

## ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name

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Project name: West Islay Tidal Project

Planned

In Operation

Completed

Project description:

*Project Developer:* DP Marine Energy Ltd.

*Technology Developer:* None

*Technology type:* Technology neutral

*Resource (wave, tidal):* Tidal

*Project scale (test site, prototype, array, commercial):* Commercial

*Installed capacity (MW):* 30MW

*Project Website:* <http://www.westislaytidal.com/faq.html>

*Launch Date:* Expected 2016

*Additional Description:* West Islay Tidal Energy is a joint venture between DP Marine Energy Ltd. (DPME) a renewable energy developer part of the DP Group of companies and DEME Blue Energy (DBE) part of the DEME Group. DP Marine Energy has been working towards developing a tidal energy site off the West Coast of Islay since 2008, and aims to install a 30 MW array in the near future. The development site lies approximately 6km off the Rinns of Islay, and covers approximately 2km<sup>2</sup> of seabed. The long term goal is to expand the array, eventually producing a project providing up to 400 MW. In 2009, DP Marine Energy commenced a two year marine mammal and bird survey campaign in the area. Upon the completion of these surveys in 2011, an Agreement for Lease for the development area was granted by the Crown Estate.<sup>1</sup>

The site development proposals are based on a technology neutral approach in an attempt to minimise development risk by deferring final device selection until technology is more proven whilst still ensuring that the project progresses to reach the point of construction as quickly as possible in order to contribute to government renewable energy targets. It is not possible to adopt a completely neutral approach given the physical constraints and resources at the site; therefore a design envelope has been developed based on generic design philosophy. The design envelope includes seabed mounted devices that are either surface piercing or non-

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<sup>1</sup> West Islay Tidal, Project Programme. Available [Online] <http://www.westislaytidal.com/programme.html> Accessed 10/03/14.

surface piercing with horizontal axis turbines. The design envelope considers two device types, the first being a twin rotor system with blades capable of 180 degree rotation to optimise on flood and ebb tidal streams. The rotor diameter would be typically up to 20m. The second system is a bi-directional ducted tidal turbine with direct drive to a permanent magnet generator. Such devices currently in production are the SeaGen S developed by Marine Current Turbines and Alstom's TGL device.<sup>2</sup>

Mooring and foundations: There are many different possible methodologies for securing the turbine in position, these include a gravity base, piled or pin-piled fixed base. The MCT/Siemens device incorporates two turbine units attached to a lifting cross arm mounted on a steel tower anchored in the seabed (the Seagen S). Alstom's turbine is mounted on a tripod support structure pinned to the seabed. Hammerfest propose a similar tripod foundation but with ballast used to keep the structure in place.<sup>4</sup> Alternative floating support structure systems have also been considered as part of the EIA using the Bluewater BlueTEC floating platform as reference for the design envelope.<sup>3</sup>

Export cables: The inter-array cabling will be marshalled and exported to shore via up to three 33kV subsea export cables, landing at Islay. A number of routes were considered with potential landing points identified near Portnahaven, Bowmore and Kintra. The preferred option and the one which is described within the Environmental Statement (ES) is to route the export cable east from the tidal park to a landfall location at Kintra on Islay. This route has been selected in preference to the other two as it is the most direct route and so the most cost effective. Additionally it passes through areas of limited ecological sensitivity and provides the minimum onshore route length and therefore reduces potential visibility issues.<sup>4</sup>

Onshore infrastructure: Following landfall at Kintra the cable route continues overland to a substation located west of Port Ellen before leaving Islay via another landfall in Kilnaughton Bay. From here the cable then continues sub-sea for approximately 35km to landfall on the Kintyre peninsula prior to continuing overland to the main substation at Carradale. Given the long connection distance, it is probable that the voltage will require to be stepped up from 33kV to around 132kV to avoid excessive line losses. This will require a 33/132kV substation to be constructed on Islay. It is expected that the sub-station will be located in the vicinity of Kilnaughton Bay to enable the sub-sea section of cable to transmit at higher voltages to reduce losses and the potential for fault levels. From the landfall at Carradale the 132kV subsea cable will continue underground until connected into a termination module prior to onward routing either overhead on wooden poles or underground. This decision will depend on several factors including environmental, technical and cost considerations. It will be necessary to locate a small control/metering building adjacent to the Carradale substation prior to connection into the substation. This building will house protection and metering equipment to enable the appropriate electrical protection to be provided for the system and to meter the generated

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<sup>2</sup> DP Marine Energy, Request for Scoping Opinion. Available [Online] [http://www.westislaitidal.com/documents/Islay\\_tidal%20farm\\_scoping\\_final.pdf](http://www.westislaitidal.com/documents/Islay_tidal%20farm_scoping_final.pdf). Accessed 10/03/14.

