GREEN VOLT

Chapter 17
Infrastructure and Other Marine Users

Offshore EIA Report: Volume 1

Revision history

Revision	Date	Description	Prepared	Checked	Approved
1	25/03/2022	First draft	CB (Royal HaskoningDHV)	JM (Royal HaskoningDHV)	VC (Flotation Energy)
2	12/12/2022	Second draft	JM (Royal HaskoningDHV)	PP (Royal HaskoningDHV)	VC (Flotation Energy)
3	06/01/2023	Final for submission	JM (Royal HaskoningDHV)	CM (Royal HaskoningDHV)	VC (Flotation Energy)

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Acronyms

Acronym	Description
AIS	Automatic Identification System
BCA	Block Crossing Agreement
BEIS	The Department for Business, Energy and Industrial Strategy
CCS	Carbon Capture and Storage
CEFAS	The Centre for Environment, Fisheries and Aquaculture Science
CES	Crown Estate Scotland
CIA	Cumulative Impact Assessment
CNOOC	China National Offshore Oil Corporation Limited
DECC	Department of Energy and Climate Change
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
EU	European Union
FPSO	Floating Production Storage and Offloading
GPS	Global Positioning System
GW	Gigawatt
HSE	Health and Safety Executive
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
ICPC	International Cable Protection Committee
INTOG	Innovation and Targeted Oil and Gas
JNCC	Joint Nature Conservation Committee
km	Kilometre
MCA	Maritime and Coastguard Agency

MDA	Military Danger Area
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MoD	Ministry of Defence
MS-LOT	Marine Scotland Licencing and Operations Team
MW	Megawatt
NLB	Northern Lighthouse Board
NMP	National Marine Plan
NSTA	North Sea Transition Authority
NtM	Notice to Mariner
O&M	Operation and Maintenance
OGA	Oil and Gas Authority
OPRED	Offshore Petroleum regulatory for Environment and Decommissioning
OPRED - ODU	Offshore Petroleum regulatory for Environment and Decommissioning - Offshore Decommissioning Unit
OREI	Offshore Renewable Energy Installations
OSP	Offshore Service Platform
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PAC	Pre-application Consultation
PEXA	Military Practise and Exercise Areas
PWA	Pipeline Works Authorisations
RAF	Royal Air Force
SFF	Scottish Fishermen's Federation
SMP-OWE	Sectoral Marine Plan for Offshore Wind Energy
SOWEC	Scottish Offshore Wind Energy Council

TPV	Third Party Verification
UK	United Kingdom
UKCPC	UK Cable Protection Committee
UKCS	United Kingdom Continental Shelf
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
WTG	Wind Turbine Generator

Glossary

Term	Description
Applicant	Green Volt Offshore Windfarm Ltd.
Buzzard	Buzzard Platform Complex.
Buzzard Export Cable Corridor	The area in which the export cables will be laid, from the perimeter of the Windfarm Site to Buzzard Platform Complex.
Green Volt Offshore Windfarm	Offshore windfarm including associated onshore and offshore infrastructure development (Combined On and Offshore Green Volt Projects).
Horizontal Directional Drilling	Mechanism for installation of export cable at landfall.
Inter-array cables	Cables which link the wind turbines to each other and the offshore substation platform.
Landfall Export Cable Corridor	The area in which the export cables will be laid, from the perimeter of the Windfarm Site to landfall.
Mean High Water Springs	At its highest and 'Neaps' or 'Neap tides' when the tidal range is at its lowest. The height of Mean High Water Springs (MHWS) is the average throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest (Spring tides).
Moorings	Mechanism by which wind turbine generators are fixed to the seabed.
NorthConnect Parallel Export Cable Corridor Option	Landfall Export Cable Corridor between NorthConnect Parallel Landfall and point of separation from St Fergus South Export Cable Corridor Option.
NorthConnect Parallel Landfall	Southern landfall option where the offshore export cables come ashore.
Offshore Development Area	Encompasses i) Windfarm Site, including offshore substation platform ii) Offshore Export Cable Corridor to Landfall, iii) Export Cable Corridor to Buzzard Platform Complex.
Offshore export cables	The cables which would bring electricity from the offshore substation platform to the Landfall or to the Buzzard Platform Complex.
Offshore infrastructure	All of the offshore infrastructure, including wind turbine generators, offshore substation platform and all inter-array and export cables.
Offshore substation platform	A fixed structure located within the Windfarm Site, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Onshore Export Cable Corridor	The proposed onshore area in which the export cables will be laid, from landfall to the onshore substation.
Project	Green Volt Offshore Windfarm project as a whole, including associated onshore and offshore infrastructure development.

Safety zones	An area around a structure or vessel which must be avoided.
St Fergus South Export Cable Corridor Option	Landfall Export Cable Corridor between St Fergus South Landfall and point of separation from NorthConnect Parallel Export Cable Corridor Option.
St Fergus South Landfall	Northern landfall option where the offshore export cables come ashore.
Windfarm Site	The area within which the wind turbine generators, offshore substation platform and inter-array cables will be present.

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CHAPTER 17: INFRASTRUCTURE AND OTHER MARINE USERS

17.1 Introduction

1. This chapter of the **Offshore Environmental Impact Assessment (EIA) Report** presents an assessment of the likely significant effects of the construction, operation and decommissioning of the Project (the Project refers to the offshore elements of the Green Volt Offshore Windfarm only, up to Mean High Water Springs (MHWS)) on the existing offshore infrastructure and other marine users within or near to the Offshore Development Area.

2. Other marine users are considered, including offshore wind farm projects (**Figure 17.1**), oil and gas activity, pipelines and carbon capture storage (**Figure 17.2**), marine disposal sites (**Figure 17.3**), telecommunications and electricity cables (**Figure 17.4**). This chapter has been prepared by Royal HaskoningDHV.

3. Infrastructure and other marine users that have been identified as part of this **Offshore EIA Report** but require more detailed assessment are covered within **Chapter 13: Commercial Fisheries**, **Chapter 14: Shipping and Navigation, Chapter 16: Aviation and Radar** and **Chapter 19: Socioeconomics, Tourism and Recreation.**

4. This chapter of the **Offshore EIA Report** specifically assesses the Project's potential impacts against the existing marine receptors within the Study Area. The Project's **Onshore EIA Report** presents the assessment of the likely significant effects of the construction, operation and decommissioning of the Project on the existing infrastructure and other marine users for the Onshore Development Area. The **Onshore EIA Report** will also assess how the Green Volt Offshore Windfarm's onshore infrastructure development could affect the terrestrial environment.

17.2 Legislation, Guidance and Policy

5. The National Marine Plan (NMP) for Scotland published in 2015 (Scottish Government, 2015) outlines a management framework for the marine environment which enables the requirements of marine users to be coordinated in a sustainable and strategic way. The NMP covers the management and coordination of marine activities from 12 to 200 nautical miles (nm) offshore. The NMP outlines specific planning policies which are relevant to the assessment of infrastructure and other marine users in this offshore EIA chapter. Chapter name and number of the relevant policies within the NMP are provided below.

