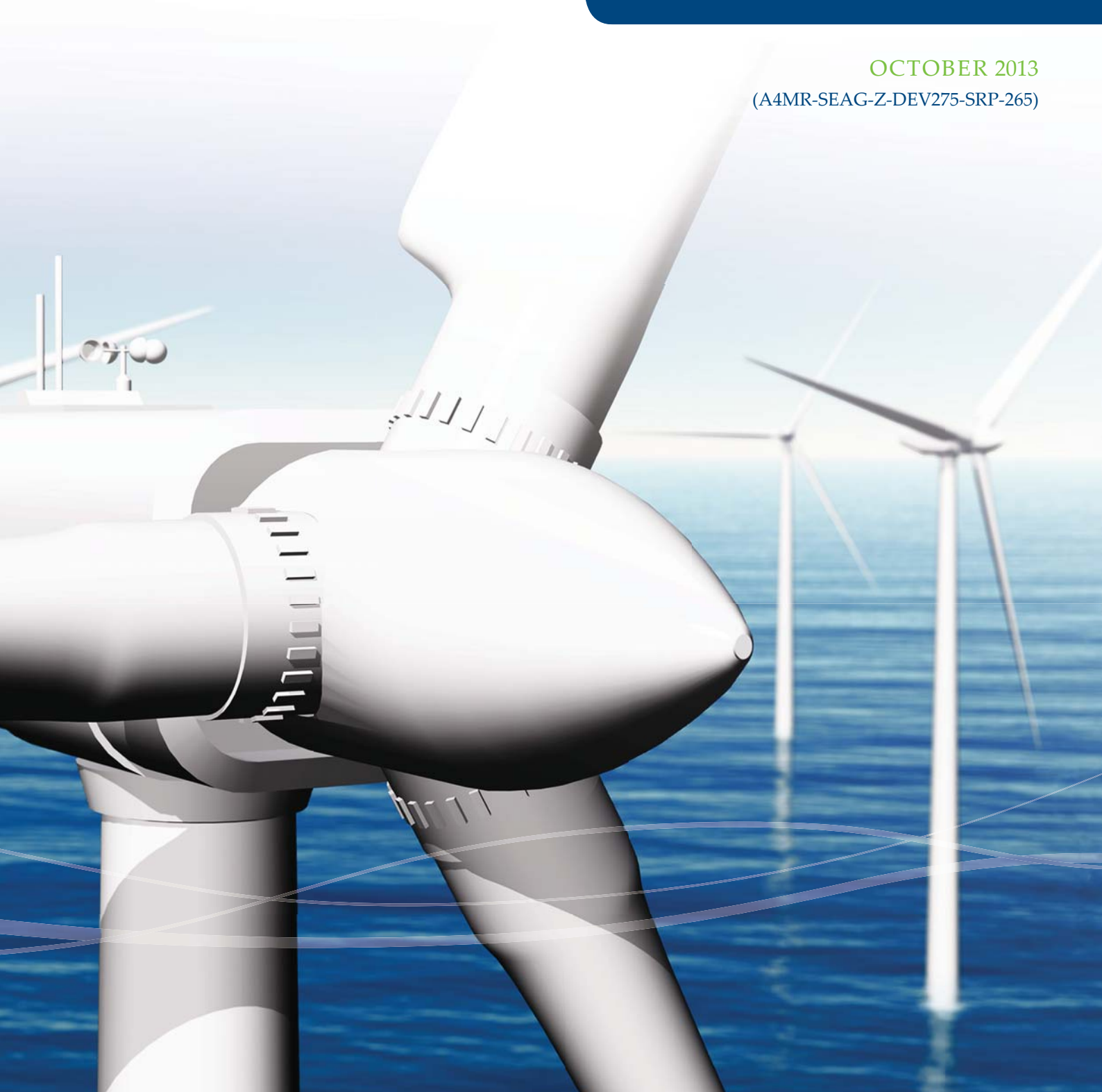


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## Non-Technical Summary

OCTOBER 2013

(A4MR-SEAG-Z-DEV275-SRP-265)



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## INTRODUCTION

This document (Reference: A4MR-SEAG-Z-DEV275-SRP-265) is a summary of an addendum (Reference: A4MR-SEAG-Z-DEV275-SRP-264) to the consent applications, submitted in October 2012 by Seagreen Wind Energy Limited under the Electricity Act 1989, the Marine and Coastal Access Act 2009 and the Marine (Scotland) Act 2010, to construct, operate and decommission Project Alpha and Project Bravo offshore wind farms and the associated Transmission Asset Project (known collectively as the 'Seagreen Project') up to Mean High Water Springs (MHWS). The addendum has been agreed with Marine Scotland and consists of the following documents:

- **Part 1:** Non-Technical Summary
- **Part 2:** Seagreen Phase 1 Offshore Project Habitats Regulations Appraisal – Information to Inform Appropriate Assessment (hereafter referred to as 'HRA Report') (Reference: A4MR-SEAG-Z-DEV275-SRP-233)
- **Part 3:** Erratum notifications for the following aspects of the Seagreen Phase 1 Offshore Project Environmental Statement (ES) (Reference A4MRSEAG-Z-DOC100-SPR-060):
  - » *Erratum 1* – Omission in error of annex to Technical Appendix F1 of Volume III of the Seagreen Phase 1 Offshore Project ES (Seagreen Reference: A4MR-SEAG-Z-DEV275-SEN-001)
  - » *Erratum 2* – Error to Plot 10.36 in Chapter 10: Ornithology of Volume I of the Seagreen Phase 1 Offshore Project ES (Reference: A4MR-SEAG-Z-DEV275-SEN-002)
  - » *Erratum 3* – Terminology error in Chapter 8: Water and Sediment Quality Volume I of the Seagreen Phase 1 Offshore Project ES (Reference: A4MR-SEAG-Z-DEV275-SEN-003)
  - » *Erratum 4* – Terminology update in Technical Appendix I2 of Volume III of the Seagreen Phase 1 Offshore Project ES (Reference: A4MR-SEAG-Z-DEV275-SEN-003)
  - » *Erratum 5* – Terminology update in Chapter 12: Natural Fish and Shellfish Resource of Volume I of the Seagreen Phase 1 Offshore Project ES and Technical Appendix I2: Phase 1 Salmon and Sea Trout Fisheries Technical Report of ES Volume III (Reference: A4MR-SEAG-Z-DEV275-SEN-005)

