

CHAPTER 12: SHIPPING AND NAVIGATION

Chapter Summary

This chapter presents an assessment of impacts relevant to shipping and navigation as identified in the 2017 Scoping Report, 2017 Scoping Opinion, Chapter 7 (Scope of Environmental Impact Assessment [EIA] Report) and consultation meetings.

Issues relevant to shipping and navigation were identified through consultation meetings and response received following submission of the 2017 Scoping Report. Key marine and navigational stakeholders consulted include the Marine Scotland Licensing Operations Team (MS-LOT), the Maritime and Coastguard Agency (MCA), Mainstream Renewable Power, Northern Lighthouse Board (NLB), Royal Yachting Association (RYA) Scotland, Scottish Fishermen's Federation (SFF), Transport Scotland (Ports and Harbours), Forth Ports, Chamber of Shipping (CoS), Cruising Association (CA), Red Rock Power Limited and regular operators identified from a marine traffic survey validation.

The optimised Seagreen Project comprises up to 120 Wind Turbine Generators (WTGs) and up to four previously consented Offshore Substation Platforms (OSPs). This chapter presents an assessment of the potential impacts on baseline receptors, including commercial vessels, commercial fishing vessels, recreational vessels and Search and Rescue (SAR) resources, within the area surrounding the optimised Seagreen Project throughout the construction, operation and decommissioning phases. Cumulative impacts are also assessed. The scope of assessment of this chapter is described in paragraphs 12.19 to 12.28 – 'Scope of Assessment'. The matrices used to determine the significance of the impacts are presented in paragraphs 12.48 to 12.51 – 'Significance Criteria'.

Following the 2012 Offshore Environmental Statement (ES), a marine traffic validation survey was carried out during February and March 2017 and July and August 2017. This collected Automatic Identification System (AIS) data from coastal receivers. The data was used to identify marine traffic numbers and routeing within a study area surrounding the optimised Seagreen Project. A desk study was also undertaken to identify navigational features within the study area. There were few navigational features identified with only the Inch Cape Offshore Wind Farm site and charted wrecks within the study area. The marine traffic survey identified cargo vessels, tankers and 'other' vessels as the main vessel types within the area, as well as fishing vessel and recreational craft activity. On average there was a minor increase in the number of vessels recorded during the summer period compared to the winter period. Other data sources used to inform the baseline include the RYA Coastal Atlas, satellite and sightings fishing data, marine incident data, Admiralty Sailing Directions and UK Admiralty Charts.

The outcomes of the impact assessment concluded that the impacts of Project Alpha or Project Bravo being built in isolation, in combination or cumulatively, on the identified receptors are **Not Significant**. The outcomes of the impact assessment have therefore been identified as the same as, or reduced when compared to the 2012 Offshore ES.

INTRODUCTION

- 12.1. This chapter of the EIA Report presents an assessment of the potential impacts upon shipping and navigation arising from the construction, operation and decommissioning of the optimised Seagreen Project as detailed in Chapter 5 (Project Description).
- 12.2. As set out in Chapter 1 (Introduction), the original Seagreen Project (herein referred to as the originally consented Project) received development consents from Scottish Ministers in 2014. This was confirmed in November 2017, following legal challenge by the Royal Society for the Protection of Birds (RSPB) to the consent award decision. Seagreen is now

applying for additional consents for an optimised design (herein referred to as the optimised Seagreen Project), based on fewer, larger, higher capacity WTGs that have become available, since the 2014 consent decision, and inclusion of monopiles as a foundation option.

- 12.3. This EIA Report provides an assessment of the potential environmental impacts of the optimised Seagreen Project, to support new applications for development consent. This chapter of the EIA Report assesses the potential impacts upon shipping and navigation throughout the construction, operation and decommissioning phases of the Project.
- 12.4. Shipping and navigation is the marine traffic movements and associated activities of vessels transiting and operating within the marine environment. Shipping and navigation is included within the EIA assessment due to the potential risks involved in implementing structures in a previously empty sea area. This chapter focusses on the movements of commercial marine traffic, fishing marine traffic and recreational marine traffic in relation to the optimised Seagreen Project. Potential impacts of the optimised Seagreen Project on these receptors include vessel displacement, increased collision risk and increased allision risk. Potential impacts on SAR resources are also assessed. These have been scoped into the assessment through review of the 2017 Scoping Report, the 2017 Scoping Opinion, Chapter 7 (Scope of EIA Report) and consultation meetings. The EIA process is discussed in Chapter 6 (EIA Process) and further detail on the optimised Seagreen Project design can be found in Chapter 5 (Project Description).
- 12.5. The originally consented Project comprises the Seagreen Alpha Offshore Wind Farm (OWF) (herein referred to as 'Project Alpha') and Seagreen Bravo OWF (herein referred to as 'Project Bravo') and the Offshore Transmission Asset. It is noted that the Offshore Transmission Asset has been separately licensed, no changes are proposed and therefore this is not considered further within this assessment. A full description of the optimised Seagreen Project is provided in Chapter 5 (Project Description).
- 12.6. The structure of this chapter is as follows:
 - Legislation, policy and guidance: sets out key legislation, policy context and guidance with reference to latest updates in guidance and approaches;
 - Scoping and consultation: provides details of consultation undertaken to date and how this has informed the assessment;
 - Scope of assessment: sets out the scope of the impact assessment for shipping and navigation in line with the 2017 Scoping Opinion and further consultation;
 - Methodology: sets out the study area, data collection undertaken and approach to the assessment of impacts for shipping and navigation;
 - Baseline conditions: describes and characterises the baseline environment for shipping and navigation and information used to inform the baseline;
 - Assessment of impacts: confirms the project design parameters to be assessed (the Worst Case Scenario [WCS]) and presents the impact assessment for shipping and navigation throughout the construction, operation and decommissioning phases and concludes on the likely significance of impacts. The assessment includes the consideration of any mitigation measures (both embedded and additional) and sets out any monitoring proposals for potentially significant impacts, if required;

- Cumulative Impact Assessment (CIA): presents the CIA for shipping and navigation throughout the construction, operation and decommissioning phases and concludes on the likely significance of impacts with consideration of mitigation measures;
- Inter-relationships: Assesses the potential inter-related impacts on any given receptor scoped into the assessment;
- Transboundary impacts: Considers the potential for any transboundary impacts in relation to shipping and navigation; and
- Assessment summary: provides a summary of the impact assessment undertaken.

12.7. All figures supporting this chapter can be found in Volume II: Figures.

12.8. The following documents support this chapter and are provided in Volume III: Appendices.

- Appendix 12A (Navigational Risk Assessment [NRA] Addendum);
- Appendix 12B (AIS Marine Traffic Validation);
- Appendix 12C (Project Alpha and Project Bravo 2012 NRA);
- Appendix 12D (2012 Hazard Log);
- Appendix 12E (Regular Operator Consultation);
- Appendix 12F (Marine Guidance Note [MGN] 543 and Methodology Checklist); and
- Appendix 12G (Consequences Assessment).

12.9. This chapter was produced by Anatec Limited (Anatec), specialist marine risk consultants.

LEGISLATION, POLICY AND GUIDANCE

12.10. The following sub-sections identify the overarching policy context, legislation or technical guidance that relates to shipping and navigation.

Policy Context

12.11. This section outlines the policy issues within the Scottish National Marine Plan that are relevant to shipping and navigation. Consideration of policies is important when defining the scope of the assessment in order to ensure that the EIA Report has been prepared in the knowledge of the relevant shipping and navigation policy issues.

12.12. The Scottish National Marine Plan: Section 13: Shipping, Ports, Harbours and Ferries – Objective One, highlights the issue of safeguarded access to ports, harbours and navigational safety. This EIA Report addresses this as baseline and future case routeing relating to ports are considered as part of Appendix 12A (NRA Addendum). The closest port (with vessel access) is Montrose, located 17.5 nautical miles (nm) west from the optimised Seagreen Project.

Legislative Requirements

12.13. Legislative requirements are limited with regard to the development of offshore renewables in consideration of shipping and navigation receptors. Therefore the following section details key guidance and methodologies considered.

Guidance

12.14. The following guidance and methodologies are considered when assessing impacts to shipping and navigation:

- MGN 543 Offshore Renewable Energy Installations (OREIs) – Guidance of UK Navigational Practice, Safety and Emergency Response (MCA, 2016);
- MCA Methodology for Assessing the Marine Navigational Safety of Offshore Wind Farms (MCA, 2015);
- The RYA's Position on Offshore Renewable Energy Developments: Paper 1 – Wind Energy (RYA, 2015);
- International Association of Lighthouse Authorities (IALA) Recommendations O-139 on the Marking of Man-Made Structures (IALA, 2013);
- Consolidated Text of the Guidelines for Formal Safety Assessment (FSA) for use in the International Maritime Organisation (IMO) Rule Making Process (MSC/Circ. 1023-MEPC/Circ.392), amended by MSC/Circ.1180-MEPC/Circ.474 and MSC-MEPC.2/Circ.5 (IMO, 2007);
- MCA MGN 372 (M+F) Guidance to Mariners Operating in the Vicinity of United Kingdom (UK) OREIs (MCA, 2008);
- The Recreational Craft Directives 2013/53/European Union (EU) – implemented into UK law by the Recreational Craft Regulations 2017 No. 737; and
- The SAR Framework for the UK and Northern Ireland (MCA, 2017).

CONSULTATION

12.15. As part of the EIA process Seagreen has consulted with a number of statutory and non-statutory organisations to inform the approach to assessment on shipping and navigation.

12.16. A Scoping Report was submitted by Seagreen in May 2017. This considered the proposed changes to the optimised Seagreen Project and identified potential requirements for assessment. A Scoping Opinion was issued by Marine Scotland Licencing and Operations Team (MS-LOT) on behalf of Scottish Ministers in September 2017. This considered the information presented within the Scoping Report and set out key issues to be addressed within the impact assessment.

12.17. Table 12.1 sets out the shipping and navigation consultation undertaken to date, including the date and type of consultation, the issues raised and how these have been addressed within this EIA Report. It should be noted that Red Rock Power Limited were also consulted within the Scoping Opinion in 2017 however no response was received.

Table 12.1 Summary of shipping and navigation consultee responses

| Consultee and Date | Summary of issues raised | How issues have been addressed |
|-----------------------------|---|--|
| Scoping Opinion 2017 | | |
| MS-LOT 15 September 2017 | Agree with the suggested assessment receptors for the shipping and navigation assessment. | Noted – no action required. |
| MS-LOT 15 September 2017 | Agree that AIS surveys are required for shipping movements during the appropriate period, but not for recreational vessels. | Noted. A marine traffic validation survey has been carried out for periods during 2017 and is summarised in this EIA Report (paragraphs 12.74 to 12.85 – ‘Current Baseline’). The full assessment can be found in Appendix 12B (AIS Marine Traffic Validation). |
| MS-LOT 15 September 2017 | Agree that the shipping baseline assessment requires updating with marine traffic survey data (in line with MGN 543) but recommend that Seagreen have on-going discussions with the MCA and the RYA to agree these requirements. | A consultation meeting was undertaken with the RYA Scotland on the 9 January 2018 and the MCA on the 25 January 2018 as detailed in Table 12.1 of this EIA Report. A proposed NRA approach was agreed with the MCA on 2 May 2018. |
| MS-LOT 15 September 2017 | Recommend that Seagreen discuss and agree the specific requirements for an updated NRA with the MCA. The outcomes of these discussions should determine whether the previous NRA remains representative of the baseline. If so, the Scottish Ministers agree that the conclusions of the Original Development EIA remain valid. | Proposed approach agreed with MCA on 2 May 2018. Includes submission of: <ul style="list-style-type: none"> • An updated EIA including updated baseline data sources; • A traffic validation exercise to ensure the marine traffic data remains valid; • A completed MGN 543 checklist to ensure that all elements of the guidance have been assessed; • The NRA undertaken as part of the original consent; and • Reassessment of the collision and allision modelling, as well as consulting directly with regular operators. |
| MS-LOT 15 September 2017 | Seagreen should confirm with the MCA which receptors should be included in the NRA (if required, see above) to ensure the requirements the MCA outline in their consultation response are taken into account. | Proposed approach agreed with MCA on 2 May 2018. Includes submission of: <ul style="list-style-type: none"> • An updated EIA including updated baseline data sources; • A traffic validation exercise to ensure the marine traffic data remains valid; • A completed MGN 543 checklist to ensure that all elements of the guidance have been assessed; • The NRA undertaken as part of the original consent; and • Reassessment of the collision and allision modelling, as well as consulting directly with regular operators. |
| MS-LOT 15 September 2017 | The WCS of Inch Cape and WCS of Neart na Gaoithe should be included in the CIA and Seagreen should confirm with the MCA that this is appropriate. | Noted. Inch Cape Offshore Wind Farm and Neart na Gaoithe Offshore Wind Farm have been included within the cumulative assessment as described in paragraph 12.336 – ‘Impact Assessment: Cumulative’. |

| Consultee and Date | Summary of issues raised | How issues have been addressed |
|--|--|---|
| Mainstream Renewable Power on behalf of Neart na Gaoithe Offshore Wind Limited (NnGOWL) 15 September 2017 | NnGOWL has submitted a scoping report for an updated design for the Neart na Gaoithe project. Information can be provided to Seagreen when available, to inform any relevant cumulative assessments or photomontages. It is our intention to construct no more than 64 WTGs. However it should be noted that the consent was granted for 75 WTGs, which is highlighted for consideration when establishing scenarios for the cumulative impact assessments. NnGOWL is open to working collaboratively with Seagreen, to gain consistency in assessment approaches and cumulative design envelopes. | Noted – no action required. |
| MCA 15 September 2017 | The ES should supply detail on the possible impact on navigational issues for both commercial and recreational craft. | Both commercial vessels and recreational craft are included in the 2017 marine traffic validation survey presented in this EIA Report (paragraphs 12.74 to 12.85 – ‘Current Baseline’). |
| MCA 15 September 2017 | An NRA update will need to be submitted in accordance with MGN 543 and the MCA Methodology for Assessing the Marine Navigational Safety & Emergency Response Risks of OREIs. | The updates to the NRA can be found in Appendix 12A (NRA Addendum). |
| MCA 15 September 2017 | It is noted that traffic studies were carried out in 2011, however in line with the requirement that traffic studies should be completed within 24 months prior to the ES submission; we would expect a new traffic study to be undertaken. We welcome discussions to agree survey data requirements. | A 2017 validation survey has been completed and is presented in Appendix 12B (AIS Marine Traffic Validation). |
| MCA 15 September 2017 | Request particular attention to cabling routes and where appropriate burial depth for which a Burial Protection Index study should be completed and, subject to the traffic volumes, an anchor penetration study if necessary. If cable protection is required e.g. rock bags, concrete mattresses, the MCA will accept a 5% reduction in surrounding depths referenced to Chart Datum. This will be particularly relevant where depths are decreasing towards shore and potential impacts on navigable water increase. | Development and implementation of a cable plan is included within the consent conditions listed in Table 12.8. This is also listed in Table 7.4 of Chapter 7 (Scope of EIA Report). |

| Consultee and Date | Summary of issues raised | How issues have been addressed |
|-----------------------------------|--|---|
| MCA 15 September 2017 | Any application for safety zones will need to be carefully assessed and additionally supported by experience from the development and construction stages. | An application for safety zones will be considered post consent. Safety zones are included as environmental measures incorporated into the Project in paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’ and section 13 of Appendix 12A (NRA Addendum). They are also included in Table 7.3 of Chapter 7 (Scope of EIA Report). |
| MCA 15 September 2017 | Consideration to the implications of the site size and location on Search and Rescue (SAR) resources and Emergency Response Co-operation Plans (ERCoP). Attention should be paid to level of radar surveillance, AIS and shore-based VHF radio coverage and give consideration for appropriate mitigation such as Radar, AIS receivers and in-field, Marine Band VHF radio communication aerial(s) (VHF voice with Digital Selective Calling [DSC]) that can cover the entire wind farm sites and their surrounding areas. | Section 5 of Appendix 12A (NRA Addendum) identifies the baseline with regards to emergency response and is then considered within the impact assessment of this EIA Report (paragraphs 12.231 to 12.232 – ‘Impact of Operation on SAR Operations (Project Alpha)’ and paragraphs 12.317 to 12.321 – ‘Impact of Operation on SAR Operations (Project Alpha and Project Bravo)’). |
| NLB 15 September 2017 | NLB are content with the topics to be included in the EIA and those sections requiring updated data. NLB are likewise content with the extension of operational life to 50 years at this site. | Noted – no action required. Note that the operational life is reduced to 25 years. |
| RYA Scotland 15 September 2017 | Agreement of suggested assessment receptors for the shipping and navigation assessment. | Noted – no action required |
| RYA Scotland 15 September 2017 | Disagreement that additional AIS surveys are required for recreational vessels. Using the new edition of the UK Coastal Atlas of Recreational Boating dataset would be sufficient. | Recreational vessels are present within the 2017 validation survey dataset; however the UK Coastal Atlas of Recreational Boating has also been utilised in this EIA Report (paragraph 12.85 – ‘Current Baseline’). |
| RYA Scotland 15 September 2017 | The updated assessment for shipping and navigation is only required to assess the significance of impacts identified in 2012. | Noted. Paragraphs 12.19 to 12.28 – ‘Scope of Assessment’, presents the scope of assessment. Paragraphs 12.381 to 12.389 – ‘Impact Assessment Summary’ compares the 2012 and 2018 impact assessment. |
| RYA Scotland 15 September 2017 | A Pilot Book for these waters based on the existing Imray Yachtsman's Pilot North and East Scotland and the Forth Yacht Clubs Association Pilot Handbook, East Coast of Scotland is currently being prepared for publication. Incorporation of details of the windfarm in this new pilot would be a helpful form of mitigation for the operational phase. | Noted – information will be promulgated allowing insertion in Pilot Books as required. |

| Consultee and Date | Summary of issues raised | How issues have been addressed |
|--|---|--|
| RYA Scotland 15 September 2017 | While the key cumulative sites consist of Inch Cape and Neart na Gaoithe offshore wind farms, the Kincardine floating wind farm and Aberdeen Bay scheme should be considered. This is not due to a direct increased risk of collision, but rather the impact of increased levels of watch keeping required on passages up or down the east coast, as commercial vessels are likely to be displaced. | Noted and agreed. Both the Kincardine Offshore Wind Farm and European Offshore Wind Deployment Centre are included within the cumulative assessment, as described in paragraph 12.337 - 'Impact Assessment: Cumulative'. |
| Scottish Fishermen's Federation (SFF) 15 September 2017 | The SFF considers the development of anchorages and moorings, amongst other items, by Forth Ports, should be included in the assessment of cumulative impacts on the fishing industry. | Noted for the purposes of shipping and navigation; further assessment is found within Chapter 11 (Commercial Fisheries). |
| Transport Scotland (Ports and Harbours) 15 September 2017 | Transport Scotland have no comments on this case. | Noted - no action required |
| CoS 15 September 2017 | AIS, Radar and observational data over appropriate periods will need to be recorded and analysed. MGN 543 (M+F) will need to be considered. | AIS data from 2017 has been analysed for the marine traffic validation survey. This is summarised in this EIA Report (paragraphs 12.74 to 12.85 - 'Current Baseline') and presented in Appendix 12B (AIS Marine Traffic Validation). |
| Meetings | | |
| NLB, RYA Scotland and Forth Ports 9 January 2018 | Cumulative impacts of main concern. Traffic pushed further inshore of Bell Rock. Tankers route closer to the coast during bad weather from west and south west. Is there any work with developers regarding traffic separation etc.? The gap between Inch Cape and Seagreen is where issues may arise. The Fife Ness Light becomes critical and Bell Rock becomes a turning point. | MCA may apply traffic separation but such decisions will be made further down the line during operational phases. Cumulative routeing has been assessed in Section 12 of Appendix 12A (NRA Addendum). Cumulative impacts are assessed in this EIA Report (paragraphs 12.346 to 12.375 - 'Cumulative Impact Assessment'). |
| | Coordination of Notice to Mariners is requested. It is difficult for people to look at more than one location for these currently. Not an action for Seagreen specifically, but a wider issue. | Noted - no action required. |
| CoS 17 January 2018 | Noted that due to an upsurge in oil and gas activity, traffic is expected to increase therefore the summer 2017 data may be unrepresentative. | Noted. An indicative 10% increase for all vessel types is assessed within the future case assessment (section 9.1 and section 11 of Appendix 12A [NRA Addendum]). |
| | The interaction between Seagreen and Inch Cape is not ideal for shipping. Port of Dundee traffic will need to take a dog leg route to navigate between the developments. | Cumulative routeing has been assessed in section 12.3 of Appendix 12A (NRA Addendum). |