   - Oil and Gas (Chapter 9);
   - Carbon Capture and Storage (CCS) (Chapter 10);
   - Offshore Wind and Marine Renewable Technology (Chapter 11);
   - Submarine Cables (Chapter 14); and
   - Aggregates (Chapter 16).

6. Although there is no specific legislation which directly relates to infrastructure and other marine users, there are some published guidance documents associated with the marine receptors discussed as part of this chapter. These include the following:

   - OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR, 2003);
   - Cable Burial Risk Assessment Guidance and Application Guide (Carbon Trust, 2015);

- National Policy Statement for renewable Energy Infrastructure (EN-3) (Department of Energy and Climate Change (DECC), 2011).
- Natural England and Joint Nature Conservation Committee (JNCC) advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas (Natural England and JNCC, 2019).
- Safety Zones around Renewable Energy Installations (United Kingdom (UK) Government, 2004);
- Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654 (M+F) Offshore Renewable Energy Installations (OREI) safety response (MCA, 2021);
- Oil and Gas UK, OP024 - Pipeline Crossing Agreement and Proximity Agreement Pack (Oil & Gas UK, 2015);
- Subsea Cables UK (formerly the UK Cable Protection Committee (UKCPC)): 'Guideline 6 for Proximity of Wind Farm developments and offshore cables' (UKCPC, 2012);
- The Crown Estate Submarine cables and OREI proximity study (The Crown Estate, 2012);
- The Crown Estate and Crown Estate Scotland Agreements and Oil and Gas Licences (OGA [now North Sea Transition Authority], 2018);
- The Crown Estate Guidance: Offshore wind farms and electricity export cables – crossing agreements (The Crown Estate, 2012b); and
- International Cable Protection Committee (ICPC) recommendations:
    - Recommendation No.2. Recommended Routing and Reporting Criteria for Cables in Proximity to Others (ICPC, 2015);
    - Recommendation No.3. Criteria to be Applied to Proposed Crossings Submarine Cables and/or Pipelines (ICPC, 2014); and
    - Recommendation No.13. The Proximity of Offshore Renewable Wind Energy Installations and Submarine Cable Infrastructure in National Waters (ICPC, 2013).

17.3 Consultation

7. Consultation is a key requirement within the EIA process as it enables stakeholders to present their assessment of the proposed works. This requirement is explained in further detail in **Chapter 6: EIA Methodology** of this **Offshore EIA Report**.

8. The assessment within this chapter considers the **Scoping Opinion** provided by Marine Scotland Licensing and Operations Team (MS-LOT) on 19th April 2022 (**Appendix 1.1**), after the **Offshore Scoping Report** (**Appendix 1.2**) was submitted in November 2021 (Royal HaskoningDHV, 2021). **Table 17.1** provides consultation responses received within the **Scoping Opinion** that are relevant to infrastructure and other marine users. **Table 17.1** also includes other consultation that has taken place during the development of the Project and provides a description of how the comments raised have already been addressed or taken into consideration within this **Offshore EIA Report.**

Table 17.1 Summary of Consultation Relating to Infrastructure and Other Marine Users

Consultee	Date / Document	Comment	Response / where addressed in the EIA
Marine Scotland Licensing and Operations Team (MS-LOT)	April 2022, Marine Scotland - Licensing Operations Team: Scoping Opinion for Green Volt Offshore Windfarm	The Scottish Ministers emphasise the importance of engaging with other marine users, including developers of ScotWind projects, throughout all phases of the Proposed Development.	Ongoing consultation will be continued during all phases. Consultation to date is discussed in this table, with further details in the Pre-Application Consultation Report (**Appendix 6.2** of this **Offshore EIA Report**)

Consultee	Date / Document	Comment	Response / where addressed in the EIA
MS-LOT	April 2022, Marine Scotland - Licensing Operations Team: Scoping Opinion for Green Volt Offshore Windfarm	The Scottish Ministers agree with the impacts scoped into the EIA Report. In addition, the Developer must fully address the representations from the MCA and Shell, as outlined below, in the EIA Report	MCA and Shell are considered within this table
MS-LOT	April 2022, Marine Scotland - Licensing Operations Team: Scoping Opinion for Green Volt Offshore Windfarm	The Scottish Ministers highlight the representation from the MCA addressed above in Section 5.15 and advise that detail on the potential impact of the Proposed Development on navigational issues for other marine users, including commercial and recreational craft, must be included in the EIA Report	Navigation issues for other marine users are considered within **Appendix 14.1**: **Navigation Risk Assessment** and in **Chapter 14: Shipping and Navigation** . Recreational craft are also included in **Chapter 19: Socioeconomics, Tourism and Recreation**.
MS-LOT	April 2022, Marine Scotland - Licensing Operations Team: Scoping Opinion for Green Volt Offshore Windfarm	The Scottish Ministers also draw the Developers attention to the representation from Shell regarding potential impacts of the Proposed Development on other activities in the area and advise that this must be addressed in the EIA Report.	As shown on **Figure 17.2**, the Offshore Development Area is not within the footprint of any Carbon Capture and Storage (CCS) or oil and gas Licence areas (except where connecting to Buzzard Platform Complex (Buzzard). Refer to **Section 17.6.2** and **Section 17.7.3.2** of this technical chapter
BP	27th January 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	Thank you for your email. I have checked with colleagues and can confirm we do not intend to provide a response to the Scoping Report.	Noted
BT	22nd December 2021 Representation to MS-LOT during consultation on Offshore Scoping Opinion	We have studied this wind farm proposal using the co-ordinates below with respect to EMC and related problems to BT point-to-point microwave radio links. The conclusion is that the Project indicated should not cause interference to BT's current and presently planned radio network.	Noted
Defence Infrastructure Organisation	14th February 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	Impact on military activity has been recognised in chapter 7.7.2.1 of the Scoping Report. The designated site area, as shown on figure 7.19, identifies military PEXA. At this time, it is not anticipated that the development would have any substantial impact though further assessment will take place when additional information is available.	There is no overlap of PEXA with the Offshore Development Area see **Section 17.6.5** of this technical chapter for further details. Potential impacts associated with Ministry of Defence (MoD) radar are discussed in **Chapter 16: Aviation and Radar**
Defence Infrastructure Organisation	14th February 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	The potential presence of unexploded ordnance (UXO) and disposal sites is also a relevant consideration to the installation of cables and other intrusive works that may be undertaken in the maritime environment.	Pre-construction surveys will be undertaken for UXO (**Appendix 5.2, 5.3 and 5.4**). Refer to **Chapter 5: Project Description (including Appendix 5.1), Chapter 10: Fish**