This Non-Technical Summary (NTS) starts with some information on the Applicants, the development goals and project approach, before providing detail on the project itself. It should be noted that there have been no changes to the project details since the original submission and that the introductory sections of this NTS repeat those of the NTS produced as part of the Seagreen Phase 1 Offshore Project ES, submitted to Marine Scotland in support of the consent applications in October 2012. This document includes a brief summary of the HRA Report and its conclusions.

## SEAGREEN WIND ENERGY LIMITED

Seagreen Wind Energy Limited (hereafter referred to as 'Seagreen') is the parent company of Seagreen Alpha Wind Energy Limited (SAWEL) and Seagreen Bravo Wind Energy Limited (SBWEL), and is a joint venture between SSE Renewables Developments UK Limited (SSER) and Fluor Limited. Seagreen combines the established and extensive track record of renewable energy development, asset management and operations experience of one of the UK's leading energy companies, with the offshore project delivery expertise of one of the world's largest publicly owned contracting, engineering, procurement, construction and maintenance services companies.

## THE SEAGREEN PROJECT GOALS

The Seagreen Project is the first phase in the development of the Forth of Forth Round 3 Zone 2. This is one of the Round 3 offshore wind projects being promoted around Scotland and the UK with a view to making major contributions to national and international renewable and low-carbon energy generation targets. The Seagreen Project, at over 1 Gigawatt (GW) target capacity, constitutes one of the largest renewable energy projects in Scotland, and will produce enough clean, renewable energy to meet the equivalent of the annual energy consumption of 670,000 homes. The Seagreen Project, and the planned development of a further 2.5GW of target capacity in subsequent development phases within the Firth of Forth Zone, will contribute significantly to the Scottish Government's aim of cutting greenhouse gas emissions by 80% and achieving the equivalent of 100% of electricity demand from renewable sources by 2020. The Seagreen Project will also contribute as part of a wider economic aim to secure investment and opportunities for renewables and to make a significant contribution to the national economy. It will offset high-carbon means of generation, with a knock-on effect in reducing the growth in carbon emissions, and the consequent climatic effects of a greater proportion of atmospheric carbon. In addition, the generated power will contribute to national goals such as energy supply security for the UK.

## SEAGREEN PROJECT APPROACH

Seagreen is seeking to construct and operate two offshore wind farms, known as Seagreen Alpha (hereafter referred to as 'Project Alpha') and Seagreen Bravo (hereafter referred to as 'Project Bravo'). Both offshore wind farms will accommodate up to 75 wind turbine generators with the capacity to generate up to 525 Megawatts (MW) of power. In addition to the offshore wind farm infrastructure, supporting transmission infrastructure is also included as part of the Seagreen Project. The offshore Transmission Asset Project includes offshore platforms, high voltage export cable(s) and cable landfall up to Mean High Water Springs at Carnoustie. Seagreen is seeking to consent this element of the Seagreen Project but it will be operated and owned by a separate entity under the Offshore Transmission regime. The Offshore Transmission Owner (OFTO) will be appointed through tender, post construction of the Transmission Asset Project.

Major project decisions regarding offshore wind farm design and construction will not be taken until project consents have been received. A 'Rochdale Envelope' approach has therefore been adopted which means that consent for a range of design parameters and installation methods is being sought, within a broad site area, so that the offshore wind farm design and construction can be refined within the current options as more technical and economic certainty becomes known.

The final offshore wind farm design and construction arrangements will be derived from the elements included within the Rochdale Envelope, following more detailed geotechnical surveys for example, as part of the detailed engineering design process. The benefit of this approach is the flexibility to respond to different design and construction requirements, and to balance this against local environmental criteria (such as reducing seabed scour to benefit species that may be affected by increased sedimentation, or reducing the effects of noise on prey species such as herring which are sensitive to noise from piling activities etc). The various options will have already been approved for use, and so the final design and construction arrangement detail can be varied to meet local conditions without need for a reapplication process, but will still be subject to the relevant licensing, mitigation and monitoring as required in consultation with Marine Scotland.



The Seagreen Project as a whole (including the various arrangements defined within the Rochdale Envelope) has been subject to an Environmental Impact Assessment (EIA), which examines the potential effects on physical, biological and human receptors, based on a worst case scenario which selects the design parameter and installation method with the greatest potential impacts for the receptor in question. This will lead to consideration of effects that may never actually occur. This precautionary approach underpins the environmental assessment within the ES, with the expectation that any impacts predicted against this will, in reality, be less (and in many cases significantly less). The ES was submitted to Marine Scotland as part of the consent applications in October 2012.



The whole consenting process is also subject to public consultation and detailed engagement with the various stakeholder groups, ranging from Marine Scotland and other statutory consultees, to local fishing groups and community representative bodies.

## SEAGREEN OFFSHORE WIND FARM PROJECT DETAILS

The Seagreen Project consists of three offshore elements:

1. **Project Alpha** Offshore Wind Farm (525MW);
2. **Project Bravo** Offshore Wind Farm (525MW); and
3. The **Transmission Asset Project** (infrastructure connecting the wind turbine generators with the National Grid, including the Export Cable Route corridor).

