1 Introduction

1.1 Scope

Marine renewable energy is an emerging industry which has very considerable potential for economic growth and job creation. This can happen through the development, manufacture, deployment and operation of wave, tidal and offshore wind technologies and the creation of an indigenous supply chain in Ireland. Ireland can capitalise on its natural advantages in the area of marine renewable energy by following the Ocean Energy Strategy. The policy context for the ocean energy initiative and for addressing wave and tidal technologies is contained in the Programme for Government, the Sustainable Energy White Paper and in the Ocean Energy Strategy 2005 (Marine Institute and Sustainable Energy Authority of Ireland).The initiative, announced in early 2008, will help establish Ireland as a leader in ocean energy technologies and to develop facilities that will enable the commercialisation of ocean energy products and services.

As part of the Ocean Energy Strategy an offshore wave energy test site is proposed for the Belmullet area of County Mayo. The proposed test site will be called the Atlantic Marine Energy Test Site (AMETS). The test site will provide a grid-connected national test facility, to which full-scale wave energy converters could be coupled during their final stages of pre-commercial development. The test site is an integral component of Ireland's Ocean Energy Strategy and will facilitate testing and validation of various wave energy converters in an open ocean environment. The test site will underpin the Government's stated target of achieving 500MW of marine renewables by 2020. It is expected that the experience gained from deployment at the test site will assist commercial scale wave energy production in the future at suitable locations around the Irish Coast. The test site will underpin the Government's stated target of achieving 500MW of marine renewables by 2020. It is expected that the experience gained from deployment at the test site will assist commercial scale wave energy production in the future at suitable locations around the Irish Coast.

Alternative test sites that meet other network requirements already exist at the Orkney Islands and in Cornwall in the UK and in Portugal. In Orkney a test site for both wave and tidal converters has been established at the European Marine Energy Centre (EMEC) with EU and UK funding. EMEC provides for installation of a total capacity of 7MW. This capacity is connected to the local electricity network and has the facility to connect four separate wave energy converters simultaneously to a maximum water depth of 50m. At the other end of the UK, Cornwall's 'Wave Hub' obtained planning approval in September 2007. This project proposes a 20MW capacity cable extending 16km off-shore in 50m water depth.

The average wave energy level likely to be encountered at the UK and Portuguese sites is less than that available at the proposed Irish site where two test areas with water depths of 50m and 100m respectively are envisaged (EQUIMAR 2011) –see Table 1-1 It is understood, however, that the Portuguese commercial Pilot Zone in development will be a licensed area designated for large scale wave farms and while seabed cable way leaves are provided, the actual cables will have to be supplied by the commercial developers.

The Marine Institute has a sheltered test site in Galway Bay which can test models up to a scale of about 1:4. This, however, is not linked to the electricity network.

Table 1-1: EQUIMAR Comparison of wave energy test site resources

Site	Resource (kW/m)	Scale	Opened / due to open
WaveHub	17	Full scale	2011
BIMEP	21	Full scale	2011
EMEC Wave	21	Full scale	2004
Pilot Zone Portugal	21–25	Full scale / pre-commercial	–
Belmullet	55–60 (50m) 70–75 (100m)	Full scale	2012

Source: (EQUIMAR 2011)

Following evaluation of seven potential sites along the Irish west coast (Marine Institute and ESB international, 2008) the current location, of Annagh Head near Belmullet, Co. Mayo, was considered to be the most suitable for development of a wave energy test site that would satisfy the following principle criteria:

- Grid capacity for pre-commercial full scale converter testing. grid offer of 10MW has been provided by the Commissioner for Energy Regulation (CER)
- Network connection at medium voltage level
- Full Atlantic exposure conditions with excellent wave energy resource
- Water depths 50–100m
- Suitable sediment for anchoring wave energy converters under test
- Landing and cargo handling facilities and shelter within reasonable distance
- A convenient local site for Irish-based wave power developers and researchers (North and South), but not excluding non-Irish based developers
- A feasible cable route to shore through suitable sediment
- Likelihood of low environmental impact

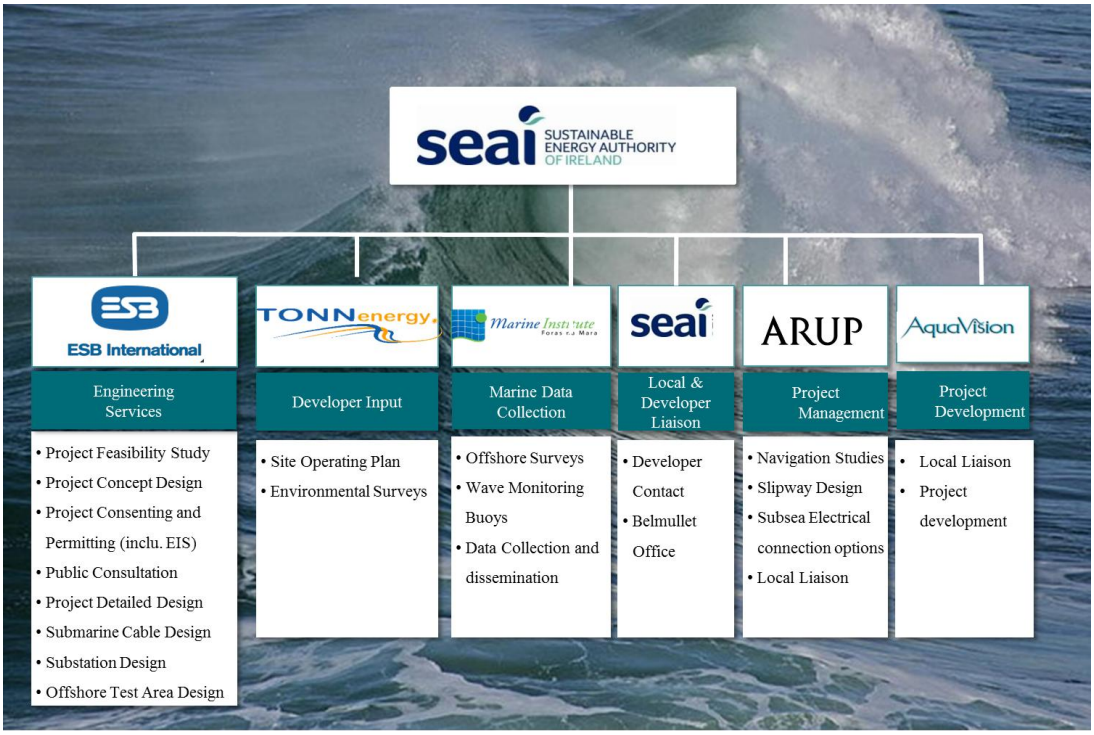
The location of the proposed wave energy test site is shown on Figure 1-1. In the marine environment the test site comprises two test areas (A and B) and a corridor for submarine electricity cables from the test areas to a landing location at Belderra Strand.