| Consultee and Date | Summary of issues raised | How issues have been addressed |
|---------------------------------------|---|---|
| | Agreed that routing measures are unlikely to be required, however the wind farm locations would present an additional challenge for individual ships. | Cumulative routing has been assessed in Section 12.3 of Appendix 12A (NRA Addendum). Cumulative impacts have been assessed in this EIA Report (paragraphs 12.346 to 12.375 – ‘Cumulative Impact Assessment’). |
| | Concern over the potential for single vessels to be involved in accidents. The cumulative impact of wind farms in the area will create more complex short sea routes with more waypoints. | Cumulative impacts have been assessed in this EIA Report (paragraphs 12.346 to 12.375 – ‘Cumulative Impact Assessment’). |
| | North Sea is traffic is likely to increase. A published prediction of displaced traffic, accounting for the cumulative picture, would be valuable. | Cumulative routing has been assessed in Section 12.3 of Appendix 12A (NRA Addendum). |
| | Acknowledged that the sea area in question is not crowded. However a prediction of changes in traffic routing would be useful. | Cumulative routing has been assessed in Section 12.3 of Appendix 12A (NRA Addendum). |
| MCA 25 January 2018 | Questioned whether construction could be phased. | Seagreen discussing potential for phased discharge of conditions with Marine Scotland. |
| | Raised concerns regarding that the AIS only validation deviates from MGN 543 therefore they would like to know how non-AIS vessels will be recorded and assessed. | A separate technical note was issued to the MCA stating why an AIS only validation is acceptable. Cumulative routing has been assessed in Section 12 of Appendix 12A (NRA Addendum). Further correspondence regarding technical note on 19 March 2018. Approach agreed on 2 May 2018. |
| | Questioned whether assessment of cumulative routing will be carried out. | Cumulative routing has been assessed in Section 12 of Appendix 12A (NRA Addendum). |
| Cruising Association 15 March 2018 | Concern over small boat harbours and small vessels being inundated with large construction vessels. | Ports used for construction vessels have not yet been selected. Seagreen will produce a Vessel Management Plan (VMP) and a Navigational Safety Plan (NSP) post consent as part of the consent conditions in Table 12.8 of this EIA Report. These are also listed in Table 7.4 of Chapter 7 (Scope of EIA Report). |
| | Concern over future projects in the Firth of Forth Zone due to cumulative impacts. | Future Firth of Forth Zone projects will consider cumulative impacts with the optimised Seagreen Project and will be consulted on and assessed on a cumulative basis. |
| | Marginal preference for monopile foundations on navigational safety grounds. | Noted – no action required. |

| Consultee and Date | Summary of issues raised | How issues have been addressed |
|--|--|--|
| | The peripheral turbines present a 'ragged edge' and do not follow continuous lines. This can be confusing to small craft navigation, particularly in strong weather or poor visibility and should be avoided. | Layouts presented at consultation and in this EIA Report are indicative. It will be a consent condition that the MCA and NLB will be required to approve the final OWF layout of the optimised Seagreen Project which will consider this issue. |
| | Support the use of temporary 500m safety zones around construction sites and of permanent 50m zones around completed operational structures. It is important that marking and lighting is consistent with common practice throughout all international and national waters. | Noted. Safety zones and a Lighting and Marking Plan (LMP) will be determined post consent. Safety zones are included as environmental measures incorporated into the Project in paragraph 12.96 and section 13 of Appendix 12A (NRA Addendum). They are also included in Table 7.3 of Chapter 7 (Scope of EIA Report). An LMP is part of the consent conditions in Table 12.8 of this EIA Report. This is also listed in Table 7.4 of Chapter 7 (Scope of EIA Report). |
| | Accept the routing and vessel type data presented but note that due to weather and tidal constraints, yachts may be considerably deviated from their direct rhumb-line tracks. Believe that 30 to 40% yachts in offshore area fitted with AIS transponders but a proportion may not be operating them. | Noted – no action required. |
| MCA 19 March 2018 (Email Correspondence) | Following technical note submission action of the meeting on 25 January 2018, the MCA still remain concerned on deviation of AIS only validation from MGN 543. | MCA queries on technical note answered and letter explaining reasoning behind AIS validation survey presented. |
| 2 May 2018 (Email Correspondence) | The MCA are content with the AIS only validation survey approach on this occasion. | Noted – no action required. |

Regular Operator Consultation

12.18. As part of the consultation process for the optimised Seagreen Project, regular operators were identified (from the marine traffic validation survey) that would potentially be required to deviate their routes due to the optimised Seagreen Project. These operators were consulted via electronic or hardcopy mail. The email/letter gave an overview of the optimised Seagreen Project and invited feedback. Overall, 28 regular operators were identified. The full list of regular operators and responses received is detailed in Appendix 12E (Regular Operator Consultation).

SCOPE OF ASSESSMENT

12.19. Chapter 7 (Scope of EIA Report) describes the parameters and assessments scoped into the EIA Report, as well as the environmental measures incorporated into the Project design. Relevant consent conditions for the originally consented Project that were considered by Marine Scotland in scoping topics and impacts scoped out are also noted.

12.20. The purpose of this chapter is to assess relevant impacts of the optimised Seagreen Project on shipping and navigation receptors. Environmental measures incorporated into the Project are also discussed as a means of mitigating these potential impacts.

- 12.21. With reference to the 2017 Scoping Opinion and confirmed through further consultation, the scope of the assessment for shipping and navigation considers the impacts outlined in paragraphs 12.22 to 12.26. It should be noted that three scenarios for each impact are assessed. These are Project Alpha in isolation, Project Bravo in isolation and Project Alpha and Project Bravo in combination. Cumulative impacts of Project Alpha and Project Bravo with other schemes are also assessed. The Offshore Transmission Asset has been separately licensed and therefore associated impacts have been scoped out of the assessment.
- 12.22. The following construction impacts on commercial vessels, commercial fishing vessels and recreational vessels are assessed:
- Vessel displacement due to construction activities;
 - Encounters and collision with construction vessels;
 - Encounters and collision with other vessels; and
 - Allision risk with partially constructed OWF components and infrastructure.
- 12.23. Operational impacts on commercial vessels, commercial fishing vessels and recreational vessels which are assessed include:
- Vessel displacement; and
 - Encounters, collision and allision risk due to presence of OWF components and infrastructure.
- 12.24. Other operational impacts assessed include diminishment of emergency response resources on SAR operations.
- 12.25. Decommissioning impacts on commercial vessels, commercial fishing vessels and recreational vessels are similar to those identified during the construction phase; therefore impacts have only been assessed in the case that notable differences between potential construction or decommissioning impacts have been identified.
- 12.26. Cumulative impacts on commercial vessels and commercial fishing vessels assessed where identified during the construction, operational and decommissioning phases are as follows:
- Vessel displacement;
 - Encounters and collision risk; and
 - Allision risk.
- 12.27. This is based on the optimised Seagreen Project design set out in Chapter 5 (Project Description) and with the assumption that mitigation measures and consent conditions as set out in Chapter 7 (Scope of EIA Report) will be applied.
- 12.28. Impacts scoped out of the assessment are as follows:
- Gear snagging of commercial fishing vessels as it is discussed in Chapter 11 (Commercial Fisheries); and
 - The impact of operation on marine radar systems due to environmental measures incorporated into the Project and experience and understanding from current operational wind farms.

METHODOLOGY

- 12.29. This section presents the impact assessment methodology applied to assess the potential shipping and navigation impacts associated with the construction, operation and decommissioning phases of the optimised Seagreen Project.

Study Area

- 12.30. This shipping and navigation chapter focuses on a 1,032nm² study area around the optimised Seagreen Project boundary (herein referred to as the 'study area') and is presented in Figure 12.1. This boundary includes the Project Alpha and Project Bravo wind farms, known collectively as the optimised Seagreen Project. The study area used is typical of a marine traffic survey and is considered an appropriate area to encompass relevant marine traffic.

Cumulative Study Area

- 12.31. The cumulative assessment considers other schemes within the surrounding North Sea as presented in Figure 12.2. This takes into account the CIA list presented in Appendix 6A (Plans and Projects for Consideration for Cumulative Impact Assessment) and discussed in Chapter 6 (EIA Process), as well as those identified through shipping and navigation consultation and scoping opinion responses. It is noted that data confidence of the projects included within the assessment is low given that construction and decommissioning programmes (including potential ports) are not yet known.
- 12.32. Two other offshore wind farm projects within the Firth of Forth are consented and undertaking revised applications. Both projects, Neart na Gaoithe Offshore Wind Farm and Inch Cape Offshore Wind Farm, are relevant to this CIA.
- 12.33. Aside from these projects and as requested within the 2017 Scoping Opinion, Kincardine Offshore Wind Farm and the European Offshore Wind Deployment Centre also known as Aberdeen Offshore Windfarm have also been considered within the CIA.
- 12.34. The Aberdeen Harbour Expansion Project, Forthwind Offshore Wind Farm and NorthConnect interconnector were identified in the CIA list in Appendix 6A and are also considered as part of the CIA. These projects have been included based on potential overlapping of spatial effects rather than temporal effects due to the low data confidence. For the purpose of assessing traffic routeing, a wider study area encompassing vessel routeing to and from UK and international ports has also been considered.
- 12.35. It is noted that the Hywind Scotland Pilot Park has been considered within baseline routeing assessments given that it is fully operational and vessel routeing will have adapted to its presence.

Data Collection

- 12.36. The optimised Seagreen Project has the same area and is within the same application boundaries as the originally consented Project; however, data collected to inform the 2012 Offshore ES was required to be updated in accordance with MGN 543 (MCA, 2016) to inform the assessment of impacts for this EIA Report. This included a desk study to identify navigational features and marine incidents within the vicinity of the optimised Seagreen Project and a marine traffic validation survey of AIS data collected from onshore receivers in 2017. Details of the validation survey are presented in Appendix 12B (AIS Marine Traffic Validation). Appendix 12C (Project Alpha and Project Bravo 2012 NRA) presents the data used to inform the 2012 Offshore ES.

12.37. Table 12.2 details the data sources used to inform this assessment.

Table 12.2 Data Sources

| Source | Data |
|---|--|
| AIS Shore Based Receivers | 14 Days February and March 2017 and 14 Days July and August 2017 |
| UK Admiralty Charts | 1407-0 and 1409-0 |
| Admiralty Sailing Directions | North Sea (West) Pilot, NP 54 |
| Marine Accident Investigation Branch (MAIB) | Marine Incident Data 1994 to 2014 |
| Royal National Lifeboat Institution (RNLI) | Marine Incident Data 2005 to 2014 |
| Marine Scotland | Satellite and Sightings Fishing Data 2016 and 2017 |
| RYA | UK Coastal Atlas of Recreational Boating 2016 |

Survey Work

- 12.38. Baseline characterisation data has been collated through a desk-based study of site-specific marine traffic data. Marine traffic survey data was first collected in 2011 for the 2012 Offshore ES; however given the time elapsed since these initial surveys, they have been validated using updated data collected during 2017. The 2017 data covers 28 days and was collected from coastal receivers during February and March 2017 (14 days) and July and August 2017 (14 days). It is noted this data only accounts for vessels required to broadcast via AIS.
- 12.39. The results of the 2017 marine traffic survey can be found in Appendix 12B (AIS Marine Traffic Validation). These results are also summarised in paragraphs 12.74 to 12.85 – ‘Current Baseline’.
- 12.40. AIS is required on board all vessels of more than 300 gross tonnage (GT) engaged on international voyages, cargo vessels of more than 500GT not engaged on international voyages and passenger vessels, irrespective of size, built on or after 1 July 2002. At the time of the 2011 marine traffic surveys, fishing vessels equal to or greater than 24 metres (m) but less than 45m in length were required to carry AIS. This requirement has since changed, with fishing vessels of 15m length and over required to carry AIS as of 31 May 2015.

Impact Assessment

- 12.41. The impact assessment for shipping and navigation follows the principles of the approach set out within Chapter 6 (EIA Process). This includes consideration of Project Alpha alone, Project Bravo alone, Project Alpha and Project Bravo combined (the optimised Seagreen Project) and Project Alpha and Project Bravo in a cumulative scenario.
- 12.42. The significance of potential impacts has been evaluated using a systematic approach based upon identification of the frequency of the impact and the consequence of the impact to define whether the impact is ‘Broadly Acceptable’, ‘Tolerable’ or ‘Unacceptable’.
- 12.43. The impacts were assessed in conjunction with the modelling results and expert opinion, to inform an FSA in line with the consolidated IMO FSA process (IMO, 2007) and MCA methodology (MCA, 2015). The methodology and parameters assessed have also taken into account issues identified through consultation with stakeholders as detailed in Table 12.1.

Developments in Assessment Methods

- 12.44. An FSA was carried out in-line with the consolidated IMO FSA process (IMO, 2007) and the Department of Energy and Climate Change (DECC) guidance (DECC, 2005) to assess the impact on shipping and navigation in the 2012 Offshore ES. An FSA has also been carried out in this EIA Report in line with the same IMO FSA process (IMO, 2007) and updated MCA methodology (MCA, 2015) guidance.
- 12.45. The study area assessed remains the same as that used within the 2012 Offshore ES and no new receptors have been identified.
- 12.46. The assessment method has been updated to current best practice to define the frequency, consequence and significance of the impacts through the use of matrices rather than simply state whether or not an impact was significant or not significant as carried out in the 2012 Offshore ES.
- 12.47. Overall, whilst some changes to the assessment method have been introduced to conform to current best practice for shipping and navigation assessment, the methodology is similar to that followed in the 2012 Offshore ES.

Significance Criteria

Frequency

- 12.48. The definitions of 'frequency' used to assess shipping and navigation impacts are presented in Table 12.3.

Table 12.3 Definitions of Frequency Levels for Shipping and Navigation

| Rank | Frequency | Definition |
|------|---------------------|---------------------------------|
| 1 | Negligible | < 1 occurrence per 10,000 years |
| 2 | Extremely Unlikely | 1 per 100 to 10,000 years |
| 3 | Remote | 1 per 10 to 100 years |
| 4 | Reasonably Probable | 1 per 1 to 10 years |
| 5 | Frequent | Yearly |

Consequence

- 12.49. The definitions of 'severity of consequence' used to assess shipping and navigation impacts are presented in Table 12.4.

Impact Significance

- 12.50. Once an impact is assigned a 'frequency' and 'severity' ranking, its significance is then determined based on the matrix shown in Table 12.5 as either 'Broadly Acceptable', 'Tolerable', or 'Unacceptable'.
- 12.51. Definitions of the significance rankings are given in Table 12.6.

Table 12.4 Definitions of Severity Levels for Shipping and Navigation

| Rank | Severity | Description (Adverse Impacts) |
|------|------------|---|
| 1 | Negligible | No injury to persons. No significant damage to infrastructure or vessel. No significant environmental impacts. No significant business (safety), operation or reputation impacts. |
| 2 | Minor | Slight injury(s) to person. Minor damage to infrastructure or vessel. Tier 1 pollution assistance (marine pollution). Minor business (safety), operation or reputation impacts. |
| 3 | Moderate | Multiple moderate or single serious injury to persons. Moderate damage to infrastructure or vessel. Tier 2 pollution assistance (marine pollution). Considerable business (safety), operation or reputation impacts. |
| 4 | Serious | Serious injury or single fatality. Major damage to infrastructure or vessel. Tier 2 pollution assistance (marine pollution). Major national business (safety), operation or reputation impacts. |
| 5 | Major | More than one fatality. Extensive damage to infrastructure or vessel (> £100M). Tier 3 pollution assistance (marine pollution). Major international business (safety), operation or reputation impacts (> £10M). |

Table 12.5 Impact Significance Matrix

| | | | | | | |
|-----------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------|
| Frequency | Frequent | Tolerable | Tolerable | Unacceptable | Unacceptable | Unacceptable |
| | Reasonably Probable | Broadly Acceptable | Tolerable | Tolerable | Unacceptable | Unacceptable |
| | Remote | Broadly Acceptable | Broadly Acceptable | Tolerable | Tolerable | Unacceptable |
| | Extremely Unlikely | Broadly Acceptable | Broadly Acceptable | Broadly Acceptable | Tolerable | Tolerable |
| | Negligible | Broadly Acceptable | Broadly Acceptable | Broadly Acceptable | Broadly Acceptable | Tolerable |
| | | Negligible | Minor | Moderate | Serious | Major |
| Severity | | | | | | |

Table 12.6 Significance Rankings

| | |
|--|---|
| No Impact | No impact on shipping and navigation. |
| Broadly Acceptable | Risk As Low As Reasonably Practicable (ALARP) with no additional mitigations or monitoring required above embedded mitigations. Includes impacts that have no perceptible impact (impact would not be noticeable to receptors). |
| Tolerable (with or without mitigation) | Risk acceptable but may require additional mitigation measures and monitoring in place to control and reduce to ALARP. |
| Unacceptable | Significant risk mitigation or design modification required to reduce to ALARP. |

Cumulative Impact Assessment

- 12.52. Cumulative impacts have been considered for shipping and navigation receptors; this includes consideration of other offshore developments, as well as activities associated with other marine operations. However it should be noted that fishing and recreational operational areas (areas of transits) have been considered as part of the baseline assessment given that they are key shipping and navigation receptors.

Assessment Limitations and Uncertainty

- 12.53. The shipping and navigation baseline and impact assessment has been carried out based on the information available and response received at the time of preparation. The desk based data sources used are the most up to date publicly available information as well as those provided through consultation as detailed in Table 12.1. The data is therefore limited by what is available and by what has been made available, at the time of writing this chapter.

BASELINE CONDITIONS

Study Area

Current baseline – Navigational Features

- 12.54. An overview of the main navigational features in proximity to the optimised Seagreen Project are presented in Figure 12.3.
- 12.55. There are no military Practice and Exercise Areas (PEXAs) that intersect the study area. The closest PEXA to the optimised Seagreen Project is the submarine exercise area located approximately 13nm south of the site.
- 12.56. The Admiralty Sailing Directions (UKHO, 2016) and navigational charts were used to identify the anchorage areas relevant to the study area. No anchorages were identified within the study area however it should be noted that there are currently no restrictions on anchoring within the optimised Seagreen Project. The closest charted anchorage to the optimised Seagreen Project is the Lunan Bay anchorage located approximately 18nm west of the site. Anchorage is also noted in the Admiralty Sailing Directions (UKHO, 2016) 1.5nm east of Scurdie Ness in depths of 24m which is approximately 15nm northwest of the optimised Seagreen Project.
- 12.57. There are no charted spoil grounds within the study area. The closest is located approximately 16nm west of the optimised Seagreen Project.
- 12.58. There are no licensed marine aggregate dredging areas within the study area. Additionally, there are no licensed marine aggregate dredging areas within the sea area surrounding the optimised Seagreen Project. The Middle Bank historic dredging area was situated within the mouth of the Firth of Forth, however, this is now inactive. Likewise, the Tay Estuary historic dredging area is also inactive.
- 12.59. The Isle of May (located approximately 28nm southwest of the optimised Seagreen Project) is designated as a Marine Environmental High Risk Area (MEHRA) as shown in Figure 12.3. The designation was based on a high concentration of vulnerable seabirds. It is noted that sections of the coast on either side of the mouth of the Firth of Forth are also designated as MEHRAs.
- 12.60. There are a number of pre-existing Aids to Navigation (AtoN) located within the vicinity of the optimised Seagreen Project; these are presented based on the assessment of the United

Kingdom Hydrographic Office (UKHO) Admiralty Charts. One of the AtoN, the Inch Cape Meteorological Mast, is located within the study area, approximately 11nm southwest of the optimised Seagreen Project.