Consultee	Date / Document	Comment	Response / where addressed in the EIA
			and Shellfish Ecology and Chapter 11: Marine Mammals
NorthConnect	April 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	NorthConnect welcome the proactive dialogue with the project team with regard to sharing data, with the aim of developing decarbonisation projects while minimise adverse environmental impacts.	Refer to **Chapter 4: Site Selection and Assessment of Alternatives and Chapter 5: Project Description**
NorthConnect	April 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	With regards to Electromagnetic Field (EMF) impacts, if Green Volt Offshore Windfarm Ltd (OWL) are to use the NorthConnect cable corridor or be close to it, the cumulative impacts of EMF should be modelled and clearly considered within the EIA Report. This is to allow for the assessment of impacts on ecological receptors including benthic and fish ecology with potential knock-on implications for the fishing sector and navigation. Significant cumulative impacts are not expected however, there is a need for transparency to be clearly demonstrated to stakeholders that EMF has been appropriately considered.	An EMF study has been undertaken. Refer to **Chapter 5: Project Description, Chapter 9: Benthic Ecology, Chapter 10: Fish and Shellfish Ecology** Refer to **Section 17.6.4.2** of this technical chapter
Oil and Gas Authority (OGA) (Now North Sea Transition Authority (NSTA))	17th December 2021 Representation to MS-LOT during consultation on Offshore Scoping Opinion	To confirm a nil return from the OGA on this scoping report.	Noted
Scottish Fisherman's Federation	28th January 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	There is an expectation that the cable delivering power to Buzzard is also removed, as a foreign object, which purpose has gone. The impact of the export cable must be addressed, with full burial being the aim.	The Offshore Export Cables will be buried in line with current guidance as discussed in **Section 17.7.1**. Where this is not possible, there will be external protection achieved by means of rock berm or 'mattressing'. It is proposed that any subsea infrastructure, such as the scour protection and cables, may be left in situ. This will be agreed upon with any external subsea cable operators where the Project's infrastructure has cable crossing and proximity agreements in place. Refer also to **Chapter 5: Project Description** and **Chapter 13: Commercial Fisheries and Chapter 14: Shipping and Navigation**
Shell	29th December 2021 Representation to MS-LOT during consultation on Offshore Scoping Opinion	We consider appropriate to include a map identifying the neighbouring CCS and Oil & Gas licenses. This would allow to identify any risk of potential stranded Assets, and more importantly would be to consider what would be the measures to prevent/mitigate impact on future CCS and oil and gas activities in the area.	As shown on **Figure 17.2**, the Windfarm Site is not within the footprint of any currently licenced CCS licence areas, and discussions are ongoing with Storegga regarding

Consultee	Date / Document	Comment	Response / where addressed in the EIA
		This is a concern voiced via the Industry Body Oil & Gas UK.	the Acorn Project (see below). The Windfarm Site and Export Cable Routes have limited footprint overlap with oil and gas Licence areas. Refer to **Section 17.6.2** of this technical chapter.
Storegga	Pre-Application Consultation (PAC) Meeting 25th August 2022	As discussed in our meeting between the Acorn and Green Volt projects on 25th August we would like to note that Acorn has a statutory requirement to monitor our CO_2 store site within the CS003 licence area and a wider secondary containment area outside the site (termed the storage complex). This potentially means access to the marine space outside the CS003 licence area boundary. At the current time the expectation is that this monitoring will be using seismic arrays towed behind a vessel and therefore unconstrained access is critical. Although the extent of our spatial monitoring area is currently still under review, it is unlikely that there will be any overlap or interaction between the two projects in terms of marine space. We would welcome continued dialogue between the projects as the developments progress.	Consultation between Green Volt Offshore Windfarm Ltd (The Applicant) and Storegga is ongoing through Project development
NSTA	PAC Correspondence 9th August 2022	From the maps it appears the main cable to shore associated with the Green Volt project has 3 pipeline crossings, namely: • PL1270: Britannia to St Fergus gas line (Pipeline Operator is listed as Chrysaor (U.K.) Britannia Limited - 02954364) • PL2074: Buzzard to Forties Pipeline oil line (Pipeline Operator is listed as CNOOC Petroleum Europe Limited - 01051137) • PL208: Fulmar to St Fergus gas line (Pipeline Operator is listed as Shell U.K. Limited - 00140141) Depending on the layout of the wind farm, there may also be some additional crossings local to the Blackbird and Ettrick Fields and also close to the Buzzard Platform. The developer should ensure the relevant Pipeline Operators are contacted to negotiate a pipeline crossing agreement, it will then be the responsibility of the respective Pipeline Operators to inform the NSTA and also the Offshore Petroleum Regulator for Environment and Decommissioning's (OPRED's) Offshore Decommissioning Unit (OPRED-ODU) to see if any updates to existing Pipeline Works Authorisations (PWAs) or decommissioning plans are required. In addition, the developer should contact owners of any petroleum blocks/licenses the cables cross to discuss whether any Block Crossing Agreements (BCA's) are needed, the license/block owner should then also contact the NSTA for awareness.	Oil and gas operations are discussed in **Section 17.6.2**. Cable and pipeline crossings are discussed in **Section 17.6.4.** Site selection to avoid cable crossings where possible, and embedded mitigation, including block, cable and pipeline crossing agreements and continued consultation with other industries, is discussed in **Section 17.7.1**
NSTA	EIA consultation 8th June 2022	NSTA has no remit on renewables, but very supportive of the effort to re-use former O&G fields	The Applicant will continue to consult with NSTA. The array pattern and position applied will deliberately avoid placing