1.2 Objective

The test site will provide prospective developers with a grid connection and a licensed ocean area in which to test and demonstrate their full scale prototype wave energy converters. The test site must allow for the requirements of resource needs: water depth, suitable substrate for anchoring and proximity to the shore. It must also facilitate the deployment and testing of the various prototype wave energy converters in a real working environment.

1.3 The Project Development Team

The project development team and main roles are shown in the image below.



1.3.1 Sustainable Energy Authority of Ireland (SEAI)

The Sustainable Energy Authority of Ireland (SEAI), formerly the Irish Energy Centre was set up by the Irish Government in 2002 as Ireland's national energy authority.

Its mission is to play a leading role in transforming Ireland into a society based on sustainable energy structures, technologies and practices.

SEAI's key strategic objectives are

- **Energy efficiency first**: implementing strong energy efficiency actions that radically reduce energy intensity and usage
- **Low carbon energy sources**: accelerating the development and adoption of technologies to exploit renewable energy sources
- **Innovation and integration**: promoting evidence-based responses that engage all actors, supporting innovation and enterprise for our low-carbon future.

The Sustainable Energy Authority of Ireland manages programmes aimed at:

- Supporting Government decision-making through advocacy, analysis and evidence
- Driving demand reduction and providing advice to all users of energy
- Driving the decarbonisation of energy supply
- Raising standards in sustainable energy products and services
- Building markets based on quality, confidence and proven performance
- Fostering innovation and entrepreneurship
- Improving the coherence of Irish energy research and development

SEAI, together with the Marine Institute manages the non-grid connected quarter-scale wave energy test site in Galway Bay and is responsible for the overall management of the proposed Atlantic Marine Energy Test Site at Belmullet in County Mayo. SEAI have also undertaken a national Strategic Environmental Assessment (SEA) of the Ocean Renewable Energy Development Plan (OREDP). Drafts of the SEA and Natura Impact Statement have been prepared for the OREDP, which is currently under review by the Department of Communications, Energy & Natural Resources (DCENR), (http://www.seai.ie/Renewables/Ocean_Energy/).

In 2008 the Government established a dedicated Ocean Energy Development Unit (OEDU) within the Sustainable Energy Authority of Ireland (SEAI), charged with co-ordinating the relevant activities of state agencies and initiating other measures to promote and develop the sector.

The Ocean Energy Development Unit, operating with the support and assistance of the Marine Institute, oversees the implementation of the initiative, coordinating the many diverse interest groups involved in ocean energy, and focuses them to achieve the objective of placing Ireland in pole position worldwide in the development of ocean energy technologies.

1.3.2 Marine Institute

The Marine Institute is the national agency for marine research, technology, development and innovation (marine RTDI). Its primary role is to undertake, coordinate, promote and assist in marine research and development. It provides services related to the assessment and realisation of the economic potential of Ireland's marine resource. It also provides essential scientific services, including marine research and monitoring that underpin the promotion of economic development to create employment while protecting the marine environment.

The essential marine research services provided by the Institute include:

- National research and development funding programmes
- Fish stock assessment
- Fish health services
- Marine food safety monitoring
- Environmental monitoring
- Research vessel operations
- Seabed mapping
- Data management

The Marine Institute has worked closely with ESB International (ESBI) to identify the most appropriate location for the Atlantic Marine Energy Test Site (AMETS), undertaking seabed mapping, deploying wave and current monitoring equipment and providing expert knowledge in their interpretation. The institute continues to monitor the wave and current climate at the AMETS location and weather and wave data are a available in real time on their website (http://www.marine.ie/home/OceanEnergy.htm).

1.3.3 ESB International

ESB International (ESBI) is a growing international energy company and one of Europe's leading engineering and consultancy organisations. It is one of ESB's non-regulated businesses and operates across a wide area of the energy industry.

ESBI invests in building, owning, operating and maintaining power stations nationally and internationally, as well as trading electricity in competitive European energy markets.