- 12.61. There are a number of wrecks within the study area, one of which is located within the southeast corner of the optimised Seagreen Project.
- 12.62. The consented Inch Cape Offshore Wind Farm is located within the study area approximately 4.6nm southwest of the optimised Seagreen Project. Neart na Gaoithe Offshore Wind Farm is also located to the southwest of the optimised Seagreen Project. Neart na Gaoithe is also consented.
- 12.63. There are no oil and gas surface platforms within the study area. The Buzzard Oil Field platforms are the nearest to the optimised Seagreen Project, located approximately 71nm northeast of the optimised Seagreen Project.

Current Baseline – SAR

- 12.64. The following section summarises the UK SAR operations (as required by MGN 543).
- 12.65. The organisation of emergency response in the UK is a combination of separate government departments but is primarily managed by the MCA.
- 12.66. The MCA (which includes Her Majesty's Coastguard) provides a comprehensive SAR service for UK waters and land based helicopter operations. As well as SAR, emergency services provided by the MCA also include counter pollution and salvage. Emergency response on behalf of the MCA coverage is primarily provided by civilian contracts.
- 12.67. In March 2013, the Bristow Group were awarded the contract by the MCA (as an executive agency of Department for Transport), to provide helicopter SAR operations in the UK over a 10 year period. Bristow have now been operating the service since April 2015. There are 10 base locations for the SAR helicopter service. The nearest SAR helicopter base to the optimised Seagreen Project is the Inverness base which is approximately 87nm from the closest point of the optimised Seagreen Project and has been in operation since April 2015. This base operates two Agusta Westland AW189 aircraft.
- 12.68. When on an operational mission, SAR aircraft are not constrained by the normal rules of the air, and operate in accordance with their Aircraft Operator Certificate. This allows pilots total flexibility to manoeuvre using best judgement thus making them highly adaptable to the environment they operate in.
- 12.69. The SAR Framework (MCA, 2017) for the UK also recognises the role of supporting services that are able to assist in the event of an emergency, including organisations such as the RNLI and offshore installations. Companies operating offshore typically have resources of vessels, helicopters and other equipment available for normal operations that can also assist with emergencies offshore. Alongside that, all vessels under IMO obligations set out in the International Convention for the Safety of Life at Sea (SOLAS) 1974 as amended are required to render assistance to any person or vessel in distress if safely able to do so.
- 12.70. For further detail on emergency response resources, please refer to Appendix 12A (NRA Addendum) which considers the guidance set out by the MCA within MGN 543 in relation to SAR and the development of offshore wind farms.

Current Baseline – Marine Incidents

- 12.71. Locations of marine incidents recorded by the MAIB and RNLI are presented in Figure 12.4 and Figure 12.5 respectively.
- 12.72. A review of the incidents recorded by the MAIB between 1994 and 2014 showed a total of 17 unique incidents within the study area, none of which occurred within the optimised Seagreen Project boundary itself. There were no MAIB incidents classified as a 'collision'. The most common incident type recorded was 'hazardous incident' (41% of incidents), while the majority of incidents occurred within the coastal region of the study area (59%).
- 12.73. The data recorded by the RNLI between 2005 and 2014 showed a total of 15 unique incidents occurring within the study area. None of these were recorded within the optimised Seagreen Project boundary itself. As with the MAIB data, there were no RNLI incidents classified as a 'collision'. The most common incident type was 'machinery failure' (33%) while the majority of incidents occurred within the west of the study area (93%).

Current Baseline – Marine Traffic Survey Results

- 12.74. This section summarises the key findings of the marine traffic validation survey data collected during 2017 from onshore AIS receivers. It should be noted that the 2017 data is AIS only. The 2017 marine traffic data is presented in Figure 12.6.
- 12.75. The 2017 data recorded an average of 18 unique vessels per day during winter and 20 unique vessels per day during summer within the study area.
- 12.76. A review of the marine traffic survey data collected in 2017 showed the majority of traffic within the study area consisted of cargo vessels (27%), tankers (20%) and 'other' vessels (20%). The 'other' category consisted mainly of oil & gas vessels as well as survey vessels, a port tender, a training vessel, a buoy-laying vessel, High Speed Craft (HSC), a multiworker vessel, lifeboats, military vessels, a marine aggregate dredger and a coastguard vessel.
- 12.77. The marine traffic survey data showed anchoring from a cargo vessel and an oil & gas vessel to the northeast of the study area. The information transmitted via AIS by these vessels suggested both vessels were awaiting access to Montrose Anchorage. No anchoring was recorded within the optimised Seagreen Project.
- 12.78. Fishing vessels accounted for 14% of vessel traffic throughout the 2017 survey periods. It was noted that the majority of fishing vessels were recorded within the west and northwest of the study area as well as within the optimised Seagreen Project itself, particularly Project Bravo. Fishing vessels within the optimised Seagreen Project were actively engaged in fishing rather than transiting through the site. Fishing vessel activity is presented in Figure 12.7.
- 12.79. Fishing method information was available for all fishing vessels recorded on AIS within the study area. The most common fishing methods identified were potter/whelkers (43%), scallop dredgers (18%) and demersal trawlers (18%). Other fishing methods identified included unspecified trawlers (10%), hook & line (5%), gill nets (4%) and pelagic trawlers (1%).
- 12.80. Flag state (nationality) information was available for all fishing vessels recorded on AIS within the study area. The only nationality identified was the UK.
- 12.81. Satellite data (from Marine Scotland and collected for fishing vessels of 12m length and over) recorded throughout 2016 and 2017 was analysed for the study area to validate the fishing vessel marine traffic. It should be noted that two years of satellite data has been analysed compared to 28 days of AIS data.

- 12.82. The majority of vessels were UK registered (97.5%) with vessels registered in Belgium (2%) also recorded. Other nationalities identified included Denmark, France, the Netherlands, Germany, Norway and the Faroe Islands (all less than 0.1%). This shows good agreement with the AIS fishing vessel tracks recorded throughout the combined summer and winter periods. Fishing methods were not available for satellite data.
- 12.83. Sightings data for 2016 and 2017 was also analysed to validate the fishing vessel marine traffic. As with satellite data, two years of sightings data has been analysed compared to 28 days of AIS data. The nationalities identified were the UK (98%) and Belgium (2%) while the majority of fishing vessels were scallop dredgers (78%). Demersal trawlers accounted for 10% of fishing vessels. Potter/whelkers (4%), unspecified dredgers (3%), unspecified trawlers (2%), long liners (2%), and pelagic trawlers (1%) were also recorded. As with the satellite data, this shows good agreement with the AIS fishing vessel tracks recorded throughout the combined summer and winter periods.
- 12.84. There were no recreational vessels recorded during the 2017 winter survey period intersecting the optimised Seagreen Project and a total of seven recreational vessels recorded across the summer period intersecting the optimised Seagreen Project. Overall, recreational vessels accounted for 7% of vessel traffic within the study area throughout the 2017 survey period.
- 12.85. The RYA Coastal Atlas of Recreational Boating (RYA, 2016) shows the study area within the limits of UK coastal waters to be of a low recreational density when compared to the coastal areas, as shown in Figure 12.8. This correlates well with the findings of the 2017 marine traffic surveys. An RYA offshore route is recorded within the study area. This route operates a southbound direction and is located 3nm northwest of the optimised Seagreen Project. It should be noted that the route is presented as point data therefore vessel traffic operating this route has the potential to intersect the optimised Seagreen Project. The Coastal Atlas also notes a general boating area located 15nm southwest of the optimised Seagreen Project outside Arbroath, as well as a general boating area associated with Montrose, located 16nm west of the optimised Seagreen Project.

Predicted future baseline

- 12.86. There is the potential for vessel traffic levels to increase during the 25 year design life of the optimised Seagreen Project, which may lead to increases in allision and collision risk within the area. Making accurate forecasts of traffic increases is challenging since a large number of variables require consideration. For this reason, an indicative vessel traffic growth of 10% has been applied to all vessel types assessed within this NRA ('future case'), in addition to an assessment of risk should traffic levels remain constant ('base case'). This growth is in line with the assessments undertaken for other UK offshore wind farms including Inch Cape Offshore Wind Farm and Neart na Gaoithe Offshore Wind Farm, and therefore ensures a consistent approach with existing assessments. It is noted that this 10% growth relates to the number of vessels rather than increases in overall tonnage.
- 12.87. The 10% vessel traffic growth was implemented to the allision and collision modelling by increasing the total vessel numbers per route shown in Table 7.1 in Appendix 12A (NRA Addendum) by 10%, whilst maintaining the vessel type and size distribution.
- 12.88. It should be noted that with ongoing decommissioning of various North Sea fields, UK oil and gas traffic is expected to decline in the long term. However, on the basis that an accurate timeframe within which this decline will occur cannot be predicted, the 10% vessel traffic growth has been applied to oil and gas related traffic, which represents a conservative approach.

12.89. On this basis, four scenarios have been assessed:

- Base case allision and collision risk should traffic levels remain at the current baseline level, pre wind farm;
- Base case allision and collision risk should traffic levels remain at the current baseline level, post wind farm;
- Future case allision and collision risk should traffic levels increase by 10% of the current baseline level, pre wind farm; and
- Future case allision and collision risk should traffic levels increase by 10% of the current baseline level, post wind farm.

ASSESSMENT OF IMPACTS – WORST CASE SCENARIO

12.90. As identified within the ‘Scope of Assessment’ the impact assessment for shipping and navigation considers the potential impacts of the optimised Seagreen Project on commercial vessels, commercial fishing vessels, recreational vessels and emergency response resources. Other receptors scoped out of the assessment are discussed in paragraph 12.28 – ‘Scope of Assessment’.

12.91. The assessment considers the potential impacts of Project Alpha alone; Project Bravo alone; Project Alpha and Project Bravo combined (the optimised Seagreen Project) and Project Alpha and Project Bravo in a cumulative scenario. The following sections set out the assessment of potential impacts during construction, operation and decommissioning phases of the Project.

Worst Case Scenario

12.92. To inform the impact assessment on shipping and navigation, a WCS has been defined using the information contained within the optimised design envelope for the Seagreen Project, Chapter 5 (Project Description). The worst case represents, for any given impact, the scenario within the range of options in the design envelope that would result in the greatest potential for change to the receptors assessed.

12.93. Table 12.7 identifies the WCS in relation to those issues scoped into the assessment and provides justification as to why no other scenario would result in a greater impact on the receptors considered. It should be noted that, while the WCS is defined for each impact for Project Alpha and Project Bravo in isolation, the WCS would be consideration of the projects combined (the optimised Seagreen Project). The impact assessment undertaken therefore considers the impacts of each project in isolation as well as the projects combined.

12.94. It is noted that the layout used within the assessment is indicative only and based on the parameters associated with the WCS for the optimised Seagreen Project.

Table 12.7 Worst Case Scenario Justification

| Type of Impact | Worst Case Scenario | Justification/Rationale of Selected Design Envelope Parameter |
|---|---|--|
| Project Alpha in Isolation or Project Bravo in Isolation - Construction | | |
| Impacts on Commercial Vessels | Maximum duration of construction for array structures of up to three years could be staggered with staggered sequence. Total development area up to 57.4nm ² (197 kilometre squared (km ²)) for Project Alpha and 56.6nm ² (194km ²) for Project Bravo. Buoyed construction area around the development area (to be defined by NLB post consent). Maximum number of construction vessel movements including jack-ups, Heavy Lift Vessels (HLV), barges and Crew Transfer Vessels (CTV). See Chapter 5 (Project Description). Application for and use of 500m ‘rolling’ safety zones around each structure during installation. Application for and use of 50m safety zones around structures pre-commissioning where installation is complete or where a structure is partially installed. | Maximum duration and extent of array construction phase marked by construction buoyage throughout. |
| Impacts on Commercial Fishing Vessels | | |
| Impacts on Recreational Vessels | | |
| Project Alpha in Isolation or Project Bravo in Isolation Operation | | |
| Impacts on Commercial Vessels | 25-year operational life. Total development area up to 57.4nm ² (197km ²) for Project Alpha and 56.6nm ² (194km ²) for Project Bravo. Up to 70 WTGs in Project Alpha or 70 WTGs in Project Bravo. Up to two OSPs in Project Alpha or two OSPs in Project Bravo ¹ . Jacket foundations: <ul style="list-style-type: none">• 30×30m for WTGs at surface; and• 40×40m for OSPs at surface. Minimum spacing of 1,000m. Minimum blade tip clearance 32.5m above Lowest Astronomical Tide (LAT) (which is greater than the 22m above Mean High Water Springs (MHWS) required by the RYA). Maximum number of maintenance vessel movements. Application for and use of 500m ‘rolling’ safety zones around structures where major maintenance is being undertaken. | Maximum duration and extent of array operational phase with regular maintenance activity undertaken. |
| Impacts on Commercial Fishing Vessels | | |
| Impacts on Recreational Vessels | | |
| Impacts on SAR Resources | Maximum intensity of people, vessels and aircraft on-site causing the greatest potential of an emergency response event and therefore maximum impact on existing resources. | |

¹ It should be noted that the OSPs are part of the Transmission Asset which was licensed separately in 2014. These assets have been quantitatively considered in this EIA Report as they form an integral part of the array and have been included within the allision and collision modelling of the NRA Addendum; it should be noted however that their consent remains valid. (Section 10 and 11 of Appendix 12A [NRA Addendum]).

| Type of Impact | Worst Case Scenario | Justification/Rationale of Selected Design Envelope Parameter |
|---|--|---|
| Project Alpha In Isolation or Project Bravo In Isolation Decommissioning | | |
| Impacts on Commercial Vessels | Maximum duration of decommissioning for array structures. Total decommissioning area up to 57.4nm ² (197 km ²) for Project Alpha and 56.6nm ² (194km ²) for Project Bravo. Buoyed decommissioning area around the development area (to be defined by NLB post consent). Maximum number of decommissioning vessel movements including jack-ups, HLVs, barges and CTVs. See Chapter 5 (Project Description) of the EIA Report. | Maximum duration and extent of array decommissioning phase marked by decommissioning buoyage throughout. |
| Impacts on Commercial Fishing Vessels | | |
| Impacts on Recreational Vessels | | |
| Project Alpha and Project Bravo Combined Construction | | |
| In general terms the WCSs identified above for individual projects also apply when considering Project Alpha and Project Bravo combined. Exceptions to this are as follows: <ul style="list-style-type: none">The size of the buoyed construction area around the development area (to be defined by NLB post consent). | | |
| Project Alpha and Project Bravo Combined Operation | | |
| In general terms the WCSs identified above for individual projects also apply when considering Project Alpha and Project Bravo combined. Exceptions to this are as follows: <ul style="list-style-type: none">Maximum number of WTGs up to 120 (up to 70 in each project);Total development area of up to 114nm² (391 kilometre squared (km²)); andMaximum number of OSPs: up to four (up to two in each project). | | |
| Project Alpha and Project Bravo Combined Decommissioning | | |
| In general terms the WCSs identified above for individual projects also apply when considering Project Alpha and Project Bravo combined. Exceptions to this are as follows: <ul style="list-style-type: none">The size of the buoyed decommissioning area around the development area (to be defined by NLB post consent); andMaximum duration of decommissioning for array structures. | | |
| Project Alpha and Project Bravo with Cumulative Schemes Construction and Decommissioning | | |
| Cumulative projects assessed include: <ul style="list-style-type: none">Seagreen Offshore Transmission Asset;Neart na Gaoithe Offshore Wind Farm; andInch Cape Offshore Wind Farm | | |
| Impacts on Commercial Vessels | Maximum duration of construction for all developments. | Maximum duration and extent of array construction phase for cumulative schemes marked by construction buoyage throughout. |
| Impacts on Commercial Fishing Vessels | | |
| Impacts on recreational vessels are not included within the CIA as they are considered as part of the current baseline assessment (paragraphs 12.84 and 12.85 - ‘Current Baseline’) and no further cumulative pathways were identified largely due to the low levels of recreational vessel activity recorded and the distance from shore. | | |

| Type of Impact | Worst Case Scenario | Justification/Rationale of Selected Design Envelope Parameter |
|---|--|---|
| Project Alpha and Project Bravo with Cumulative Schemes Operation | | |
| Cumulative projects assessed include: <ul style="list-style-type: none">• Seagreen Offshore Transmission Asset;• Neart na Gaoithe Offshore Wind Farm;• Inch Cape Offshore Wind Farm;• Kincardine Offshore Wind Farm;• European Offshore Wind Deployment Centre;• Forthwind Offshore Wind Farm• NorthConnect Interconnector; and• Aberdeen Harbour Expansion Project. | | |
| Impacts on Commercial Vessels | Maximum build out of all developments. | Maximum extent of array and cumulative schemes causing largest displacement for vessels routeing or activity. |
| Impacts on Commercial Fishing Vessels | | |
| As per the construction phase, impacts on recreational vessels are not included within the CIA as they are considered as part of the current baseline assessment (paragraphs 12.84 and 12.85 - ‘Current Baseline’) and no further cumulative pathways were identified largely due to the low levels of recreational vessel activity recorded and the distance from shore. | | |

Environmental Measures Incorporated Into the Project

- 12.95. 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. 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.
- 12.96. Mitigation measures that were identified and consent conditions applied to the originally consented project are provided within Chapter 7 (Scope of EIA Report). Measures relevant to the assessment of shipping and navigation are detailed below:
- Application for and use of safety zones during construction, major maintenance work during operations and decommissioning;
 - Buoyed construction and decommissioning area – temporary (as per NLB requirements);
 - Blade clearance exceeds 22m above MHWS;
 - Development Specification and Layout Plan (DSLPP) to be developed post consent giving consideration to MGN 543 (it is noted the current layout shown is indicative only);
 - Promulgation of information through Notices to Mariners, Kingfisher bulletins, fisheries liaison and further appropriate media. As per RYA Scotland's request, information will be promulgated to allow insertion into Pilot Books as required;
 - The use of guard vessels during construction and decommissioning when deemed appropriate by a risk assessment;

- Compliance from all vessels with international maritime regulations as adopted by the flag state, including the Convention for the Prevention of Collisions at Sea (COLREGs) (IMO, 1972) and the SOLAS (IMO, 1974);
- Development of an ERCoP post consent;
- Dedicated Marine Coordination Centre to manage on site vessels;
- Consideration of MGN 543 – Including SAR annex;
- Permanent AtoN in line with IALA, NLB, CAA and MCA SAR requirements; and
- WTGs, cables and OSPs marking on Admiralty Navigational Charts and Admiralty Sailing Directions.

12.97. A number of consent conditions were attached to the original consents received for the originally consented Project in 2014. These were defined to manage the environmental risk of the Project. Any future consents issued to Seagreen may include similar conditions to manage the risk to shipping and navigation, where necessary. Consent conditions applied to the originally consented project are provided within Chapter 7 (Scope of EIA Report). Consent conditions relevant to the management of shipping and navigation are set out below in Table 12.8.