Consultee	Date / Document	Comment	Response / where addressed in the EIA
		Secretary of State is liable for exploration and appraisal wells, therefore mooring line proximity to exploration and appraisal wells is not a matter for the NSTA The O&G Operator is liable for developed wells It was suggested to engage the O&G field operator would be good practice to ensure the following is applied: • A crossing is categorized as a pipeline modification and a Pipeline Works Authorisation (PWA) will need to be submitted to the NSTA by the O&G operator (an associated environmental approval may be required from BEIS-OPRED) • Any addition of rock or concrete mattresses for protection will need a "deposit" consent (again from the NSTA and an associated environmental approval may be required from BEIS-OPRED) • The monitoring obligation remains with the O&G operator The approved O&G decommissioning programme will need to be revised with ORPED	turbines and substructures directly above pipelines and umbilicals remaining in-situ, and abandoned well-centres at the seabed. The final offsets applied will be determined by collaboration with the oil and gas operator via a structured risk assessment approach. Positioning of wind farm equipment on the seabed such as moorings and inter-array cables will also avoid interaction where possible, however, there is a strong likelihood that crossings will be necessary. Such crossings will be finalised with the input and agreement with the oil and gas operator since they will be legally responsible for the notification process and the ongoing liability associated with the decommissioned equipment affected by the crossing.
Ministry of Defence (MoD)	14th February 2022 Representation to MS-LOT during consultation on Offshore Scoping Opinion	In relation to the Onshore element of the proposed development, chapter 2.2.3 of the Scoping report identifies the landfall zones have not yet been determined, however two principal areas are currently under consideration: North of Peterhead (figure 1.3) and South of Peterhead (figure 1.3). The MOD hope to be consulted to determine any impact on MOD assets. A table (table 2.6) of the corridor which will contain the Offshore cable route is included in the Scoping Report we request that we are consulted once the cable route and Onshore landfall location is finalised.	Further consultation on landfall locations was undertaken during Pre-Application Consultation (PAC) (see below)
MoD	PAC Correspondence 10th August 2022	Thank you for your email below. I can confirm that MOD has no concerns or comments at this stage in your preparation of this development proposal for the export cable and associated rock deposits for in-trench burial of the cable. The MOD should be consulted at the next stage of this application to enable defence maritime navigational interests to be considered.	Noted and the Applicant will .continue to consult with MoD throughout the development of the Project.
OPRED	EIA consultation 2nd August 2022	• OPRED scope with respect to pipeline/umbilical crossings is focused on decommissioned lines, not live lines. Joint Nature Conservation Committee (JNCC) and Scottish Fishermen's Federation (SFF) will need to be consulted for each crossing and this will also require an update to the O&G decommissioning program. • Mooring lines crossing pipelines is not a new concept in O&G operations, however, normally this involves the same operator crossing their own pipeline/umbilical. Since the exclusion zone applied around a wind turbine is small (50m), the pipelines will still be considered as a potential hazard for other marine users. This means the	Offshore Petroleum Regulator or Environment and Decommissioning (OPRED), JNCC and SFF will continue to be consulted throughout the development of the Project. The final offsets from historic oil and gas asset locations applied will be determined by collaboration with the oil and gas operator via a structured risk assessment approach, as

Consultee	Date / Document	Comment	Response / where addressed in the EIA
		pipelines still must be accessible for survey to verify they continue to not present a hazard to other users of the sea.	discussed in **Section 17.7.1.**
OPRED	EIA consultation 8th June 2022	We would advise that in developing the project you have consideration of the ongoing decommissioning work at the former Ettrick and Blackbird oil fields in the proposed development location. We would also advise that you have regard to the presence of the legacy infrastructure decommissioned in situ, including pipelines and infrastructure piles which were cut below the seabed. You should also be aware that post decommissioning monitoring will be required following completion of decommissioning activities, including along routes of pipelines decommissioned in situ. As OPRED has a risk based approach to determining the need for and number of further surveys, the duration of the monitoring period is not fixed and not known at this point.	Consultation is ongoing and decommissioning works and legacy infrastructure within the Ettrick and Blackbird oil fields are considered within the development of the Project (see **Section 17.7**).
CNOOC	Various discussions /meetings April 2022	After the enquiry was discussed internally within CNOOC involving the Decommissioning Manager and Legal Counsel, the conclusion was a risk assessment would be used to determine the proximity of each legacy feature in the Ettrick and Blackbird oil fields since there was no existing clear guidance in place.	The final offsets from historic oil and gas asset locations applied will be determined by collaboration with the oil and gas operator via a structured risk assessment approach, as discussed in **Section 17.7.1.**
Ancala – SAGE Gas Terminal at St Fergus nr Peterhead	PAC correspondence 20th September 2022	To assist us in understanding the interface between Green Volt's project and the SAGE Gas Terminal and offshore gas pipelines I should be grateful if you would provide detail of the windfarm location, proposed cable routes, landfall and project timeline. I have reviewed the information in your letter and the associated website and information board materials. I also looked at the Offshore Scoping Report for the Offshore Environmental Impact Assessment. I have shared a summary of these internally This information and associated maps seem to indicate that the export cable route will cross the Britannia to SAGE pipeline. There are two potential cable landings one south and one north of Peterhead. The Northern landing corridor seems to come close to St Fergus, but it is not entirely what if any interaction there could be with gas terminal offshore pipeline landings or other elements. I would like to take up your offer of a TEAMS call so I can get more clarity around the above and any other potential interactions between Green Volt and SAGE terminal offshore and onshore activities	Major Accidents and Disasters are considered with **Appendix 5.1** of this **Offshore EIA Report,** and includes for the risk of a floating anchor breaking free of moorings. Mitigation, including Third Party Verification (TPV) and Global Positioning System (GPS) monitoring is discussed in **Section 17.7.1** A meeting was held on 12th October (see below).
Ancala – SAGE Gas Terminal at St Fergus nr Peterhead	Meeting 12th October 2022	Meeting concluded doesn't appear to be any significant interactions with SAGE operations and assets directly owned by them. The Britannia to SAGE pipeline is operated by Harbour so any crossings agreement will be with them, but Ancala are interested in it as the gas feeds into their terminal so ultimately want it well protected to protect their business.	Major Accidents and Disasters are considered within **Appendix 5.1** of this **Offshore EIA Report**, and includes for the risk of a floating anchor breaking free of moorings. This is also

Consultee	Date / Document	Comment	Response / where addressed in the EIA
		Looking at the ArcGIS map it appears that the main Beryl/SAGE Pipeline which lands gas at the SAGE terminal is about 2 to 3 km from the edge of the development area. While this is not proximate it caused us to consider what the potential risk would be from a turbine breaking free of its moorings and drifting on to the pipeline i.e. Anchor lines catching on and damaging the pipeline. While not common there have been some examples of FPSOs doing this in bad weather e.g. Gryphon FPSO in Feb 2011 This is a low probability but potentially high impact risk but has or will you consider this under your assessment of Risks of Major Accidents and/or Disasters? If it has been considered what mitigations exist or will be put in place to address this	included in the NRA (**Appendix 14.1**) Mitigation, including TPV and GPS monitoring is discussed in **Section 1.5.3.7** of **Appendix 5.1** and **Section 17.7.1** of this Chapter. Other St Fergus operators have also been contacted by the Applicant through the PAC process.
Transport Scotland Ports and Harbours	PAC correspondence 15th August 2022	I refer to your recent correspondence on the above development in which you seek Transport Scotland's comments on the proposed burial of the export cable and associated rock deposits for the proposed Green Volt Offshore Wind Farm. This information has been passed to SYSTRA Limited (SYSTRA) for review in their capacity as Term Consultants to Transport Scotland – Roads Directorate. Based on the review undertaken, we would provide the following comments. Proposed Development We note that the proposed Green Volt Offshore Wind Farm is located approximately 80km from the Aberdeenshire coast, with the nearest trunk road to the site being the A90(T) around the Peterhead/ St Fergus area. The development will include a grid connection back to a substation at New Deer, which lies approximately 25km inland from Peterhead. We understand that the offshore works is being dealt with under a separate application from the Inshore Region works and this current consultation relates to licensable marine activities between Mean Water Springs and up to 12nm offshore. Pre-Application Comments Given that the works are effectively all marine-based, we do not expect that the operations will have a significant impact on the trunk road network. To demonstrate this, we would ask that the forthcoming Environmental Impact Assessment Report (EIA Report) quantifies both the number and composition of vehicular trips relating to the export cable and rock deposits. The traffic generation information should be used to determine whether there are likely to be any significant environmental issues associated with increased traffic on the trunk road network, and any requirement for further trunk road assessment. The thresholds as indicated within the Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic should be used as a screening process for the assessment, and potential trunk road related environmental impacts such as driver delay, pedestrian amenity, severance, safety etc will require to be considered and assessed where appropriate (i.e. where IEMA Guidelines for further assessment are breached).	All materials for marine works will be transported to the Project site by sea, so there will be no increased traffic on the trunk road network during the marine works. Potential impacts upon traffic and transport from onshore works will be fully considered within the **Onshore EIA Report**. Consultation will be undertaken during the development of the **Onshore EIA Report** to ensure any potential impacts are understood, assessed, and minimised to within acceptable levels.

