the acoustic release located and activated. The recovery line will be brought on deck and the equipment recovered.	Best practice measures to reduce disturbance and collision risk from vessels and to reduce the potential for pollution incidents. Implementation of a META MPCP in order to manage the risk of accidental pollution in the marine environment, including spill kits available on vessel.
2	Once all equipment is recovered from site and the seabed left in its former condition the vessel will return to Neyland where equipment will be unloaded onto the quayside.	META Invasive Non-Native Species Management Plan measures, for example inspecting recovered equipment for INNS. Best practice measures to reduce disturbance and collision risk from vessels and to reduce the potential for pollution incidents. Implementation of a META MPCP in order to manage the risk of accidental pollution in the marine environment, including spill kits available on vessel.

NOTE: all lifting operations are to be performed by the vessel contractor's qualified personnel using the vessel contractor's certified lifting equipment.

Table 3 Summary of META Project EMMP measures to be undertaken during Floating Tidal Energy Convertor deployment at Warrior Way

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) in order 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
All fish and shellfish	Mitigation	Implementation of a MPCP in order 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), Section 7.2.1
Archaeological receptors	Mitigation	Micro-siting to avoid impact on marine archaeology receptors	PEMP (Annex 7), Section 8.2