Table 12.8 Original consent conditions relevant to shipping and navigation

| Project Phase | Consent and Condition Number | Summary of Conditions |
|---------------|-----------------------------------|---|
| | Section 36, condition 12 | Development and implementation of a DSLP. |
| | Section 36, condition 15 | Development and implementation of a VMP. |
| | Section 36, condition 17 | Development and implementation of an NSP. |
| | Section 36, condition 18 | Development and implementation of a Cable Plan. |
| | Section 36, condition 19 | Development and implementation of an LMP. |
| | Section 36, condition 24 | Provide the positions and maximum heights of the WTGs and construction equipment over 150m (measured above LAT) and any Offshore Sub-Station Platforms to the UKHO for aviation and nautical charting purposes. |
| | Section 36, condition 25 | Development and implementation of a Traffic and Transportation Plan. |
| | Marine Licence, condition 3.2.1.3 | <p>Notify the UKHO of the proposed works, to facilitate the promulgation of maritime safety information and updating of nautical charts and publications through the national Notice to Mariners system.</p> <p>Ensure that local mariners, fishermen's organisations and HM Coastguard, in this case Maritime Rescue Coordination Centre (MRCC) Aberdeen, are made fully aware of any Licensable Marine Activity through local Notice to Mariners or any other appropriate means.</p> <p>Ensure that details of the Works are promulgated in the Kingfisher Fortnightly Bulletin, and inform the Sea Fish Industry of the vessel routes, the timings and the location of the works and of the relevant operations.</p> <p>Completion of an 'Application for Statutory Sanction to Alter/Exhibit' form and submission to the NLB.</p> |

| Project Phase | Consent and Condition Number | Summary of Conditions |
|------------------------|-----------------------------------|---|
| | Marine Licence, condition 3.2.2.3 | <p>Notify the Licensing Authority of any case of damage to, or destruction, or decay of the Works.</p> <p>Ensure that any Emergency Response and Rescue Vehicle (ERRV) and/or cable-laying vessel permitted to engage in the Works must be equipped with an AIS receiver and Automatic Radar Plotting Aids (ARPA).</p> <p>Ensure that no radio beacon or radar beacon operating in the marine frequency bands is installed, or used on the Works without the prior written approval of the Office of Communications ('OfCom').</p> <p>Ensure that navigational safety is not compromised by the Works.</p> |
| | Marine Licence, condition 3.2.2.4 | <p>Ensure that the Works are marked and lit in accordance with the requirements of the NLB, the CAA and the MOD at all times.</p> <p>Ensure the site boundaries are marked by Cardinal Mark buoys.</p> |
| | Marine Licence, condition 3.2.2.5 | <p>Ensure that any vessels permitted to engage in the Works are marked in accordance with the COLREGs whilst under way, and in accordance with the UK Standard Marking Schedule for Offshore Installations if secured to the seabed.</p> |
| | Marine Licence, condition 3.2.2.9 | <p>Construct the Works in accordance with the approved Meteorological Mast Piling Strategy (MMPS), DSLP and the Meteorological Mast Lighting and Marking Plan (MMLMP) (as updated and amended on occasion by the Licensee).</p> |
| | Marine Licence, condition 3.2.3.2 | <p>Notify the UKHO of the Completion of the Works to facilitate the promulgation of maritime safety information and updating of nautical charts and publications through the national Notice to Mariners system.</p> <p>Provide the 'as-built' positions and maximum heights of all WTGs, Metrological Masts, along with any sub-sea infrastructure, to the UKHO for aviation and nautical charting purposes.</p> <p>Ensure that local mariners, fishermen's organisations and HM Coastguard, in this case MRCC Aberdeen, are made fully aware of the Completion of the Works.</p> <p>Ensure that the Completion of the Works is promulgated in the Kingfisher Fortnightly Bulletin to inform the Sea Fish Industry.</p> <p>Notify the Licensing Authority, in writing, as soon as reasonably practicable, of any case of damage to or destruction or decay of the Works.</p> <p>Ensure that no radio beacon or Radar beacon operating in the Marine frequency bands is installed or used on the Works without the prior written approval of OfCom.</p> |
| | Marine Licence, condition 3.2.3.4 | <p>Ensure that the Works are marked and lit in accordance with the requirements of the NLB, the CAA and MOD at all times.</p> <p>Ensure that the required IALA availability target for Category 1 AtoN is achieved.</p> |
| Decommissioning | Section 36, Condition 3 | Development of a Decommissioning Programme. |

IMPACT ASSESSMENT – CONSTRUCTION PHASE

Project Alpha

Impact of Construction on Commercial Vessels

12.98. During the construction phase, there will be an increased level of vessel activity within Project Alpha such as jack-ups, barges and CTVs (see Chapter 5 (Project Description)). The presence of construction traffic could therefore lead to an increase in commercial vessel to vessel encounters and collision risk in the area due to vessel displacement when compared to baseline conditions. There may also be an increase in allision risk due to the presence of pre-commissioned structures (up to 70 substructures and WTGs and two previously consented OSPs) in a previously empty sea area. These potential impacts are discussed in the following sections.

Potential Impacts

Displacement

12.99. Based on the analysis of the marine traffic data, there are four routes passing through Project Alpha which could be affected during construction works. The busiest of these routes is the Aberdeen to Immingham route used by an estimated one vessel per day. Vessels on this route are expected to deviate to the east to increase their passing distance around construction activities. Although vessels are not prohibited from entering the construction area (outside of authorised safety zones), it will be marked by construction buoyage (which will be promulgated) and experience at constructed projects (such as London Array Offshore Wind Farm or Beatrice Offshore Wind Farm) shows that commercial vessels typically route around wind farms during construction.

Encounters and Collision with Project Alpha Construction Vessels

12.100. The increase in vessel traffic associated with Project Alpha construction will largely be present within the buoyed construction area, which commercial vessels are likely to avoid. However, certain activities will require vessel presence out with the buoyed construction area and minimum safe passing distances will be in place to protect the associated vessels from an increased risk of collision. Given the small working area of these vessels (and minimum safe passing distances) there are not expected to be any increases in collision risk associated with the displacement of commercial vessels around them.

Encounters and Collision with Other Vessels

12.101. The construction works in Project Alpha may also displace commercial fishing and recreational vessels into areas transited by commercial vessels (outside of the buoyed construction area) and vice versa, leading to a minor increase in vessel to vessel encounters; however any risk of collision is expected to be mitigated by COLREGs (IMO, 1972).

Allision Risk

12.102. It is expected that larger commercial vessels (cargo and tankers) will avoid Project Alpha during all project phases due to the deviations required. Any allision scenario involving such a vessel is therefore expected when the vessel is outside Project Alpha and either drifting (not under command) into a structure, or alliding under power with a structure due to human error or mechanical failure.

12.103. It is assumed that any construction vessels will take necessary precautions and mitigations (as part of their passage plans and risk assessments) to avoid allision with structures outside of their risk assessed work whereby proximity to structures would be required.

Summary

12.104. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, a Marine Coordination Centre will be established. This will coordinate construction vessel operations and will monitor and record AIS information to indicate the movement of project vessel traffic in and around Project Alpha to ensure the safe and efficient construction of Project Alpha.

12.105. The impact on commercial vessels directly arises from the activities associated with the construction of Project Alpha. Impacts will be temporary in nature throughout the construction phase of Project Alpha which is estimated to take up to three years. The impacts are likely to have a small spatial extent and be localised to the buoyed construction area.

12.106. Due to the available sea room for commercial deviations around the construction activities, environmental measures incorporated into the Project and the temporary nature of the construction activity, the frequency of impacts is considered to be **Extremely Unlikely**. The severity of consequence is considered to be **Moderate** given the potential for moderate damage to vessels, injury to person and environmental impacts should an increased risk of displacement, increased collision or allision risk occur. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

12.107. No additional mitigation is either required or proposed in relation to construction on commercial vessels as no adverse significant impacts are predicted.

Residual Impact

12.108. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha

Impact of Construction on Commercial Fishing Vessels

12.109. During the construction phase, there will be an increased level of vessel activity within Project Alpha such as jack-ups, barges and CTVs (see Chapter 5 [Project Description]). The presence of construction traffic could therefore lead to an increase in encounters for commercial fishing vessels with the potential for subsequent collision risk when compared to baseline conditions. There may also be an increase in allision risk due to the presence of pre-commissioned structures (up to 70 substructures and WTGs and two previously consented OSPs) in a previously empty sea area. As previously noted, the OSPs are part of the Transmission Asset which was licensed separately in 2014. This asset remains as licensed, and is therefore not part of the current EIA, however OSPs have been quantitatively considered in this EIA Report as they form an integral part of the array and have been included within the allision and collision modelling of the NRA Addendum (Section 10 and 11 of Appendix 12A [NRA Addendum]). These potential impacts are discussed in the following sections.

Potential Impacts

Displacement

12.110. Commercial fishing vessels were recorded within Project Alpha during the validation survey in 2017. This included vessels engaged in fishing and transiting through the Project Alpha site. A buoyed construction area will be in place which commercial fishing vessels are expected to deviate around when on transit, but deviations are expected to be minimal. Consideration of construction activities on vessels engaged in fishing is contained within Chapter 11 (Commercial Fisheries) of the EIA Report.

Encounters and Collision with Project Alpha Construction Vessels

12.111. The increase in vessel traffic associated with Project Alpha construction will largely be present within the buoyed construction area and may displace commercial fishing vessels from operating within it. However given environmental measures incorporated into the Project such as marine coordination and guard vessels, there is not expected to be any increase in collision associated with this (commercial fishing vessels and Project Alpha construction vessels).

12.112. Certain activities will require vessel presence out with the buoyed construction area and minimum safe passing distances will be in place to protect the associated vessels from an increased risk of collision. Given the small working area of these vessels (and minimum safe passing distances) again there are not expected to be any increases in collision risk associated with the displacement of commercial fishing vessels around them.

Encounters and Collision with Other Vessels

12.113. The construction works in Project Alpha may also displace commercial and recreational vessels into areas used by commercial fishing vessels and vice versa, leading to a low increase in vessel to vessel encounters; however any increase in collision will be mitigated by COLREGs (IMO, 1972).

Allision Risk

12.114. It is expected that commercial fishing vessels will avoid Project Alpha during all phases due to the deviations required. Any allision scenario involving such a vessel is therefore expected when the vessel is outside Project Alpha and either drifting (not under command) towards Project Alpha into a structure, or alliding under power with a structure due to human error or mechanical failure.

Summary

12.115. Embedded mitigation measures are as per paragraphs 12.96 - 'Environmental Measures Incorporated into the Project'. In particular, a Marine Coordination Centre will be established. This will coordinate construction vessel operations and will monitor and record vessel AIS information to indicate the movement of project vessel traffic in and around Project Alpha, to ensure the safe and efficient construction of Project Alpha. Guard vessels will also be on site to ensure commercial fishing vessels stay within minimum safe passing distances.

12.116. The impact on commercial fishing vessels directly arises from the activities associated with the construction of Project Alpha. Impacts associated with construction activities will be temporary in nature throughout the construction phase of Project Alpha which is estimated to take up to three years. The impacts are likely to have a small spatial extent and be localised to the buoyed construction area.

- 12.117. Due to the available sea room for commercial fishing vessels to deviate around construction works including the buoyed construction area, the frequency of impacts on commercial fishing vessels is considered to be **Remote**. The severity of consequence is considered to be **Minor** given the potential for minor injury to persons, property or the environment should an increased risk of displacement, collision or allision occur. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.
- 12.118. The severity of consequence is deemed to be less than that for commercial vessels (paragraph 12.106, 'Impact of Construction on Commercial Vessels [Project Alpha]'). This is due to the typically larger size of commercial vessels and the energy at which they would allide with a structure. Commercial fishing vessels, being generally smaller, will be transiting at a lower speed and with less force behind them resulting in a lower energy impact with less severity of consequence (including less crew and lower levels of potential pollutants on board).
- 12.119. Further details on the impact on fishing activity can be found in Chapter 11 (Commercial Fisheries) of the EIA Report.

Additional Mitigation

- 12.120. No additional mitigation is either required or proposed in relation to construction on commercial fishing vessels as no adverse significant impacts are predicted.

Residual Impact

- 12.121. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha

Impact of Construction on Recreational Vessels

- 12.122. During the construction phase, there will be an increased level of vessel activity within Project Alpha such as jack-ups, barges and CTVs (see Chapter 5 [Project Description]). The presence of construction traffic could therefore lead to an increase in encounters for recreational vessels with the potential for subsequent collision risk when compared to baseline conditions. There may also be an increase in allision risk due to the presence of pre-commissioned structures (up to 70 substructures and WTGs and two previously consented OSPs) in a previously empty sea area. These potential impacts are discussed in the following sections.

Potential Impacts

Displacement

- 12.123. A small number of recreational vessels were recorded intersecting Project Alpha during the summer validation survey in July and August 2017. There were no recreational vessels recorded intersecting Project Alpha during the winter validation survey in February and March 2017. The RYA Coastal Atlas (RYA, 2016) did not cover Project Alpha itself; however, it showed that recreational activity within the sea area was largely coastal, noting one offshore route indicator northwest of the Project Alpha boundary which indicates that vessels may transit within proximity to Project Alpha. Recreational vessels are expected to make minor deviations to increase their passing distance around construction activities. A buoyed construction area will be in place which recreational vessels are expected to deviate around.

Encounters and Collision with Project Alpha Construction Vessels

- 12.124. The increase in vessel traffic associated with Project Alpha construction will largely be present within the buoyed construction area and is likely to displace recreational vessels from operating within it. However given environmental measures incorporated into the Project such as marine coordination and guard vessels, there is not expected to be any increase in collision associated with this (recreational vessels and Project Alpha construction vessels).
- 12.125. Certain activities will require vessel presence out with the buoyed construction area and minimum safe passing distances will be in place to protect the associated vessels from an increased risk of collision. Given the small working area of these vessels (and minimum safe passing distances) again there are not expected to be any increases in collision risk associated with the displacement of recreational vessels around them.

Encounters and Collision with Other Vessels

- 12.126. The construction works in Project Alpha may displace commercial and commercial fishing vessels onto routes used by recreational vessels and vice versa, leading to an increase in vessel to vessel encounters; however as with commercial vessels and commercial fishing vessels this will be mitigated by COLREGs (IMO, 1972).

Allision Risk

- 12.127. It is expected that recreational vessels will avoid Project Alpha during all phases due to the deviations required. Any allision scenario involving such a vessel is therefore expected when the vessel is outside Project Alpha and either drifting (not under command) towards Project Alpha into a structure or alliding under power with a structure due to human error or mechanical failure.

Summary

- 12.128. Embedded mitigation measures are as per paragraph 12.96 - 'Environmental Measures Incorporated into the Project'. In particular, a Marine Coordination Centre will be established. This will coordinate construction vessel operations and will monitor and record vessel AIS information to indicate the movement of project vessel traffic in and around Project Alpha to ensure the safe and efficient construction of Project Alpha. Guard vessels will also be on site to ensure recreational vessels stay within minimum safe passing distances.
- 12.129. The impact on recreational vessels directly arises from the activities associated with the construction of Project Alpha. Impacts will be temporary in nature throughout the construction phase of Project Alpha which is estimated to take up to three years. The impacts are likely to have a small spatial extent and be localised to the buoyed construction area.
- 12.130. Given the low level of recreational vessel activity within Project Alpha, the buoyed construction area and the available sea room for recreational vessels to deviate, the frequency of impacts of construction on recreational vessels is considered to be **Extremely Unlikely**. The severity of consequence is **Minor** given the potential minor impacts on persons, property and the environment should an increased risk of displacement, collision or allision occur. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

12.131. The severity of consequence is deemed to be less than that for commercial vessels (paragraph 12.106, 'Impact of Construction on Commercial Vessels [Project Alpha]'). This is due to the typically larger size of commercial vessels and the energy at which they would allide with a structure. Recreational vessels, being generally smaller, will be transiting at a lower speed and with less force behind them meaning a lower energy impact with less severity of consequence (including less crew and lower levels of potential pollutants on board).

Additional Mitigation

12.132. No additional mitigation is either required or proposed in relation to construction on recreational vessels as no adverse significant impacts are predicted.

Residual Impact

12.133. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Bravo

Impact of Construction on Commercial Vessels

12.134. During the construction phase, there will be an increased level of vessel activity within Project Bravo such as jack-ups, barges and CTVs (see Chapter 5 (Project Description) of the EIA Report). The presence of construction traffic could therefore lead to an increase in commercial vessel to vessel encounters and collision risk in the area due to vessel displacement when compared to baseline conditions. There may also be an increase in allision risk due to the presence of pre-commissioned structures (up to 70 substructures and WTGs and two previously consented OSPs) in a previously empty sea area. These potential impacts are discussed in the following sections.

Potential Impacts

Displacement

12.135. Based on the analysis of the marine traffic data, there are four routes passing through Project Bravo which will be affected during construction works. The busiest of these routes is the Peterhead to Immingham route used by an estimated one vessel per day. Vessels on this route are expected to deviate to the east to increase their passing distance around construction activities.

12.136. Although the baseline differs slightly in terms of routeing, the impacts of displacement are considered to be the same as those for Project Alpha in isolation (paragraph 12.99 - 'Impact of Construction on Commercial Vessels [Project Alpha]').

Encounters and Collision with Project Bravo Construction Vessels

12.137. Although the baseline differs slightly the impacts on displacement and therefore collision risks are considered to be the same as Project Alpha in isolation (paragraph 12.100 - 'Impact of Construction on Commercial Vessels [Project Alpha]').

Encounters and Collision with Other Vessels

12.138. Although the baseline differs slightly the impacts of encounters and collision risk are considered to be the same as Project Alpha in isolation (paragraph 12.101 - 'Impact of Construction on Commercial Vessels [Project Alpha]').

Allision Risk

12.139. Although the baseline differs slightly the impacts of allision risk are considered to be the same as Project Alpha in isolation (paragraph 12.102 – ‘Impact of Construction on Commercial Vessels [Project Alpha]’).

Summary

12.140. Embedded mitigation measures as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’ are considered to be the same as those for Project Alpha in isolation (paragraph 12.104 – ‘Impact of Construction on Commercial Vessels [Project Alpha]’).

12.141. The impact on commercial vessels directly arises from the activities associated with the construction of Project Bravo. Impacts will be temporary in nature throughout the construction phase of Project Bravo which is estimated to take three years. The impacts are likely to have a small spatial extent and be localised to the buoyed construction area.

12.142. Due to the available sea room for commercial deviations around the construction activities, environmental measures incorporated into the Project and the temporary nature of the construction activity, the frequency of impacts is considered to be **Extremely Unlikely**. The severity of consequence is considered to be **Moderate** given the potential for moderate damage to vessels, injury to person and environmental impacts should an increased risk of displacement, collision or allision occur. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

12.143. No additional mitigation is either required or proposed in relation to construction on commercial vessels as no adverse significant impacts are predicted.

Residual Impact

12.144. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Bravo

Impact of Construction on Commercial Fishing Vessels

12.145. During the construction phase, there will be an increased level of vessel activity within Project Bravo such as jack-ups, barges and CTVs (see Chapter 5 [Project Description]). The presence of construction traffic could therefore lead to an increase in encounters for commercial fishing vessels with the potential for subsequent collision risk when compared to baseline conditions. There may also be an increase in allision risk due to the presence of pre-commissioned structures (up to 70 substructures and WTGs, and two previously consented OSPs) in a previously empty sea area. These potential impacts are discussed in the following sections.

