

CHAPTER 6: EIA PROCESS

INTRODUCTION

- 6.1. This Chapter of the Environmental Impact Assessment (EIA) Report describes the process that has been followed in undertaking an EIA for the optimised Seagreen Project consent applications. This includes an overview of the methodology used to identify, assess and mitigate potential significant environmental impacts associated with the construction, operation and maintenance, and decommissioning phases of the optimised Seagreen Project (Project Alpha and Project Bravo).
- 6.2. As set out in Chapter 1 (Introduction), a previous suite of consent applications was made in 2012 which was supported by a comprehensive Environmental Statement (the 2012 Offshore ES). Consent for the previous applications was awarded by Scottish Ministers in 2014. This EIA Report is provided in support of a suite of consent applications for the optimised Seagreen Project, to allow the incorporation of fewer, larger, higher capacity Wind Turbine Generators (WTGs) that have become available since the 2014 consents, and the inclusion of monopiles as a foundation option.
- 6.3. The approach to EIA specified within this chapter broadly follows the approach set out within the original 2012 Offshore ES (Chapter 6, EIA Process). Necessary deviations from this assessment approach are described within each of the topic specific chapters (Chapters 8 to 15 of this EIA Report). The approach to assessment set out within this chapter is applicable to all aspects of the optimised Seagreen Project Design Envelope, as set out in Chapter 5 (Project Description) of this EIA Report.
- 6.4. This Chapter should be read in conjunction with other relevant chapters of this EIA Report.

REQUIREMENT FOR EIA

Legislative Framework

- 6.5. The optimised Seagreen Project (Project Alpha and Project Bravo) will comprise an offshore generating station with a capacity greater than 50MW and therefore the construction of which (or the operation of which) requires Scottish Ministers consent under Section 36 of the Electricity Act 1989. The Project will also require Marine Licences, granted by the Scottish Ministers, under the Marine and Coastal Access Act 2009 and the Marine (Scotland) Act 2010, to allow for construction and the deposit of structures and substances on or under the seabed.
- 6.6. EIA Directive (2011/92/EU) (EIA Directive) (as amended) requires that an EIA must be carried out in support of an application for consent for certain types of major projects. Under the EIA Directive, an EIA is required for all projects listed under Annex I; Annex II projects may require an EIA, depending on the potential environmental effects of the project. Offshore Wind Farm (OWF) developments are listed under Annex II as “installations for the harnessing of wind power for energy production (wind farms)”. Annex II projects require an EIA to be undertaken where the project is “likely to have significant effects on the environment by virtue of factors, including their nature, size or location”. Due to the size and scale of the optimised Seagreen Project, Seagreen has prepared an EIA in support of this application for development consent.

- 6.7. The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations (as amended), implement the EIA Directive, in Scotland, in relation to the construction and operation of generating stations. On 16 May 2017, a new set of EIA Regulations came into force, transposing changes to the EIA Directive into UK law. In Scotland the requirements of the 2014 amendment (2014/52/EU) to the Environmental Impact Assessment (EIA) Directive (2011/92/EU) were transposed by:
 - The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended).
- 6.8. For projects from 0 to 12 nautical miles (nm):
 - The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended); and
- 6.9. For projects from 12 to 200nm:
 - The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended).
- 6.10. Furthermore, the Electricity Works Regulations 2017 and the Marine Works Regulations 2007 (as amended) were subsequently amended by:
 - The Environmental Impact Assessment (Miscellaneous Amendments) (Scotland) Regulations 2017 which came into force on the 30th June 2017 and introduced minor changes.
- 6.11. The consent application for the optimised Seagreen Project considers the offshore elements of the Seagreen project only. As these elements are beyond 12nm, the Electricity Works Regulations 2017 and the Marine Works 2007 Regulations (as amended) (hereafter referred to together as the '2017 EIA Regulations') are applicable.
- 6.12. Seagreen requested a scoping opinion prior to the 16 May 2017 and the new EIA Regulations coming into force and therefore this EIA Report has been prepared in accordance with the transitional provisions set out within the 2017 EIA regulations. This means that the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and the Marine Works (Environmental Impact Assessment) Regulations 2007 continue to apply with respect to the scope of the assessment. The legislative requirements and frameworks relevant to the optimised Seagreen Project are discussed further in Chapter 4 (Policy, Legislation and Guidance) of this EIA Report.
- 6.13. The Transmission Asset Project (including the Offshore Substation Platforms (OSPs) and export cable) was licenced separately, no changes are proposed, this remains as licenced and is therefore excluded from this assessment.
- 6.14. This EIA Report is prepared in support of applications for Section 36 Consents under the Electricity Act 1989 and Marine Licences under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009, for the optimised Seagreen Project. The report describes and assesses the potential impacts of the project throughout construction, operation and decommissioning phases for both Project Alpha and Project Bravo, alone and in combination with other wind farm and infrastructure projects. The assessment concludes the likely significance of impacts assessed, to enable understanding of the effects of the optimised project. Where significant impacts are identified mitigation is proposed to manage, reduce and where possible remove potential impacts.

EIA Guidance and Best Practice

- 6.15. This EIA Report has been prepared in accordance with regulatory requirements and current general best practice, together with applicable EIA guidance. Where specific guidance has been used, these are identified within the relevant technical chapters (Chapters 8 to 15) of this EIA Report.
- 6.16. Further information on relevant regulations, guidance and legislation is provided in Chapter 4 (Policy Legislation and Guidance) of this EIA Report.