ESBI provides a full range of engineering and consultancy services as well as operations and maintenance solutions to the renewable energy sector including:

- Strategic technology assessment and appraisal
- Electricity market analysis and economic modelling
- Financial/investment analysis
- Regulatory and policy analysis
- Environmental services
- Fuel and carbon emissions strategies
- Electricity/energy industry development trends and analysis

ESBI is fully committed to supporting ESB's strategic framework towards 2020, which will see major investment in renewable energy. Recognising the potential wave energy resource of over 6,000 MW off the Irish coast, ESBI is committed to playing its part in harnessing this renewable energy source. It has dedicated resources focused on emerging ocean energy technologies with a view to assisting the best potential candidates reach commercial application, (Westwave Project). It is associated with the world's first commercial scale tidal power generating device, SeaGen, in Northern Ireland.

ESBI is providing engineering and environmental services to the AMETS project.

1.3.4 Tonn Energy

Tonn Energy is an Irish wave farm development company providing developer input to the project from the aspect of future users of the AMETS. Tonn Energy is working to transform wave energy in Ireland from a technical innovation into a viable new marine industry, and has considerable backing and specialist expertise input from Vattenfall.

Tonn Energy and Vattenfall are providing environmental, cultural heritage and technical expertise to the AMETS project.

Tonn Energy is following an R&D roadmap, covering topics such as environmental, operational and electrical design, which must be resolved before full-scale deployment can be undertaken.

Vattenfall AB is a Swedish public limited company and one of Europe’s largest electrical utilities with operations in Sweden, Denmark, Finland, Germany, Poland, The Netherlands, UK and Ireland. It is 100%-owned by the Swedish state. Vattenfall is involved in several of the largest offshore wind projects in northern Europe and considers ocean energy as the next energy source to be commercially viable. Vattenfall has been actively involved in this area since 2005, in Sweden, Norway, UK and Ireland.

1.3.5 Arup

Arup is an independent firm of designers, planners, engineers, consultants and technical specialists.

Arup, established in Dublin since 1946, is an engineering company operating within a framework of social responsibility and a commitment to sustainable design.

On the AMETS project Arup is providing project management on behalf of SEAI and technical advice services for the development of the test site. Arup has also prepared the Shipping and Navigation Assessment that is part of the EIS (Chapter 12).

1.3.6 Aquavision

Aquavision is a locally based marine project development company which has assisted with project development and local liaison aspects of the proposed AMETS.

1.4 Applicable Policy, Legislation and Regulations

1.4.1 EIA Legislative Requirements

EIA Directive (85/337/EEC) as amended by 97/11/EC and 2003/35/EC requires that certain developments be mainly considered for likely 'significant' environmental effects (commonly known as environmental impact assessment (EIA)) before permission can be granted.

The EIA Directive does not refer specifically to ocean energy projects and no overarching specific guidance has been formulated for developers or regulators. Some countries (for example, Spain – Bald *et al.*, 2010) have produced specific guidance, and likewise some test centres have also issued EIA guidance, for example, EMEC in Scotland (2008). Other European projects, such as EquiMar, provide good models of the EIA process (EquiMar, 2009).

In Ireland certain developments on the foreshore are subject to the European Communities (Environmental Impact Assessment) Regulations 1989 to 2006, and require the preparation of an Environmental Impact Statement (EIS) which must be provided to the consultative organisations specified in the European Communities (Foreshore) Regulations 2009 (S.I. No. 404 of 2009).

An EIS has been prepared for the AMETS Project with reference to the European Communities Environmental Impact Assessment Regulations 1989 to 1999, the Foreshore (Environmental Impact Assessment) Regulations, 1990 and the European Communities (Foreshore) Regulations 2009 (S.I. No. 404 of 2009). Reference has also been made to the '*Guidelines on the Information to be contained in Environmental Impact Statements*' published by the Environmental Protection Agency (EPA) in 2002 and '*Advice Notes on Current Practice in the preparation of Environmental Impact Statements*', also published by the EPA in 2003.

1.4.2 Department of the Environment, Community & Local Government

In Ireland, the foreshore is owned and administered by the State. The foreshore is defined as the seabed and resources below the line of high water of ordinary or medium tides and extending outwards to the limit of the territorial seas for 12 nautical miles (22.224 kilometres), the zone within which the proposed development will be constructed and operated.

The required consents for the project include both a foreshore lease and a foreshore licence from the Irish Government's Department of the Environment, Community &Local Government (DECLG) for all installations between the high water mark and the 12 nautical mile limit.

- A **Lease** is generally issued for a development that requires exclusive occupation of the foreshore. The offshore test areas in the 50m and 100m water depths are subject to a lease.
- A **Licence** is generally issued for a development that does not require exclusive occupation of the foreshore.

The EIA is submitted under the European Communities (Foreshore) Regulations 2009 (S.I. No. 404 of 2009).

The focus of foreshore management in Ireland is the sustainability of the licensed activity or development with regard to the environment and sound marine spatial planning. In addition there is a need to ensure a fair return to the State for permitting activities or developments licensed on this State property resource.

1.4.3 National Parks and Wildlife Service

Consent is required from the National Parks and Wildlife Service (NPWS) to undertake works in protected areas. Although there are no designated Special Areas of Conservation (SAC), proposed Natural Heritage Areas (pNHA) or Special Protection Areas (SPA) in the marine environment at the location of the test areas or along the cable route, the Mullet/Blacksod Bay Complex SAC and pNHA (Site Code 000470) extends along the shoreline and in the general vicinity of the proposed substation location.

