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## AFLOWT Site Investigation

### Report to Accompany Foreshore Licence Application for Site Investigation

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Government

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## Change History of Report

Date	New Revision	Author	Summary of Change
September 2019	000	C. Whiteway	Original Issue
January 2020	001	C. Whiteway	To include MBES, SSS & Benthic surveys

## Table of Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
1.1	Preamble	4
1.2	AFLOWT Project	4
1.3	Purpose of this Report	5
<b>2</b>	<b>Description of SI Works</b>	<b>6</b>
2.1	Multi-Beam Echo Sounder (MBES)	8
2.2	Side-Scan Sonar (SSS)	8
2.3	Sub-Bottom Profiling	9
2.4	Cone Penetration Testing	9
2.5	Benthic Sampling	10
2.6	Survey Vessels	10
<b>3</b>	<b>Environmental Considerations</b>	<b>11</b>
3.1	Screening for Appropriate Assessment	11
3.2	Screening for Environmental Impact Assessment	11
3.3	Project Type	12
3.4	Mandatory Thresholds	12
3.5	Sub-Threshold Development	12
<b>4</b>	<b>Conclusion</b>	<b>13</b>

## Table of Figures

<b>Figure 2-1: SI Location – Foreshore Licence Map</b>	<b>7</b>
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# 1 Introduction

## 1.1 Preamble

The Sustainable Energy Authority of Ireland (SEAI) is Ireland's national sustainable energy authority. SEAI was established by Government under the Sustainable Energy Act 2002 and has a mission to transform Ireland into a society based on sustainable energy structures, technologies and practices. SEAI's key objectives are implementing strong energy efficiency actions; accelerating the development and adoption of technologies to utilise renewable energy sources; supporting innovation and enterprise for our low-carbon future; and supporting evidence-based responses that engage all actors. SEAI is financed in part by Ireland's EU Structural Funds Programme, co-funded by the Irish Government and the European Union.

The Offshore Renewable Energy Development Plan (OREDPA), published in February 2014, sets out Government policy in relation to the sustainable development of Ireland's abundant offshore renewable energy resource. SEAI have responsibility for a key component of the OREDPA through development of the Atlantic Marine Energy Test Site (AMETS) off Annagh Head, west of Belmullet in County Mayo.

AMETS was granted a Foreshore Lease by the Minister for the Environment, Community and Local Government in November 2015. The lease application was accompanied by a full Environmental Impact Statement (EIS) under the Environmental Impact Assessment (EIA) Directive and Appropriate Assessment (AA) under the Habitats Directive.

## 1.2 AFLOWT Project

SEAI is a partner in the AFLOWT project – Accelerating market uptake of Floating Offshore Wind Technology – which was awarded Interreg North West Europe funding under the Low Carbon theme. One of the main objectives of the project is the demonstration of high survivability cost competitive Floating Offshore Wind (FOW) technology.

The AFLOWT project proposes the development of AMETS to cater for FOW by developing a subsea electrical cable, the fabrication, deployment and testing of a FOW turbine and platform and connection to the grid. The AFLOWT project plans to deploy a FOW turbine, up to 6 MW in size, at the AMETS site.

SEAI's main role in the project is as test site owner, having responsibility for consenting the offshore elements of the site (including the technology) and for the management of the onshore and offshore builds. The FOW platform design and fabrication, along with electrical cable connection, monitoring system and turbine control system are managed by SEAI's partners on the project.

The proposed FOW technology is a pendulum lightweight structure composed of a submersible floater made of tubular elements, a counter-weight connected to the floater with tendons, simple mooring lines with drag anchor and a Lazy Wave dynamic cable.

The current stage of the project relates to the design development. Site Investigation (SI) activities are required to inform this.

### 1.3 Purpose of this Report

A Foreshore Licence is required for the proposed SI and this report has been prepared to accompany the Foreshore Licence application, when submitted to the Department of Housing, Planning and Local Government.