THE EIA PROCESS

- 6.17. EIA is an iterative tool for examining and assessing the impacts and effects of the construction, operation and decommissioning stages of a development on the environment. The purpose of an EIA is to carry out an independent assessment of the 'likely significant effects' of a project, both adverse and beneficial. It is a systematic and evidence based process and comprises the following broad stages:
- Scoping of issues to be considered within the EIA;
 - Collection of baseline data, through surveys, consultation and desk based study, to describe and characterise the existing environmental conditions, as a basis for the impact assessment process;
 - Identification and assessment of potential environmental impacts and conclusions on the likely significance of impacts identified;
 - Identification of mitigation measures and monitoring, or management strategies that can be applied, to avoid, reduce, or remove identified adverse impacts and the subsequent assessment of residual impact significance.
- 6.18. The following sections describe the requirements and scope of this EIA report, consultation undertaken and how this has informed the assessment, including the approach to assessment of interrelationships, cumulative impact assessment (CIA) and transboundary issues.
- 6.19. The requirement and approach to HRA is summarised within Section 'Habitats Regulations Appraisal' below. Full details of this assessment are provided within Chapter 16 (Habitats Regulations Appraisal) of this EIA Report.

Scope of This EIA Report

- 6.20. Under EIA Regulations an applicant may submit a 'Request for Scoping Opinion' which requests opinion from the relevant regulatory authority on aspects such as the project design and the information to be provided within the supporting ES. In July 2010 Seagreen developed and submitted an EIA Scoping Report (Seagreen, 2010) to Scottish Ministers which considered the elements of the Seagreen Project. A Scoping Opinion was received from Marine Scotland Licencing and Operations Team (MS-LOT) on behalf of Scottish Government in November 2010 (MS-LOT, 2010). The 2012 Offshore ES was prepared on this basis and consent was granted on the information contained within the 2012 Offshore ES. A copy of the Marine Scotland Scoping Opinion was provided in Appendix B2, Volume III of the 2012 Offshore ES.

- 6.21. In May 2017 Seagreen submitted a Scoping Report to Marine Scotland (Seagreen 2017a), to seek opinion on the scope of EIA required for consent applications for the proposed optimised Seagreen Project. In September 2017 Seagreen received a Scoping Opinion from MS-LOT (MS-LOT, 2017) which clearly set out the proposed scope of the assessment and key areas where further assessment may be required.
- 6.22. The Scoping Opinion confirms that the 2012 Offshore ES has previously assessed the potential significant impacts of the full design envelope and the range of design parameters for the originally consented Project, and that where those design parameters remain unchanged, there is no need for further assessment. Where significant effects are not anticipated to arise, or where the significance of impact has already been assessed and concluded to be not significant, these topics/receptors are, therefore, scoped out of further assessment. However, where project design optimisation results in changes to design envelope parameters, the potential impact of those changes require assessment. In addition, where the baseline environment is considered to have changed, or where best practice in assessment approach has developed and improved then these aspects are scoped into the assessment, in line with the 2017 Scoping Opinion.
- 6.1. It is noted that socio-economics was originally scoped out of assessment in this EIA Report, however an up to date assessment of the potential economic benefits of the optimised Seagreen Project is included in Chapter 15.
- 6.2. Table 6.1 details the topics scoped into the assessment for the new consent application for the proposed optimised project and justification for inclusion. Further details of the scoping assessment and scope of this EIA Report are provided within the 2017 Scoping Report (Seagreen, 2017) and Chapter 7 (Scope of EIA Report).

Structure of Assessment

- 6.3. For those topics and impacts scoped into the assessment, the assessment of impacts is presented as a separate technical chapter within this EIA Report (Chapters 8 to 15). For those topics and impacts scoped out of this assessment, justification and associated mitigation are presented in Chapter 7 (Scope of EIA Report). Each topic chapter broadly follows the same approach to assessment and includes the following information. Where topics necessarily deviate from this approach this is stated within the relevant chapter.
- Chapter summary: provides a summary of the assessment undertaken, scope of the assessment, consultation that informed the assessment, conclusions of impact significance and any mitigation or monitoring required;
 - Introduction: introduces the topic assessment and sets out the scope of the assessment, with respect to the optimised Seagreen Project, and provides references to supporting figures, technical reports and further information;
 - Legislation, policy and guidance: sets out key legislation, policy context and guidance relevant to the topic assessment;
 - Consultation: details topic specific consultation undertaken to date and with whom, both formal and informal and sets out how the outcome of consultation has informed the assessment;
 - Scope of the assessment: sets out the scope of the impact assessment undertaken, confirms topics scoped in and out of the impact assessment in line with the 2017 Scoping Opinion and further consultation;

Table 6.1 Parameters and assessments scoped into the EIA Report

Parameter	Scoped in	Scoped out
Ornithology	Potential effects of increased turbine size on predicted mortality associated with collision and displacement of kittiwake, gannet, herring gull, razorbill, guillemot and puffin interest features of identified SPAs. Availability of new baseline data. Updates to assessment methodologies to reflect current guidance and best practice.	All other potential impacts, species and interest features.
Natural Fish and Shellfish Resource	Potential effects of underwater noise from pile driving on herring scoped in due to changes in the design of WTG foundations. Updated baseline information on Atlantic salmon. Review of potential impact of suspended sediments and smothering from gravity base installation on scallops and <i>Nephrops</i> required. Review of underwater noise in terms of particle motion effects required.	All other potential impacts on Natural Fish and Shellfish Resource.
Marine Mammals	Potential effects of underwater noise from pile driving on bottlenose dolphin, harbour seal, grey seal, harbour porpoise, minke whale and white beaked dolphin scoped in due to changes in the design of WTG foundations and updated best practice guidance.	All other potential impacts on Marine Mammals
Commercial Fisheries	Scoped in to update commercial fisheries baseline, to obtain validation of baseline data from the fishing industry and to address points raised by Scottish Fishermen's Federation.	None
Shipping and Navigation	Scoped in due to potential influence of optimised design on this receptor.	Marine traffic radar survey (scoped out through use of existing marine traffic surveys and AIS validations to meet the requirements of MGN 543).
Seascape, Landscape and Visual Amenity	Scoped in due to potential influence of optimised project design on this receptor. Updated guidance requires a new assessment to be undertaken. The assessment will also require consideration of the installation of WTGs of greater dimensions which could increase visibility. Consideration of Bell Rock Lighthouse and Ladyloan Signal tower.	None
Military and Civil Aviation	Scoped in due to potential influence of optimised design on this receptor.	None
Socio-economics	Socio-economics was originally scoped out of assessment in this EIA Report, however an up to date assessment of the potential economic benefits of the optimised Seagreen Project is included in Chapter 15	None