The offshore wind farms are located on relatively flat, uniform seabed to the east of the Angus coastline approximately 27 kilometres (km) from the town of Arbroath (see Figure NTS 1 at the back of this NTS). Inshore of Seagreen’s Firth of Forth Zone two other offshore wind farms are also proposed, Neart na Gaoithe and Inch Cape. A key part of the consenting process has been to consider the combined impact of all of the proposed offshore wind developments in this region.

The final layouts of Project Alpha and Project Bravo are dependent upon a number of factors, including the choice of wind turbine generator, the final foundation and substructure design and any mitigation measures to reduce the predicted impacts of the offshore wind farms. The design parameters for Project Alpha and Project Bravo are very similar and are summarised in Table 1 below along with the key design parameters associated with the Transmission Asset Project.

Project Alpha and Project Bravo comprise the first of three phases of wind farm development within the Firth of Forth Zone. Seagreen was awarded the right to develop the Firth of Forth Zone by The Crown Estate and the target generation capacity for the Zone is 3.5GW.

The wind turbine generators are composed of a nacelle and rotor complete with three blades, which are mounted upon a cylindrical steel tower; this in turn is supported by a foundation fixed to the seabed. The maximum height of the wind turbine generators above the lowest predicted water level to the blade tip will be circa 210m in a vertical position and the minimum spacing between wind turbine generators will be 610m.

**Table 1. Key Parameters of the Seagreen Project**

Key Parameter	Project Alpha	Project Bravo
Number of wind turbine generators (WTGs)	Up to 75	Up to 75
Total maximum installed capacity	525MW	525MW
Area	197 square kilometres (km <sup>2</sup> )	194km <sup>2</sup>
Distance from shore (closest point)	27km	38km
WTG rotor diameter	122 metres (m) (minimum) to 167m (maximum)	122m – 167m
WTG hub height above Lowest Astronomical Tide (LAT)	87.1m – 126m	87.1m – 126m
Tip height of the WTG above LAT	148.1m – 209.7m	148.1m – 209.7m
Minimum blade clearance above LAT	26.1m – 42.7m	26.1m – 42.7m
Minimum separation distance between WTGs	610m – 835m	610m – 835m
Colour of WTGs	Pale matt grey/off-white colour and will include display lighting	Pale matt grey/off-white colour and will include display lighting
<b>Other infrastructure</b>		
Meteorological masts	Up to six (three in each Offshore Wind Farm (OWF) project) ranging from 87.1m to 209.7m above LAT	
Wave buoys	Up to six (three in each OWF project)	
<b>Transmission Asset Project</b>		
Number of OSPs (not to exceed five across all projects)	2 – 5	
Number of export cables	2 – 6	
Indicative total export cable length (all high voltage cables)	up to 530km	

A number of different foundation and substructure designs are being considered for Project Alpha and Project Bravo (as part of the Rochdale Envelope approach) and the final choice will be based upon the size of wind turbine generator selected, as well as ground conditions, water depth and environmental conditions at the site. The offshore wind farms may also include up to six meteorological masts (three in each wind farm), to collect data on wind speed and direction, and up to six wave buoys (three in each wind farm), to monitor wave height and wave direction. The WTGs will be interconnected by a buried array cable network, which will also connect the WTGs to offshore platforms. Up to five offshore platforms may be required across the Seagreen Project depending upon final electrical connection design requirements.



The electricity generated will be transmitted to shore by up to six export cables, which will come ashore at Carnoustie on the Angus coastline. The offshore cables will be buried in the seabed to a target depth of at least 0.5m and where this is not possible they will be laid on the seabed surface and protected, typically under concrete mattresses, by rock dumping or by placing of large bags filled with concrete grout.

The onshore cable route will run from the Mean Low Water Tide Mark to an onshore transition pit close to the landfall, to a connection point with the electrical transmission network at Tealing via buried transmission cables. Details of the onshore works, which were subject to a separate consent application in May 2013, can be found in the Seagreen Phase 1 Onshore Transmission Works ES.



Offshore platform at Greater Gabbard Offshore Wind Farm  
Photo courtesy of GGOWL

The Crown Estate site lease is for 50 years and the Seagreen Project will have an operational life of 25 years. Towards the end of the operational life a decision will be made by the operating companies to proceed with decommissioning or to apply to the relevant regulatory authority at the time to repower the offshore wind farm. If repowering is desired for either offshore wind farm, this would be subject to a separate consenting process and an investigation of the possible options for repowering would be undertaken. A full Decommissioning Plan will be agreed with the Department of Energy and Climate Change (DECC) prior to construction and will include for the complete removal of all offshore structures above seabed level.

Regular servicing of the WTGs will take place during the operational life of Project Alpha and Project Bravo. In addition to maintenance, core operations staff will also be required to manage and support all aspects of wind farm operation. The location of a support base for these activities will be influenced by the contractor chosen to do this work but it is currently expected that at least some of these activities might be based in local ports along the east coast of Scotland.



Photo © Seagreen

## REGULATORY CONSENTS

A number of regulatory consents are required for the construction and operation of the Seagreen Project. The consents process is being led by the Scottish Ministers, acting through Marine Scotland, which is the Scottish Governmental body with responsibility for marine planning and licensing functions.

Seagreen has applied for the following key consents:

- Consent under Section 36 of the Electricity Act 1989 to construct and operate the offshore wind farms, including all ancillary infrastructure; and
- Marine Licences under the Marine and Coastal Access Act 2009 and the Marine (Scotland) Act 2010.

In addition to the above, an application will be made to the DECC for the implementation of safety zones under Section 95 of the Energy Act 2004 to ensure the safety of the offshore wind farm infrastructure, individuals working thereon, construction vessels and other vessels navigating in the area whilst works take place. The safety zones are likely to be up to 500m around all offshore structures during construction and decommissioning and a maximum of 50m around offshore wind farm structures may also be established during operation. Rolling safety zones around construction vessels will also be applied for during construction, also under the Energy Act 2004.

## PROGRAMME

The Seagreen Project is in the early stages of development and an outline programme of key milestones is provided in Table 2.