The cables will be ducted under the beach area at Belderra Strand, which is within the SAC. Reef areas as defined under the Habitats Directive are located in the marine environment of the proposed cable route. There are also other SAC, pNHAs and SPAs in the general locality of the project. Screening for appropriate assessment under Article 6.3 of the Habitats Directive is required (see below) and a permit from the Minister of Environment, Heritage and Local Government may be required.

1.4.4 Habitats Directive requirement

Article 6.3 of the Habitats Directive states:

> *'Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.'*

The Natura 2000 site Mullet/Blacksod Bay Complex (cSAC Site Code 000470) will be traversed by the cable landing in the shore area.

The proposed development is not directly connected with the management of this conservation site.

Within 15 kilometres of the area, there are Special Protection Areas (SPA) designated under the EU Birds Directive (Termoncarragh Lake, Cross Lough and Inishglora/Inishkerragh Islands) and there are also cSAC areas such as Inishkea important for its birds and grey seal breeding population. In this context, a review of the potential, residual (indirect and direct) and cumulative impacts is required to be undertaken and a Screening Report for the Offshore Wave energy test site project at Belmullet under Article 6 of the EU Habitats Directive has been prepared.

1.4.5 Water Framework Directive

The European Communities (Water Policy) Regulations, 2003, (S.I. 722 of 2003) is the enabling Irish legislation of the European Communities Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000, establishing a framework for Community action in the field of water policy).

In brief the enabling legislation provides for the protection of the status of all waters (surface and groundwater), the establishment of River Basin Districts (RBDs), coordination of actions by all relevant public authorities for water quality management in an RBD including cross-border RBDs, characterisation of each RBD, establishment of a Register of Protected Areas, establishment of environmental objectives and the development of programmes of measures and River Basin Management Plans (RBMP).

A final RBMP, covering the period 2009 to 2015, was adopted by Mayo County Council on 12 April 2010. The RBMP is implemented jointly by the local authorities (including Mayo County Council) in the Western RBD – the overall coordinating role provided by Galway County Council. A full description of the river basin and its characteristics as well as the WFD objectives can be found on www.wfdireland.ie and on www.westernrbd.ie.

The Western River Basin Management Plan (2009) establishes four core environmental objectives to be achieved generally by 2015:

- Prevent deterioration of water status
- Restore good status where status is assigned as less than good by the EPA
- Reduce chemical pollution
- Achieve water related protected areas objectives.

These include the objective to maintain water status for High and Good status waters and to restore all waters to at least Good status by 2015. In addition, the Surface Waters Environmental Objectives Regulations (SI 272 of 2009) and the Groundwater Environmental Objectives Regulations (SI 9 of 2010) were made to give effect to the measures needed to achieve surface water and groundwater environmental objectives established in river basin management plans. These regulations place a legal obligation on public authorities to aim to achieve those objectives in the context of their statutory functions.

Part of the proposed project area comes within the Western River Basin District (WRBD) River Basin Management Plan (RBMP) management area (www.wfdireland.ie). The proposed 50mdepth mooring location lies within the Western Atlantic Seaboard Coastal water body (IE_WE_250_0000). The submarine power cables will pass through this water body also.

The proposed substation location is situated outside of any surface river water body as defined by the Environmental Protection Agency (EPA).

1.4.6 Policy

Ocean Energy Strategy

Ireland's Ocean Energy Strategy was developed to advance Ireland's capability to deploy ocean energy technology and develop an industry sector in this field of emerging energy technology. It proposed a four phase strategy to capitalise on Ireland's marine energy resource.

Phase 1 (2005 to 2007)	This phase focuses on development by supporting product R&D and research facilities with an objective to develop and test prototype concepts and develop technical leadership in this area.
Phase 2 (2008 to 2010)	This phase supports the development of pre-commercial grid connected devices with the objective of demonstrating the potential for a cost-effective fully functional wave energy converter operating in the Irish electricity market.

Phase 3 (2011 – 2015)	This phase could provide support for a 10MW large-scale array of devices to be connected to the grid.
Phase 4 (2016 onwards)	This phase sees large-scale market deployment for ocean energy.

This phased strategy aims:

- To introduce ocean energy into the renewables portfolio in Ireland
- To develop an Irish ocean energy industry sector

The AMETS Test Site is a component of Phase 2 of the strategy.

The 2007 Government White Paper on energy policy 'Delivering a sustainable energy future for Ireland – The Energy Policy Framework 2007-2020' sets out a number of strategic goals, including a specific ocean (wave and tidal) energy target of 500 MW by 2020. This target was then restated in the 2007 Programme for Government.

Ocean Renewable Energy Development Plan (OREDP)

The Department of Communications, Energy & Natural Resources (DCENR), with input from the Sustainable Energy Authority of Ireland (SEAI), is in the process of developing the Offshore Renewable Energy Development Plan (OREDP), which will shape the exploitation of offshore wind and renewable energy resources in Ireland's marine territory.

The main aim of the OREDP is to establish scenarios for the development of offshore renewable resources in Irish waters up to 2030, and to provide a description of developing policy, which will affect the context within which they may develop.

The OREDP area covers all Irish waters from the Mean High Water Mark out to the 200m water depth contour off the west and south west coast of Ireland and the Exclusive Economic Zone (EEZ) off the north, east and south east coasts of Ireland.

A Strategic Environmental Assessment (SEA) in compliance with the Planning and Development (Strategic Environmental Assessment) Regulations 2004, is required under the provisions of S.I. No. 94/1997 – European Communities (Natural Habitats) Regulations, 1997 (as amended).

In addition, as the plan may affect sites designated as being of European importance (collectively, Natura 2000) an Appropriate Assessment is required to establish whether there will be significant effects on such sites.