This report is set out as follows:

- Section 1: Introduction
- Section 2: Description of SI Works;
- Section 3: Environmental Considerations;

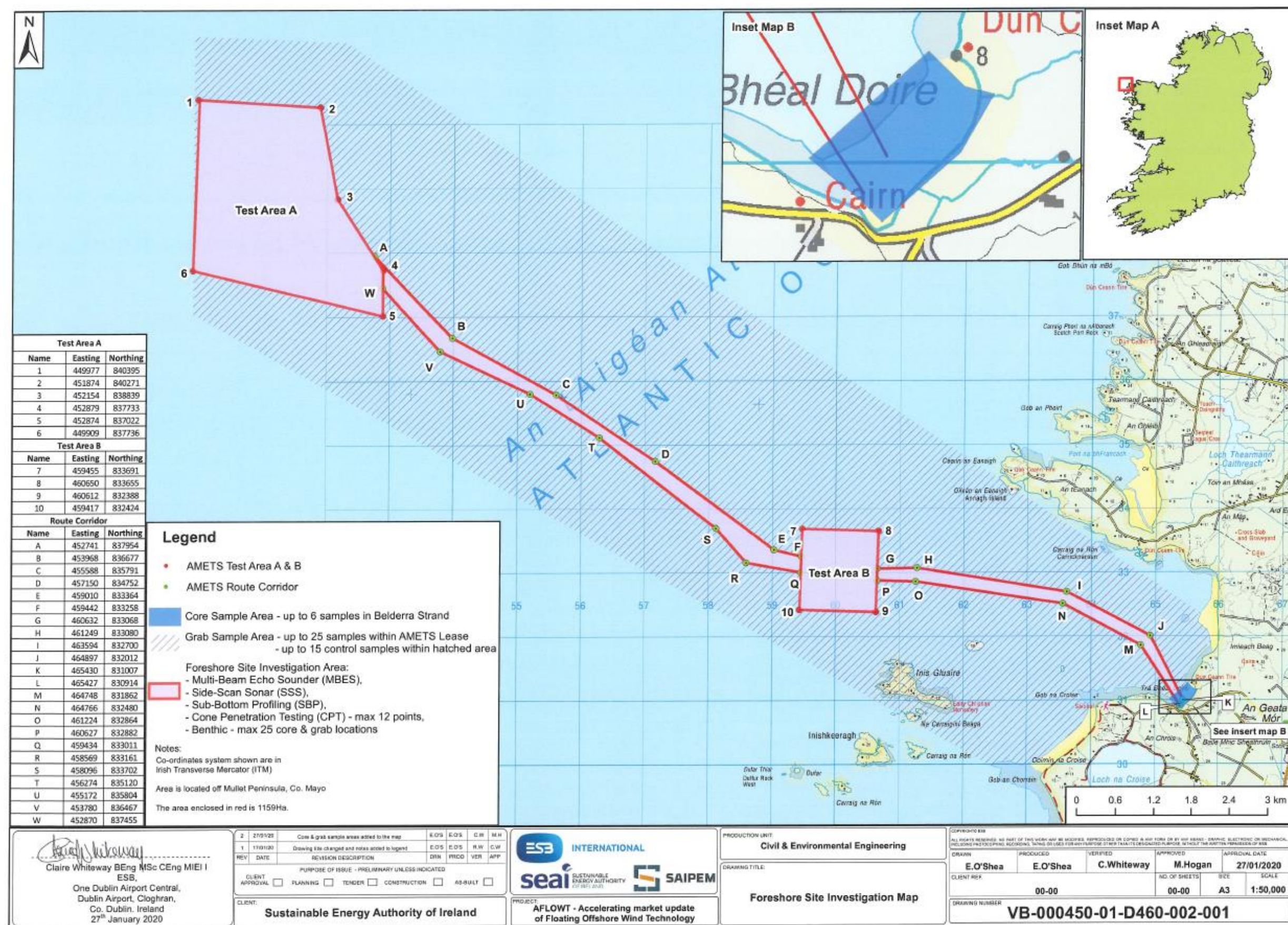
The Electricity Supply Board (ESB) are supporting SEAI on the AFLOWT project and have prepared this report on behalf of SEAI, to accompany the Foreshore Licence application.