Consultee	Date / Document	Comment	Response / where addressed in the EIA
		These specify that road links should be taken forward for assessment if: • Traffic flows will increase by more than 30%, or • The number of HGVs will increase by more than 30%, or • Traffic flows will increase by 10% or more in sensitive areas. In addition to above, if there are any abnormal load deliveries associated with this element of the works, Transport Scotland will require to be satisfied that the size of loads proposed can negotiate the selected route and that their transportation will not have any detrimental effect on structures within the trunk road route path. A full Abnormal Loads Assessment report should be provided with the EIA Report that identifies key pinch points on the trunk road network. Swept path analysis should be undertaken and details provided with regard to any required changes to street furniture or structures along the route.	
OFCOM	PAC correspondence 10th August 2022	In reply to your email, please note that Ofcom no longer replies to these requests The windfarm process as originally developed was aimed at putting a windfarm developer and potentially impacted fixed link licensees in contact with each other. Beyond this Ofcom did/does not have any further involvement or enter into the co-ordination / planning discussions between the concerned parties. The same applies now that the fixed link licence information in the Ofcom managed and co-ordinated bands is provided via the Spectrum Information System. i.e. Ofcom does not enter into the discussions between windfarm and fixed link operators. It should also be noted that while Ofcom provides information via the Spectrum Information System there are a number of bands that are now awarded on a block basis i.e. these bands are managed and assigned by the licensees themselves and the individual link information is not published on the SIS. Further information on these bands and the licensees details can be found here: https://www.ofcom.org.uk/manage-your-licence/radiocommunication-licences/mobile-wireless-broadband/above-5ghz The location of published licences is located on the Wireless Telegraphy Register so you should perform your search there however not all fixed links masts are detailed on this service as above. Wireless Telegraphy Register: https://www.ofcom.org.uk/spectrum/information/spectrum-info-faq/wtr#:~:text=The%20Wireless%20Telegraphy%20Act%20Register,the%20Wireless%20Telegraphy%20Act%202006	Noted and as the Project engineering progresses the address links for the licensees will be utilised as appropriate and further queries will be addressed to the noted spectrum licensing team.

Consultee	Date / Document	Comment	Response / where addressed in the EIA
		We will be updating the website and will advise once this has been done.	
BT	PAC correspondence 27th July 2022	We have studied this proposal using the attached map with respect to EMC and related problems to BT point-to-point microwave radio links. The conclusion is that, the Project indicated should not cause interference to BT's current and presently planned radio network.	Noted
Network Rail	PAC correspondence 21st July 2022	After reviewing the proposal we consider that the development will have no impact on railway infrastructure as the proposed cable landfall connections will not be within the vicinity of any railway infrastructure.	Noted
BEIS	Stakeholder engagement meeting 13th January 2021	This project fits into the current carbon target and decarbonization agenda for the UK and gives a good platform for pushing floating wind forward in this package for the next rounds of floating offshore wind in the UK. Clearly Scotland has the initial pre-commercial demonstration projects (Hywind and Kincardine), but it is important that the UK push forward in supporting larger floating offshore wind developments by building on this knowledge. It is important that the next phase of floating offshore wind projects be moved forward and critically drive the supply chain and reduce the cost of floating offshore wind to meet the requirements of the late 20's/30s deployment of the required floating developments. So, BEIS see the whole floating space as the key area going forward into the future and we are therefore supportive of this project and floating wind in general. Fixed offshore wind farms will gradually max out in the North Sea and therefore projects such as this will help support the wider UK carbon neutral agenda. The PM will want to push this target and therefore the HMQ sees this a key project to drive things forward alongside the CFD rounds for floating. What sort of interventions need to be helped going forward are to be announced, but please watch this space. This Project offers a clear opportunity to drive supply chain for floating in the UK going forward.	Noted
BEIS	Stakeholder engagement meeting 27th May 2021	A very ambitions process in both the project and the timelines. The project could be doable but there are lots of hurdles to jump through on the way to startup. This is a key step towards the UK government target of 1GW floating wind by 2030 and the Project drives large commercial scale production. This appears to be a very key project to push floating offshore wind in the UK.	Noted
BEIS	Stakeholder engagement meeting 27th May 2021	This 300MW project will require a supply chain process document to confirm the local/UK content.	The Applicant is seeking to engage with the floating offshore wind supply chain through industry-specific networks such as that offered by the Scottish Offshore Wind Energy Council (SOWEC). Flotation Energy attended the SOWEC Offshore Wind Supply Chain Summit held in Aberdeen on 22 August 2022.

Consultee	Date / Document	Comment	Response / where addressed in the EIA
			The Green Volt Offshore Windfarm website also enables those interested in supply chain opportunities to register their interest in the Project - https://greenvoltoffshorewind.com/#supply Expected spending at local, regional and national levels is outlined in **Section 19.7.1.2** of **Chapter 19: Socioeconomics, Tourism and Recreation** of this **Offshore EIA Report**
OPRED	Stakeholder engagement email 10th November 2021	"in answer to Green Volt OWL queries: 1. When are the Ettrick & Blackbird decommissioning programmes due to be completed and signed off by OPRED? – Works were scheduled for completion by end of 2020 however OPRED are currently reviewing a revision to the programme which will encompass a revision of the schedule, once the revision has been completed this will be available on our website. 2. Has a post-decommissioning survey programme been agreed & what is it scope? - A post decommissioning environmental seabed survey to cover the site of the wellheads and installations will be carried out following the completion of decommissioning activities in order to identify any chemical or physical disturbances to the seabed following decommissioning. The survey reports will be submitted to OPRED and a post monitoring survey regime will be agreed."	Ongoing consultation with relevant stakeholders will be undertaken during and on completion of this decommissioning process.
BEIS	Stakeholder engagement meeting 27th May 2021	With regard to the CFD process, private wire connections can be included in the CFD process as long as appropriate metering is installed to measure incoming and outgoing outputs. Allocation Round 4 opened up this year. Project expectations for AR5 timing (Q2/Q3 2023) are roughly correct, (firm dates will be issued six months in advance).	Noted
BEIS	Stakeholder engagement meeting 27th May 2021	UK content is key to the process. What investments are need in the yards and how could UK and Scottish Government help support this process for you - build back greener and building port and harbour infrastructure.	The Applicant is seeking to engage with the floating offshore wind supply chain through industry-specific networks such as that offered by the SOWEC. Flotation Energy attended the SOWEC Offshore Wind Supply Chain Summit held in Aberdeen on 22 August 2022. The Green Volt Offshore Windfarm website also enables those interested in supply chain opportunities to register their interest in the Project -