Potential Impacts

Displacement, Encounters and Collision Risk

12.146. A number of commercial fishing vessels were recorded within Project Bravo during the validation survey in 2017. This included vessels engaged in fishing and transiting through the Bravo site. Commercial fishing vessels are expected to make minor deviations to increase their passing distance around construction activities. A buoyed construction area

will be in place which commercial fishing vessels in transit are expected to deviate around. Consideration of construction activities on vessels engaged in fishing is contained within Chapter 11 (Commercial Fisheries) of the EIA Report.

- 12.147. Although levels of fishing were slightly higher in Project Bravo than those recorded within Project Alpha the impacts of displacement, encounters and collision are considered to be the same (paragraphs 12.110 to 12.113 - 'Impact of Construction on Commercial Fishing Vessels [Project Alpha]').

Allision Risk

- 12.148. Although the numbers of fishing vessels recorded were slightly higher in Project Bravo than those recorded within Project Alpha the impacts of allision are considered to be the same (paragraph 12.114 - 'Impact of Construction on Commercial Fishing Vessels [Project Alpha]').

Summary

- 12.149. Embedded mitigation measures as per paragraph 12.96 - 'Environmental Measures Incorporated into the Project' are considered to be the same as those for Project Alpha in isolation (paragraph 12.115 - 'Impact of Construction on Commercial Fishing Vessels [Project Alpha]').
- 12.150. The impact on commercial fishing vessels directly arises from the activities associated with the construction of Project Bravo. Impacts will be temporary in nature throughout the construction phase of Project Bravo which is estimated to take up to three years. The impacts are likely to have a small spatial extent and be localised to the buoyed construction area.
- 12.151. Due to the available sea room for commercial fishing vessels to deviate around construction works including the buoyed construction area, the frequency of impacts on commercial fishing vessels is considered to be **Remote**. The severity of consequence is considered to be **Minor** given the potential for minor injury to persons, property or the environment should an increased risk of displacement, collision or allision occur. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.
- 12.152. The severity of consequence is deemed to be less than that for commercial vessels (paragraph 12.106 - 'Impact of Construction on Commercial Vessels (Project Bravo)'). This is due to the typically larger size of commercial vessels and the energy at which they would allide with a structure. Commercial fishing vessels, being generally smaller, will be transiting at a lower speed and with less force behind them meaning a lower energy impact with less severity of consequence (including less crew and lower levels of potential pollutants on board).
- 12.153. Further details on the impact on fishing activity can be found in Chapter 11 (Commercial Fisheries) of the EIA Report.

Additional Mitigation

- 12.154. No additional mitigation is either required or proposed in relation to construction on commercial fishing vessels as no adverse significant impacts are predicted.

Residual Impact

- 12.155. No additional mitigation is required therefore residual impacts are as per pre-additional mitigation.

Project Bravo

Impact of Construction on Recreational Vessels

12.156. During the construction phase, there will be an increased level of vessel activity within Project Bravo such as jack-ups, barges and CTVs (see Chapter 5 [Project Description]). The presence of construction traffic could therefore lead to an increase in encounters for recreational vessels with the potential for subsequent collision risk when compared to baseline conditions. There may also be an increase in allision risk due to the presence of pre-commissioned structures (up to 70 substructures and WTGs and two previously consented OSPs) in a previously empty sea area. These potential impacts are discussed in the following sections.

Potential Impacts

Displacement, Encounters and Collision Risk

12.157. Although the baseline differs slightly, the impacts of displacement, encounters and collision risk are considered to be the same as Project Alpha in isolation (paragraphs 12.123 to 12.126 – ‘Impact of Construction on Recreational Vessels [Project Alpha]’).

Allision Risk

12.158. Although the baseline differs slightly, the impacts of allision risk are considered to be the same as Project Alpha in isolation (paragraph 12.127 – ‘Impact of Construction on Recreational Vessels [Project Alpha]’).

Summary

12.159. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’ and are considered to be the same as those for Project Alpha in isolation (paragraph 12.128 – ‘Impact of Construction on Recreational Vessels [Project Alpha]’).

12.160. The impact on recreational vessels directly arises from the activities associated with the construction of Project Bravo. Impacts will be temporary in nature throughout the construction phase of Project Bravo which is estimated to take up to three years. The impacts are likely to have a small spatial extent and be localised to the buoyed construction area.

12.161. Given the low level of recreational vessel activity within Project Bravo, the buoyed construction area and the available sea room for recreational vessels to deviate, the frequency of impacts of construction on recreational vessels is considered to be **Extremely Unlikely**. The severity of consequence is **Minor** given the potential minor impacts on persons, property and the environment should an increased risk of displacement, collision or allision occur. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

12.162. The severity of consequence is deemed to be less than that for commercial vessels (paragraph 12.151 – ‘Impact of Construction on Commercial Vessels [Project Bravo]’). This is due to the typically larger size of commercial vessels and the energy at which they would allide with a structure. Commercial fishing vessels, being generally smaller, will be transiting at a lower speed and with less force behind them meaning a lower energy impact with less severity of consequence (including less crew and lower levels of potential pollutants on board).

Additional Mitigation

12.163. No additional mitigation is either required or proposed in relation to construction on recreational vessels as no adverse significant impacts are predicted.

Residual Impact

12.164. No additional mitigation is required therefore residual impacts are as per pre-additional mitigation.

Project Alpha and Project Bravo Combined

Impact of Construction on Commercial Vessels

12.165. During the construction phase, there will be an increased level of vessel activity within Project Alpha and Project Bravo (the optimised Seagreen Project) such as jack-ups, barges and CTVs (see Project 5 [Project Description]). The presence of construction traffic could therefore lead to an increase in commercial vessel to vessel encounters and collision risk in the area due to vessel displacement when compared to baseline conditions. There may also be an increase in allision risk due to the presence of pre-commissioned structures (up to 120 substructures and WTGs and four previously consented OSPs) in a previously empty sea area. These potential impacts are discussed in the following sections.

Potential Impacts

Displacement

12.166. Based on the analysis of the marine traffic data, there are five routes passing through the optimised Seagreen Project which will be affected during construction works and therefore displacement is more frequent than that observed for either Project Alpha or Project Bravo in isolation and will require larger deviations depending on the route. The busiest of these routes are the Peterhead to Immingham route and Aberdeen to Immingham route, both used by an estimated one vessel per day. Vessels on both of these routes are expected to deviate to the east to increase their passing distance around construction activities. Although vessels are not prohibited from entering the construction area (outside of authorised safety zones) it will be marked by construction buoyage (which will be promulgated) and experience at projects (such as London Array Offshore Wind Farm or Beatrice Offshore Wind Farm) shows that commercial vessels typically route around wind farms during construction.

Encounters and Collision with Optimised Seagreen Project Construction Vessels

12.167. Although the baseline differs due to the larger project area considered for the combined assessment, the impacts of displacement and therefore collision risk due to the presence of the optimised Seagreen Project are considered to be the same as Project Alpha or Project Bravo in isolation albeit to a larger extent (see paragraph 12.100 – ‘Impact of Construction on Commercial Vessels [Project Alpha]’).

Encounters and Collision with Other Vessels

12.168. As with Project Alpha and Project Bravo in isolation, the construction works in the optimised Seagreen Project may also displace commercial fishing and recreational vessels into areas transited by commercial vessels (outside of the buoyed construction area) and vice versa, leading to a minor increase in vessel to vessel encounters; however any risk of collision is expected to be mitigated by COLREGS (IMO, 1972).

Allision Risk

- 12.169. It is expected that larger commercial vessels (cargo and tankers) will avoid the optimised Seagreen Project during all phases due to the deviations required. Any allision scenario involving such a vessel is therefore expected when the vessel is outside the optimised Seagreen Project and either drifting (not under command) towards the optimised Seagreen Project into a structure, or alliding under power with a structure due to human error or mechanical failure.
- 12.170. It is assumed that any construction vessels will take necessary precautions and mitigations (as part of their passage plans and risk assessments), to avoid allision with structures outside of their risk assessed work whereby proximity to structures would be required.

Summary

- 12.171. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, a Marine Coordination Centre will be established. This will coordinate construction vessel operations and will monitor and record AIS information to indicate the movement of project vessel traffic in and around the optimised Seagreen Project to ensure the safe and efficient construction of the optimised Seagreen Project.
- 12.172. The impact on commercial vessels directly arises from the activities associated with the construction of the optimised Seagreen Project. Impacts will be temporary in nature throughout the construction phase of the optimised Seagreen Project which is estimated to take up to four years. The impacts are likely to have a small spatial extent and be localised to the buoyed construction area.
- 12.173. Due to a larger construction area, compared to construction of Project Alpha or Project Bravo in isolation, the frequency of impacts are considered to be slightly higher and are therefore deemed to be **Remote**. The severity of consequence is considered to be **Moderate** given the potential for moderate damage to vessels, injury to person and environmental impacts should an increased collision or allision risk occur. This gives a significance ranking of **Tolerable with Mitigation** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

- 12.174. No additional mitigation is either required or proposed in relation to construction on commercial vessels as no adverse significant impacts are predicted.

Residual Impact

- 12.175. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha and Project Bravo Combined

Impact of Construction on Commercial Fishing Vessels

- 12.176. During the construction phase, there will be an increased level of vessel activity within the optimised Seagreen Project such as jack-ups, barges and CTVs (see Chapter 5 [Project Description]). The presence of construction traffic could therefore lead to an increase in encounters for commercial fishing with the potential for subsequent collision risk when compared to baseline conditions. There may also be an increase in allision risk due to the presence of pre-commissioned structures (up to 120 substructures and WTGs and four previously consented OSPs) in a previously empty sea area. These potential impacts are discussed in the following sections.

Potential Impacts

Displacement, Encounters and Collision Risk

- 12.177. A number of commercial fishing vessels were recorded within the optimised Seagreen Project during the validation survey in 2017. This included vessels engaged in fishing and transiting through the optimised Seagreen Project site. A buoyed construction area will be in place which commercial fishing vessels are expected to deviate around when on transit, but deviations are expected to be minimal. Consideration of construction activities on vessels engaged in fishing is contained within Chapter 11 (Commercial Fisheries) of the EIA Report.
- 12.178. Although levels of commercial fishing were higher in the optimised Seagreen Project than those recorded within Project Alpha or Project Bravo in isolation, the impacts of displacement and collision are considered to be similar (paragraphs 12.110 to 12.113 – ‘Impact of Construction on Commercial Fishing Vessels [Project Alpha]’).

Allision Risk

- 12.179. It is expected that commercial fishing vessels will avoid the optimised Seagreen Project during all phases due to the deviations required. Any allision scenario involving such a vessel is therefore expected when the vessel is outside the optimised Seagreen Project and either drifting (not under command) towards the optimised Seagreen Project into a structure, or alliding under power with a structure due to human error or mechanical failure.

Summary

- 12.180. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, a Marine Coordination Centre will be established. This will coordinate construction vessel operations and will monitor and record vessel AIS information to indicate the movement of project vessel traffic in and around Project Alpha to ensure the safe and efficient construction of the optimised Seagreen Project. Guard vessels will also be on site to ensure commercial fishing vessels stay within minimum safe passing distances.
- 12.181. The impact on commercial fishing vessels directly arises from the activities associated with the construction of the optimised Seagreen Project. Impacts associated with construction activities will be temporary in nature throughout the construction phase of the optimised Seagreen Project which is estimated to take up to four years. The impacts are likely to have a small spatial extent and be localised to the buoyed construction area.
- 12.182. Due to the available sea room for commercial fishing vessels to deviate around construction works and the buoyed construction area, the frequency of impacts is considered to be the same as that of Project Alpha and Project Bravo in isolation and therefore is deemed to be **Remote**. The severity of consequence is considered to be **Minor** given the potential for impacts on persons, property and the environment should an impact occur. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.
- 12.183. Further details on the assessment of safety risks on commercial fishing activity can be found in Chapter 11 (Commercial Fisheries).

Additional Mitigation

- 12.184. No additional mitigation is either required or proposed in relation to construction on commercial fishing vessels as no adverse significant impacts are predicted.

Residual Impact

12.185. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha and Project Bravo Combined

Impact of Construction on Recreational Vessels

12.186. During the construction phase, there will be an increased level of vessel activity within the optimised Seagreen Project such as jack-ups, barges and CTVs (see Chapter 5 [Project Description]). The presence of construction traffic could therefore lead to an increase in encounters for recreational vessels with the potential for subsequent collision risk when compared to baseline conditions. There may also be an increase in allision risk due to the presence of pre-commissioned structures (up to 120 substructures and WTGs and four previously consented OSPs) in a previously empty sea area. These potential impacts are discussed in the following sections.

Potential Impacts

Displacement, Encounters and Collision Risk

12.187. A small number of recreational vessels were recorded intersecting the optimised Seagreen Project during the summer validation survey in July and August 2017. There were no recreational vessels recorded intersecting the Project during the winter validation survey in February and March 2017. The RYA Coastal Atlas (RYA, 2016) did not cover the optimised Seagreen Project itself; however, it showed that recreational activity within the sea area was largely coastal, noting one offshore route indicator northwest of the Project boundary which indicates that vessels may transit within proximity to the optimised Seagreen Project. Recreational vessels are expected to make minor deviations to increase their passing distance around construction activities, including the buoyed construction area.

12.188. Although the baseline differs due to the larger project area considered for the combined assessment, the impacts of displacement, encounters and collision risk are considered to be the similar to that of Project Alpha or Project Bravo in isolation albeit to a larger extent (paragraphs 12.123 to 12.126 – ‘Impact of Construction on Recreational Vessels [Project Alpha]’).

Allision Risk

12.189. It is expected that recreational vessels will avoid the optimised Seagreen Project during all phases due to the deviations required. Any allision scenario involving such a vessel is therefore expected when the vessel is outside the optimised Seagreen Project and either drifting (not under command) towards the optimised Seagreen Project into a structure or alliding under power with a structure due to human error or mechanical failure.

Summary

12.190. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, a Marine Coordination Centre will be established. This will coordinate construction vessel operations and will monitor and record vessel AIS information to indicate the movement of project vessel traffic in and around Project Alpha to ensure the safe and efficient construction of the optimised Seagreen Project. Guard vessels will also be on site to ensure recreational vessels stay within minimum safe passing distances.

- 12.191. The impact on recreational vessels directly arises from the activities associated with the construction of the optimised Seagreen Project. Impacts will be temporary in nature throughout the construction phase of the optimised Seagreen Project which is estimated to take up to four years. The impacts are likely to have a small spatial extent and be localised to the buoyed construction area.
- 12.192. Given the low level of recreational vessel activity within the optimised Seagreen Project, the buoyed construction area and the available sea room for recreational vessels to deviate, the frequency of impacts is considered to be the same as that of Project Alpha or Project Bravo in isolation and therefore is deemed to be **Extremely Unlikely**. The severity of consequence is **Minor** given the potential for impacts on persons, property and the environment should a collision or allision occur. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

- 12.193. No additional mitigation is either required or proposed in relation to construction on recreational vessels as no adverse significant impacts are predicted.

Residual Impact

- 12.194. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

IMPACT ASSESSMENT – OPERATIONAL PHASE

Project Alpha

Impact of Operation on Commercial Vessels

- 12.195. Commercial vessels will be displaced from their regular routes during the operational phase of Project Alpha due to the presence of up to 70 substructures and WTGs and two previously consented OSPs. The potential impacts are discussed in the following sections.

Potential Impacts

Displacement

- 12.196. Based on the analysis of the marine traffic data, four routes intersected Project Alpha and are expected to deviate around the Project. The busiest of these routes is the Aberdeen to Immingham route used by an estimated one vessel per day with vessels on this route expected to deviate to the east of Project Alpha. The impact will be present throughout the 25 year operational phase; however the displaced vessels will adapt to the presence of Project Alpha (noting that deviations will already be established during the construction phase). Deviations are not expected to have a significant impact on a vessel's voyage distance given the mitigations in place to allow a vessel to effectively passage plan around the site. Such mitigations include promulgation of information, lighting and marking and the marking of Project Alpha structures on Admiralty Charts and Admiralty Sailing Directions.
- 12.197. Experience at operational wind farms (such as London Array Offshore Wind Farm or Walney Phase 1 Offshore Wind Farm) shows that some smaller commercial vessels may still transit through Project Alpha, noting that the minimum WTG spacing is 1,000m. This gives ample room in which to passage plan, depending on the weather conditions and the mitigations in place, including lighting and marking of WTGs.

Encounters, Collision and Allision Risk

- 12.198. The collision modelling undertaken in 2012 (Appendix 12C [Project Alpha and Project Bravo 2012 NRA]) for vessels on regular routes estimated that, post Project Alpha, commercial vessels would be involved in a collision within the area once every 982 years, compared to once every 1,899 years pre wind farm. It is noted that this includes commercial, fishing and recreational vessels.
- 12.199. In the 2012 modelling (Appendix 12C [Project Alpha and Project Bravo 2012 NRA]), it was estimated that a vessel would allide with a structure within Project Alpha under power once every 3,947 years. A drifting allision was estimated to occur once every 27,981 years. Drifting allisions are identified as being less frequent than powered allisions.
- 12.200. Given that this modelling was undertaken on a higher number of structures than is currently under consideration for Project Alpha (in isolation), allision and collision frequencies are assumed to be within those already assessed.

Summary

- 12.201. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, an LMP will ensure Project Alpha is visible to marine traffic during operation and safe to navigate through should a smaller commercial vessel decide to do so.
- 12.202. The impact on commercial vessel displacement directly arises from the presence of WTGs and OSPs. Impacts will be present throughout the operational phase of Project Alpha (which is estimated to last 25 years) however they are expected to be temporary in nature given that vessels will adapt to the presence of Project Alpha over time. The impacts are likely to have a small spatial extent and be localised to the locations of the WTGs and OSPs.
- 12.203. The frequency of occurrence is anticipated to be **Extremely Unlikely** with a severity of consequence of **Minor** given the limited potential for any impacts on persons, property or the environment. Significance is therefore assessed as **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

- 12.204. No additional mitigation is either required or proposed in relation to operation on commercial vessels as no adverse significant impacts are predicted.

Residual Impact

- 12.205. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha

Impact of Operation on Commercial Fishing Vessels

- 12.206. Commercial fishing vessels will be displaced from their regular routes during the operational phase of Project Alpha due to the presence of up to 70 substructures and WTGs and two previously consented OSPs. The potential impacts are discussed in the following sections.

Potential Impacts

Displacement

- 12.207. Commercial fishing vessels were recorded within the northeast of Project Alpha during the validation survey in 2017, with vessels both engaged in fishing activity and transiting through Project Alpha.
- 12.208. Experience at operational wind farms (such as London Array Offshore Wind Farm or Walney Phase 1 Offshore Wind Farm) shows that some commercial fishing vessels may still navigate within Project Alpha, noting that the minimum WTG spacing is 1,000m. This gives ample room in which to passage plan, depending on the weather conditions and the mitigations in place, including lighting and marking of WTGs.
- 12.209. For those commercial fishing vessels not transiting through the array there is sufficient sea room surrounding Project Alpha for commercial fishing vessels to pre-plan any revised passage in advance of encountering Project Alpha and with negligible increases to voyage distance.
- 12.210. Due to the level of commercial fishing activity and the available options for routing through or around the site, the frequency of occurrence (fishing vessel displacement) is considered to be **Remote**. The severity of consequence is considered **Minor** given the limited potential for any impacts on persons, property or the environment. This gives a significance ranking of **Broadly Acceptable** and therefore is **Not Significant** under EIA guidelines.