Copies of the draft OREDP, the SEA and the Natura Impact Statement for the Plan are available for download at http://www.seai.ie/Renewables/Ocean_Energy/.

Mayo County Development Plan 2008 –2014

The Mayo County Development Plan is the 2008–2014 edition which encourages the production of energy from renewable sources under reference TI-RE 2, with a specific reference to wave and tidal among other sources (Mayo, 2008 – 2014). It recognises that natural resources are a vital element of the county's resource base and that they have not been developed to their full potential. The development of renewable resources is specifically addressed as part of the its overall strategy for transport and infrastructure developments, where it aims to optimise the development of appropriate renewable energy sources that make use of the natural resources of the area concerned in an environmentally acceptable and sustainable manner.

The quality of the landscape is recognised as a key economic resource and the county has been divided into 'Landscape Protection Policy Areas'. It is also recognised that the development of the county's natural resources is necessary for economic survival and prosperity.

Landscape Policy Areas have been defined among others as:

- Policy Area 1 – Montaine Coastal Zone
- Policy Area 2 – Lowland Coastal Zone

The location of Annagh/Frenchport/Belderra falls within Policy Area 2 – Lowland Coastal Zone. Development impacts within this area are assessed based on a landscape sensitivity matrix. There are three ratings, high, medium and low. The landscape sensitivity in the Belderra area is rated as high and any development must take account of this sensitivity.

From the NPWS designations, the land-side area is categorised variously as an NHA, SAC and SPA. Appropriate Assessment under Article 6 of the Habitats Directive is required.

In addition the County Development Plan outlines its development objectives in relation to natural heritage and under EH-NH 1 states 'It is an objective of the Council to protect, enhance and conserve areas designated as candidate Special Areas of Conservation, Special Protection Areas and proposed National Heritage Areas.

1.5 Mayo County Council Renewable Energy Strategy 2011– 2020

Mayo County Council adopted its Renewable Energy Strategy on 9 May 2011. The Strategy sets out a path to allow County Mayo to contribute to meeting the national legally-binding renewable energy targets and clarifies the approach Mayo County Council takes to renewable energy. All major forms of renewable energy are considered in the Strategy, including ocean energy.

Mayo has potential to harness 18,500–19,500MW of renewable energy from fixed wind, floating wind and wave resources. However it is considered that less than half of this (4,900–7,900MW) can be exploited in an environmentally sensitive manner.

The area identified by Mayo County Council for wave energy potential in the strategy is reproduced in Figure 1-2. The AMETS test site is located within this area. Specific reference is made to the proposed AMETS development and it is identified as an important component in the development of a future commercial renewable wave industry. The Strategy identifies the potential for Mayo to become a centre for research and development in ocean energy.

With respect to individual projects the Strategy states that permitting any onshore infrastructure associated with offshore wave energy developments will be determined in accordance with the principles of proper planning and sustainable development with a view to ensuring minimal adverse environmental impact. Developments must take account of the presence of and requirement to protect all Natura 2000 sites and also Local Biodiversity Areas.

All proposed renewable energy development in marine waters or associated landward elements will be subject to an ecological impact assessment.

1.6 Format of EIS and methodology

The Environmental Impact Statement (EIS) has been prepared in the grouped-format structure with each category having a dedicated chapter (Human activity, Noise, and so on) and being considered under the separate headings: Description of existing environment; Impact of the development; Mitigation (where appropriate); and Conclusions (where appropriate).

It reflects the Advice Note on Current Practice (in the preparation of Environmental Impact Statements) and the Guidelines on the Information to be contained in Environmental Impact Statements issued by the Environmental Protection Agency (EPA). The order of presentation has been adjusted to aid comprehension. The EIS feeds into the Environmental Impact Assessment (EIA) process which is the responsibility of the Competent Authority.

The competent authority (Department of the Environment, Community & Local Government) examines the EIS and consults with authorities likely to have an interest in a particular proposal by reason of their specific environmental responsibilities.

The EIS considers the construction, operation and decommissioning of the Atlantic Marine Energy Test Site. Every effort has been made in the preparation of the document to keep it as concise as possible while also ensuring that relevant material is adequately covered.

Appropriate methodologies have been used to assess the effects relating to each of the environmental topics that have been investigated as part of the preparation of the EIS. These methodologies are based on recognised good practice and guidelines specific to each subject area, details of which are provided within each individual technical section.

The EIS was prepared by ESBI Engineering & Facility Management Limited, Stephen Court, 18-21 St Stephen's Green, Dublin 2, Ireland with inputs from the projects developers and specialist consultant reports. The EIS contents are set out in Table 1-2.

Table 1-2: Contents of EIS

Chapter	Subject	Prepared by
	Non-technical summary	ESBI
1	Introduction	ESBI
2	Rationale and alternatives to the project	ESBI/SEAI
3	Project alternatives	ESBI
4	Description	ESBI
5	Human beings	ESBI
6	Flora and fauna	Specialist report by MERC Environmental Consultants Ltd.
7	Water	ESBI
8	Geology and groundwater	ESBI
9	Air and climate	ESBI
10	Noise (terrestrial)	Specialist report by Biospheric Engineering Ltd.
11	Traffic and transport	Specialist report by Martin Peters and Associates
12	Navigation	Specialist report by Arup
13	Cultural heritage	Specialist report by Moore Marine Services Ltd.
14	Visual impact assessment	Specialist report by URS Scott Wilson
15	Material assets	ESBI
16	Coastal processes	Specialist report by the Hydraulic Maritime Research Centre (HMRC)

Chapter	Subject	Prepared by
17	Indirect, cumulative and interaction of impacts	ESBI
18	Summary of impacts	ESBI
19	Management and monitoring	ESBI
20	Overall conclusion	ESBI

1.7 Consultations

1.7.1 Scoping Report

An Environmental Scoping Report for the project was prepared separately in both English and Irish and issued to statutory bodies nationally and to key stakeholders in the Belmullet area. It is available from on the SEAI website, www.seai.ie.