Consultee	Date / Document	Comment	Response / where addressed in the EIA
			https://greenvoltoffshorewind.com/#supply Expected spending at local, regional and national levels is outlined in **Section 19.7.1.2 of Chapter 19: Socioeconomics, Tourism and Recreation** of this **Offshore EIA Report .**
Crown Estate Scotland	Stakeholder engagement meeting 13th January 2021	CES role in this is the seabed management in this process, but within the strategic planning concept overview. CES are developing several broad approaches to allow leasing to move forward, once the planning framework is in place from Scottish Government and Marine Scotland. The process to allow Project Green Volt exclusivity agreements will need additional thoughts and we are very supportive of this project and having a worked example such as Green Volt will allow more of this sort of O&G decarbonisation project to move forward in the future	Noted
Crown Estate Scotland	Stakeholder engagement meeting 27th May 2021	At present, CES are closing the ScotWind process in July and within the Marine plan there was element discussing decarbonisation. However, there is currently no process in place to obtain Seabed rights outside Scotwind. Strategic process is ongoing and any future strategic plan needs to be undertaken via Marine Scotland •Agreement for carbon storage agreement south of NE7 needs to be noted in discussions. •CFD queries – Does CFD allow connection from offshore? •Buzzard needs 70MW of power, whereas we are planning a 300MW wind farm. Could the farm be at a smaller scale?	See consultation above with Storegga re CCS site. We need to overplant to allow Green Volt to meet the expected power demands of the offshore oil and gas platform for the majority of the time. A smaller scale option would require significant grid electricity to operate, additionally this is allowed as per the Innovation and Targeted Oil and Gas (INTOG) (INTOG) leasing round that provides the required seabed rights and also the Marine Scotland strategic planning process. Additionally, this allows the possible connection of additional offshore oil and gas platforms ahead of the primary option.
ESVAGT	Stakeholder engagement email 6th April 2022	No comment	Noted
Fraserburgh Harbour Commissioner	6th December 2021 Representation to MS-LOT during consultation on Offshore Scoping Opinion	We have nothing to add or remove from the scope of the EIA for the proposed works.	Noted
Moray Firth Partnership	PAC correspondence 14th July 2022	Received - no comments, please remove from consultation list and refer to East Grampian Coastal Partnership	Noted

Consultee	Date / Document	Comment	Response / where addressed in the EIA
OGA (now NSTA)	Stakeholder engagement meeting 27th May 2021	Thanks to the project team and also the other regulators for engaging on Green Volt. •The proposed solution is a major contribution towards decarbonisation goals the possibility of sharing this electrification with a number of other platforms is very appealing. • it is recognised that there are a lot of projects and it is good to see the number of regulators working together to move this forward.	Noted
Tidewater	Stakeholder engagement meeting 20th April 2022	No comments	Noted
Total	Stakeholder engagement meeting 13th January 2021	We have been pushing forward into renewables in the UK and sees this project opportunity to answer the two objectives of renewable energy and decarbonization of the O&G industry.	Noted
Total	Stakeholder engagement meeting 27th May 2021	We are fully behind this process and we will bring our knowledge to the project to make it happen.	Noted

17.4 Assessment Methodology

17.4.1 Impact Assessment Methodology

9. The approach to the impact assessment requires assigning each potential receptor a sensitivity and magnitude level to determine the significance of an impact on each receptor. This approach is applied to all potential impacts that are identified as part of the EIA. Each potential impact has been assessed against the Project's construction, operation and maintenance (O&M) and decommissioning development phases. The impact assessment methodology approach is detailed further in **Chapter 6**: **EIA Methodology**.

17.4.1.1 Sensitivity

10. For the purpose of this assessment, both physical receptors and human activities are considered to have potential to be impacted by the development.

11. The sensitivity of human activities to impacts associated with the development involves consideration of the value (or importance) of the receptor or activity and the ability of the receptor or activity to accommodate the predicted change. The criteria for defining the sensitivity of a potential impact to infrastructure and other marine users is shown in **Table 17.2.**

Table 17.2 Definitions of Sensitivity Levels

Sensitivity	Definition
High	Activity / receptor is of strategic national importance (e.g. infrastructure or assets / developments) and has no or very limited capacity to accommodate the predicted change or interaction.
Medium	Activity / receptor is of regional importance (e.g. infrastructure or assets / developments) and has limited capacity to accommodate the predicted change or interaction
Low	Activity / receptor is of local importance (e.g. infrastructure or assets / developments) and has capacity to accommodate the predicted change or interaction.
Negligible	Activity / receptor is not considered to be any importance and is capable of accommodating the predicted change or interaction.

17.4.1.2 Magnitude of Impact

12. The criteria for defining the magnitude of impactimpact to infrastructure and other marine users is shown in **Table 17.3**.

Table 17.3 - Definitions of Magnitude levels

Magnitude	Definition
High	Fundamental, permanent / irreversible changes, over the whole receptor, and / or fundamental alteration to key characteristics, function or features of the particular receptor
Medium	Considerable, permanent / irreversible changes, over the majority of the receptor, and / or discernible alteration to key characteristics, functions or features of the particular receptor
Low	Discernible, temporary (throughout project duration) change, over a minority of the receptor, and / or limited but discernible alteration to key characteristics, functions or features of the particular receptors
Negligible	Discernible, temporary (for part of the project duration) change, or barely discernible change for any length of time, over a small area of the receptor, and/or slight alteration to key characteristics, functions or features of the particular receptor.

17.4.1.3 Impact Significance

13. The combination of both the sensitivity and magnitude levels will provide the criteria for defining the significance of the potential effect to infrastructure and other marine users as shown in **Table 17.4**.

For the purposes of this assessment, any effects with a significance level of Minor or less has been concluded to be Not Significant.

Table 17.4 - Effect Significance Matrix

		Negative Magnitude				Beneficial Magnitude			
		High	Medium	Low	Negligible	Negligible	Low	Medium	High
Sensitivity	High	Major	Major	Moderate	Minor	Minor	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Minor	Minor	Minor	Moderate	Major
	Low	Moderate	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

14. **Table 17.5** presents the definition of each effect significance category to be assigned to each potential impact.