<sup>3</sup> DP Marine Energy, Non-Technical Summary, Available [Online] [http://www.westislaitidal.com/documents/ES/Vol1-NTS\\_complete.pdf](http://www.westislaitidal.com/documents/ES/Vol1-NTS_complete.pdf) Accessed 07/04/14

<sup>4</sup> West Islay Tidal Energy Park, Volume 2, Environmental Statement. Available [Online] [http://77.68.107.10/Renewables%20Licensing/DP\\_Marine\\_Energy\\_Islay\\_Tidal/Environmental%20Statements/ES\\_Vol2\\_Book1\\_Completeredacted.pdf](http://77.68.107.10/Renewables%20Licensing/DP_Marine_Energy_Islay_Tidal/Environmental%20Statements/ES_Vol2_Book1_Completeredacted.pdf) Accessed 21/03/14

electricity prior to connection.

**Vessel Spread:** The main installation vessel will remain on site carrying out installation activities while a transport barge will be tasked with sailing between the installation site and the base port for loading of the components. The number of vessel movements and type of vessels used will depend on the selected turbine technology.<sup>4</sup> This information will be provided in the Construction Method Statement once the final design has been completed; however the installation works is most likely to be carried out by either jack up vessels, dynamic positioning vessels or heavy lift vessels. The vessels that are likely to be used are outline in the following table.

Type of installation vessel	Option 1: Large size Jack up barge as installation vessel	Option 2: Medium size Jack up barge as installation vessel	Option 3: Dynamic positioning scenario
Size of vessel	150m x 45m	68m x 38m	155m x 30m
Footprint of mooring system	4 triangular lattice spuds with circa 140m <sup>2</sup> spud area	4 circular spuds ca. 10m <sup>2</sup> spud area (possibly extended with spud cans)	Dynamic positioning holding a footprint of +/- 5m
No. tugs required	Jack up vessel is typically self-propelled,	Jack up vessel is typically self-propelled, but possible single tug required for initial positioning (30x22m)	n/a
Anchor handling vessel	n/a	n/a	n/a
Flat top barge (to bring out large items)	n/a	n/a	n/a
Crew change support vessel (vessel length)	Up to 26m		Up to 26m
Install vessel	100m x 50m		100m x 50m
SeaGen unit installed by	Same vessel	JUP vessel in case SeaGen S unit split up into multiple sections or by HLV (Heavy Lifting Vessel)	DP2 vessel in case SeaGen S unit split up into multiple sections or by HLV <sup>4</sup>

**Location:** 6km South West of the Rinns of Islay, South West Scotland.

**Coordinates:** The tidal energy site is centered on latitude 55.65°N and longitude 6.60°W.<sup>4</sup>

**Status:** In October 2011 The Crown Estate granted DPME an Agreement for Lease. A suite of environmental baseline characterization surveys to inform EIA commenced in 2011. The Environmental Statement was published in 2013 in support of an application for statutory consents. Following consent it is expected that drilling and foundation installation will begin in 2015.

**Licensing information:** An application for consent was submitted in 2013 and is yet to be determined.

Licence	Competent Authority	Reference
Marine Licence (Marine	Marine Scotland	TBC

(Scotland) Act)		
Section 36 (Electricity Act) Consent	Scottish Ministers	TBC
Licence to Disturb Basking Shark	Marine Scotland	TBC
European Protected Species Licence	Marine Scotland	TBC

Key environmental issues: Several potential impacts were identified during the Environmental Impact Assessment, however only the following were deemed to be potentially significant:

- Mortality or death of marine mammals as a result of collisions with operating turbines; and
- Temporary loss of fishing grounds due to the construction of the development.<sup>4</sup>

Environmental webpage: <http://www.westislaytidal.com/eia.html>

Mitigation measures:

A number of key mitigation and best practice measures have been proposed throughout the ES. These are as follows:

- Development of an Environmental Management Plan (EMaP) to be agreed with SNH and Marine Scotland, following submission of this ES. The EMaP will be a working document detailing the environmental actions highlighted in the ES, all activities to be carried out on site, responsibilities for those activities, environmental risks and the management protocols to be put in place to control these, as well as identification of personnel responsible for each element of the EMaP;
- An Environmental Monitoring Programme (EMP), to be agreed with Marine Scotland (MS) and Scottish Natural Heritage (SNH);
- A detailed Construction Method Statement (CMS) and a Pollution Control and Spillage Response Plan to be prepared and agreed with SEPA, SNH and MS-LOT prior to commencement of construction;
- All work will be undertaken to an overarching Health, Safety and Environmental Management System (HSEMS), which will include the CMS, the PIRP and the EMaP. The project will be supervised in accordance with the Construction Design and Management Regulations (2007); and
- Pollution Control and Spillage Response Plans to be developed and included in the EMaP.<sup>4</sup>

## Baseline studies and project effects studies: West Islay Tidal Energy Park

**General description** The following field surveys were undertaken (or commissioned by) the developer to inform baseline characterisation.