Encounters, Collision and Allision Risk

- 12.211. Collision modelling was undertaken in 2012 (Appendix 12C [Project Alpha and Project Bravo 2012 NRA]) with the results outlined as part of the commercial vessel collision risk previously discussed (paragraph 12.198 – ‘Impact of Operation on Commercial Vessels [Project Alpha]’).
- 12.212. Commercial fishing vessel allision risk for Project Alpha was also assessed in 2012 (Appendix 12C [Project Alpha and Project Bravo 2012 NRA]), which estimated an allision to occur once every 49 years. Given that WTG numbers have reduced for Project Alpha (in isolation), the corresponding fishing allision risk is assumed to be within the parameters already assessed.
- 12.213. The frequency of occurrence is anticipated to be **Remote** with a severity of consequence of **Minor** given the limited potential for any impacts on persons, property or the environment. Significance is therefore assessed as **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Summary

- 12.214. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, an LMP will ensure Project Alpha is visible to marine traffic during operation and safe to navigate through should a commercial fishing vessel decide to do so.
- 12.215. The impact on commercial fishing directly arises from the presence of WTGs and OSPs. Impacts will be present throughout the operational phase of Project Alpha (which is estimated to last 25 years), however, they are expected to be temporary in nature given that vessels will adapt to the presence of Project Alpha over time. The impacts are likely to have a small spatial extent and be localised to the locations of the WTGs and OSPs.
- 12.216. Further assessment on the impact of Project Alpha on commercial fishing vessels is considered within Chapter 11 (Commercial Fisheries) of the EIA Report.

Additional Mitigation

12.217. No additional mitigation is either required or proposed in relation to operation on commercial fishing vessels as no adverse significant impacts are predicted.

Residual Impact

12.218. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha

Impact of Operation on Recreational Vessels

12.219. Recreational vessels will be displaced from their regular routes during the operational phase of Project Alpha due to the presence of up to 70 substructures and WTGs and two previously consented OSPs. The potential impacts are discussed in the following sections.

Potential Impacts

Displacement

12.220. There were no recreational vessels recorded intersecting Project Alpha during the winter survey period and a total of five recreational vessels recorded intersecting Project Alpha during the summer survey period; therefore recreational vessel activity is considered to be low. The RYA Coastal Atlas (RYA, 2016) did not cover Project Alpha itself; however, it showed that recreational activity within the sea area was largely coastal, noting one offshore route indicator northwest of the Project Alpha boundary which indicates that vessels may transit within proximity to Project Alpha. Considering there will be no restrictions on navigation through Project Alpha (outside of authorised major maintenance safety zones) and the level of recreational activity within Project Alpha, displacement of recreational vessels is anticipated to be low.

12.221. Experience at operational wind farms (such as London Array Offshore Wind Farm or Walney Phase 1 Offshore Wind Farm) shows that recreational vessels may still transit Project Alpha, noting that the minimum spacing is 1,000m. This gives ample room in which to passage plan, depending on the weather conditions and the mitigations in place including lighting and marking of WTGs.

12.222. For those recreational vessels not transiting through the array there is sufficient sea room surrounding Project Alpha for recreational vessels to pre-plan any revised passage in advance of encountering Project Alpha with negligible increases to voyage distance.

Encounters, Collision and Allision Risk

12.223. The impact on vessel to vessel collision risk for recreational vessels was assessed in 2012 (Appendix 12C [Project Alpha and Project Bravo 2012 NRA]) and has been included as part of the commercial vessel collision risk previously discussed (paragraph 12.198 – ‘Impact of Operation on Commercial Vessels [Project Alpha]’).

12.224. Recreational vessel allision is most likely to occur during periods of fog or poor visibility. However, no recreational vessels were recorded intersecting Project Alpha during the winter survey period (February and March 2017) suggesting that recreational vessels are unlikely to transit within the Project Alpha site in poor weather conditions.

Summary

- 12.225. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, an LMP will ensure Project Alpha is visible to marine traffic during operation and safe to navigate through should a recreational vessel decide to do so.
- 12.226. The impact on recreational vessel displacement, collision and allision risk directly arises from the presence of WTGs and OSPs. Impacts will be present throughout the operational phase of Project Alpha (which is estimated to last 25 years) however they are expected to be temporary in nature given that vessels will adapt to the presence of Project Alpha over time. The impacts are likely to have a small spatial extent and be localised to the locations of the WTGs and OSPs.
- 12.227. Due to the low level of recreational activity, the frequency of occurrence for recreational vessel displacement, collision or allision is considered to be **Extremely Unlikely**. The severity of consequence is considered **Minor** given the limited potential for any impacts on persons, property or the environment. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

- 12.228. No additional mitigation is either required or proposed in relation to operation on recreational vessels as no adverse significant impacts are predicted.

Residual Impact

- 12.229. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha

Impact of Operation on SAR Operations

- 12.230. SAR operations may be impacted during the operational phase of Project Alpha due to an increased density of people, vessels and aircraft on site. Potential impacts are discussed in the following sections.

Potential Impacts

Diminishment of Emergency Response Resources

- 12.231. Project Alpha has the potential to increase the incident rate within the area, leading to an increased need for SAR resources. A review of historical incidents from MAIB and RNLI data (paragraphs 12.71 to 12.73 – ‘Current Baseline’) indicated that no incidents were recorded within Project Alpha with most incidents occurring closer to the coast. It is noted that incidents may increase once Project Alpha is in place, due to vessel displacement and increased encounter and collision risk.
- 12.232. However, given that incident rates are considered low in the area (as established in the baseline), any rise associated with Project Alpha is not anticipated to raise rates to a level that would put undue strain on SAR resources. Furthermore, Seagreen maintenance vessels will be working regularly on the Project Alpha site and, if required, will offer assistance in an emergency response (as per requirements under SOLAS, 1974).

Summary

- 12.233. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, compliance from all vessels with international maritime regulations such as COLREGs (IMO, 1972) and SOLAS (IMO, 1974) will ensure any vessel in the vicinity of Project Alpha will offer assistance in an emergency.
- 12.234. The impact on SAR operations directly arises from the presence of structures within Project Alpha and therefore these will continue throughout the 25 year lifetime of the Project as whilst the structures are in place there is no potential for SAR operations to return to as they were previously.
- 12.235. The frequency of impact is considered to be **Extremely Unlikely**. The severity of consequence is considered **Moderate** given the potential for any impacts on persons, property or the environment. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

- 12.236. No additional mitigation is either required or proposed in relation to operation on SAR operations as no adverse significant impacts are predicted.

Residual Impact

- 12.237. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Bravo

Impact of Operation on Commercial Vessels

- 12.238. Commercial vessels will be displaced from their regular routes during the operational phase of Project Bravo due to the presence of up to 70 substructures and WTGs and two previously consented OSPs. The potential impacts are discussed in the following sections.

Potential Impacts

Displacement

- 12.239. Based on the analysis of the marine traffic data, four routes intersect Project Bravo and are expected to deviate around the Project. The busiest of these routes is the Peterhead to Immingham route used by an estimated one vessel per day, with vessels on this route expected to deviate to the east of Project Bravo. The impact will be present throughout the 25 year operational phase; however the displaced vessels will adapt quickly to the presence of Project Bravo (noting that deviations will already be established during the construction phase).
- 12.240. Although the baseline differs slightly, the impacts on displacement and mitigations in place are considered to be the same as Project Alpha in isolation (paragraphs 12.196 to 12.197 – ‘Impact of Operation on Commercial Vessels [Project Alpha]’).

Encounters, Collision and Allision Risk

- 12.241. The collision modelling undertaken in 2012 (Appendix 12C [Project Alpha and Project Bravo 2012 NRA]) for vessels on regular routes estimated that, post Project Bravo, commercial vessels would be involved in a collision within the area once every 1,561 years, compared to every 3,094 years pre wind farm. It is noted that this includes commercial, fishing and recreational vessels.

12.242. In 2012 (Appendix 12C [Project Alpha and Project Bravo 2012 NRA]), it was estimated that a vessel would allide with a structure within Project Bravo under power once every 2,272 years. A drifting allision was estimated to occur once every 23,498 years. Drifting allisions are identified as being less frequent than powered allisions.

12.243. Given that this modelling was undertaken on a higher number of structures than is currently under consideration for Project Bravo (in isolation), allision and collision frequencies are assumed to be within those already assessed.

Summary

12.244. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’ and are considered to be the same as those for Project Alpha in isolation (paragraph 12.201 – ‘Impact of Operation on Commercial Vessels [Project Alpha]’).

12.245. The commercial vessel collision and allision risk is also considered to be temporary in nature and the impacts are likely to have a small spatial extent as per the impacts of Project Alpha in isolation (paragraph 12.202 – ‘Impact of Operation on Commercial Vessels [Project Alpha]’).

12.246. The frequency of occurrence is anticipated to be **Extremely Unlikely** with a severity of consequence of **Minor** given the limited potential for any impacts on persons, property or the environment. Significance is therefore assessed as **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

12.247. No additional mitigation is either required or proposed in relation to operation on commercial vessels as no adverse significant impacts are predicted.

Residual Impact

12.248. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Bravo

Impacts of Operation on Commercial Fishing Vessels

12.249. Commercial fishing vessels will be displaced from their regular routes during the operational phase of Project Bravo due to the presence of up to 70 substructures and WTGs and two previously consented OSPs. The potential impacts are discussed in the following sections.

Potential Impacts

Displacement

12.250. Commercial fishing vessels were recorded within Project Bravo during the validation survey in 2017, with vessels both engaged in fishing activity and transiting through Project Bravo.

12.251. Although levels of fishing were slightly higher in Project Bravo than those recorded within Project Alpha, the impacts of displacement are considered to be the same (paragraphs 12.207 to 12.210 – ‘Impact of Operation on Commercial Fishing Vessels [Project Alpha]’).

- 12.252. Due to the level of commercial fishing activity and the available options for routing through or around the site, the frequency of occurrence (fishing vessel displacement) is considered to be **Remote**. The severity of consequence is considered **Minor**, given the limited potential for any impacts on persons, property or the environment. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Encounters, Collision and Allision Risk

- 12.253. Collision risk modelling was undertaken in 2012 (Appendix 12C [Project Alpha and Project Bravo 2012 NRA]) and has been included as part of the commercial vessel collision risk previously discussed (paragraph 12.241 – ‘Impact of Operation on Commercial Vessels [Project Bravo]’).
- 12.254. Commercial fishing vessel allision risk for Project Bravo was also assessed in 2012 (Appendix 12C [Project Alpha and Project Bravo 2012 NRA]) which estimated an allision would occur once every 96 years. Given that WTG numbers have reduced for Project Bravo (in isolation), the corresponding fishing allision risk is assumed to be within the parameters already assessed.
- 12.255. The frequency of occurrence is anticipated to be **Remote** with a severity of consequence of **Minor** given the limited potential for any impacts on persons, property or the environment. Significance is therefore assessed as **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Summary

- 12.256. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’ and are considered to be the same as those for Project Alpha in isolation (paragraph 12.214 – ‘Impact of Operation on Commercial Fishing Vessels [Project Alpha]’).
- 12.257. The commercial fishing vessel impacts are considered to be temporary in nature as vessels will adapt to Project Bravo over time and the impacts are likely to have a small spatial extent as per the impacts of Project Alpha in isolation (paragraph 12.215 – ‘Impact of Operation on Commercial Fishing Vessels [Project Alpha]’).
- 12.258. Further assessment on the impact of Project Bravo on commercial fishing vessels is considered within Chapter 11 (Commercial Fisheries) of the EIA Report.

Additional Mitigation

- 12.259. No additional mitigation is either required or proposed in relation to operation on commercial fishing vessels as no adverse significant impacts are predicted.

Residual Impact

- 12.260. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Bravo

Impact of Operation on Recreational Vessels

12.261. Recreational vessels will be displaced from their regular routes during the operational phase of Project Alpha due to the presence of up to 70 substructures and WTGs and two previously consented OSPs. The potential impacts are discussed in the following sections.

Potential Impacts

Displacement

12.262. There were no recreational vessels recorded intersecting Project Bravo during the winter survey period and a total of four recreational vessels recorded intersecting Project Bravo during the summer survey period; therefore recreational vessel activity is considered to be low. The RYA Coastal Atlas (RYA, 2016) did not cover Project Bravo itself; however, it showed that recreational activity within the sea area was largely coastal, noting one offshore route indicator northwest of the Project Bravo boundary which indicates that vessels may transit within proximity to Project Bravo. Considering there will be no restrictions on navigation through Project Bravo (outside of authorised major maintenance safety zones) and the level of recreational activity within Project Bravo, displacement of recreational vessels is anticipated to be low.

12.263. Levels of recreational vessels were similar in Project Bravo compared to those recorded within Project Alpha; therefore the impacts of displacement are considered to be the same (paragraphs 12.220 to 12.222 – ‘Impact of Operation on Recreational Vessels [Project Alpha]’).

Encounters, Collision and Allision Risk

12.264. The impact on vessel to vessel collision risk for recreational vessels was assessed in 2012 (Appendix 12C [Project Alpha and Project Bravo 2012 NRA]) and has been included as part of the commercial vessel collision risk previously discussed (paragraph 12.241 – ‘Impact of Operation on Commercial Vessels [Project Bravo]’).

12.265. Recreational vessel allision is most likely to occur during periods of fog or poor visibility. However, no recreational vessels were recorded intersecting Project Bravo during the winter survey period (February and March 2017) suggesting that recreational vessels are unlikely to transit within the Project Bravo site in poor weather conditions.

Summary

12.266. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’ and are considered to be the same as those for Project Alpha in isolation (paragraph 12.225 – ‘Impact of Operation on Recreational Vessels [Project Alpha]’).

12.267. The recreational vessel impacts are considered to be temporary in nature as vessels will adapt to the presence of Project Bravo over time and the impacts are likely to have a small spatial extent as per the impacts of Project Alpha in isolation (paragraph 12.226 – ‘Impact of Operation on Recreational Vessels [Project Alpha]’).

12.268. Due to the low level of recreational activity, the frequency of occurrence for recreational vessel displacement, collision or allision is considered to be **Extremely Unlikely**. The severity of consequence is considered **Minor** given the limited potential for any impacts on persons, property or the environment. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

12.269. No additional mitigation is either required or proposed in relation to operation on recreational vessels as no adverse significant impacts are predicted.

Residual Impact

12.270. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Bravo

Impact of Operation on SAR Operations

12.271. SAR operations may be impacted during the operational phase of Project Bravo due to an increased density of people, vessels and aircraft on site. Potential impacts are discussed in the following sections.

Potential Impacts

Diminishment of Emergency Response Resources

12.272. Project Bravo has the potential to increase the incident rate within the area, leading to an increased need for SAR resources. A review of historical incidents from MAIB and RNLI data (paragraphs 12.71 to 12.73 – ‘Current Baseline’) indicated that no incidents were recorded within Project Bravo with most incidents occurring closer to the coast. It is noted that incidents may increase once Project Bravo is in place due to vessel displacement and increased encounter and collision risk.

12.273. As per Project Alpha in isolation, there were no historical incidents in Project Bravo, therefore the impacts of diminishment of emergency response resources are considered to be the same (paragraphs 12.231 to 12.232 – ‘Impact of Operation on SAR Operations [Project Alpha]’).

Summary

12.274. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’ and are considered to be the same as those for Project Alpha in isolation (paragraph 12.233 – ‘Impact of Operation on SAR Operations [Project Alpha]’).

12.275. The SAR operations impact are considered to be present throughout the 25 year lifetime of Project Bravo as per the impacts of Project Alpha in isolation (paragraph 12.234 – ‘Impact of Operation on SAR Operations [Project Alpha]’).

12.276. The frequency of impact is considered to be **Extremely Unlikely**. The severity of consequence is considered **Moderate** given the potential for any impacts on persons, property or the environment. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

12.277. No additional mitigation is either required or proposed in relation to operation on SAR operations as no adverse significant impacts are predicted.

Residual Impact

12.278. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha and Project Bravo Combined

Impact of Operation on Commercial Vessels

12.279. Commercial vessels will be displaced from their regular routes during the operational phase of Project Alpha and Project Bravo combined (the optimised Seagreen Project) due to the presence of up to 120 substructures and WTGs and four previously consented OSPs. The potential impacts are discussed in the following sections.

Potential Impacts

Displacement

12.280. As discussed for the construction phase, five main routes out of the 16 identified intersect the optimised Seagreen Project. The most heavily trafficked routes impacted by the optimised Seagreen Project are both currently used by an estimated one vessel per day. These are the Peterhead to Immingham route and Aberdeen to Immingham route, both of which are expected to deviate to the east of the Project. The Peterhead to Immingham route is used by cargo vessels and tankers and is anticipated to make a minor deviation whereas the Aberdeen to Immingham route is used by tankers and is anticipated to make a larger deviation. Of these five routes, four will be impacted by Project Alpha in isolation and four will be impacted by Project Bravo in isolation. The combined presence of the optimised Seagreen Project impacting five of the main routes corresponds to approximately four vessels per day on average being displaced.

12.281. Experience at operational wind farms (such as London Array Offshore Wind Farm or Walney Phase 1 Offshore Wind Farm) shows that some smaller commercial vessels may still transit through the optimised Seagreen Project, noting that the minimum WTG spacing is 1,000m. This gives ample room in which to passage plan, depending on the weather conditions and the mitigations in place, including lighting and marking of WTGs.

12.282. It is considered there is sufficient sea room surrounding the optimised Seagreen Project for commercial vessels to pre-plan any revised passage in advance of encountering the Project and there will only be a minor increase to voyage distance.

Encounters and Collision Risk

12.283. The collision modelling undertaken within the NRA (Appendix 12A [NRA Addendum]) for vessels on regular routes estimated that, post wind farm, commercial vessels would be involved in a collision within the area once every 851 years, compared to once every 1,117 years pre wind farm. It is noted that this included commercial, fishing, and recreational vessels. This modelling is considered the WCS, based on the current optimised Seagreen Project design envelope.

Allision Risk

12.284. Commercial vessels also have the potential to allide with OWF components and infrastructure (up to 120 substructures and WTGs and four previously consented OSPs) in the optimised Seagreen Project. An allision may occur whilst a vessel is under power (due to human error or mechanical failure) or while a vessel is drifting (not under command).

12.285. Allision modelling undertaken within the NRA (Appendix 12A (NRA Addendum)) estimated that for vessels on regular routes, commercial vessels would allide with a structure in the optimised Seagreen Project under power once every 1,425 years. A drifting allision was estimated to occur once every 5,773 years. Compared to Project Alpha and Project Bravo in isolation, the optimised Seagreen Project is the WCS for allision risk.

12.286. Drifting collisions are identified as being less frequent than powered collisions. As previously noted, this modelling is considered the WCS based on the current optimised Seagreen Project design envelope.

Summary

12.287. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, an LMP will ensure the optimised Seagreen Project is visible to marine traffic during operation and safe to navigate through should a smaller commercial vessel decide to do so.

12.288. The impact of the optimised Seagreen Project on commercial vessel routing directly arises from the presence of WTGs and OSPs. Impacts will be temporary in nature throughout the operational phase of the optimised Seagreen Project (which is estimated to last 25 years) given that vessels will adapt to the presence of the optimised Seagreen Project. The impacts are likely to have a small spatial extent and be localised to the locations of the WTGs and OSPs.

12.289. The frequency of occurrence is considered to be **Remote** with a severity of consequence of **Moderate** given the potential for moderate damage to vessels, injury to person and environmental impacts should an increased collision or allision risk occur. This gives a significance ranking of **Tolerable with Mitigation** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

12.290. No additional mitigation is either required or proposed in relation to operation on commercial vessels as no adverse significant impacts are predicted.

Residual Impact

12.291. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha and Project Bravo Combined

Impact of Operation on Commercial Fishing Vessels

12.292. Commercial fishing vessels will be displaced from their regular routes during the operational phase of the optimised Seagreen Project due to the presence of up to 120 substructures and WTGs and four previously consented OSPs. The potential impacts are discussed in the following sections.