Table 17.5 – Effect Significance Definitions

Effect Significance	Definition
Major	Very large or large change in receptor condition or very large or large disturbance to an activity, both adverse or beneficial, which are likely to be important considerations at a regional or district level because they contribute to achieving national, regional or local objectives, or, could result in exceedance of statutory objectives and / or breaches of legislation.
Moderate	Intermediate change in receptor condition or intermediate disturbance to an activity, which are likely to be important considerations at a local level.
Minor	Small change in receptor condition or small disturbance to an activity, which may be raised as local issues but are unlikely to be important in the decision making process.
Negligible	No discernible change in receptor condition or disturbance to activity.
No impact	No impact, therefore no change in receptor condition or activity.

17.4.2 Cumulative Impact Assessment (CIA)

15. Cumulative impacts are assessed through consideration of the extent of influence of changes or effects upon infrastructure and other users within the Study Area arising from the Project alone and cumulatively with other projects.

16. Several other projects have been identified on the east coast of Scotland, including other offshore wind farm developments, oil and gas developments, spoil disposal at licensed offshore sites, cable and pipeline projects, offshore cables and other marine works such as harbour expansions, sea outfall construction and sea wall works.

17. However, most of these can be screened out from cumulative impacts due to: (i) their distance from the Project; (ii) the timing of construction of other projects unlikely to overlap with timing of construction of the Project; (iii) embedded mitigation measures between infrastructure operators, and no significant effects arising during the operational phase.

18. Notwithstanding this, a small number of projects cannot be screened out from cumulative impacts and have therefore been considered within the cumulative impact assessment (CIA). Cumulative impacts associated with vessel traffic are assessed in **Chapter 14: Shipping and Navigation** and recreational marine users in **Chapter 19: Socioeconomics, Tourism and Recreation**.

17.4.3 Transboundary Impact Assessment

19. Transboundary impacts are relevant where the extent of influence of change or effects to other infrastructure and marine users extend to areas that are located within neighbouring international waters, in this case notably nearby European Union (EU) member states.

20. Impacts relating to transboundary infrastructure (in this case inter-country cables) have been considered within the main assessment (**Section 17.8**).

17.5 Scope

17.5.1 Study Area

21. Those activities associated with the infrastructure and other marine users that have the potential to overlap, influence or be influenced by the Project's Offshore Development Area have been identified. The Study Area is the area of North Sea located off the Aberdeenshire coast and is consistent for all receptors analysed as part of this chapter. **Figure 5.1** shows the Project's Offshore Development Area and the Study Area.

17.5.2 Data Sources

22. The data sources that have been used to identify the potentially affected infrastructure and other marine users are provided in **Table 17.6**.

Table 17.6 - Data Sources

Data Set	Source
Offshore Wind	Crown Estate Scotland https://www.crownestatescotland.com/resources/documents
Oil and Gas Activity	NSTA https://www.nstauthority.co.uk/data-centre/interactive-maps-and-tools
Carbon Capture Storage	Crown Estate Scotland https://www.crownestatescotland.com/resources/documents North Sea Transition Authority https://www.nstauthority.co.uk/data-centre/interactive-maps-and-tools
Marine Disposal Sites	Centre for Environment, Fisheries and Aquaculture Science (CEFAS) https://data.cefas.co.uk/view/407
Submarine cables	Kingfisher Information Service – Offshore Renewable Cable (KIS-ORCA): Marine cables digital data - Homepage | KIS-ORCA Other marine infrastructure developers or operators' websites and documentation, including (but not limited to NorthConnect, Hywind, Eastern Green Link 2).
Pipelines	NSTA https://www.nstauthority.co.uk/data-centre/interactive-maps-and-tools
MoD PEXA areas	UK Hydrographic Office https://data.admiralty.co.uk/portal/apps/sites/#/marine-data-portal
Munition Dumping Grounds	EMODnet https://www.emodnet-humanactivities.eu/search-results.php?dataname=Dumped+Munitions+%28Points%29 OSPAR https://odims.ospar.org/en/submissions/ospar_encounters_2019_01/

Data Set	Source
INTOG Areas of Search	Marine Scotland, National Marine Planning Interactive (NMPi): including spatial data on dredging and disposal sites, marine aggregates, aquaculture, and recreational uses (NMPi, 2021a)

17.5.3 Assumptions and Limitations

23. Characterisation of the existing environment and the resulting impact assessment is based on stakeholder consultation, publicly available information, purchased data or information gained directly from relevant companies/organisations. There may be elements of uncertainty associated with the locations of some existing infrastructure and this will be discussed with the owners/occupiers during negotiations and/or will be established during pre-construction surveys where necessary.

17.6 Existing Environment

24. This section of the chapter outlines the existing environment in relation to the infrastructure and other marine users. This includes the Offshore Development Area which incorporates the Project's Windfarm Site, Buzzard Export Cable Corridor and Landfall Export Cable Corridor (with both potential landfall options). The Buzzard oil and gas Platform Complex (Buzzard) is located 20 kilometres (km) to the west of the Project's Windfarm Site and will benefit from the renewable power generated by the Project. Further information is provided in **Chapter 5: Project Description**. **Figure 5.1** provides an overview of the Project's Windfarm Site and Offshore Export Cable Corridors.

25. Some topics have been scoped out of further assessment, as a result of not being identified within the Study Area or within the scoping responses for not being relevant to this area. In addition to the onshore receptors associated with the Project that are covered in the **Onshore EIA Report**, the following offshore receptors have been scoped out of the **Offshore EIA Report:**

- Marine aggregate extraction sites;
- Subsea telecommunication cables.

26. Further to the **Scoping Opinion** received in April 2022 (**Appendix 1.1**), the Applicant has undertaken consultation with Storegga to confirm no overlap between the Project and the Acorn Project (CCS), and communication between both parties will be ongoing throughout Project development.

27. The following receptors have been scoped into the offshore assessment of infrastructure and other marine users:

- Offshore wind farms;
- Oil and gas operations (including exploration and decommissioning activities);
- Marine disposal sites; and
- Cables and pipelines.

17.6.1 Offshore Wind Farms

28. UK waters, in particular the North Sea, are a focus of significant offshore wind development activity. There are a number of offshore wind projects which are both operational and in early stage of developments which are situated off the Aberdeenshire coast. There are no existing offshore wind projects that are present within the Offshore Development Area.

29. The nearest operational wind farm to the Project is the Hywind Scotland Pilot Park. Hywind is a 30 Megawatt (MW) floating offshore wind farm which was developed by Equinor in 2017 (Equinor, 2017).

The Hywind array is located 54 km southwest of the Windfarm Site and 12.7 km south of the NorthConnect Parallel Export Cable Corridor. The array is 22 km off Peterhead. The export cables for the Hywind project make landfall at Peterhead between the Project's two landfall options, at a distance of approximately 1 km south of the St Fergus South Landfall option and 5 km north of the NorthConnect Parallel Landfall option.