Parameter	Scoped in	Scoped out
Physical Environment	None	All potential effects on Physical Environment. No significant effects were predicted in the 2012 Offshore ES and this is predicted to remain the case. Confirmed by 2017 Scoping Opinion.
Water and Sediment Quality	None	All potential effects on Water and Sediment Quality. The 2017 Scoping Report concluded that the expected effects will remain as previously assessed and no significant effects are predicted with regards to water and sediment quality. Confirmed by 2017 Scoping Opinion.
Benthic Ecology	None	All potential impacts on Benthic Ecology. The 2017 Scoping Report reported that no significant effects were predicted in the 2012 Offshore ES and no further assessment would be required. Confirmed by 2017 Scoping Opinion.
Archaeology and Cultural Heritage	Consideration of Bell Rock Lighthouse and Ladyloan Signal tower. This issue is considered within the SLVIA assessment (Chapter 13).	All potential impacts on Archaeology and Cultural Heritage. The 2017 Scoping Report reported that no significant effects were predicted in the 2012 Offshore ES and no further assessment was proposed. Confirmed by 2017 Scoping Opinion.
Other Marine Users and Activities	None	All potential impacts on Other Marine Users and Activities. No significant effects were predicted in the 2012 Offshore ES and the 2017 Scoping Report concluded that this will remain the case. Confirmed by 2017 Scoping Opinion.

Parameter	Scoped in	Scoped out
Habitats Regulations Appraisal (HRA)	<p><i>Ornithology</i></p> <p><i>European sites and qualifying interests</i></p> <p>Buchan Ness to Collieston Coast SPA – guillemot, kittiwake and herring gull.</p> <p>Forth Islands SPA – gannet, puffin, guillemot, razorbill, kittiwake, herring gull.</p> <p>Fowlsheugh SPA – guillemot, razorbill, kittiwake, herring gull.</p> <p>Outer Firth of Forth and St Andrews Bay Complex pSPA – gannet, puffin, guillemot, razorbill, kittiwake, herring gull.</p> <p>St Abb’s Head to Fast Castle SPA – kittiwake, herring gull, guillemot, razorbill.</p> <p><i>Potential Impacts</i></p> <p>Displacement – in respect of gannet, guillemot, razorbill, puffin, kittiwake and herring gull only.</p> <p>Barrier effect – in respect of puffin, guillemot, razorbill, kittiwake only.</p> <p>Collision risk – in respect of gannet, guillemot, razorbill, puffin, kittiwake and herring gull only.</p> <p><i>Marine Mammals</i></p> <p><i>European sites and qualifying interests</i></p> <p>Isle of May SAC (Grey Seal)</p> <p>Berwickshire & North Northumberland Coast SAC (Grey Seal)</p> <p>Firth of Tay & Eden Estuary SAC (Harbour seal)</p> <p>Moray Firth SAC (Bottlenose dolphin)</p> <p><i>Potential Impacts</i></p> <p>Potential direct effects arising from underwater noise generated from pile driving activities only</p>	All other sites/qualifying interests.



- Methodology: sets out the study area, data collection undertaken and approach to the assessment of impacts for the topic specific assessment and guidance followed. Should this necessarily deviate from the approach set out within this chapter, this is highlighted and described within the relevant technical chapter;
- Baseline Conditions: describes and characterises the baseline environment for the relevant receptors and the information used to inform the baseline, with reference as relevant to the 2012 ES. Where data are used to inform the assessment these are provided as required. To provide an understanding of baseline conditions over time, the predicted future baseline is also described;
- Assessment of impacts: confirms the project design parameters to be assessed (the worst case scenario) and presents the impact assessment for the topic and receptors scoped into the assessment throughout construction, operation and decommissioning phases and concludes on the likely significance of impacts. Mitigation measures and subsequent residual impacts are also identified. Impacts are assessed for Project Alpha and Project Bravo alone and cumulatively with other plans and projects, including the licenced Seagreen Transmission Asset Project;
- Mitigation and monitoring requirements: summarises relevant mitigation measures identified (both embedded and additional) for the topic assessed and sets out any monitoring proposals for potentially significant impacts identified;
- Summary: provides a summary of the impact assessment undertaken and concludes impact significance, mitigation required and residual impact significance for the optimised Seagreen Project. For completeness a comparison of residual impact significance with the 2012 Offshore ES, the 2013 SEIS/HRA and the 2014 consents, where relevant, is also provided.

Consultation

6.4. Effective consultation with stakeholders is an essential element of the EIA process. Views of key statutory and non-statutory consultees help to inform environmental studies and to identify specific issues that may require further investigation. Consultation is also an ongoing process which enables important feedback and consultee input in to the design evolution process, as well as enabling discussion of mitigation measures to be incorporated into the design of the project, thereby limiting adverse impacts and potentially enhancing benefits.