**Table 2. Seagreen indicative Project Programme based on achieving consents in Q4 2013.**

Programme Stage	Start	Finish
Tendering and award of contracts	Q4 2013	Q4 2015
Installation of export cables	Q4 2015	Q4 2017
Offshore foundations / substructures installation	Q3 2016	Q3 2019
Array cable installation	Q3 2016	Q3 2019
Installation of turbines and offshore platforms	Q2 2017	Q3 2019
Commissioning and first generated output to National Grid	Q2 2017	Q3 2019
Project completion	Q4 2019	Q4 2019



## THE NEED FOR AN ADDENDUM

The Seagreen Project is subject to an EIA, as required under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and the Marine Works (Environmental Impact Assessment) Regulations 2007, as amended by the Marine Works (Environmental Impact Assessment) Regulations 2011. Following submission of the consent applications in October 2012, Seagreen supplied Marine Scotland with an HRA Report under the Habitats Directive on 18th April 2013. Marine Scotland subsequently confirmed in a letter dated 22nd April 2013 that they consider the information as constituting additional information under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and the Marine Works (Environmental Impact Assessment) Regulations 2007, and that they require Seagreen to advertise the HRA Report under addendum procedures. Seagreen sought clarifications with Marine Scotland, Scottish Natural Heritage (SNH) and the Joint Nature Conservation Committee (JNCC), on the content of the addendum before updating the HRA Report and addendum as detailed below.

## INFORMATION TO INFORM APPROPRIATE ASSESSMENT

### Habitats Regulations Appraisal Process

The requirement for HRA is set out under the Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (the 'Habitats Directive').

The Habitats Directive protects habitats and species of European nature conservation importance. Together with the 'Birds Directive' (Council Directive 2009/147/EC on the conservation of wild birds), the Habitats Directive establishes a network of internationally important sites designated for their ecological status.

Special Areas of Conservation (SAC) are designated under the Habitats Directive, and promote the protection of flora, fauna and habitats. Special Protection Areas (SPAs) are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds. These sites combined create the wider 'Natura 2000' network of European designated areas. Internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them. The same level of protection is also afforded to potential SPAs (pSPAs), candidate SACs (cSACs) and draft SACs (dSACs).

Under Regulation 48 (2) of The Conservation (Natural Habitats, &c.) Regulations 1994 or Regulation 25 (2) of The Offshore Marine Conservation (Natural Habitats, &c.) Regulations (2007), if the proposed development is unconnected with Natura 2000 site management and is likely to significantly affect the designated site, the Competent Authority (in this case Scottish Ministers) must undertake an Appropriate Assessment (AA). The HRA process as defined by SNH (2012) includes the decision on whether the plan or project should be subject to appraisal, the screening process for determining whether an AA is required and any subsequent AA that may be required. The AA is the final assessment required by the Competent Authority (Scottish Ministers acting via MS in this instance) to enable the final decision on the application to be made, save where the exception for projects of imperative reasons of overriding public interest is invoked. Further details on this process are provided in the Seagreen Phase 1 Offshore Project ES (Volume I: Chapters 4 and 6 and Volume III: Appendix D).

## Screening and Consultation

The European sites (SACs and SPAs) and species (birds, marine mammals, fish and shellfish) included are based primarily on advice received from the JNCC and SNH in response to Seagreen's Phase 1 HRA Screening Report, submitted in October 2011.

For SPAs, the screening report was based on the data collected from the first year of boat-based ornithological surveys (December 2009 – November 2010), aerial surveys commissioned by The Crown Estate in 2009 and 2010, and also from satellite tracking data of relevant species where available. The Screening Report proposed a list of European sites, SPAs designated under the Birds Directive (2009/147/EC), and their qualifying and assemblage species that had the potential to experience a LSE from the Seagreen Project, either alone or in combination.

On 18th April 2013 Seagreen issued via email the Phase 1 Offshore Project Habitats Regulations Appraisal – Information to Inform Appropriate Assessment Report to MS, SNH and JNCC. The report issued provided the HRA of the Seagreen Project alone and did not present an HRA for the Seagreen Project in combination with the Inch Cape and Neart na Gaoithe offshore wind farms, as agreed with MS. The report was not published.

The HRA report now published provides the additional information requested by MS since April 2013 and includes HRA for the Seagreen Project in combination with the Inch Cape and Neart na Gaoithe offshore wind farms. This report also provides a revised ornithology assessment based on new advice from MS-Science (MSS), SNH and JNCC. The Ornithology HRA has been undertaken for eight breeding seabird species at four SPAs with between four and eight species qualifying at each SPA.

## Approach to Assessment

Seagreen has carried out a screening exercise to identify the plans and projects for consideration in combination with the Seagreen Project. Screening was based on the distance between the Seagreen Project and other plans and project, and on the identification of pathways by which there could be potential effects on HRA receptors (e.g. birds, marine mammals, and fish).

With respect to ornithology, marine mammal, fish and shellfish receptors, the following plans and projects were identified for consideration in combination with the Seagreen Project:

- Inch Cape Offshore Wind Farm (Inch Cape); and
- Neart na Gaoithe Offshore Wind Farm (Neart na Gaoithe).

The HRA takes the following approach to the assessment of potential adverse effects on the integrity of European sites, for both the Seagreen Project alone and in combination with other plans and projects:

- Definition of the assessment methodology (for example, collision risk modelling and underwater noise modelling);
- Identification of the potential impacts for which assessment is required; and
- Definition of the scenarios against which to make the assessment (according to the precautionary principle).



The assessment is made considering the Conservation Objectives for each European site, and then for the designated interest features of these sites. Conservation Objectives are generic for each SPA or SAC site.