Potential Impacts

Displacement

12.293. Commercial fishing vessels were observed mainly within Project Bravo and the northeast of Project Alpha. Commercial fishing vessels were observed both engaged in fishing activity and transiting through the optimised Seagreen Project.

12.294. Experience at operational wind farms (such as London Array Offshore Wind Farm or Walney Phase 1 Offshore Wind Farm) shows that some commercial fishing vessels may still navigate within the optimised Seagreen Project, noting that the minimum WTG spacing is 1,000m. This gives ample room in which to passage plan, depending on the weather conditions and the mitigations in place, including lighting and marking of WTGs.

12.295. For those commercial fishing vessels not transiting through the array there is sufficient sea room surrounding the optimised Seagreen Project for commercial fishing vessels to pre-plan any revised passage in advance of encountering the optimised Seagreen Project and with negligible increases to voyage distance.

Encounters, Collision and Allision Risk

12.296. The presence of the optimised Seagreen Project may displace commercial vessels and recreational vessels into areas used by commercial fishing vessels and vice versa, leading to a low increase in vessel to vessel encounters; however any increase in collision will be mitigated by COLREGs (IMO, 1972).

12.297. The impact on vessel to vessel collision risk was assessed in the NRA (Appendix 12A [NRA Addendum]) and has been included as part of the commercial vessel collision risk, as per paragraph 12.283 – ‘Impact of Operation on Commercial Vessels [Project Alpha and Project Bravo]’.

12.298. Allision modelling for the optimised Seagreen Project was assessed in the NRA (Appendix 12A [NRA Addendum]), which estimated a fishing vessel allision would occur once every 17 years. During the operational phase, commercial fishing vessels will be able to transit through the optimised Seagreen Project site, and this has therefore been assumed to be the case within the allision modelling process.

Summary

12.299. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, an LMP will ensure the optimised Seagreen Project is visible to marine traffic during operation and safe to navigate through should a commercial fishing vessel decide to do so.

12.300. The impact of the optimised Seagreen Project on commercial fishing vessels directly arises from the presence of WTGs and OSPs. Impacts will be present throughout the operational phase of the optimised Seagreen Project (which is estimated to last 25 years). The impacts are likely to have a small spatial extent and be localised to the locations of the WTGs and OSPs.

12.301. Due to the level of fishing activity, the impact frequency on commercial fishing vessel displacement, collision and allision is considered to be **Remote**. The severity of consequence is considered **Minor** given the potential for impacts on persons, property and the environment should an impact occur. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

12.302. Further assessment on the impact of the optimised Seagreen Project on commercial fishing vessels is considered within Chapter 11 (Commercial Fisheries) of the EIA Report.

Additional Mitigation

12.303. No additional mitigation is either required or proposed in relation to operation on commercial fishing vessels as no adverse significant impacts are predicted.

Residual Impact

12.304. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha and Project Bravo Combined

Impact of Operation on Recreational Vessels

12.305. Recreational vessels will be displaced from their regular transit areas during the operational phase of the Seagreen Project due to the presence of up to 120 substructures and WTGs and four previously consented OSPs. The potential impacts are discussed in the following sections.

Potential Impacts

Displacement

12.306. There were no recreational vessels recorded intersecting the optimised Seagreen Project during the winter survey period and a total of seven recreational vessels recorded intersecting the optimised Seagreen Project during the summer survey period; therefore recreational vessel activity is considered to be low. The RYA Coastal Atlas (RYA, 2016) did not cover the Project itself; however, it showed that recreational activity within the sea area was largely coastal, noting one offshore route indicator northwest of the optimised Project boundary which indicates that vessels may transit within proximity to the Project. Considering there will be no restrictions on navigation through the optimised Seagreen Project (outside of authorised major maintenance safety zones) and the level of recreational activity within the Project, displacement of recreational vessels is anticipated to be low.

12.307. The impact of recreational vessels transiting through the optimised Seagreen Project is considered similar to commercial vessels and commercial fishing vessels. Experience at operational wind farms (such as London Array Offshore Wind Farm or Walney Phase 1 Offshore Wind Farm) shows that recreational vessels may still navigate within the optimised Seagreen Project, noting that the minimum WTG spacing is 1,000m. This gives ample room in which to passage plan, depending on the weather conditions and the mitigations in place including lighting and marking of WTGs.

12.308. For those recreational vessels not transiting through the array there is sufficient sea room surrounding the optimised Seagreen Project for recreational vessels to pre-plan any revised passage in advance of encountering the optimised Seagreen Project and with negligible increases to voyage distance.

Encounters, Collision and Allision Risk

12.309. The impact on vessel to vessel collision risk has been included as part of the commercial vessel collision risk previously discussed (paragraph 12.283 – ‘Impact of Operation on Commercial Vessels [Project Alpha and Project Bravo]’).

12.310. Recreational vessel allision is most likely to occur during periods of fog or poor visibility. However, no recreational vessels were recorded intersecting the optimised Seagreen Project during the winter survey period (February and March 2017) suggesting that recreational vessels are unlikely to transit within the Project in poor weather conditions.

Summary

12.311. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, an LMP will ensure the optimised Seagreen Project is visible to marine traffic during operation and safe to navigate through should a recreational vessel decide to do so.

12.312. The impact of the optimised Seagreen Project on recreational vessels directly arises from the presence of WTGs and OSPs. Impacts will be present throughout the operational phase of the optimised Seagreen Project (which is estimated to last 25 years). The impacts are likely to have a small spatial extent and be localised to the locations of the WTGs and OSPs.

12.313. Due to the low level of recreational activity, the impact frequency on recreational vessel displacement, collision or allision is considered to be **Extremely Unlikely**. The severity of consequence is considered **Minor** given the potential for impacts on persons, property and the environment should an impact occur. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

12.314. No additional mitigation is either required, or proposed in relation to operation on recreational vessels as no adverse significant impacts are predicted.

Residual Impact

12.315. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Project Alpha and Project Bravo Combined

Impact of Operation on SAR Operations

12.316. SAR operations may be impacted during the operational phase of the optimised Seagreen Project due to an increased density of people, vessels and aircraft on site. Potential impacts are discussed in the following sections.

Potential Impacts

Diminishment of Emergency Response Resources

12.317. The optimised Seagreen Project has the potential to increase the incident rate within the area, leading to an increased need for SAR resources. A review of historical incidents from MAIB and RNLI data (paragraphs 12.71 to 12.73 – ‘Current Baseline’) indicated that no incidents were recorded within the optimised Seagreen Project with most incidents occurring closer to the coast. It is noted that incidents may increase once the optimised Seagreen Project is in place due to vessel displacement and increased encounter and collision risk.

12.318. However, given that incident rates are considered low in the area (as established in the baseline); any rise associated with Project Alpha and Project Bravo combined is not anticipated to raise rates to a level that would put undue strain on SAR resources. Furthermore, Seagreen maintenance vessels will be working regularly on the optimised Seagreen Project site and, if required, will offer assistance in an emergency response (as per requirements under SOLAS, 1974).

Summary

12.319. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, compliance from all vessels with international maritime regulations such as COLREGs (IMO, 1972) and SOLAS (IMO, 1974) will ensure any vessel in the vicinity of the optimised Seagreen Project will offer assistance in an emergency.

- 12.320. The impact on SAR operations directly arises from the presence of structures within the optimised Seagreen Project and therefore these will continue throughout the 25 year lifetime of the Project, as whilst the structures are in place there is no potential for SAR operations to return to as they were previously.
- 12.321. The frequency of impact is considered to be **Extremely Unlikely**. The severity of consequence is considered **Moderate** given the potential for any impacts on persons, property or the environment. This gives a significance ranking of **Broadly Acceptable** and therefore **Not Significant** under EIA guidelines.

Additional Mitigation

- 12.322. No additional mitigation is either required, or proposed in relation to operation on SAR operations, as no adverse significant impacts are predicted.

Residual Impact

- 12.323. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

IMPACT ASSESSMENT – DECOMMISSIONING

- 12.324. Impacts during decommissioning are broadly similar to those assessed for the construction phase on the basis that both will see an increased number of vessels on site, the implementation of safety zones, and the presence of partial structures. Therefore impacts have only been assessed where a notable difference between construction and decommissioning has been identified (i.e. if there is the potential that an impact may be of more significance when assessed in the decommissioning phase than within the construction phase).

Project Alpha and Project Bravo Combined

Impact of Decommissioning on Commercial Vessels

Potential Impacts

Displacement

- 12.325. During active decommissioning, commercial vessels are expected to continue to avoid the optimised Seagreen Project. Once decommissioning is complete, these vessels would be free to navigate the area, and therefore there is considered to be no impact beyond the current baseline already assessed for construction.

Encounters, Collision and Allision Risk

- 12.326. As commercial vessel displacement is considered to be similar to that observed during construction and operation, there is considered to be no additional collision or allision impacts beyond the current baseline already assessed.

Project Alpha and Project Bravo Combined

Impact of Decommissioning on Fishing Vessels

Potential Impacts

Displacement

12.327. During active decommissioning, fishing vessels would be free to transit the optimised Seagreen Project assuming they avoided the active decommissioning work, as indicated by safety zones. Post decommissioning there will be no restrictions on navigation, however it is noted that vessels may choose to avoid active fishing should array cables be left in situ noting that they will not be left exposed. Further details are provided in Chapter 11 (Commercial Fisheries).

Encounters, Collision and Allision Risk

12.328. As commercial fishing displacement is considered to be similar to that observed during the construction phase, there is considered to be no additional collision or allision impacts beyond the current baseline already assessed.

Project Alpha and Project Bravo Combined

Impact of Decommissioning on Recreational Vessels

Potential Impacts

Displacement

12.329. During active decommissioning, recreational vessels would be free to transit the optimised Seagreen Project assuming they avoided the active decommissioning work, as indicated by safety zones. Once decommissioning is complete, these vessels would be free to navigate the area, and therefore there is considered to be no impact beyond the current baseline already assessed for construction.

Encounters, Collision and Allision Risk

12.330. As recreational vessel displacement is considered to be similar to that observed during construction, there is considered to be no additional collision or allision impacts beyond the current baseline already assessed.

IMPACT ASSESSMENT: CUMULATIVE

12.331. In addition to identifying the potential impacts of Project Alpha and Project Bravo on sensitive receptors in isolation, it is also important to consider the cumulative impacts of the elements of the optimised Seagreen Project with other existing, consented or proposed development activity in the Firth of Forth region and beyond. As stated in Chapter 6 (EIA Process), the 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. These may include schemes other than offshore wind developments.

- 12.332. 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 schemes on the same receptor. The purpose of considering cumulative impacts is to understand if the impacts from the optimised Seagreen Project, when considered together (combined), or cumulatively with other plans and projects are different, or more significant than from projects in isolation. This enables additional mitigation to be identified, if required.
- 12.333. Table 12.9 presents the projects which have been screened as potentially contributing to a cumulative impact with the optimised Seagreen Project. Temporal overlap with the optimised Seagreen Project during construction, operation or decommissioning phases have been identified where information is available; noting that data confidence is considered to be low.
- 12.334. It should be noted that Kincardine Offshore Wind Farm and European Offshore Wind Deployment Centre (operation phase) have been screened in as requested through the 2017 Scoping Opinion. The Aberdeen Harbour Expansion Project, the Forthwind Offshore Wind Farm and the NorthConnect interconnector were identified in the CIA list (see Appendix 6A and Chapter 6 [EIA Process] of the EIA Report).

Table 12.9 Projects Screened in to Cumulative Impact Assessment

| Project | Phase of Optimised Seagreen Project |
|--|--|
| Seagreen Offshore Transmission Asset | Construction, operation, decommissioning |
| Neart na Gaoithe Offshore Wind Farm | Construction and operation |
| Inch Cape Offshore Wind Farm | Construction and operation |
| Kincardine Offshore Wind Farm | Construction and operation |
| European Offshore Wind Deployment Centre | Operation |
| Aberdeen Harbour Expansion Project | Operation |
| Forthwind Offshore Wind Farm | Not applicable. Currently dormant |
| NorthConnect Interconnector | Construction and operation |

- 12.335. The Offshore Transmission Asset has been included within the cumulative assessment as it is already licenced and is unchanged and therefore is considered alongside other identified projects and plans.
- 12.336. The Neart na Gaoithe and Inch Cape Offshore Wind Farms have been included in the cumulative assessment as they are also located within the Firth of Forth region and therefore will be in close proximity to the optimised Seagreen Project, once all three projects are constructed.
- 12.337. The RYA Scotland requested that Kincardine Offshore Wind Farm and the European Offshore Wind Deployment Centre be included within the cumulative assessment, due to increased levels of watch keeping on passages along the east coast of Scotland, due to commercial vessel displacement as a result of the optimised Seagreen Project.
- 12.338. The Aberdeen Harbour Expansion Project is included within the assessment as it is currently under construction and multiple routes identified in the baseline assessment (section 7 of Appendix 12A [NRA Addendum]) transit to and from Aberdeen.

- 12.339. The Forthwind Offshore Wind Farm is included within the assessment, due to its location within the Firth of Forth. Its proximity to the optimised Seagreen Project means there is potential for routeing along the east coast to be affected, due to the presence of both projects.
- 12.340. The NorthConnect Interconnector begins at Long Haven Bay, Aberdeenshire. Construction is scheduled to begin between 2021 and 2022 and therefore construction and operation may also impact the baseline routes identified as transiting to Aberdeen (section 7 of Appendix 12A [NRA Addendum]) which have already been deviated due to the optimised Seagreen Project.
- 12.341. Identification of relevant projects and plans has been informed by scoping and wider consultation, as set out within Chapter 7 (Scope of EIA Report). Potential cumulative impacts are considered within the assessment set out below. It is noted that the CIA has been split into the construction, operation and decommissioning phases of the optimised Seagreen Project, noting that impacts are broadly similar. The WCS is the operation of all the cumulative projects at the same time creating the maximum displacement of vessels therefore the maximum risk of encounters, collision and allision over the largest period of time.
- 12.342. Given lessons learnt, since the original application in 2012, at existing offshore wind farm developments and technical assessments undertaken there are not expected to be any impacts of marine radar systems from the cumulative projects. Impacts on marine radar are only intolerable (as per MGN 543 [MCA, 2016]) within 0.5nm of wind turbine structures and can be mitigated by adjustment of controls on the marine Radar systems (as with heavy rain or swell). Given the spacing between structures in nearby adjacent projects are greater than 0.5nm there are not expected to be intolerable impacts associated with the cumulative developments.
- 12.343. Cumulative SAR impacts are also not considered likely, given that individual Environmental Measures (compliance with MGN 543 [MCA, 2016]) required for each project mean that the impacts are not significant and combining them cumulatively would not influence this.
- 12.344. Potential cumulative impacts have been identified for the following shipping and navigation receptors:
- Commercial vessels (of any size); and
 - Commercial fishing vessels (of any size).
- 12.345. Recreational users have not been considered as no potential cumulative impacts on their routeing were identified.

CUMULATIVE IMPACT ASSESSMENT

Cumulative Impact of Construction or Decommissioning Phases on Commercial Vessels

- 12.346. Given that similar buoyed construction areas will be deployed around both the construction and decommissioning areas, both phases are considered to be comparable. The potential impacts are discussed in the following sections.

Potential Impacts

Displacement, Collision, Encounters and Allision

- 12.347. During construction, it is anticipated that the majority of vessels will avoid transiting through any of the developments (or construction/installation areas) within the Firth of Forth (including the optimised Seagreen Project, Neart Na Gaoithe Offshore Wind Farm, Seagreen Offshore Transmission Asset and Inch Cape Offshore Wind Farm). The only cumulative impacts would be on vessel routeing with the largest impacts on vessels routeing into Forth ports. These routes would have notable deviations required which would be dependent on the overlap between construction phases and the size of buoyed construction areas. Given the low data confidence associated with other project timelines it is not possible to fully assess a WCS.
- 12.348. However, assuming that all four projects are constructing at the same time it is considered that shipping and navigation regulators, notably MCA and NLB, would require post consent environmental measures to mitigate any significant effects. These would likely include construction buoyage designed so as to allow routeing between developments, or with minimal deviations, additional aids to navigation such as AIS transmitters or cooperation between marine coordination facilities, to ensure that vessels were not subject to large deviations.

Summary

- 12.349. Given the environmental measures in place (paragraph 12.96 - 'Environmental Measures Incorporated into the Project'), most notably marine coordination and promulgation of information, as well as consent conditions such as the NSP, there are not expected to be any cumulative impacts (greater than those assessed in isolation or in combination for Project Alpha and Project Bravo). It is noted that allision risk is considered to be localised to a specific project, given that it is unlikely that a vessel could allide with structures from more than one project (given the spacing between them).
- 12.350. Therefore frequency of occurrence is considered to be **Extremely Unlikely** with a severity consequence of **Minor** given the limited anticipated consequence to people or the environment. Significance of impact has therefore been assessed to be **Broadly Acceptable** which is **Not Significant** for the purposes of this assessment phase.

Additional Mitigation

- 12.351. No additional mitigation is either required or proposed in relation to the construction and decommissioning phase on commercial vessels, as no adverse significant cumulative impacts are predicted.

Residual Impact

- 12.352. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Cumulative Impact of Operation Phase on Commercial Vessels

- 12.353. Although some smaller commercial vessels may continue to pass through the optimised Seagreen Project, the Seagreen Offshore Transmission Asset, the Inch Cape Offshore Wind Farm and the Neart na Gaoithe Offshore Wind Farm once the structures are in place, the majority are expected to continue deviating around the cumulative projects. Encounters and collision risk are therefore present due to displaced traffic causing areas of higher traffic density within the surrounding sea areas. There will also be an increase in allision risk, compared to the optimised Seagreen Project in isolation, due to the presence of multiple operational wind farms.

Potential Impacts

Displacement, Encounters and Collision Risk

- 12.354. Post construction of the optimised Seagreen Project, the Seagreen Offshore Transmission Asset, the Inch Cape Offshore Wind Farm and the Neart na Gaoithe Offshore Wind Farm, commercial vessels transiting the area will either need to pass west (inshore) of the wind farms, east (offshore) or transit between project boundaries (either between the optimised Seagreen Project and Inch Cape Offshore Wind Farm, or between Inch Cape Offshore Wind Farm and Neart na Gaoithe Offshore Wind Farm). This represents an increased deviation and will affect a greater number of commercial vessels than the optimised Seagreen Project in isolation. Based on the limited sea room and the pre-existing vessel activity, it is considered unlikely that commercial vessels would pass inshore of the wind farms (and the Isle of May), unless they required access to ports in the Firth of Tay or Firth of Forth.
- 12.355. Of the 16 vessel routes identified, nine will be cumulatively affected by the presence of the optimised Seagreen Project, the Seagreen Offshore Transmission Asset, the Inch Cape Offshore Wind Farm and the Neart na Gaoithe Offshore Wind Farm. The largest deviation required in terms of an increase in distance will be route L shown in Figure 12.2 of Appendix 12A (NRA Addendum), which consists mainly of cargo vessels transiting between Dundee and Køge.
- 12.356. Vessels displaced inshore of the optimised Seagreen Project, the Seagreen Offshore Transmission Asset, the Inch Cape Offshore Wind Farm and the Neart na Gaoithe Offshore Wind Farm, or between wind farms may increase vessel density, either between the coast and a wind farm, or between wind farms, thus increasing the risk of encounters and the collision risk. Vessels displaced east of the wind farms will have ample sea space to manoeuvre and therefore encounter rates (and subsequent collision rates) are less likely to increase.
- 12.357. In terms of the cumulative impact of the projects scoped in through consultation and the CIA list, Kincardine Offshore Wind Farm and NorthConnect are the only projects which may cause direct cumulative displacement on commercial vessels, due to minor baseline routeing deviations. One commercial vessel route is identified as intersecting the proposed Kincardine Offshore Wind Farm. However, it should be noted that the boundary for Kincardine Offshore Wind Farm is determined by the current WTG layout and therefore is subject to change and finalisation before the cumulative assessment can be accurately determined. Three commercial vessel routes cross the proposed NorthConnect project route; however it is noted that this impact should only be present during construction of the project when rolling 500m safety zones will be in place which are subject to change as the cable is laid. Once operational, the NorthConnect cable will be buried or suitably protected in seabed conditions unsuitable for burial and therefore should not affect these routes.
- 12.358. It is not considered likely that the operation of the Aberdeen Harbour Expansion Project or the Forthwind Offshore Wind Farm would affect routeing options (given the distance from the optimised Seagreen Project) or affect numbers of vessels so as to increase the level of risk.