Consultation with statutory consultees

- 6.5. Under the EIA Regulations, consultation must be undertaken with particular regulators and other bodies known as statutory consultees. With respect to this EIA Report, Marine Scotland have confirmed the statutory consultees to be:
- Scottish Natural Heritage (SNH);
 - The Crown Estate Scotland (CES);
 - Scottish Environment Protection Agency (SEPA);
 - Historic Environment Scotland (HES);
 - Angus Council;
 - Dundee City Council;
 - East Lothian Council;
 - Fife Council;
 - Scottish Borders Council;
 - Maritime and Coastguard Agency (MCA); and
 - Northern Lighthouse Board (NLB).

- 6.6. During scoping, Seagreen requested that consultees advise if other organisations should be included in the consultation process for the Seagreen Project. No additional consultees were proposed from those initially consulted.
- 6.7. Following submission of the Scoping Report, consultation has been continued, to agree the approach to the new consent application, for specific technical topics scoped into the EIA Report, the approach to assessment, methods of analysis and presentation of information. A summary of consultation undertaken with key statutory consultees is provided in Chapter 7 (Scope of the EIA Report) and full details of consultation undertaken with statutory consultees is provided within the relevant section of technical chapters (Chapters 8 to 15) of this EIA Report.

Consultation with non-statutory consultees

- 6.8. The Scoping Report was also used to form the basis for early consultation with a number of other relevant (non-statutory) consultees and organisations, including those relating to the sea-users communities, including fishing, navigation and recreation. Consultees were asked for information, where relevant, opinions on the Seagreen Project and approach to the assessment and views on the proposed assessment methodologies.
- 6.9. Each technical chapter of this EIA Report includes a consultation summary of the organisations contacted, response to scoping, further consultation undertaken and confirmation of how comments have been addressed. The issues raised by consultees are addressed as far as possible within each of the technical chapters (Chapters 8 to 15) of this EIA Report.

Public consultation

- 6.10. In addition to the opinions of statutory and non-statutory consultees obtained during scoping, the views and opinions of the general public were also obtained throughout the EIA process.

Public information days

- 6.11. As part of the wider consultation process, Public Information Days were held to provide information about the optimised Seagreen Project and to invite comments or ideas from the local communities. The Public Information Days were held in February and March 2018 at locations nearest to the Seagreen Project area.
- 6.12. Public exhibitions were held on the 26 February 2018 at Arbroath Community Centre and on the 27 February 2018 at Montrose Town Hall. Due to severe weather conditions and concern for public safety, the third exhibition was re-scheduled and held at the later date of 27 March 2018 at The Station Hotel function room in Carnoustie.
- 6.13. Members of the public were informed via public notices placed in local and regional newspapers prior to these events. These included;
 - One notice of original events in the Dundee Courier;
 - Two notices of original events in the Carnoustie Guide and Gazette, and the Arbroath Herald; and
 - One notice of the re-scheduled event in the Carnoustie Guide and Gazette, and the Arbroath Herald.
- 6.14. Visitors to the exhibitions included councillors, association-members, journalists and land-owners.

- 6.15. A questionnaire to enable the public to provide their views on the proposals and request additional information on the Seagreen Project, if required, was also provided at the Public Information Days. Further details of the Public Information Days are provided within the Public Consultation Report (NIRAS, 2018).

Design Envelope Approach

- 6.16. Offshore wind farm projects are complex and it is not possible to define the final project design at the time an application for development consent is made. As a result, a number of options within the project design may remain under consideration until after consent is granted and further geotechnical investigations, detailed engineering design and procurement processes have taken place.
- 6.17. To enable projects to accommodate these uncertainties, EIA can be based on the established principle of the 'Design Envelope'. This approach is set out in the cases of *R v Rochdale Metropolitan Borough Council ex p Milne* (2000) and *R v Rochdale Metropolitan Borough Council ex p TEW* (1999).
- 6.18. The 2012 Offshore ES was based on the principles of the Design Envelope approach and this consent application is seeking to optimise the design envelope previously assessed. Specifically the optimised Seagreen Project is seeking to include an option to install fewer, larger WTGs (220m rotor diameter) and the option to use a monopile foundation solution in some locations. The use of a turbine with larger rotor diameter also implies that turbine hub height and maximum tip height, for example, defined in the 2012 Design Envelope will also need to be increased.
- 6.19. The assessment of a Design Envelope, for the purposes of EIA, requires that the Worst Case Scenarios (WCS) possible within that envelope are identified and assessed. The WCS identified and assessed is the most realistic scenario that would give rise to the greatest potential impact for the topic assessed. Any design parameter values less than the WCS assessed would therefore give rise to a reduced impact. The WCS will necessarily differ from topic to topic and from receptor to receptor and is based on the range of design options for the project, as set out within Chapter 5 (Project Description) of this EIA Report. The detailed design of a project, following consent award, can then vary within the Design envelope and can be further refined as engineering design details become available, without rendering the supporting EIA inadequate.
- 6.20. The Scoping Opinion and subsequent consultation with MS-LOT and other consultees has confirmed those topics for which impact assessment is required and the scope of those assessments for the optimised Seagreen Project. Within each technical chapter (Chapters 8 to 15) of this EIA Report, the WCS relevant to that topic is described in detail and these are used to form the basis of the assessment undertaken.
- 6.21. For those parameters for which no change is proposed and for those topics and receptors where no change in effect is anticipated, no further assessment has been undertaken as part of this EIA (in line with the Scoping Opinion 2017). Any relevant effects have already been considered and assessed in the 2012 Offshore ES and the conclusions of that assessment remain valid. As stated above, Socio-economics was originally scoped out of assessment in this EIA Report, however an up to date assessment of the potential economic benefits of the optimised Seagreen Project is included in Chapter 15.