For the SPA sites assessed, the Conservation Objectives are as follows:

- To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and
- To ensure, for the qualifying species, that the following are maintained in the long term:
  - » Population of the species as a viable component of the site;
  - » Distribution of the species within the site;
  - » Distribution and extent of habitats supporting the species;
  - » Structure, function and supporting processes of habitats supporting the species;
  - » No significant disturbance of the species.

For the SAC sites assessed, the Conservation Objectives are as follows:

- To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, this ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and
- To ensure, for the qualifying species, that the following are maintained in the long term:
  - » Population of the species as a viable component of the site;
  - » Distribution of the species within the site;
  - » Distribution and extent of habitats supporting the species;
  - » Structure, function and supporting processes of habitats supporting the species;
  - » No significant disturbance of the species.

The following sections present a summary of the Seagreen HRA (alone and in combination), in terms of ornithology, marine mammals, and fish and shellfish.

## Ornithology HRA

The ornithology HRA assessed the effects of Project Alpha, Project Bravo and the Transmission Asset Project on the eight breeding seabird species and four SPAs shown below (Table 3).

**Table 3. Breeding seabird species and SPAs considered**

Species	SPAs
Fulmar	Buchan Ness to Collieston Coast; Fowlsheugh; Forth Islands
Gannet	Forth Islands
Kittiwake	Buchan Ness to Collieston Coast; Fowlsheugh; Forth Islands; St Abb's Head to Fast Castle
Lesser Black-backed Gull	Forth Islands
Herring Gull	Buchan Ness to Collieston Coast; Fowlsheugh, Forth Islands; St Abb's Head to Fast Castle
Guillemot	Buchan Ness to Collieston Coast; Forth Islands; Fowlsheugh; St Abb's Head to Fast Castle
Razorbill	Fowlsheugh, Forth Islands; St Abb's Head to Fast Castle
Puffin	Forth Islands

These SPA colonies are designated for their breeding seabirds and therefore Seagreen was asked by SNH, JNCC and MS to focus its assessment on adult birds during the breeding season and consider two principle effects which could affect their survival or breeding success. These were collision with the rotating turbine blades and displacement from the wind farm footprint, which could include feeding grounds.

Firstly, Seagreen used boat-based survey data, gathered in each month over two breeding seasons, to estimate the density and total number of birds within the Project Alpha and Project Bravo sites. The proportion of each species that could be attributed to each SPA, as opposed to other colonies in the region, was then calculated. The calculations were based on the known foraging range of the birds and, where possible, on GPS tracking information from some SPAs. Tracking provided empirical evidence of the areas the birds preferred to use.

Assessment was then carried out to calculate how many birds from each SPA could collide with the turbines or be displaced. The assessment was based on best available information and is considered rigorous and robust. The results were compared to the total population size of the relevant SPA and discussed in terms of the population trend i.e. whether it was stable, increasing or decreasing.

The test of ornithological HRA is to determine whether the wind farm would have an effect on the SPA by ascertaining, amongst other things, that the population can be maintained in the long term. All of the assessments predicted that there would be no significant effect at a population scale due to Project Alpha and Project Bravo, either individually or combined, and because of this there would be no adverse effect on the overall population size or trend for any of the species at any of the SPAs. As a result it is considered that the competent authority should conclude in its Appropriate Assessment that there will be no adverse effect upon the integrity of the SPAs



## Marine Mammals HRA

The marine mammals HRA assessed the effects of Project Alpha, Project Bravo and the Transmission Asset Project on three marine mammal species and four SACs shown below (Table 4).

**Table 4. Marine mammal species and SACs assessed**

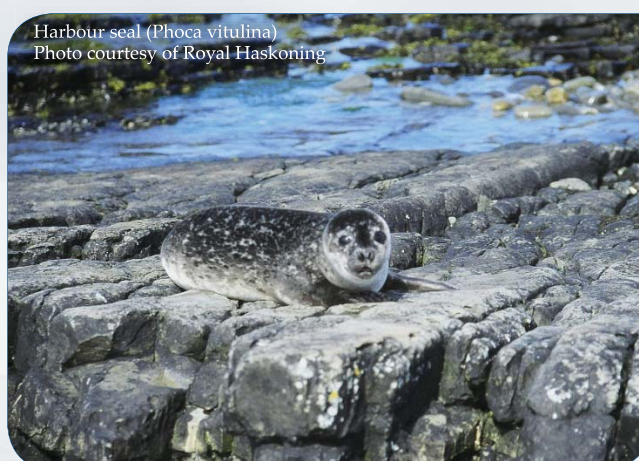
Species	SAC
Grey seal	Isle of May; Berwickshire & North Northumberland Coast
Harbour seal	Firth of Tay & Eden Estuary
Bottlenose dolphin	Moray Firth

The Seagreen assessment for these marine mammal SACs and species is focused on the potential effects of underwater noise arising during the construction phase of development. These effects include: fatality and physical injury; auditory injury; and behavioural effects.

Seagreen collected boat-based survey data with the aim of determining the presence and abundance of marine mammal species in the project area. These data were supplemented with information from long-term datasets including the Small Cetaceans in the European Atlantic and North Sea (SCANS-II) dataset, and satellite tracking data for seals. Underwater noise modelling has been undertaken to estimate the potential area of impact associated with underwater noise from pile driving, at different levels. Methods developed by the Sea Mammal Research Unit (SMRU) of St. Andrews University were used to determine marine mammal density in the project area, and to calculate the potential number of individuals of each species experiencing effects associated with underwater construction noise.

The predictions for potential impacts on grey seal, harbour seal, and bottlenose dolphin were compared to the reference population estimates, derived from the most recently available survey data, and discussed in terms of the population trend (i.e. whether it was stable, increasing or decreasing).