Allision Risk

- 12.359. It is expected that commercial vessels will avoid the optimised Seagreen Project and all other cumulative schemes during all phases due to the deviations required. Any allision scenario involving such a vessel is therefore expected when the vessel is close to one of the projects and is either drifting (not under command) into a structure or alliding under power with a structure due to human error or mechanical failure.
- 12.360. The allision risk is also expected to increase given the larger number of structures that are in place when multiple wind farms are considered.

Summary

- 12.361. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, permanent AtoN and an LMP will aim to ensure the optimised Seagreen Project is visible to marine traffic navigating between Inch Cape Offshore Wind Farm and the optimised Seagreen Project and that the array is safe to navigate should a smaller commercial vessel decide to do so.
- 12.362. The cumulative impact of the optimised Seagreen Project and other schemes on commercial vessels arises directly from the presence of the structures. It will continue throughout the 25 year operational lifetime of the optimised Seagreen Project as commercial vessel deviations will be required for as long as the structures are in place. Compared to the optimised Seagreen Project in isolation, there will be an increase in collision and allision risk due to an increased number of structures when multiple offshore projects are operational rather than the optimised Seagreen Project in isolation.
- 12.363. The frequency of occurrence is considered to be **Remote** with a severity consequence of **Moderate** given any anticipated consequence to people or the environment. Significance of impact has therefore been assessed to be **Tolerable with Mitigation** which is **Not Significant** for the purposes of this assessment.

Additional Mitigation

- 12.364. No additional mitigation is either required or proposed in relation to operation on commercial vessels as no adverse significant cumulative impacts are predicted.

Residual Impact

- 12.365. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

Optimised Seagreen Project and other Schemes

Cumulative Impact of Construction and Decommissioning on Commercial Fishing Vessels

- 12.366. As with commercial vessels, cumulative impacts on commercial fishing vessels are expected to be mitigated by post consent environmental measures (see paragraphs 12.347 to 12.365 – ‘Cumulative Impact of Construction or Decommissioning Phases on Commercial Vessels’).

Cumulative Impact of Operation on Commercial Fishing Vessels

- 12.367. Commercial fishing vessels are expected to continue to pass through the optimised Seagreen Project, the Seagreen Offshore Transmission Asset, the Inch Cape Offshore Wind Farm and the Neart na Gaoithe Offshore Wind Farm when the structures are in place which means the presence of the cumulative projects is only expected to have a minor impact on their routes. The potential impacts are discussed in the sections below.

Potential Impacts

Displacement, Encounters and Collision Risk

- 12.368. There will be an increased number of displaced commercial vessels that commercial fishing vessels can collide with, due to the combined presence of the optimised Seagreen Project, the Seagreen Offshore Transmission Asset, the Inch Cape Offshore Wind Farm and the Neart na Gaoithe Offshore Wind Farm Farms displacing commercial vessels into reduced sea areas. It is anticipated that commercial fishing vessels displaced into commercial routes, or exiting the optimised Seagreen Project into commercial vessel routes, will encounter a greater number of vessels, therefore increasing collision risk.

Allision Risk

- 12.369. Any allision scenario involving a commercial fishing vessel is expected when the vessel is in one of the projects and is either drifting (not under command) into a structure or alliding under power with a structure due to human error or mechanical failure.
- 12.370. The allision risk is also expected to increase, given the larger number of structures that are in place when multiple wind farms are considered.

Summary

- 12.371. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. In particular, permanent AtoN and an LMP will aim to ensure the optimised Seagreen Project is visible to marine traffic navigating between Inch Cape Offshore Wind Farm and the optimised Seagreen Project and that the array is safe to navigate should a commercial fishing vessel decide to do so.
- 12.372. The cumulative impact of the optimised Seagreen Project and other schemes on commercial vessels arises directly from the presence of the structures. It will continue throughout the 25 year lifetime of the optimised Seagreen Project as commercial fishing vessel deviations will be required for as long as the structures are in place.
- 12.373. The frequency of occurrence is considered to be **Remote** with a severity consequence of **Minor** given any anticipated consequence to people or the environment. Significance of impact has therefore been assessed to be **Broadly Acceptable** which is **Not Significant** for the purposes of this assessment.

Additional Mitigation

- 12.374. No additional mitigation is either required or proposed in relation to operation on commercial fishing vessels as no adverse significant cumulative impacts are predicted.

Residual Impact

- 12.375. No additional mitigation is required and therefore residual impacts are as per pre-additional mitigation.

INTERRELATIONSHIPS

- 12.376. Interrelationships describe the potential interaction of multiple project impacts upon one receptor and have a spatial and/or temporal component. This section identifies potential interrelationships associated with shipping and navigation and other identified impacts associated with the development of the optimised Seagreen Project.
- 12.377. It should be noted that shipping and navigation as a receptor contains a number of marine activities that are both transient in the form of a navigating vessel as well as localised in terms of their activity, for example fishing vessels on transit and fishing vessels engaged in fishing. This chapter has already considered these receptors in their navigational or transient state. Table 12.10 highlights any additional inter-relationships with their localised activities.

Table 12.10 Interrelationships

| Interrelationship | Summary | Chapter Reference |
|---|--|--------------------------------------|
| Increased snagging risk for fishing vessels engaged in fishing activity | <p>Navigational safety impacts for vessels on transit have already been considered within this chapter. Allision and collision risk modelling has not differentiated between vessels engaged in or not engaged in fishing activity.</p> <p>All navigational safety impacts are considered not significant. Operational impacts of fishing vessels are considered within the commercial fisheries chapter.</p> <p>The effects on commercial fishing vessels from gear snagging are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented within each of the individual assessments.</p> | Chapter 11 (Commercial Fisheries) |

TRANSBOUNDARY IMPACTS

12.378. Due to the distance of the optimised Seagreen Project from non UK ports and the small spatial scale of predicted impacts, there are no major transboundary issues for shipping and navigation, as any vessels on international routes are already considered within the baseline or CIA.

MITIGATION AND MONITORING

12.379. Embedded mitigation measures are as per paragraph 12.96 – ‘Environmental Measures Incorporated into the Project’. No additional mitigation measures have been identified within the impact assessment.

12.380. Monitoring proposals identified within the impact assessment of the 2012 Offshore ES remain valid for the optimised Seagreen Project impact assessment. These include:

- Safety Management System (SMS). The SMS will include an incident/accident reporting system which will ensure that incidents and near misses are recorded and reviewed to monitor the effectiveness of the risk control measures in place at the site.
- During planned and unplanned maintenance works, there will be vessels operating regularly in the OWF sites which can monitor any third party vessel activity both visually and on Radar, although this will not be their primary function.
- The Marine Coordination Centre will coordinate project vessel operations and will monitor and record vessel AIS information to indicate the movement of project vessel traffic in and around Project Alpha and/or Project Bravo.
- Routine operational inspections and maintenance will be carried out on WTGs, and foundations. Array and export cables will be subject to periodic inspection to ensure they remain buried and/or protected.

IMPACT ASSESSMENT SUMMARY – THE OPTIMISED SEAGREEN PROJECT

12.381. This chapter has assessed the potential impacts on shipping and navigation of the construction, operation and decommissioning phases of the optimised Seagreen Project in isolation and combined, as well as cumulatively with other projects. All impacts assessed are within tolerable limits and no significant impacts have been identified; therefore additional mitigation has not been incorporated into the assessment. Table 12.11 summarises the impact assessment undertaken and the conclusion of residual impact significance.

- 12.382. Impact assessment was undertaken to inform the 2012 Offshore ES for the originally consented Project. For the assessment of the optimised Seagreen Project design, the assessment method has been updated to current best practice to define the frequency, consequence and significance of the impacts through the use of matrices (paragraphs 12.48 to 12.51 – ‘Significance Criteria’), rather than simply a statement of whether or not an impact was significant or not significant, as carried out in the 2012 Offshore ES.
- 12.383. Compared to the outcomes of the 2012 Offshore ES, there have been no changes in the significance of impacts in this updated assessment.
- 12.384. In terms of Project Alpha or Project Bravo in isolation, the receptors remain the same in that there will be impacts on commercial vessels, commercial fishing vessels and recreational vessels during all phases of the Project. For construction, all impacts are concluded to be **Not Significant**, as per the 2012 Offshore ES. For the operational phase, SAR operations were also assessed and marine Radar systems were scoped out of the assessment. All operational impacts were also concluded to be **Not Significant**, as per the 2012 Offshore ES. Decommissioning impacts were considered to be broadly similar to those of the construction phase; therefore impacts were only assessed where a notable difference between construction and decommissioning scenarios were identified. No significant impacts were identified for the decommissioning phase as per the 2012 Offshore ES. Therefore impacts have not increased or decreased when compared to the 2012 Offshore ES.
- 12.385. The impacts of Project Alpha and Project Bravo combined have been assessed in both the 2012 Offshore ES and this EIA Report. In the 2012 Offshore ES, Project Alpha and Project Bravo combined had a design envelope of up to 150 WTGs and up to five OSPs. The optimised Seagreen Project assessed in this EIA has a design envelope of up to 120 WTGs and the assessment also included up to 4 OSPs (part of the already licensed Offshore Transmission Asset). The originally consented Project 2012 Offshore ES assessment was not split into the construction, operation and decommissioning phases, as in this EIA Report. Receptors assessed remain the same as those assessed for Project Alpha or Project Bravo in isolation, aside from SAR operations which was not assessed in the 2012 Offshore ES, but has been included this EIA Report.
- 12.386. Decommissioning impacts were considered to be broadly similar to those of the construction phase; therefore impacts were only assessed to the point of discerning if there was a notable difference between scenarios per phase. All impacts were concluded to be **Not Significant** within this EIA Report, as per the 2012 Offshore ES. Therefore impacts have not increased or decreased when compared to the 2012 Offshore ES.
- 12.387. CIA of the originally consented Project with other schemes in the 2012 Offshore ES included assessment with the Inch Cape Offshore Wind Farm and the Neart na Gaoithe Offshore Wind Farm. Both these schemes have been included within the cumulative assessment of the optimised Seagreen Project for this EIA Report, as well as other schemes identified through the 2017 Scoping Opinion and the CIA list (see Appendix 6A and Chapter 6 [EIA Process]).
- 12.388. Cumulative receptors assessed remain the same or less than those assessed for the 2012 Offshore ES in that the impacts on commercial vessels and commercial fishing vessels were assessed. Recreational impacts were not assessed as there was no cumulative pathway identified. All impacts were concluded to be **Not Significant** within this EIA Report and within the 2012 Offshore ES.
- 12.389. It should be noted that no additional mitigation measures are required as no significant adverse impacts are predicted following the impact assessment.

Table 12.11 Summary of Predicted Impacts for the optimised Seagreen project

| Receptor | Potential Impact | Phase (C or O) | Impact Significance | Additional Mitigation Measures | Residual Impact Significance |
|----------------------------|--|-------------------|---|--|---|
| Project Alpha | | | | | |
| Commercial Vessels | Displacement | C | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial vessels during construction as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters and Collision with Project Alpha Construction Vessels | | | | |
| | Encounters and Collision with Other Vessels | | | | |
| | Allision Risk | | | | |
| Commercial Fishing Vessels | Displacement | C | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial fishing vessels during construction as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters and Collision with Project Alpha Construction Vessels | | | | |
| | Encounters and Collision with Other Vessels | | | | |
| | Allision Risk | | | | |
| Recreational Vessels | Displacement | C | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on recreational vessels during construction as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters and Collision with Project Alpha Construction Vessels | | | | |
| | Encounters and Collision with Other Vessels | | | | |
| | Allision Risk | | | | |
| Commercial Vessels | Displacement | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial vessels during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters, Collision and Allision Risk | | | | |
| Commercial Fishing Vessels | Displacement | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial fishing vessels during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters, Collision and Allision Risk | | | | |

| Receptor | Potential Impact | Phase (C or O) | Impact Significance | Additional Mitigation Measures | Residual Impact Significance |
|----------------------------|--|-------------------|---|--|---|
| Recreational Vessels | Displacement | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on recreational vessels during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters, Collision and Allision Risk | | | | |
| SAR Operations | Diminishment of Emergency Response Resources | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on SAR operations during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| Project Bravo | | | | | |
| Commercial Vessels | Displacement | C | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial vessels during construction as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters and Collision with Project Bravo Construction Vessels | | | | |
| | Encounters and Collision with Other Vessels | | | | |
| | Allision Risk | | | | |
| Commercial Fishing Vessels | Displacement, Encounters and Collision Risk | C | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial fishing vessels during construction as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Allision Risk | | | | |
| Recreational Vessels | Displacement, Encounters and Collision Risk | C | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on recreational vessels during construction as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Allision Risk | | | | |
| Commercial Vessels | Displacement | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial vessels during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters, Collision and Allision Risk | | | | |

| Receptor | Potential Impact | Phase (C or O) | Impact Significance | Additional Mitigation Measures | Residual Impact Significance |
|--|---|-------------------|--|--|--|
| Commercial Fishing Vessels | Displacement | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial fishing vessels during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters, Collision and Allision Risk | | | | |
| Recreational Vessels | Displacement | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on recreational vessels during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters, Collision and Allision Risk | | | | |
| SAR Operations | Diminishment of Emergency Response Resources | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on SAR operations during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| Projects Alpha and Bravo Combined | | | | | |
| Commercial Vessels | Displacement | C | Tolerable with Mitigation (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial vessels during construction as no adverse significant impacts are predicted. | Tolerable with Mitigation (Not Significant) |
| | Encounters and Collision with Optimised Seagreen Project Construction Vessels | | | | |
| | Encounters and Collision with Other Vessels | | | | |
| | Allision Risk | | | | |
| Commercial Fishing Vessels | Displacement, Encounters and Collision Risk | C | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial fishing vessels during construction as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Allision Risk | | | | |
| Recreational Vessels | Displacement, Encounters and Collision Risk | C | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on recreational vessels during construction as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Allision Risk | | | | |

| Receptor | Potential Impact | Phase (C or O) | Impact Significance | Additional Mitigation Measures | Residual Impact Significance |
|---|---|-------------------|---|---|---|
| Commercial Vessels | Displacement | O | Tolerable with Mitigation (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial vessels during operation as no adverse significant impacts are predicted. | Tolerable with Mitigation (Not Significant) |
| | Encounters and Collision Risk | | | | |
| | Allision Risk | | | | |
| Commercial Fishing Vessels | Displacement | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on commercial fishing vessels during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters, Collision and Allision Risk | | | | |
| Recreational Vessels | Displacement | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on recreational vessels during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| | Encounters, Collision and Allision Risk | | | | |
| SAR Operations | Diminishment of Emergency Response Resources | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to impacts on SAR operations during operation as no adverse significant impacts are predicted. | Broadly Acceptable (Not Significant) |
| Decommissioning Phase | | | | | |
| The impacts associated with decommissioning of the optimised Seagreen Project are anticipated to be similar in nature and extent to those described for the construction phase. | | | | | |
| CIA – Construction and Decommissioning | | | | | |
| Given the low data confidence it is not possible to undertake a detailed cumulative assessment of a realistic WCS during the construction and decommissioning for shipping and navigation. However if simultaneous construction is considered worst case then it is assumed that post consent environmental measures deployed by maritime regulators would ensure that any impacts on commercial vessels or commercial fishing vessels would be effectively mitigated and impacts would be 'Tolerable with Mitigation' (Not Significant). | | | | | |

| Receptor | Potential Impact | Phase (C or O) | Impact Significance | Additional Mitigation Measures | Residual Impact Significance |
|---|---|-------------------|--|--|--|
| CIA - Operation | | | | | |
| Commercial Vessels | Displacement, Encounters and Collision Risk | O | Tolerable with Mitigation (Not Significant) | No additional mitigation is required or proposed in relation to cumulative impacts on commercial vessels during operation as no adverse significant impacts are predicted. Construction and decommissioning impacts are not expected to exceed those of the operational phase. | Tolerable with Mitigation (Not Significant) |
| | Allision Risk | | | | |
| Commercial Fishing Vessels | Displacement, Encounters and Collision Risk | O | Broadly Acceptable (Not Significant) | No additional mitigation is required or proposed in relation to cumulative impacts on commercial fishing vessels during operation as no adverse significant impacts are predicted. Construction and decommissioning impacts are not expected to exceed those of the operational phase. | Broadly Acceptable (Not Significant) |
| | Allision Risk | | | | |
| Key: C = Construction, O = Operational | | | | | |

REFERENCES

- DECC. 2005. DECC Methodology for Assessing the Marine Navigational Safety Risks of Offshore Wind Farms. DECC, London.
- IALA. 2013. IALA Recommendations O-139 on the Marking of Man-Made Offshore Structures. Edition 2. IALA, Saint-Germain-en-Laye, France.
- IMO. 1972. International Regulations for the Prevention of Collisions at Sea. IMO, London.
- IMO. 1974. Convention on the Safety of Life at Sea. IMO, London.
- IMO. 2007. Consolidated text of the Guidelines for FSA for use in the IMO rule-making Process. (MSC/ Circ. 2013-MEPC/ Circ. 392). IMO, London.
- Marine Scotland. 2015. Scotland's National Marine Plan. Chapter 13. Shipping, Ports, Harbours and Ferries. Marine Scotland, Edinburgh.
- MCA. 2008, Marine Guidance Note 372 (M+F) Guidance to Mariners Operating in the Vicinity of UK OREIs. MCA, Southampton.
- MCA. 2015, Methodology for Assessing Marine Navigational Risks of Offshore Wind Farms. MCA, Southampton.
- MCA. 2016. Marine Guidance Note 543 (M+F) – Safety of Navigation: OREIs – Guidance on UK Navigational Practice, Safety and Emergency Response. MCA, Southampton.
- MCA. 2017. The SAR Framework for the UK and Northern Ireland. MCA, Southampton.
- MS-LOT. 2017. MS-LOT: Scoping Opinion for Seagreen Phase 1 Offshore Project. Marine Scotland, Aberdeen.
- The Recreational Craft Regulations 2017, No. 737, Available at:
https://www.legislation.gov.uk/ukxi/2017/737/pdfs/ukxi_20170737_en.pdf
- RYA. 2015. The RYA's Position on Offshore Renewable Energy Developments: Paper 1 – Wind Energy. RYA, Southampton.
- RYA, 2016. RYA UK Coastal Atlas of Recreational Boating 2.0. RYA, Southampton.
- Seagreen. 2010. Seagreen Phase 1 Scoping Report. Document No. A6SW/SEAG-Z-DEV230-SWR-020-A3. Seagreen, Glasgow.
- Seagreen. 2017a. Seagreen Phase 1 Offshore Project Scoping Report: Round 3: Firth of Forth. Document No. A4MR/SEAG-AB-DEV230-SPR-311, Seagreen, Glasgow.
- UKHO, 2016. Admiralty Sailing Directions, North Sea (West) Pilot, NP 54. UKHO, Somerset.