- 6.22. For ease of reference, the scope of assessment for the full design envelope for which consent is being sought, the conclusions of impact significance and mitigation and/or consent conditions applied from the 2012 Offshore ES are summarised in Chapter 7 (Scope of EIA Report). For completeness, the conclusions of significance of impact for the full design envelope and the assessment used to inform the conclusion of impact significance (i.e. 2012 Offshore ES or this EIA Report) is summarised in Chapter 17 (Summary of Impacts) of this EIA Report.

Impact Identification and Evaluation

- 6.23. This EIA Report is provided in support of applications for two Section 36 Consents under the Electricity Act 1989 and two Marine Licences under the Marine and Coastal Access Act 2009 and Marine (Scotland) Act 2010, for the optimised Seagreen Project. The assessment approach broadly follows that set out within the 2012 Offshore ES which was provided in support of the original consents application. The approach to assessment is summarised in the following sub-sections.

Source-pathway-receptor model

- 6.24. The potential environmental impacts of the optimised Seagreen project have been assessed using a systematic approach to EIA, to identify and evaluate the potential impacts of the project throughout construction, operation and decommissioning for both Project Alpha and Project Bravo, alone and in combination. The assessment approach utilises the conceptual ‘source-pathway-receptor’ model, to identify potential impacts resulting from the proposed project activities on the environment and sensitive receptors within it.
- 6.25. The source represents an activity related to the project (e.g. piling, or vessel presence). The pathway represents the route through the environment by which the effects of an activity are transmitted (e.g. noise propagation, or disturbance/displacement) to potential receptors. The receptor is the environment (animal/human) or resource (viewpoint) that receives the effect and is impacted by it.
- 6.26. The purpose of the model is to establish the relationship between the effects generated during each phase of the Project and the receptor considered at risk. For this EIA Report the effects generated are those project activities associated with the revised design parameters and the receptors are those scoped into the assessment (in line with the Scoping Opinion [2017]) and further stakeholder consultation.

Effect vs Impact

- 6.27. The terms ‘effect’ and ‘impact’ are often used interchangeably and for the purposes of this assessment, the term ‘effect’ is used to describe the impact pathway as a result of project activities, for example underwater noise effects, while the term ‘impact’ is used to describe perceived changes in existing conditions (baseline) of sensitive receptors in the physical, ecological or human environment. Impacts can be adverse, beneficial or neutral and within this EIA Report, impacts reported are adverse unless identified otherwise.
- 6.28. Table 6.2 provides impact definitions used within this EIA Report.

Table 6.2 Impact Definitions

Impacts	Definitions
Direct Impact	Arises from activities occurring as a result of the Project
Indirect Impact	Occurs as a consequence of a direct impact (sometimes as part of a chain of events) and may be experienced at a point in space or time that is removed from the direct impact.
Adverse Impact	Results in negative changes to baseline conditions
Neutral Impact	Results in no detectable change to the baseline
Beneficial Impact	Results in an improvement to baseline conditions
Temporary Impact	Impacts that are intermittent/occasional in nature and are reversible i.e. are not permanent within the life of the Project
Permanent Impact	An impact that causes a permanent change in the affected receptors and continues indefinitely beyond the life of the Project.
Cumulative impacts	(see Section 'Assessment of Cumulative Impacts', of this chapter) Potential impacts that are likely to occur as a result of the Seagreen Project in conjunction with other current or planned OWFs or other marine and coastal developments or activities
Interrelated impacts	Impacts that can arise from the interrelationship of different topic specific impacts, either through space or time, upon the same receptor. For example commercial fishing activity may be spatially restricted during construction, while the seasonal distribution of target species may be impacted by noise from offshore piling operations.

Baseline Environment

- 6.29. A key part of the EIA process involves the collection of baseline data and information, either through desk based studies, literature review or project specific surveys, to understand the existing environment and therefore how identified receptors are likely to be affected by the Project. Understanding baseline conditions provides a means to assess potential changes in the environment once the project is in place, which includes consideration of trends in natural variation.
- 6.30. The optimised Seagreen Project has the same area and is within the same red line boundary as the originally consented Project and therefore, data collected to inform the 2012 Offshore ES remains a useful source of information, to inform the assessment of impacts for this EIA Report. This includes a range of detailed project specific surveys and site characterisation studies to define baseline conditions. The requirement to update, or validate baseline conditions was considered within the 2017 Scoping Report and the Scoping Opinion received. In the majority of cases the baseline of the assessment is considered valid, however, where necessary further data review and in some cases data collection has been undertaken in order to validate and update the baseline for assessment. In order to ensure this assessment can be read as a standalone, where relevant, baseline information is provided within this EIA Report and the accompanying Technical Appendices.
- 6.31. A description of the baseline environment and where relevant review of information to update the baseline is described in detail within the relevant section of the technical chapters (Chapters 8 to 15) of this EIA Report.

Assessing Impact Significance

- 6.32. Impact significance considers the sensitivity of the receptor and the magnitude of the effect. The definitions of these vary depending on the individual receptor or parameter assessed and this is defined in detail within the relevant section of each technical chapter (Chapters 8 to 15) of this EIA Report.

- 6.33. For each impact identified, the assessment of impact significance has been made with reference to accepted standards, criteria, technical guidance or legislation, as appropriate, for each technical topic and for individual receptors. The approach broadly follows that set out within the 2012 Offshore ES and the same terminology and definitions are applied. Determination of impact significance has been made using significance criteria that allows impacts to be expressed as Major, Moderate, Minor or Negligible. Impacts can also be beneficial or adverse and within this EIA Report, impacts reported are adverse unless stated otherwise.
- 6.34. The approach to assessment necessarily differs between technical topics, but wherever possible the same criteria are used to allow impact significance to be compared. A standard approach to the assessment of impact significance is summarised below, however, where specific guidance is applicable to individual technical assessments this is referred to and where the assessment necessarily deviates from the standard approach, this is clearly set out within the relevant chapter (Chapters 8 to 15) of this EIA Report.