Receptor	Study description	Design and methods (brief description)	Results (brief description)	Status (planned, underway, completed, with dates)
Marine mammals	Vessel based visual survey by SAMS Research Services Ltd.	Monitoring was conducted during monthly boat-based surveys using both visual and acoustic methods. In addition, a seabed mounted passive acoustic recorder was also tested.	The variety of marine mammals identified using the waters immediately west of Islay are very much as would be expected for this site and habitat. Minke whales and basking sharks were not observed in the development site in summer. Monthly surveys were too sparse to confirm their absence. In general the sightings (and detection) rates of all species were not especially high, particularly in comparison to the number of marine mammals seen on the summer legs between northern Islay and Colonsay. The comparatively low detection rate for harbour porpoises in the centre of the development site was also evident on the moored porpoise detector. However, detection rates of some species (harbour porpoise and the two seal species in particular) appeared to be higher in particular areas of the survey area, with porpoise click events apparently concentrated in the southern half of the survey area (particularly along the ridge southwest of Portnahaven) and sightings of seals (especially grey seals) concentrated in the south eastern portion of the survey area. As clarified above, the small sample sizes mean that this spatial variability cannot currently be rigorously assessed, but it is suggestive of small-scale	Completed 2011 (2 year survey from November 2009 to November 2011)

			heterogeneity in habitat use.	
Benthic Ecology	Benthic ecology characterisation by Envision Mapping	Drop down video (DDV) survey, epibenthic beam trawls and benthic grab sampling, as well as intertidal biotope surveys	Mixed sediment habitats were observed along the western export cable route. Biotopes found at the Tidal Site and along the Western Export Cable Route were then superimposed onto both UKSeaMap 2010 predicted habitats and geophysical data results in order to estimate the extent of the biotopes.	Completed 2012 (between July and August)
Otters	Full otter survey of the development area	A full otter survey was conducted following standard methodology and using an appropriate field guide.	No evidence of an otter holt was recorded during the course of the survey. However, an otter spraint was recorded outside a rabbit burrow on the bank of Cornabus Burn.	Completed (15th and 16th September 2012,)
Ornithology	Vessel based transect survey	The European Seabird at Sea (ESAS) survey method was used as this is the most appropriate method for surveying relatively large areas offshore. Surveyors recorded all birds seen within 300m of the transect line (to one side of the survey vessel). The species, number, plumage, activity, flight direction, distance-band from the boat (0-50m; 50-100m; 100–200m; 200-300m), and whether flying birds were 'in transect' at the time flying-bird snapshot were taken. In the summer months (April to August) additional survey work was carried out along two corridors stretching from the main survey area to the North Colonsay and Rathlin Island SPAs respectively.	A total of 11 seabirds species were regularly recorded (defined as at least two records) using the development area and 1km buffer during the two years of baseline surveys. Of these, fulmar, gannet, and Manx shearwater were commonly seen but the great majority of individuals were in flight apparently transiting through the area. Common guillemot and razorbill were both reasonably common through the year and at times in the winter occurred in relatively large numbers.	Completed 2011 (2 year survey beginning in October 2009)
Fish ecology	Beam trawl surveys	Conducted using a 2m beam trawl fitted with an iron tickler chain and 24mm mesh net. A total of 8 tows were undertaken lasting from 5 to 13 minutes in length, at a speed over ground of between 2 and 3 knots. Total swept areas thus ranged from 802m <sup>2</sup> to 1845m <sup>2</sup> . The trawls were undertaken along the Western and Eastern Export Cable Routes.	The fish and shellfish communities at the Tidal Site and along the Western Export Cable Route to Islay are characterised by relatively low abundances of largely common and widespread species suited to a coarse rock/boulder strewn substratum, with strong water movement. There is no evidence that the Tidal Site or Western Export Cable Route to Islay are important	Completed 2012 (between July and August)

			nursery or spawning grounds, although spawning and nursery grounds for some species are reported within approximately 20 nautical miles of the Tidal Site.	
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## Monitoring and adaptive management: West Islay Tidal Energy Park

**General description** The following mitigation and monitoring measures are proposed within the project ES. The project team, along with Marine Scotland and other key stakeholders are currently preparing a Preliminary Environmental Monitoring Plan (PEMP) which will outline the proposed monitoring strategy in more detail.

Receptor	Monitoring program description	Design and methods (brief description)	Results (brief description)	Status (planned, underway, completed, with dates)
Marine mammals and basking sharks	Statistical feasibility study	DPME propose to undertake detailed statistical analysis based on the occurrence of species at the site and the scale of change anticipated, to determine feasible monitoring strategies at the site. The results of this study will then need to be discussed relative to the anticipated risks at the site to determine the precise scope of the on-going monitoring strategy.	n/a	Planned
Ornithology	Survey to quantify displacement	Collection of boat-based survey data using the same method during the installation and operational phases would potentially provide a means to measure the extent of any seabird displacement response to the development. Monitoring should focus on the species rated as having or medium EIA priority and SPA qualifying species for which potential LSE has been identified.	n/a	Planned
	Collision risk survey	Monitoring the response of diving auks to turbine rotors and provide data on collision risk would also be desirable. However, at this stage it is not clear how this may be practically achieved. <sup>4</sup>	n/a	Planned