Prior to the issuing of the Scoping Report, consultation took place with the National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage & Local Government (DEHLG). (NPWS now come under the Department of Arts, Heritage & the Gaeltacht). A public meeting was also held in Belmullet in April 2010 where the proposed project was outlined with poster displays and information provision.

The Scoping Report provided a description of the proposed test site and outlined preliminary ecological, cultural heritage and navigation issues. It identified the key areas to be addressed in the Environmental Impact Assessment and also provided the specific methodology for ecological assessment. A total of ten responses were received to the Scoping Report. These are listed in Table 1-3.

The responses received are provided in **Appendix 1**: Responses to Scoping Report. Issues raised in the responses have informed the preparation of the Environmental Impact Statement .

Table 1-3: Responses received to Environmental, Scoping Report

No.	Doc. Date	Organisation	Issue identified / Comment	Recommendation
1	08/07/2010	Údarás Eitlíochta na hÉireann (Irish Aviation Authority)	No observations on proposal	No action
2	09/07/2010	Commissioners of Irish Lights	Issue *re* Test Site B – vessels attempting to avoid site to east run a risk from Edye Rock (known locally as the Mainistir)	Risk analysis of potential navigation risk to be undertaken
3	20/07/2010	Department of Defence	No observations on proposal	No action
4	21/07/2010	EPA	Development not a licensable activity under the EPA Act 1992 as amended and the Waste Management Act 1996 nor is it an SID. No observations.	No action

No.	Doc. Date	Organisation	Issue identified / Comment	Recommendation
5	28/07/2010	Irish Coast Guard, Department of Transport	Concerned with safety of maritime traffic	Clear marking of the test areas. Where possible AIS transceivers to be employed. Contingency Plan in place for offshore development of device arrays coming adrift and posing a shipping hazard. Construction phase Radio Navigation Warning broadcast during cable laying and device anchoring operations. Prior notification of vessels and numbers of personnel and daily reports to MRSC Malin Head
6	30/07/2010	An Taisce - The National Trust for Ireland	No comment or concern at this stage	No action
7	06/08/2010	Inland Fisheries	No negative fishery implication	No action
8	09/08/2010	DEHLG - NPWS	Assessment under Article 6.3 of the EU Habitats Directive required. Risk assessment under Article 12 Habitats Directive on potential for impact of likely construction / operation activities. Impact under the Wildlife Act 1976 and amendments to be described.	Recommended to use EU published Assessment Guidance and recently published Appropriate Assessment of plans or Project s in Ireland.
9	11/08/2010	Mayo County Council	Agrees with proposed approach to EIS preparation	Full planning application to be provided for the onshore substation and access road.
10	10/08/2010	Lucy Bingham McAndrew	Welcomed the proposal as potentially beneficial to the area provided it is implemented sensitively . Would like to ensure issues such as cultural heritage, navigation and the ecology particularly at habitat level are addressed adequately.	Should seriously consider a detailed analysis of how the cultural and archaeological sites and their historical significance might best be recorded and preserved for the benefit both of the local and of the national community. Provide names of company undertaking the ecological research aspect of the EIS. Undertake a fuller investigation of flora and fauna.

1.7.2 Consultation meetings

Throughout the project development stage meetings were held with key stakeholders at local and national level and with representatives in the Belmullet area. A list of consultations undertaken is provided in Table 1-4.

Table 1-4: List of consultation meetings

Group Consulted	Date	Purpose
Mayo Co. Council Chief Planning Officer	07/12/2007	Exploratory meeting *re* planning issues for possible substation as part of site selection process
Mayo Co. Council engineering staff, Belmullet	14/08/2008	Presentation of proposed project
Erris Inshore Fishermen's Association (EIFA) and others	17/11/2008	Meeting with ad hoc local group including Eddie Diver, chairman of EIFA. Introduction to the project
Mayo Co. Council staff and local area councillors	04/12/2010	Presentation of proposed project
Erris Inshore Fishermen's Association (EIFA)	08/01/2009	Attended general meeting of the association. Introduction to the project
Coastal Zone Management Unit (CZMU)	09/03/2009	Meeting with CZMU in DAFF, Johnstown castle, Wexford *re* lease / licensing requirements
Oireachtas Committee for Climate Change and Energy Conservation, Belmullet	30/03/2009	Presentation on marine renewables and proposed AMETS project
Coastal Zone Management Unit (CZMU)	21/05/2009	Meeting with the CZMU in Clonakilty *re* lease / licensing requirements
Water-based activities stakeholders	30/06/2009	Project information meeting
Erris Inshore Fishermen's Association (EIFA)	01/07/2009	Information meeting *re* test site and potential slipway at Frenchport
Oireachtas Committee for Climate Change and Energy Conservation, Dáil Eireann	30/03/2009	Presentation on proposed AMETS project and marine renewables
Erris Inshore Fishermen's Association (EIFA)	28/07/2009	Consultation *re* Frenchport slipway options
National Parks and Wildlife Service (NPWS)	25/09/2009	Meeting to discuss scoping of EIS
Local environmentally active stakeholders	06/10/2009	Meeting with Anthony Irwin and Machiel Oudejans on the scoping of the project Environmental Impact Assessment
Local stakeholders	10/11/2009	Meeting with Erris Research and Development Network
Irish Coastguard	09/02/2010	Meeting to discuss potential impact on navigation
Local surfers ad hoc group	23/02/2010	Project Information meeting
Commissioners of Irish Lights (CIL)	10/03/2010	Meeting to discuss potential impact on navigation.