The test of the marine mammals HRA is to determine whether the wind farm would have an effect on the SAC population by ascertaining, amongst other things, that the population can be maintained in the long term. All of the impact estimates for the Project Alpha, Project Bravo and Transmission Asset Project areas are considered not significant in comparison to the SAC reference populations. It is therefore considered that the competent authority should conclude in its Appropriate Assessment that there will be no adverse effect upon the integrity of the SACs



## Natural Fish and Shellfish Resource HRA

The natural fish and shellfish HRA assessed the effects of Project Alpha, Project Bravo and the Transmission Asset Project on three fish species and one shellfish species, at five SAC sites shown below (Table 5).

**Table 5. Fish and shellfish species and SACs assessed**

Species	SAC
Atlantic salmon	River Dee; River South Esk; River Tay; River Teith; River Tweed.
Freshwater pearl mussel	River Dee; River South Esk
Sea lamprey	River Tay; River Teith; River Tweed
River lamprey	River Tay; River Teith; River Tweed

The focus of the Seagreen assessment for these fish and shellfish SACs and species is focused on the potential effects of underwater noise arising during the construction phase of development. These effects include: fatality and physical injury; auditory injury; and behavioural effects.



The assessment uses existing data for the study area spanning several years (e.g. from MSS and Cefas survey) and considers data from epibenthic trawl surveys undertaken by the Institute of Estuarine and Coastal Studies (ICES) for the project area. Video survey was also carried out. Underwater noise modelling has been undertaken to estimate the potential area of impact associated with underwater noise from pile driving, at different levels.

The test of the fish and shellfish HRA is to determine whether the wind farm would have an effect on the SAC population by ascertaining, amongst other

things, that the population can be maintained in the long term. All of the impact estimates for the Project Alpha, Project Bravo and Transmission Asset Project areas are considered not significant in comparison to the SAC reference populations. It is therefore considered that the competent authority should conclude in its Appropriate Assessment that there will be no adverse effect upon the integrity of the SACs.

Whilst there is no indication, on the basis of the information currently available, of an adverse effect on any SAC for which Atlantic Salmon, lamprey species and freshwater pearl mussel are an interest feature, there remains uncertainty about the specific movements of salmon to and from each of these sites. MSS is formulating a strategy aimed at improving the understanding of salmon ecology, and in particular the migratory routes of smolt. It is understood that this will include research that will inform the management of impacts on migrating salmon with a view to avoiding any adverse effects on populations, including those that are interest features of SACs. In support of this MSS has identified the knowledge gaps in relation to migratory fish and marine renewable energy projects.



## In Combination Assessment

The Habitats Directive requires all OWF applications to consider the potential effects arising from development activity for both the project alone, and in combination with other plans or projects.

To identify these plans and projects, a screening exercise was undertaken. This exercise was based on the distance of other plans and projects from the Seagreen Project, and on the identification of pathways for potential impacts on receptor species.

Screening identified two projects currently in the planning process for which there is potential for in combination effects, the Inch Cape and Neart na Gaoithe offshore wind farm projects.

### *Approach to in combination HRA: ornithology*

After assessment of Project Alpha and Project Bravo separately, these projects were considered in combination with Inch Cape and Neart na Gaoithe.

Data were standardised for all four wind farms and the same effects were assessed; that is displacement from the footprint of the constructed wind farm and collision with the rotating turbine blades. Because the proposed wind farms are located relatively close together, the same species and SPAs were included in the assessment.

The ornithology HRA found that the combined effects of the wind farms, although greater than those of the Seagreen Project alone, would not result in significant effects at a population scale on any of the species considered at the SPAs. As a result it is considered that the competent authority should conclude in its Appropriate Assessment that, in combination, there will be no adverse effect upon the integrity of the SPAs.

### *Approach to in combination HRA: marine mammals, fish and shellfish*

For marine mammals and fish and shellfish, after assessment of Project Alpha and Project Bravo separately, these projects were considered in combination with Inch Cape and Neart na Gaoithe.

The same effects were considered for all four wind farms, in relation to underwater noise during the construction phase: fatality; physical injury; auditory injury and behavioural effects. Because the proposed wind farms are located relatively close together, the same species and SACs were included in the assessment.

The HRA found that the combined effects of the wind farms, although greater than those of the Seagreen Project alone, would not result in significant effects on any of the species considered at the SACs. As a result it is considered that the competent authority should conclude in its Appropriate Assessment that, in combination, there will be no adverse effect upon the integrity of the SACs.

## Conclusion

HRA for the Seagreen Project (Project Alpha, Project Bravo and the Transmission Asset Project), both alone and in combination with the other planned wind farm developments in the Firth of Forth, has considered the SACs, SPAs and interest features shown in Table 6.

**Table 6. SACs, SPAs and interest features considered in HRA, both alone and in combination, of the Seagreen Project**

Site	Interest Feature
Forth Islands SPA	Fulmar, Gannet, Kittiwake, Lesser Black-backed Gull, Herring Gull, Guillemot, Razorbill, Puffin
Fowlsheugh SPA	Fulmar, Kittiwake, Herring Gull, Guillemot, Razorbill,
St. Abb's to Fast Castle SPA	Kittiwake, Herring Gull, Guillemot, Razorbill,
Buchan Ness to Collieston Coast SPA	Fulmar, Kittiwake, Herring Gull, Guillemot
Isle of May SAC	Grey seal
Firth of Tay & Eden Estuary SAC	Harbour seal
Berwickshire & North Northumberland Coast SAC	Grey seal
Moray Firth SAC	Bottlenose dolphin
River Dee SAC	Atlantic salmon and freshwater pearl mussel
River Tay SAC	Atlantic salmon, sea lamprey, and river lamprey
River South Esk SAC	Atlantic salmon and freshwater pearl mussel
River Teith SAC	Atlantic salmon, sea lamprey, and river lamprey
River Tweed SAC	Atlantic salmon, sea lamprey, and river lamprey

As advised by SNH, JNCC and MSS, the Seagreen ornithology HRA has focussed on two principle effects: collision with wind turbine blades and displacement from the operational wind farm site. The HRA found no evidence of adverse effects on the integrity of these SPAs and key features either from the Seagreen development sites, Project Alpha and Project Bravo alone or in combination with the other proposed offshore wind farm developments in the Firths of Forth and Tay.

