

# **Vattenfall Wind Power Ltd**

## **Thanet Extension Offshore Wind Farm**

Appendix 22 to Deadline 4 Submission: Outline  
Offshore Operation and Maintenance Plan

Relevant Examination Deadline: 4

Submitted by Vattenfall Wind Power Ltd

Date: March 2019

Revision B

Drafted By:	GoBe Consultants Ltd
Approved By:	Daniel Bates
Date of Approval:	March 2019
Revision:	B

Revision A	Original document submitted to the Examining Authority
Revision B	Revised document submitted to the Examining Authority
N/A	
N/A	
N/A	
N/A	

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**Vattenfall Wind Power Ltd**

**Thanet Extension Offshore Wind Farm**

## **Outline Offshore Operations and Maintenance Plan**

March 2019, Revision B

Document Reference: 8.10

Pursuant to: APFP Reg. 5(2)(a)

Vattenfall Wind Power Ltd  
Thanet Extension Offshore Wind Farm  
Volume 8  
Outline Operations and Maintenance Plan  
March 2019

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Approved By:	Daniel Bates
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**Table of Contents**

10 Summary of Environmental Impact Assessment for Offshore Maintenance Activities..... 10-1  
10.1 Introduction..... 10-1  
10.2 Discharging the consent conditions..... 10-1

Table 10.1: Summary of Outline Offshore Operational and Maintenance Plan containing Environmental Statement sections of relevance ..... 10-2

## 10 Summary of Environmental Impact Assessment for Offshore Maintenance Activities

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### 10.1 Introduction

10.1.1 This document was originally submitted with respect to the application for the development consent order (DCO) for the Thanet Extension Offshore Wind Farm (Thanet Extension), submitted to the Planning Inspectorate (PINS) by Vattenfall Wind Power Ltd (VWPL). This document is a revision following consultation with the Marine Management Organisation (MMO) during the Thanet Extension examination process.

10.1.2 Table 10.1 outlines the key environmental impacts assessed within the Environmental Statement (ES) for the offshore operations and maintenance activities during the lifetime of the Thanet Extension project. The columns with headings shaded dark grey list the maintenance activities which would be undertaken under the DCO and deemed Marine Licences (if granted). The right-hand columns (with light grey shaded headings) outline the chapters and sections where relevant impacts have been assessed in the ES. Within each chapter of the ES the Maximum Adverse Scenario table, presented in each chapter's 'key criteria for assessment' section, outlines the relevant "realistic worst case" scenario for topic specific receptors for the operation and maintenance (O&M) phase of the project.

10.1.3 Details outlining the assessed quantity for each O&M activity can be audit of the project description (PINS Ref REP3-063).

### 10.2 Discharging the consent conditions

10.2.1 The list of activities to be undertaken during the O&M phase is provided in Table 10.1.

10.2.2 For each activity, a 'traffic light system' will be used to provide clarity as to those activities that can be carried out under the existing DML.

- **Green** indicates that an additional marine licence is not required, however notification should be provided to the MMO on works being undertaken;
- **Amber** indicates that an additional marine licence may be required if proposed works exceed those assessed within the Environmental Statement or described within the DCO; or
- **Red** indicates that an additional marine licence could be required dependant on the type of works to be undertaken.

10.2.3 Additional activities, such as foundation replacement which has not been assessed in the Environmental Statement, are not outlined. If required, future consents such as a Marine Licence under the Marine and Coastal Access Act 2009. Such activities will be discussed with the MMO prior to undertaking if appropriate.

10.2.4 This document forms the Outline Offshore Operations and Maintenance Plan that is a requirement of the transmission and generation DMLs. In total there will be two DMLs; one for transmission and one generation licence.

10.2.5 A final plan will be submitted to the MMO (post-consent) however this outline plan provides details of the activities which will be included. In addition, the final plan will include further detail on the:

- Duration of the activities and programme of works;
- Location of the activities (where possible); and
- Methodologies to be employed.

**Table 10.1: Summary of Outline Offshore Operational and Maintenance Plan containing Environmental Statement sections of relevance**

Ref	Maintenance	Method	Additional licence likely to be required	Marine Water & Sediment Quality (ES Volume 2, Chapters 3) (Document Ref: 6.2.3)	Offshore Ornithology (ES Volume 2, Chapter 4) (Document Ref: 6.2.4)	Benthic Ecology (ES Volume 2, Chapter 5) (Document Ref: 6.2.5)	Fish and shellfish ecology (ES Volume 2, Chapter 6) (Document Ref: 6.2.6)	Marine Mammals (ES Volume 2, Chapter 7) (Document Ref: 6.2.7)	Commercial Fisheries (ES Volume 2, Chapter 9) (Document Ref: 6.2.9)	Shipping and navigation & Infrastructure and users (ES Volume 2, Chapters 10 & 11) (Document Ref: 6.2.10 & 6.2.11)	Marine Archaeology (ES Volume 2, Chapter 13) (Document Ref: 6.2.13)
1	Wind turbine										
1.01	Transition piece repair	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
1.02	Transition piece maintenance	Vessel		Section 3.11: Accidental release or spills of construction	Section 4.12, Impact 3: Disturbance/ displacement		Section 6.11: Direct disturbance resulting from	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds.	Section 10.12: Ship collision risk Section 10.12: Impact on	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed

				<p>material or chemicals.</p> <p>Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species</p> <p>Section 4.12, Impact 5: Collision risk</p>		<p>maintenance during operation</p> <p>Section 6.11: Increase in SSC and associated sediment deposition from O&amp;M activities</p> <p>Section 6.11: Indirect disturbance resulting from the accidental release of pollutants</p>		<p>Section 9.18: Safety Issues for Fishing Vessels</p> <p>Section 9.18: Increased steaming times to fishing grounds</p> <p>Section 9.18: Interference with fishing activities</p> <p>Section 9.18: Displacement of fishing activities into other areas.</p>	<p>recreational vessel activity</p> <p>Section 10.12: Impact on fishing vessel activity</p> <p>Section 11.11: Impacts on the O&amp;M activities of other OWFs due to the use of the Port of Ramsgate</p> <p>Section 11.11: Restriction of use of disposal sites during O&amp;M activities</p>	<p>receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&amp;M activities</p> <p>Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall</p> <p>Section 13.12: Changes to the perceptions of historic seascape from O&amp;M activities</p>
1.03	Transformer replacement	Jack-up vessel, vessel		<p>Section 3.11: Accidental release or spills of construction material or chemicals.</p> <p>Section 4.12, Impact 3: Disturbance/ displacement</p> <p>Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species</p> <p>Section 4.12, Impact 5: Collision risk</p>	<p>Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel operations and cable maintenance activities</p>	<p>Section 6.11: Direct disturbance resulting from maintenance during operation</p> <p>Section 6.11: Increase in SSC and associated sediment deposition from O&amp;M activities</p> <p>Section 6.11: Indirect disturbance resulting from the accidental release of pollutants</p>	<p>Section 7.12: Vessel Interactions – collision and noise.</p>	<p>Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds.</p> <p>Section 9.18: Safety Issues for Fishing Vessels</p> <p>Section 9.18: Increased steaming times to fishing grounds</p> <p>Section 9.18: Interference with fishing activities</p> <p>Section 9.18: Displacement of fishing activities into other areas.</p>	<p>Section 10.12: Ship collision risk</p> <p>Section 10.12: Impact on recreational vessel activity</p> <p>Section 10.12: Impact on fishing vessel activity</p> <p>Section 11.11: Impacts on the O&amp;M activities of other OWFs due to the use of the Port of Ramsgate</p> <p>Section 11.11: Restriction of use of disposal</p>	<p>Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&amp;M activities</p> <p>Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall</p> <p>Section 13.12: Changes to the perceptions of</p>



										sites during O&M activities	historic seascape from O&M activities
1.04	Gearbox repair and replacement	Jack-up vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk	Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel operations and cable maintenance activities	Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
1.05	Generator replacement	Jack-up vessel; CTV		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk	Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel operations and cable maintenance activities	Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine

							resulting from the accidental release of pollutants		Section 9.18: Displacement of fishing activities into other areas.	due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
1.06	Paint and repair	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals.  Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk			Section 6.11: Direct disturbance resulting from maintenance during operation  Section 6.11: Increase in SSC and associated sediment deposition from O&M activities  Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds.  Section 9.18: Safety Issues for Fishing Vessels  Section 9.18: Increased steaming times to fishing grounds  Section 9.18: Interference with fishing activities  Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity  Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities  Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
1.07	J-Tube cleaning and ladder replacement, repair and cleaning	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals.  Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on			Section 6.11: Direct disturbance resulting from maintenance during operation  Section 6.11: Increase in SSC and associated	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds.  Section 9.18: Safety Issues for Fishing Vessels	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other

				habitats and prey species Section 4.12, Impact 5: Collision risk		sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants		Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
1.08	Annual wind turbine maintenance	Vessel and/ or helicopter for technicians, components and consumables		Section 3.11: Accidental release or spills of construction material or chemicals. Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
1.09	Wind turbine troubleshooting	Vessel		Section 3.11: Accidental release or spills	Section 4.12, Impact 3:	Section 6.11: Direct disturbance	Section 7.12: Vessel Interactions –	Section 9.18: Loss or Restricted Access to	Section 10.12: Ship collision risk	Section 13.12: Permanent physical loss/ disturbance of

				of construction material or chemicals.	Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		resulting from maintenance during operation Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	collision and noise.	Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
1.10	Major wind turbine component repair or replacement	Jack-up vessel, vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk	Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel operations and cable maintenance activities	Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the

										sites during O&M activities	perceptions of historic seascape from O&M activities
1.11	Blade inspection	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
1.12	Blade and hub repair	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of

									Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
1.13	Blade replacement	Jack-up vessel and/ or helicopter for technicians, components and consumables		Section 3.11: Accidental release or spills of construction material or chemicals. Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk	Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel operations and cable maintenance activities	Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities	
1.14	Anode replacement	Jack-up vessel and/ or vessel		Section 3.11: Accidental release or spills of construction material or chemicals. Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on	Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel operations and cable	Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Indirect	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or	

				habitats and prey species Section 4.12, Impact 5: Collision risk	maintenance activities	disturbance resulting from the accidental release of pollutants		Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
1.15	Bird waste removal	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals. Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities

2 Offshore Substation (OSS)											
2.01	Yearly service	Vessel and/ or helicopter for technicians, components and consumables		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
2.02	Regular maintenance/ troubleshooting	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine



							accidental release of pollutants		Section 9.18: Displacement of fishing activities into other areas.	of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
2.03	Bird waste removal	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals. Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk			Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
2.04	J-Tube and ladder maintenance and cleaning	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals. Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on			Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other

					habitats and prey species Section 4.12, Impact 5: Collision risk		sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants		Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
2.05	General maintenance work	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
2.06	Switchgear replacement	Vessel		Section 3.11: Accidental release or spills	Section 4.12, Impact 3:		Section 6.11: Direct disturbance	Section 7.12: Vessel Interactions –	Section 9.18: Loss or Restricted Access to	Section 10.12: Ship collision risk	Section 13.12: Permanent physical loss/ disturbance of

				of construction material or chemicals.	Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		resulting from maintenance during operation Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	collision and noise.	Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
2.07	Anode replacement	Vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk		Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the

											sites during O&M activities	perceptions of historic seascape from O&M activities
3	Cable (Export and Inter array)											
3.01	Cable inspection	Vessel, ROV		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk	Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel operations and cable maintenance activities	Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities	
3.02	Cable Repair	Jack-up vessels, vessels, ROV, divers, cable laying vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species	Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel operations and cable maintenance activities	Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities	

					Section 4.12, Impact 5: Collision risk		Section 6.11: Indirect disturbance resulting from the accidental release of pollutants		Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
3.03	Cable burial using surface protection	Jack-up vessel, vessels, ROV, divers, cable laying vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk	Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel operations and cable maintenance activities	Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
3.04	Cable re-burial	Vessels, ROV, cable laying vessel		Section 3.11: Accidental release or spills of construction	Section 4.12, Impact 3: Disturbance/ displacement	Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel	Section 6.11: Direct disturbance resulting from	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds.	Section 10.12: Ship collision risk Section 10.12: Impact on	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow

				material or chemicals.	Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk	operations and cable maintenance activities	maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants		Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities
3.05	Additional cable replacement/ laying	Jack-up vessels, vessels, ROV, divers, cable laying vessel		Section 3.11: Accidental release or spills of construction material or chemicals.	Section 4.12, Impact 3: Disturbance/ displacement Section 4.12, Impact 4: Indirect impacts through effects on habitats and prey species Section 4.12, Impact 5: Collision risk	Section 5.11: Direct and indirect disturbance to the seabed from jack-up vessel operations and cable maintenance activities	Section 6.11: Direct disturbance resulting from maintenance during operation Section 6.11: Increase in SSC and associated sediment deposition from O&M activities Section 6.11: Indirect disturbance resulting from the accidental release of pollutants	Section 7.12: Vessel Interactions – collision and noise.	Section 9.18: Loss or Restricted Access to Traditional Fishing Grounds. Section 9.18: Safety Issues for Fishing Vessels Section 9.18: Increased steaming times to fishing grounds Section 9.18: Interference with fishing activities Section 9.18: Displacement of fishing activities into other areas.	Section 10.12: Ship collision risk Section 10.12: Impact on recreational vessel activity Section 10.12: Impact on fishing vessel activity Section 11.11: Impacts on the O&M activities of other OWFs due to the use of the Port of Ramsgate Section 11.11: Restriction of use of disposal sites during O&M activities	Section 13.12: Permanent physical loss/ disturbance of known and potential seabed receptors in shallow sediments from the legs of jack-up vessels and/ or anchors of other vessels associated with O&M activities Section 13.12: Indirect effects on the setting of marine archaeological receptors offshore and at the landfall Section 13.12: Changes to the perceptions of historic seascape from O&M activities