## 2 Description of SI Works

SI works (geophysical & geotechnical) are proposed to be undertaken in Test Site A, Test Site B and along the cable route corridor, all areas contained within the AMETS Foreshore Lease area. In addition, several random benthic sampling stations from appropriate control locations for each test area and the cable route will be required, as illustrated by Figure 2-1 below.

Specific details relating to the SI proposed, including equipment and the methods, are outlined in the following sections.

Figure 2-1: SI Location – Foreshore Licence Map



## 2.1 Multi-Beam Echo Sounder (MBES)

A Bathymetric survey with multi beam echo sounder (MBES) is recommended to assess the seabed condition prior to deploy the CPT tool.

### 2.1.1 Survey Spacing

For these SI works, contour intervals at 0.20 m will be used.

### 2.1.2 Equipment

High resolution multibeam will be used (200-400 Khz). Kongsberg EM2040, or equipment of similar specification, will be used for the bathymetric survey (200-400 Khz). It is composed of latest high accuracy technology elements as well as innovative digital image treatment systems. This equipment allows performing high resolution works under International IHO standards.

### 2.1.3 Timing

The MBES is proposed to be undertake between May and September 2020 subject to suitable weather windows and vessel availability. Duration is anticipated to be in the order of 1 month, again subject to an appropriate weather window.

## 2.2 Side-Scan Sonar (SSS)

A seabed clearance survey to detect any obstructions and identify other seabed features survey with Side-Scan Sonar survey (SSS) is recommended prior to undertaking of the Core Penetration Testing (CPT) for safety aspects.

### 2.2.1 Survey Spacing

For these SI works, SSS is proposed to be carried out in the same location as the CPT in Test Areas 'A' and 'B', at each potential anchor location.

### 2.2.2 Equipment

Edgetech side scan sonar, or equipment of similar frequencies, will be used (100 - 900khz). The towed vehicle is a cylindrical device with hydrodynamic design provided with fins, which is towed behind the stern of the boat. SSS is provided by two transducers that each emit acoustic waves across the water in a frequency range between 100 and 900 kHz. The reflection of this wave, coming from the bottom, is caught by the same transducers, amplified and transmitted across the cable, up to the recorder, where the corresponding sign is digitized, processed and recorded, to identify the different substrate morphologies, and the visualization of objects.

### 2.2.3 Timing

The SSS is proposed to be undertake between May and September 2020 subject to suitable weather windows and vessel availability. Duration is anticipated to be in the order of 1 month, again subject to an appropriate weather window.

## 2.3 Sub-Bottom Profiling

Sub-Bottom Profiling (SBP) is a geophysical survey, undertaken to characterise the make-up of the various layers, and their interfaces, of sediment and / or rock under the sea floor. It is an effective method of determining the composition of the seafloor using sound pulse techniques; it is a method for obtaining high-resolution characterisation of sediments and rock under bodies of water.

The technique of undertaking SBP is based on the principles of seismic reflection, i.e. the emission of a seismic wave into the subsurface, and the reception of the energy reflected by the various interfaces.

### 2.3.1 Survey Spacing

For these SI works it is proposed that SBP survey lines will be spaced at a maximum of 230 m which such a configuration to allow a 2 x 2 m Digital Terrain Model (DTM) within test areas 'A' and 'B' to be created. If geohazards or any other specific area requiring detailed data are encountered the DTM will be reduced to 1 x 1 m grid size.