Group Consulted	Date	Purpose
National Parks and Wildlife Service (NPWS)	12/03/2010	Meeting *re* draft scoping document for environmental impact statement
Ad hoc group of landowners from Annagh peninsula	30/03/2010	Meeting *re* possible project developments at Annagh. Subsequently, arising from geophysical survey results it was decided not to pursue any development on Annagh Peninsula
Marine Survey Office (Dept. of Transport, Tourism & Sport)	07/04/2010	Meeting to discuss potential navigation risks and safety requirements
Commission for Energy Regulation	08/04/2010	Meeting to discuss electricity generation and connection requirements
Local area councillors	27/04/2010	Project update and consultation
Public Information Day, Belmullet	28/04/2010	Poster and model display of project plans and public consultation
Coastal Zone Management Unit (CZMU)	21/05/2010	Meeting about exploration licence for surveys and deployment of wave and weather monitoring buoys
Local area planning officer, Belmullet	02/06/2010	Exploratory meeting *re* planning issues for proposed substation at Belderra
Bord Iascaigh Mhara (BIM)	11/06/2010	Meeting with North Mayo representative *re* fishing activity in vicinity of proposed test areas
Erris Lobster Conservation and Restocking Association (ELCRA)	29/06/2010	Consultation meeting with fishermen
National Parks and Wildlife Service (NPWS)	09/07/2010	Meeting at NPWS office, Ballycroy, *re* potential impact of slipway construction at Frenchport
Erris Inshore Fishermen's Association (EIFA)	11/08/2010	Update on proposed test site design and a presentation about the Orkneys test site
Ad hoc local stakeholders, Erris Chamber of Commerce, etc	12/08/2010	Update on proposed test site design and a presentation about the Orkneys test site
Declan Doogan, Killybegs Fishermen's Organisation	24/08/2010	Meeting *re* location and nature of trawling activities in vicinity of the proposed Test Area A
National Coastguard Service, Dublin	02/09/2010	Presentation of project and request for historical AIS data
Killybegs Fishermen's Organisation	21/09/2010	Project update and consultation meeting
Killybegs Harbour Master	21/09/2010	Presentation of project
Sonartron Ltd, Killybegs	21/09/2010	Collection and interpretation of fishing track data

Group Consulted	Date	Purpose
Mayo Co. Council	11/10/2010	Project update and consultation meeting in Council Chamber
Erris Inshore Fishermen's Association (EIFA)	13/10/2010	Meeting to discuss size and locations of test areas
Coláiste Comáin in Rossport	18/10/2010	Presentation on project to post Leaving Cert. classes
Local surfers ad hoc group	19/10/2010	Project update meeting and consultation *re* proposed cable landfall at Belderra
Mayo Ideas Lab	21/10/2010	Project update and consultation meeting
Belderra commonage owners ad hoc group	02/11/2010	Consultation *re* onshore cable route at Belderra, Cross
Erris Inshore Fishermen's Association (EIFA)	09/11/2010	Consultation *re* alternative Test Area A location
Erris Inshore Fishermen's Association (EIFA)	25/01/2011	Meeting to discuss their request for relocation of proposed Test Area A
Dept of Environment, Heritage & Local Government	10/02/2011	Presentation of project and EIS survey methodologies and results
Killybegs Fishermen's Organisation	10/03/2011	Meeting to discuss re-location of Test Area A
Erris Inshore Fishermen's Association (EIFA)	05/05/2011	Project update and consultation *re* alternative location for Test Area A
Local area councillors	10/05/2011	Project update and consultation
Bord Iascaigh Mhara (BIM)	26/05/2011	Consultation at Regional level *re* potential impacts on fishing activities
World Mayo Convention, Westport	28/05/2011	Presentation on project and its context within national energy strategy
Erris Inshore Fishermen's Association (EIFA)	27/09/2011	Project update and consultation *re* alternative location for Test Area A
Erris Inshore Fishermen's Association (EIFA)	05/10/2011	Consultation *re* relocation of Test Area A

Stakeholder groups and issues raised

The following is a summary of the main stakeholders groups consulted and the issues raised

Fishermen The principal concern of fishermen was loss of fishing ground, particularly trawling and crab potting areas. Other concerns included possible impacts from noise or electromagnetic effects on target species and the potential for further loss of fishing ground to large-scale commercial wave farms which might start up in the future.

Water based activities Issues raised included possible impacts on the SAC near the cable landing beach, effects on birds, noise, effects on surfing waves, whether pylons would be required and potential employment.

Surfers	The issue raised by the surfers related to the cable route at Belderra Strand and the need to avoid a sand bank which is the source of a good surfing break.
Local area councillors	The principle concern of the locally elected representatives was that local people, particularly fishermen, would be properly consulted about plans for the project.
Other, including Public Information Day	Other issues, raised at the first public information day (April 2010) and through correspondence and informal encounters included concerns about the effect of trenching of cables on the beach, the visual impact of shore facilities and devices at sea, impacts on the flora and fauna, the question of royalties on the commercial exploitation of wave energy and the assertion that even the wave and weather buoys deployed for the proposed project were taking up valuable fishing area.