Seagreen has already demonstrated a strong commitment to responsible development that minimises environmental impact through avoiding development on Scalp Bank, an important area for seabirds, and by proposing a reduced number of larger WTGs to achieve site capacity. Seagreen has also presented a further, precautionary, analysis of the potential effects of collision and displacement on the identified seabirds and sites and is confident that any future concerns over the effects of its own projects may be mitigated.

The HRA for marine mammals, fish and shellfish considers underwater noise arising from piling activity as the most significant impact. Underwater modelling techniques have been used for the purposes of assessment of potential fatality, physical (non-auditory) injury, auditory injury (PTS) and behavioural effects. The appraisal found no indication of adverse effects on the integrity of SACs and their key features, either from the Seagreen Project alone or in combination with other proposed offshore wind farm developments in the Firths of Forth and Tay.

Based on the evidence of the assessments presented Seagreen considers that the competent authority should conclude in its Appropriate Assessment that the Seagreen Project development sites of Project Alpha and Project Bravo, either alone or combined with each other or in combination with other developments, would have no adverse effect upon the integrity of any SPA or SAC.



## FURTHER INFORMATION

The addendum can be viewed during the statutory consultation period at the following locations:

### SEAGREEN WIND ENERGY LIMITED

C/o SSE Renewables  
1 Waterloo Street  
Glasgow  
G2 6AY

### SCOTTISH GOVERNMENT LIBRARY

Victoria Quay  
Edinburgh  
EH6 6QQ

### DUNDEE CENTRAL LIBRARY

The Wellgate  
Dundee  
DD1 1DB

### ANGUS PLANNING OFFICE

Planning and  
Transport Division  
County Buildings  
Market Street  
Forfar  
DD8 3LG

### ARBROATH LIBRARY

Hill Terrace  
Arbroath  
DD11 1AH

### CARNOUSTIE LIBRARY

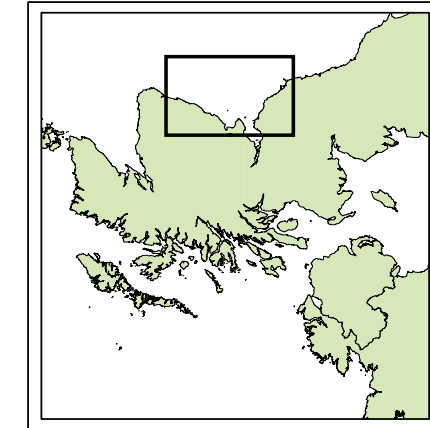
21 High Street  
Carnoustie  
DD7 6AN

### MONTROSE LIBRARY

214 High Street  
Montrose  
DD10 8PH

Copies of the addendum may be obtained from Seagreen (+44 (0) 141 224 7038 or [info@seagreenwindenergy.com](mailto:info@seagreenwindenergy.com)) at a charge of £350 per hard copy and £10 for a copy on DVD. Copies of a short non-technical summary are available free of charge.

Any representations to the application should be made by email to: The Scottish Government, Marine Scotland Licensing Operations Team mailbox at [seagreenphaseone@scotland.gsi.gov.uk](mailto:seagreenphaseone@scotland.gsi.gov.uk) or by post to: The Scottish Government, Marine Scotland, Marine Laboratory, PO Box 101, 375 Victoria Road, Aberdeen, AB11 9DB identifying the proposal and specifying the grounds for representation.



**Coordinate System**  
 UTM Zone 30 North (WGS84)  
 Projection: Transverse Mercator  
 Spheroid: Meridian Datum  
 Datum: 1980  
 Latitude of Origin: 0° North  
 False Easting: 500000.0  
 False Northing: 0.0  
 Reference Spheroid: WGS84  
 Inverse Flattening: 298.2572236