Sensitivity of a receptor

- 6.35. Defining the sensitivity of a receptor has regard to relevant guidance, available knowledge and professional opinion. Where guidance does not exist, the term is generally characterised by the receptors ability to tolerate, adapt to and recover from changes in the environment. Consideration is also given to its importance, for example, protected status, economic value or value to the local community.
- 6.36. Within this EIA Report the sensitivity of a receptor is identified as Negligible, Low, Medium, or High. The Value and Sensitivity of each receptor assessed is set out and defined with each technical chapter (Chapters 8 to 15) of this EIA Report and this is necessarily topic specific. Table 6.3 sets out general definitions for the sensitivity of a receptor.

Table 6.3 Sensitivity of receptor

Term	Definition
Tolerance	Describes the sensitivity of the receptor to disturbance, damage, or loss from an external factor/activity. For example some fish species are more tolerant of subsea noise.
Adaptability	Describes the degree to which a receptor can avoid or adapt to an impact.
Recoverability	Describes the ability of the receptor to return to a state close to that which existed before the activity or event causing change took place.
Importance	Defined as either through recognition as a statutory designation, through protection under law, recognition as a resource locally, nationally or internationally, or economic value generated.

Magnitude of Effect

- 6.37. Magnitude of effect provides an indication of the scale and direction of change in the environment, following a project activity. It refers to the 'size' or 'amount' of a change and is a function of other aspects including extent, duration, frequency, likelihood and reversibility.
- 6.38. Within this EIA Report, magnitude of effect is identified as either Negligible, Low, Medium, or High. The magnitude of effect for a given project activity is set out and defined with each technical chapter (Chapters 8 to 15) of this EIA Report and this is necessarily topic specific. Table 6.4 sets out general definitions for magnitude of effect.

Table 6.4 Magnitude of effect

Term	Definition
Extent	The area over which there is potential for an impact to occur. This may be site specific (i.e. within the immediate footprint of the activity), Local (extending into the local area) Regional (extending into the regional area), National (extending into the national setting), or Transboundary (extending beyond national borders i.e. beyond UK waters).
Duration	The time over which the impact is expected to last, prior to recovery or replacement of the resource feature. Short term impacts are considered to be those associated with the site preparation, construction and demolition stages; long term impacts are those associated with the completed, operational development; and permanent impacts extend into the post-operational stage.
Frequency	A measure of how often the impact is likely to occur compared to natural variation. For example frequency could be continuous or intermittent.
Likelihood	The probability that an impact will occur
Reversibility	The ability of an impact to be reversed, i.e. an irreversible (permanent) impact is one from which recovery is not possible within a reasonable timescale, or for which there is no reasonable chance of action being taken to reverse it.

Impact Significance

- 6.39. Following identification of receptor value and sensitivity and magnitude of effect, it is possible to determine the significance of impact using the Impact Assessment Matrix (IAM). This is presented in Table 6.5.
- 6.40. The matrix provides a framework for the consistent assessment of impacts across all technical chapters. Judgement relating to the position on the matrix for specific impacts is based on professional opinion.
- 6.41. The significance of impact(s) identified is then defined according to the terminology in Table 6.6. This approach provides a consistent framework for considering and evaluating impacts across technical chapters.
- 6.42. For the purposes of this EIA Report, potential impacts identified as major or moderate are generally considered to be significant in EIA terms and mitigation may be required, while impacts identified as minor or negligible are generally considered to be not significant in EIA terms.
- 6.43. In instances where the method of assessment deviates from that described, or necessitates a change in terminology, this is clearly described within the relevant section of the technical chapter. Owing to the nature of certain environmental effects, for particular technical chapters, the application of the matrix approach may not be capable in itself of defining whether an impact is significant or not. In such cases the professional opinion of the topic specialist is applied, to determine potential impact significance. Where this is applicable, this is clearly set out within the relevant technical chapters (Chapters 8 to 15) of this EIA Report.

Table 6.5 Significance of Impact – Impact Assessment Matrix

Value / Sensitivity	Magnitude			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Table 6.6 Terminology for classifying impact significance

Impact Significance	Definition
Major	Very large or large change in site/asset conditions, both adverse or beneficial, which are likely to be important considerations at a regional or district level because they contribute to achieving national, regional or local objectives, or, could result in exceedance of statutory objectives and/or breaches of legislation.
Moderate	Intermediate change in site/asset conditions, which are likely to be important considerations at a local level.
Minor	Small change in site/asset conditions, which may be raised as local issues but are unlikely to be important in the decision making process.
Negligible	A barely discernible change which may not be detectable in site/asset condition and is likely to have a negligible influence on the site/asset.
No Impact	No discernible change in site/asset conditions, likely to have no measurable influence, irrespective of other effects.

Mitigation and Residual Impacts

- 6.44. Throughout the design evolution process and with consideration of the findings of the 2012 Offshore ES, measures have been taken to avoid potentially significant impacts wherever possible and practical to do so. The process of design evolution is described in Chapter 3 (Site Selection and Alternatives) and Chapter 5 (Project Description) of this EIA Report.
- 6.45. Mitigation measures that are incorporated into the design of the project are referred to as ‘environmental measures incorporated into the Project’. These measures are intended to prevent, reduce and where possible offset any significant adverse impacts on the environment. These are effectively ‘built in’ to the impact assessment and as such, the assessment includes consideration of these measures. These measures are detailed within the relevant technical chapters (Chapters 8 to 15) of this EIA Report.
- 6.46. Mitigation measures that were identified for topics scoped out of this EIA Report are provided within Chapter 7 (Scope of this EIA Report). Where relevant, these are discussed further within the relevant technical chapters (Chapters 8 to 15) of this EIA Report.
- 6.47. Where potentially significant adverse impacts have not been eliminated by project design or embedded mitigation, further mitigation measures, which are additional (additional mitigation) may be required. These measures are determined by the relevant technical experts and agreement with relevant stakeholders would be sought wherever possible.
- 6.48. Following the identification of additional mitigation measures, impacts are reassessed and residual impact significance is identified. The assessment of residual impact occurs following the identification and consideration of any additional mitigation and this process is presented and summarised within each technical chapter (Chapters 8 to 15) of this EIA Report.