All the issues raised in the public consultation have informed the Environmental Impact Statement (EIS). A further information day was also held for the public in early December 2011 to provide a general summary of the project's status after completion of the various consultations and to give advance notice of the submission of an application for a foreshore lease.

1.8 Data availability and constraints

Data and knowledge gaps can affect the level of confidence with which potential effects on the environment are identified and evaluated. An environmental baseline has been established for the project area through detailed surveys; hence knowledge of the receiving environment is comprehensive. To enhance the robustness of the ecology baseline, further monitoring is being undertaken for a period of an additional two years in advance of the deployment of wave energy converter technology at the site. The impacts from cable laying operations are well understood as their deployment is well documented. However, wave energy technology is still at the development stage and the data on impacts from full scale wave energy converters of the type ultimately to be deployed at Belmullet is not available. Assessment of impacts must therefore rely on knowledge and observations from existing marine industries such as oil, gas and shipping, from limited information from prototype wave energy converters deployed at other test sites (for example, at the European Marine Energy Centre in Orkney) and from expert judgement.

The AMETS facility, being a test site, will allow for comprehensive monitoring of impacts of deployed wave energy converters at a scale where the potential impact on the receiving environment will be low and where adaptive management will further reduce or eliminate such impacts. This is an essential step in designing future wave energy developments to ensure that when developed commercially, their impact is minimised.

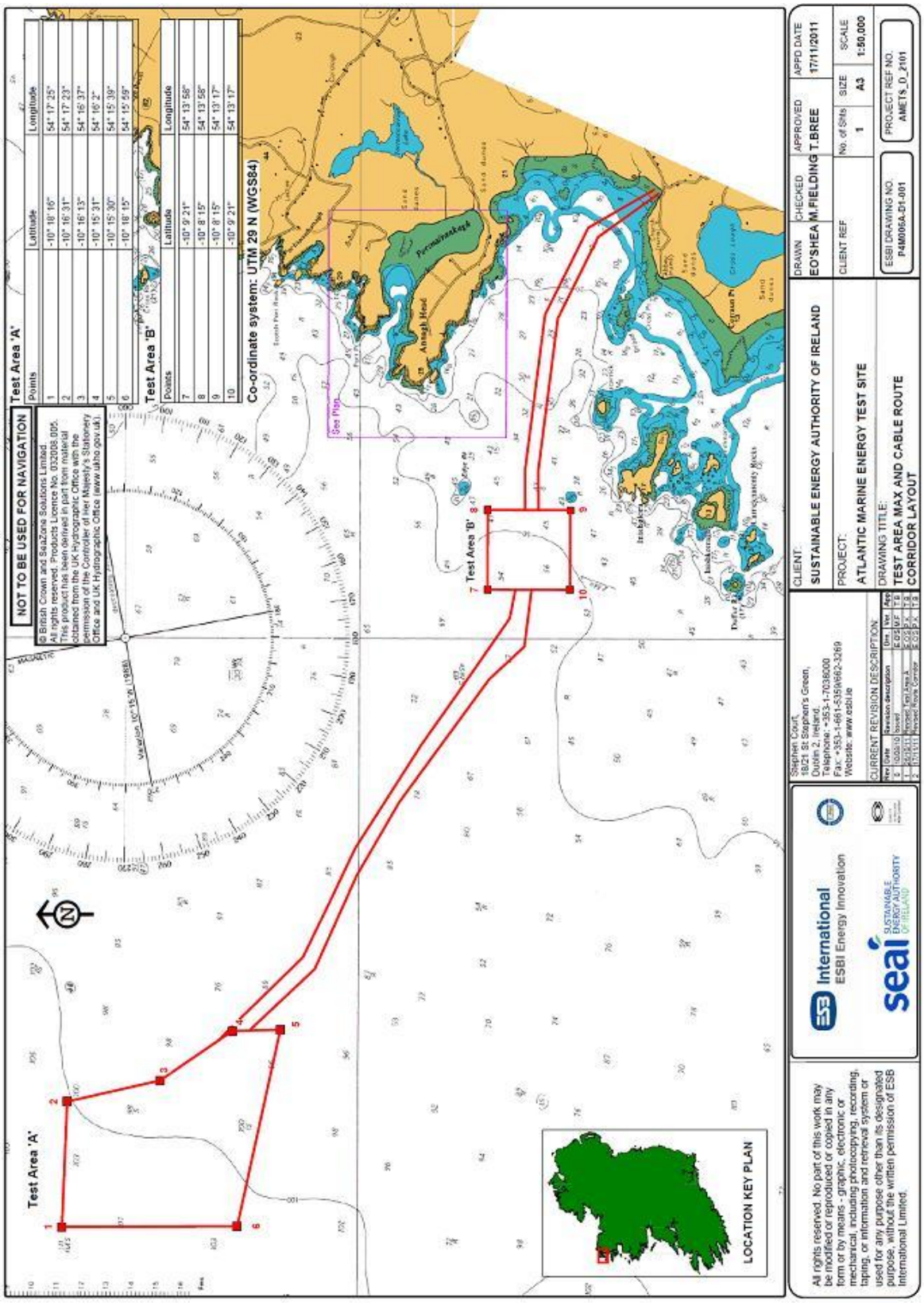


Figure 1-1: Proposed wave energy test site layout

Figure 1-2: Mayo County Council Renewable Energy Strategy – Potential Wave Energy Map