### 2.3.2 Equipment

Various types of equipment are commonly used for SBP including those utilising boomers, pingers and chirper systems; all of which emit different acoustic signals.

For this SI, an Ixblue Echoes 3500, or equipment of similar specifications (i.e. with operating frequencies ranging from 1.7 to 5.5 kHz), is expected to be employed. It is anticipated to be used in the low frequency combination of 1.7 / 5.5 kHz for the SI works proposed.

### 2.3.3 Timing

The SBP is proposed to be undertake between May and September 2020 subject to suitable weather windows and vessel availability. Duration is anticipated to be in the order of 1 month, again subject to an appropriate weather window.

## 2.4 Cone Penetration Testing

Cone Penetration Testing (CPT) is a geotechnical investigative survey, undertaken to determine the parameters of sea floor soils / sediments and delineating soil / sediment stratigraphy at specific locations. CPT can be used to rapidly determine in situ soil properties.

The technique of undertaking CPT involves pushing an instrumented device into the seabed at a constant speed with continuous measurement of a range of reactions.

### 2.4.1 Survey Spacing

A total of 12 CPT (6 CPT x 2) are proposed to be carried out a Test Areas 'A' and 'B', at each potential anchor location. CPT will be carried out to a minimum depth of 10 m below seabed or rock formation refusal.

## 2.4.2 Equipment

For these SI works a Ronson seabed CPT will be employed. This instrument uses a wheel drive system to push the CPT rods into the seabed. Wheel friction is imposed by hydraulic force. A self-tensioning electric winch with heave compensation feeds the umbilical for power supply and data communication. The system is therefore operated by a single direct force being applied to the rods rather than by a hammering, coring or drilling action. The instrument weighs in the region of 10 tonne and is deployed by lowering it directly onto the seabed from the stern of the vessel using a crane. No significant underwater acoustic signal results from the operation of CPT.

## 2.4.3 Timing

The CPT is proposed to be undertake between May and September 2020 subject to suitable weather windows and vessel availability. Duration is anticipated to be in the order of 1 month, again subject to an appropriate weather window.

# 2.5 Benthic Sampling

Standard sampling techniques for subtidal and intertidal collection will be employed to include collection of macrofauna and associated sediment particle size and organic content.

## 2.5.1 Survey Spacing

It is considered likely that twenty-five (25) random stations from test area A, test area B and the cable route and fifteen (15) random stations from appropriate control locations for each test area and the cable route will require to be sampled for macrofauna particle size and organic content. This gives a total of forty (40) subtidal grab stations. It is considered likely that a further six (6) intertidal sediment stations will be required to characterise Belderra Strand, the cable landfall location.

## 2.5.2 Equipment

Subtidal sediments will be collected by grab surveys (day grab) and intertidal stations will be collected using a standard 20 cm core to complement the original methodology and data set for the AMETS.

## 2.5.3 Timing

The benthic sampling is proposed to be undertaken during the months of May to August in 2020 and 2021 and anticipated to take approximately 1 month depending on suitable weather conditions.

# 2.6 Survey Vessels

All SI works outlined above are proposed to be undertaken from the Celtic Explorer. The SI will be undertaken from this vessel in accordance with the relevant guidelines required to manage the risk to marine mammals from man-made sound sources in Irish waters.

## 3 Environmental Considerations

### 3.1 Screening for Appropriate Assessment

An Appropriate Assessment (AA) Screening Report is included with this Investigative Foreshore Licence Application for Offshore Renewable Energy. Please see document 'AA\_SCREENING\_AMETS\_SI\_D0.6'.

This AA Screening concludes that there will be no impact on any Natura 2000 site as a result of the proposed SI activities. It further concludes that the proposed activities are extremely local and of short duration and are extremely unlikely to cause any significant impacts on marine mammals, seabirds or benthic habitats.