Project:  
**Firth of Forth Offshore Wind Farm**



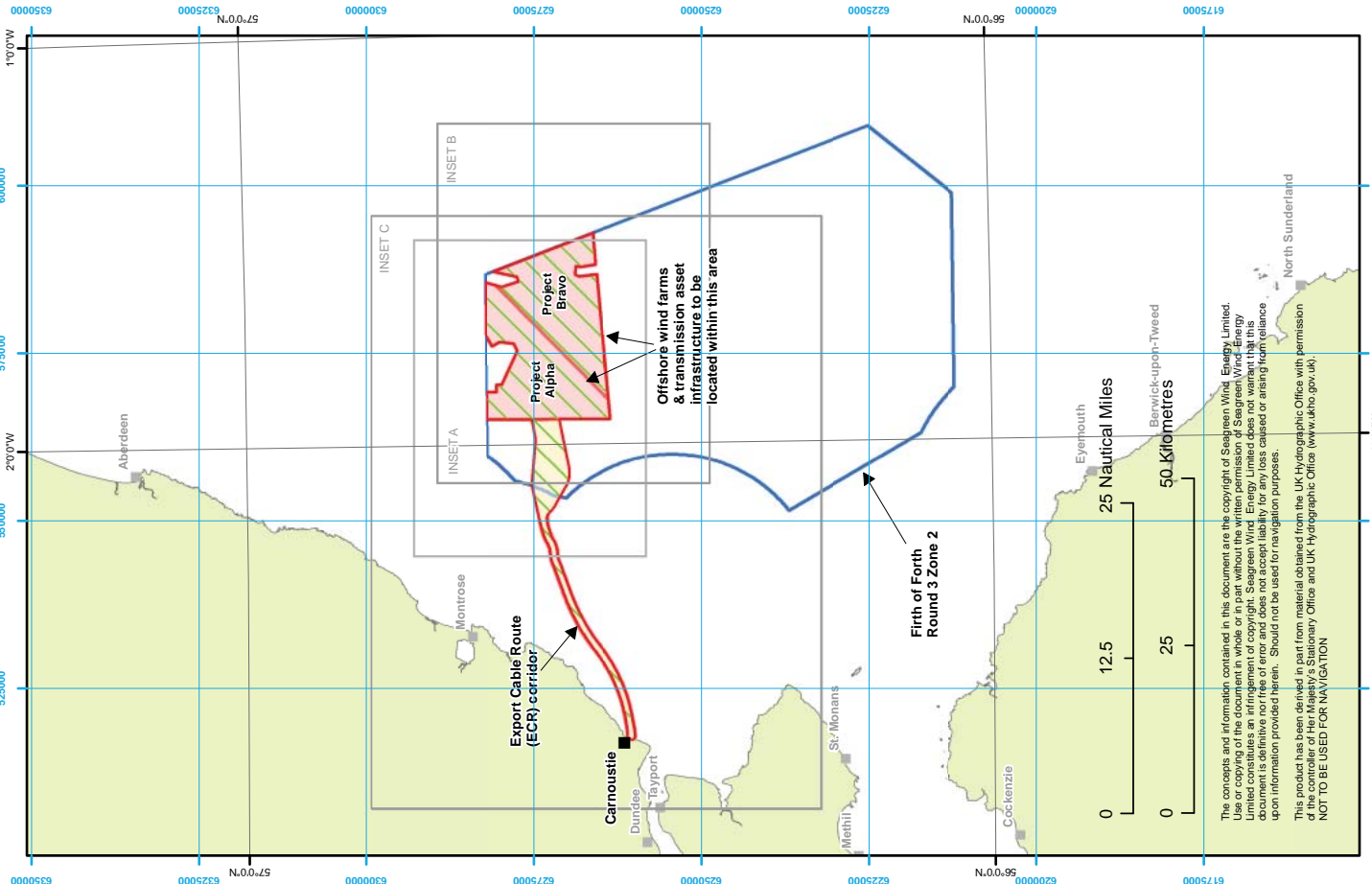
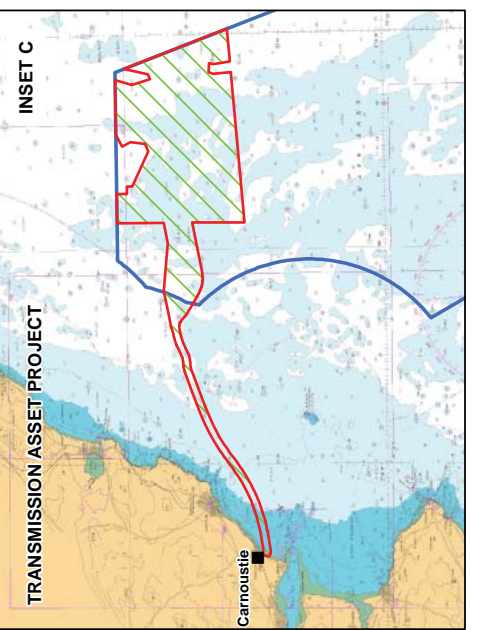
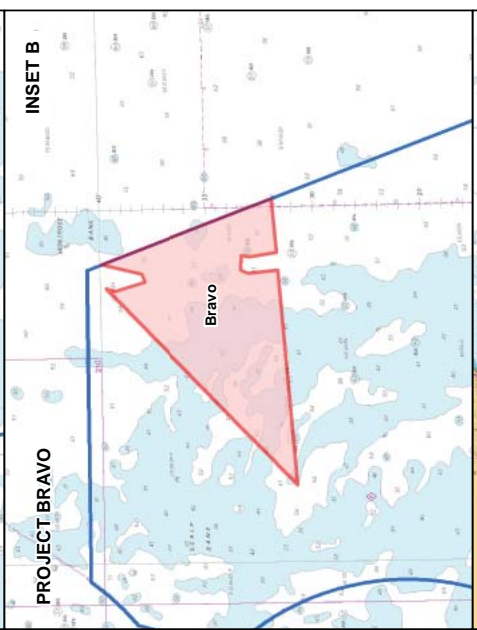
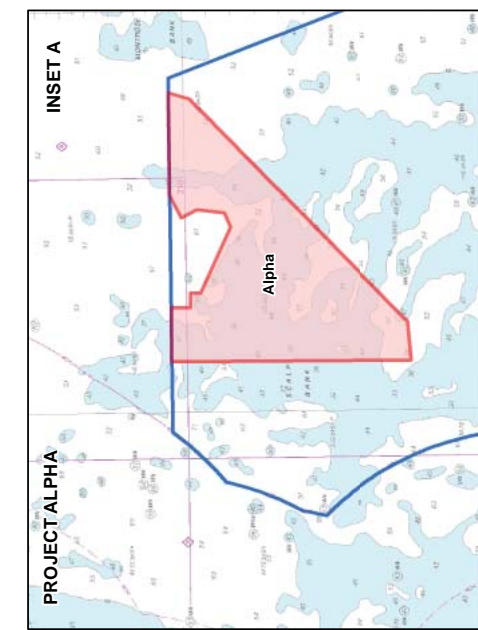
Figure / Drawing Title:  
**SEAGREEN PROJECT BOUNDARIES**

Figure/Drawing Number: FIGURE NTS 1

UNLESS THE REVISION IS B OR HIGHER THE DRAWING IS NOT TO BE USED FOR DESIGN OR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHKD	APPR	APPR	ENG
B0	26 SEPT 13	FOR FORMAL SUBMISSION	DT	NB	KB		RK

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**REGISTERED OFFICE:**

Seagreen Wind Energy Limited  
55 Vastern Road  
Reading  
Berkshire  
RG1 8BU  
Company No. 06873902

[www.seagreenwindenergy.com](http://www.seagreenwindenergy.com)



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