Monitoring

- 6.49. In cases where residual uncertainty of impact is identified within this EIA Report, or the success of implemented mitigation measures requires validation, commitments may be made for the provision of monitoring. Monitoring programmes are most commonly required as a condition of consent, during and for a period after construction, but can also be utilised prior to and during operation, depending on the nature of the impact or mitigation measure under inspection.

- 6.50. Where monitoring is anticipated for identified impacts, or for mitigation proposals, outline monitoring proposals are set out within the relevant technical chapter (Chapters 8 to 15) of this EIA Report.

INTERRELATIONSHIPS

- 6.51. This EIA report considers the project life cycle from construction, throughout operation and maintenance to decommissioning and identifies potential linkages between technical assessments and interrelationships between project activities and receptors, to ensure a robust and holistic impact assessment for all receptors is identified.
- 6.52. Interrelationships describe the potential interaction of multiple project impacts upon one receptor and have a spatial and temporal component. Impacts may be short term, temporary or longer term over the lifetime of the Project. For example commercial fishing activity may be spatially restricted during construction and visually impacted during operation, while the seasonal distribution of target species may be impacted by noise from offshore piling operations.
- 6.53. The interrelationships between different impacts experienced by any given receptor, over each development phase is considered and summarised within each technical chapter (Chapters 8 to 15) of this EIA Report. This allows identification and understanding of the multiple potential impacts, from a variety of sources that may impact upon receptors.

ASSESSMENT OF CUMULATIVE IMPACTS

- 6.54. EIA Regulations require the assessment of cumulative impacts. This requires consideration and assessment of existing projects, projects under construction and consented or proposed projects identified in relevant development plans and programmes that have the potential to impact cumulatively with the optimised Seagreen Project.
- 6.55. Cumulative impacts can occur when the impacts from one project on an identified receptor combine (through either spatial or temporal overlap) with similar impacts from other projects on the same receptor. The purpose of considering cumulative impacts is to understand if the impacts from the optimised Seagreen Project (Project Alpha and Project Bravo), when considered together (combined), or cumulatively with other plans and projects are different, or more significant than from the individual projects in isolation. This enables additional mitigation to be identified, as appropriate.

Cumulative Impact Assessment Methodology

- 6.56. Cumulative impacts are considered for all stages of the Seagreen Project throughout construction, operation and decommissioning. Where design parameters remain unchanged and where impacts have been scoped out of the assessment (in line with the 2017 Scoping Opinion) these are not reassessed.
- 6.57. As stated above, the offshore Transmission Asset Project was licenced in 2014, this remains as licenced and is not assessed within this EIA Report. It is therefore considered as a separate project within the cumulative impact assessment.
- 6.58. The cumulative impact assessment considers the combined impact of the optimised Seagreen Project (i.e. comprising Project Alpha, Project Bravo), together with other OWFs, including the licenced Seagreen offshore Transmission Asset and 'relevant developments' identified for assessment (for example, aggregate extraction projects, cables and interconnectors and oil and gas projects). This assessment, in most cases, is qualitative and

is based on best available information and informed judgement. Where greater detail is available (i.e. submitted application and EIA information) this has been used.

- 6.59. The full list of relevant developments and an outline approach to the cumulative assessment has been agreed with Marine Scotland following consultation with key stakeholders. The scope of cumulative assessments has been considered within the relevant technical chapters (Chapters 8 to 15) of this EIA Report. The full list of developments considered for cumulative impact assessment is presented in Appendix 6A (Plans and Projects for Consideration for Cumulative Impact Assessment).
- 6.60. In undertaking the cumulative impact assessment, each technical chapter has reviewed the list of projects and plans presented, to identify those projects and plans that have the potential to give rise to cumulative impacts (due to spatial or temporal overlap with the optimised Seagreen project), for the specific receptor(s) under consideration. Where no impact pathway is identified, the project can be screened out of the technical topic cumulative assessment and this is stated. For those projects and plans identified as having the potential to give rise to cumulative impacts these are assessed within the relevant technical chapters (Chapters 8 to 15 of this EIA Report).

TRANSBOUNDARY IMPACTS

- 6.61. The United Nations Economic Commission for Europe (UNECE) Convention on EIA in a Transboundary Context (the Espoo Convention) (as amended), was negotiated to promote environmentally sound and sustainable development, while enhancing international co-operation in assessing environmental impacts of a proposed project.
- 6.62. The Espoo Convention requires assessments to be extended across national borders when a proposed activity in one country may cause a potential significant effect in another.
- 6.63. Under EIA Regulations, the competent authority, in this case Marine Scotland must determine if a development is likely to have significant impacts on the environment of another European Economic Area (EEA) State. To assist with this process, this EIA Report considers potential transboundary impacts of the optimised Seagreen Project. This is described, as relevant, within each technical chapter (Chapters 8 to 15) of this EIA Report. Where no transboundary impacts have been identified this is also stated.