### 3.2 Screening for Environmental Impact Assessment

#### 3.2.1 European Communities Directives & Domestic Legislation

European Communities Directive 85/337/EEC, on the assessment of the effects of certain public and private projects on the environment, was adopted on 27<sup>th</sup> June 1985. It was later amended by Directives 97/11/EC, 2003/35/EC and 2009/31/EC.

The 1985 Directive and its amendments were codified in 2011 by Directive 2011/92/EU. The current Directive 2014/52/EU amends the 2011 codified Directive but does not replace it.

The Planning and Development Regulations 2001 (as amended) transpose the requirements of the 2014 EIA Directive into planning consent procedures. As stated in the regulations an environmental impact assessment (EIA) shall be carried out where either the proposed development would be of a class specified in Part 1 of Schedule 5 of the regulations (as amended) or Part 2 of Schedule 5 of the same regulations.

#### 3.2.2 Screening for EIA

While final screening for EIA can only be undertaken by a Competent Authority (CA) this report outlines the findings of a preliminary assessment undertaken in relation to the requirement for EIA in order to support the Foreshore Licence application.

This report has been produced with reference to Schedule 7 and Schedule 7A of the Planning and Development Regulations 2001 (as amended): *Criteria for determining whether Development listed in Part 2 of Schedule 5 should be subject to an Environmental Impact Assessment and Information to be provided by the applicant or developer for the purposes of Screening sub-threshold development for environmental impact assessment.*

Screening is Stage 1 of the EIA process whereby it is determined whether or not an EIA needs to be undertaken with consideration for each of the following, as considered by the subsequent sections of this report:

- Project Type – is the proposed development “a project” as understood by Article 1(2)(a) of Amended 2011/92/EU Directive. **See Section 3.3.**

- **Thresholds** – does the project exceed the applicable threshold as listed in the Schedule 5 of the Planning & Development Regulations 2001 (as amended). **See Section 3.4.**
- **Sub-threshold Development** – is the project of a type that could lead to effects on the environment, is it in a sensitive location and / or could the effects be significant. **See Section 3.5.**

### 3.3 Project Type

Article 1(2)(a) of the Amended 2011/92/EU Directive provides the following definition for a project:

*“the execution of construction works or of other installations or schemes”*

*“other interventions in the natural surroundings and landscape including those involving the extraction of mineral resources”*

The proposed SI development comprises temporary, short term, investigations including the undertaking of SBP and CPT as detailed by Section 0 herein.

**These SI works do not comprise a project for the purposes of EIA.**

### 3.4 Mandatory Thresholds

Schedule 5 of the Planning and Development Regulations 2001 (as amended) provides the classes of development for which the undertaking of EIA is considered mandatory.

These thresholds represent, in Irish legislation, Annex I and Annex II of the 2014 Directive (2014/52/EU) in addition to identifying national thresholds for developments regarded as Part 2 classes.

**The proposed SI is not of a mandatory threshold for EIA purposes as identified by Part 1 and Part 2 of the Planning and Development Regulations (as amended).**

### 3.5 Sub-Threshold Development

As referenced previously, the AA Screening Report provides an assessment of the proposed SI works in relation to the Natura 2000 network. That assessment concludes that there will be no impact on any Natura 2000 site as a result of the proposed SI activities. It further concludes that the proposed activities are extremely local and of short duration and are extremely unlikely to cause any significant impacts on marine mammals, seabirds or benthic habitats.

The SI works are both temporary and short term in nature and not of a type that could lead to effects on the environment. The SI works do not comprise a project for the purposes of EIA, nor are they of a class of development which requires mandatory EIA. They are not expected to lead to significant effects on the environment. Therefore, no EIA accompanies this application for Foreshore Licence to undertake SI activities at the AMETS site.

## 4 Conclusion

As outlined by this document, SI is proposed to be undertaken at and near the AMETS site (Foreshore Lease FS005726) between May and September 2020. As summarised herein this SI is not anticipated to result in any significant impacts on the environment and is both short term and temporary in nature.