ASSUMPTIONS AND LIMITATIONS

- 6.64. A number of assumptions have been made during preparation of this EIA Report, which are set out below. Assumptions specific to technical assessments are presented and discussed within the relevant technical chapters (Chapters 8 to 15) of this EIA Report.
- Information provided by third parties, including publicly available information and databases is assumed correct at the time of publication;
 - Baseline information from third parties presented is assumed to be accurate at the time publication. Any additional surveys undertaken provide an accurate representation of environmental features, however, due to the dynamic nature of the environment, conditions may change during the site preparation, construction, operational and decommissioning stages;
 - The worst case scenario, or scenarios, for each technical chapter will be assessed in accordance with current best practice and the Design Envelope principle;

- More detailed works will be required to finalise construction methods. For assessment purposes this EIA Report has adopted reasonable assumptions on the worst case scenario, with reference to Chapter 5 (Project Description) of this EIA Report; and
- The assessment of cumulative impacts is reliant on the availability of information on the projects and development schemes identified.

HABITATS REGULATIONS APPRAISAL

- 6.65. EC Directive on the conservation of natural habitats and of wild fauna and flora 92/43/EEC, generally known as ‘The Habitats Directive’ requires that certain habitats and species are given legal protection through a network of protected sites, the Natura 2000 Network of Sites. The Natura 2000 network includes Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) classified under the Birds Directive (Directive 2009/147/EC of the European Parliament and of the Council).
- 6.66. In addition to SACs and SPAs it is UK Government policy, and that of the devolved administration in Scotland, to provide Ramsar sites (designated under the Ramsar Convention on Wetlands of International Importance (Ramsar, 1971)) with the same level of protection as that provided for Natura 2000 sites. Together, SPAs and SACs make up the UK’s contribution to the EU’s Natura 2000 network of protected areas.
- 6.67. The Habitats and Birds Directive are transposed into domestic law in Scotland by the Conservation (Natural Habitats, &c.) Regulations 1994, for onshore aspects and marine aspects from 1 to 12nm. From 12-200nm the Conservation of Offshore Marine Habitats and Species Regulations 2017 apply. Under these regulations, SACs and SPAs are known as European sites. The competent authority (in this case the Scottish Ministers) must consider whether a plan or project has the potential to have an adverse effect on the integrity of a European site (including candidate and proposed sites). This process is known as Habitats Regulations Appraisal (HRA).
- 6.68. Under this process, where a likely significant effect is identified for a plan or project, either alone, or in combination with other plans or projects, an Appropriate Assessment (AA) is required to assess the implications with regards to the conservation objectives of the European Site.
- 6.69. In 2011, an HRA Screening Report was submitted for the Seagreen Project to Marine Scotland. The Screening Opinion was received in February 2012. Following receipt of the Screening Opinion, a standalone HRA report was submitted to Marine Scotland in October 2013.
- 6.70. To support this suite of consent applications, an HRA has been undertaken, to assist Marine Scotland, in their role as competent authority in undertaking an AA. The HRA assessment focuses on those effects scoped into the assessment, in line with the 2017 Scoping Opinion, and is presented within this EIA Report as a separate chapter (Chapter 16 [Habitats Regulations Appraisal]).
- 6.71. To inform the preparation of the HRA, an HRA Status Report was provided to Marine Scotland and Scottish Natural Heritage (SNH) for review in December 2017. This set out the proposed scope and approach to assessment. A response to the Status Report was received in January 2018. This confirmed that the approach to assessment was accepted and additional advice was provided with respect to the scope of the assessment. Advice received within this response has been considered in detail and this is presented in Chapter 16 (Habitats Regulations Appraisal) of this EIA Report.

REFERENCES

- European Commission. 2017. Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU).
- Institute of Environmental Management and Assessment (IEMA). 2004. Guidelines for Environmental Impact Assessment.
- Marine Scotland. 2015. Guidance for Marine Licence Applications – Version 2.
- Marine Scotland Licensing Operations Team. 2010. Scoping Opinion for the proposed Section 36 Application for the Seagreen Round 3 Offshore Wind Farm Phase 1, Firth of Forth.
- Marine Scotland Licensing Operations Team. 2017. Scoping Opinion for Seagreen Phase 1 Offshore Project.
- NIRAS. 2018. Public Consultation Report.
- Ramsar. 1971. The Convention on Wetlands of International Importance especially as Waterfowl Habitat, the ‘Ramsar Convention’. Iran, 1971
- R v Rochdale Metropolitan Borough Council ex p Milne. 2000. and R v Rochdale Metropolitan Borough Council ex p Tew. 1999.
- Scottish Natural Heritage. 2013. A Handbook on Environmental Assessment. Guidance for competent authorities, consultees and others involved in the Environmental Assessment Process in Scotland.
- Seagreen. 2010. Seagreen Phase 1 Scoping Report. Document No. A6SW/SEAG-Z-DEV230-SWR-020-A3. Seagreen, Glasgow
- Seagreen. 2011. Offshore Phase 1 Habitats Regulations Appraisal (HRA) Screening Report. Document No. A4MR/SEAG-Z-DEV200-SRP-094. Seagreen, Glasgow.
- Seagreen. 2013. Seagreen Phase 1 Offshore Project Habitats Regulations Appraisal – Information to Inform Appropriate Assessment.
- Seagreen. 2017a. Seagreen Phase 1 Offshore Project Scoping Report: Round 3: Firth of Forth. Document No. A4MR/SEAG-AB-DEV230-SPR-311.
- Seagreen, 2017b, Seagreen HRA Status Report. Document No. A4MR-SEAG-Z-DEV240-SRP-333.
- Seagreen. 2018. Revised Consenting Strategy for Phase 1 – Position Statement for Marine Scotland. Document No. A4MR-SEAG-Z-LGL810-SLE-535
- United Nations. 1991. Convention on EIA in a Transboundary Context (the Espoo Convention). Finland 1991.