30. The second nearest operational offshore wind farm to the Project is the Aberdeen Bay Windfarm, located 3 km off the east coast of Aberdeen, Scotland. Aberdeen Bay Windfarm is a 97 MW fixed offshore wind farm which was developed by Vattenfall in 2018. Aberdeen Bay is located 100 km southwest of the Project's Windfarm Site and 24 km south of the NorthConnect Parallel Export Cable Corridor. The export cables for the Aberdeen Bay Windfarm make landfall to the north of Aberdeen, at Blackdog Beach (Vattenfall, 2018),38 km south of the St Fergus South Export Cable Corridor and 30 km south of the NorthConnect Parallel Export Cable Corridor.

31. **Chapter 3: Policy and Legislative Content** of this **Offshore EIA Report** details the legislative and policy drivers behind Scotland's strategy to reduce CO_2 emissions, including the key role offshore wind will play in decarbonisation and Scotland's net zero commitment.

32. The Scottish and UK Governments are committed the development of floating offshore wind farms as a method of reducing the greenhouse gas emissions. In October 2020, the Scottish Government published the Sectoral Marine Plan for Offshore Wind Energy (SMP-OWE) which has facilitated the ScotWind leasing round, managed by Crown Estate Scotland (CES). In January 2022, the ScotWind leasing round announced the successful developer application bids for seabed development areas which made available areas of the Scottish seabed for the development of new offshore wind projects, with a particular focus in the Scottish North Sea.

33. The SMP-OWE further identified the need to allow more targeted projects to progress with the specific focus of seeking to electrify oil and gas infrastructure. As discussed within Marine Scotland's Initial Plan Framework for INTOG Decarbonisation, Areas of Search have been defined as areas where potential constraints with other marine users are considered to be low, including avoiding areas where existing offshore infrastructure (including offshore wind and leases) are in place (also managed by CES). The Project is being developed as part of the INTOG leasing round and is bidding for the INTOG leasing zone 'E-b', which is adjacent to Buzzard.

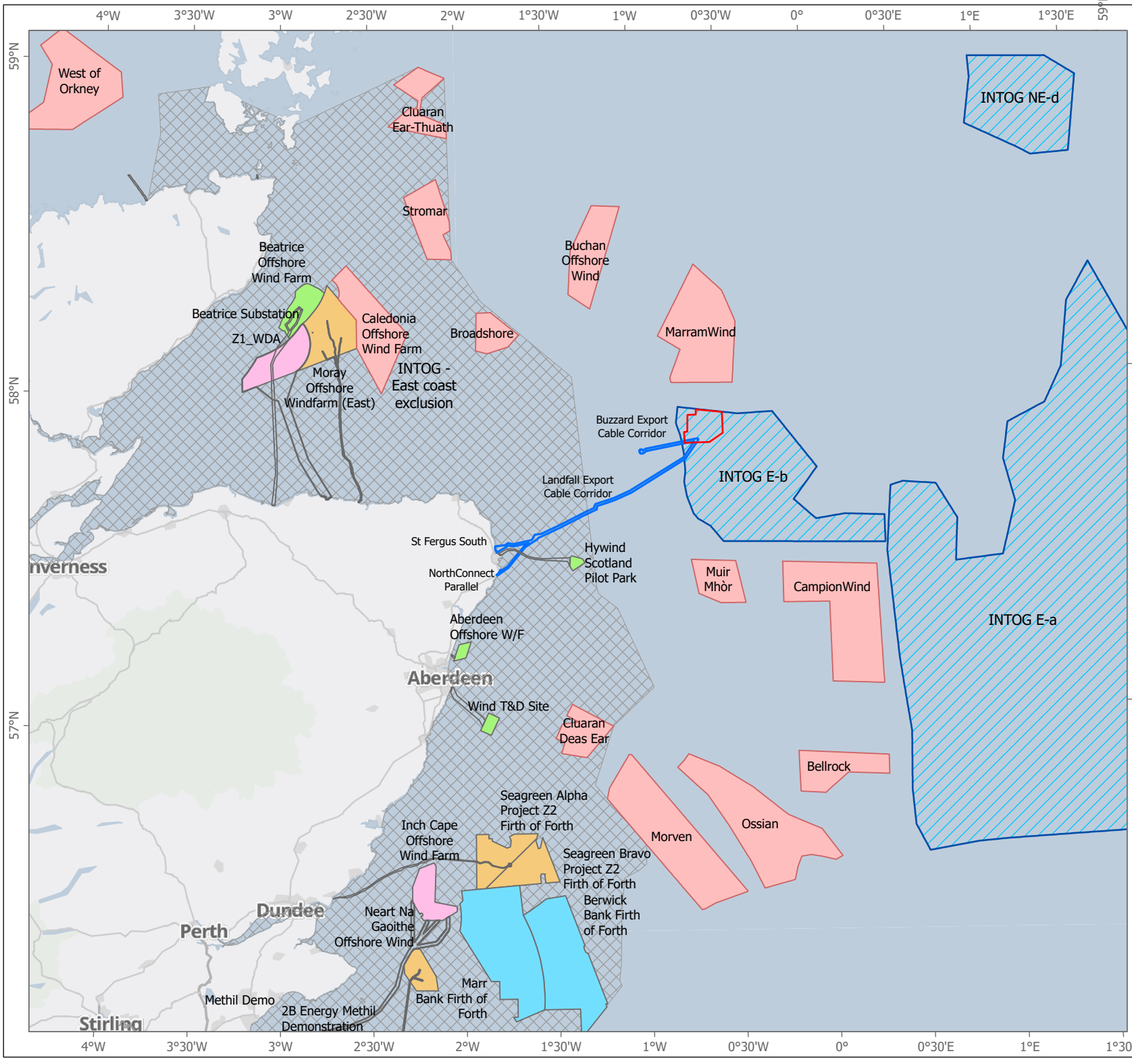
34. **Table 17.7** provides further information on the offshore wind farms present within the Study Area, and other leasing rounds which are planned. **Figure 17.1** provides an overview of the offshore wind projects located around the Project.

Table 17.7 Offshore Wind farms and INTOG leasing areas within 200 km of the Project and their closest approximate distance from the Project

Offshore Windfarm	Status	Development Phase	Developer/Owner	Generating Capacity	Distance from the Project (km)	
					Windfarm Site	Export Cables
Salamander Floating Offshore Windfarm	Pre-Construction	Pre-Application	Simply Blue Energy	Up to 200 MW	35	10
Hywind Scotland Pilot Park	Operational	Complete	Equinor	30 MW	54	0 (crossed by Landfall Export Cable Corridor)
Aberdeen Offshore Windfarm	Operational	Complete	Vattenfall	92.4 MW	100	24

Offshore Windfarm	Status	Development Phase	Developer/Owner	Generating Capacity	Distance from the Project (km)	
					Windfarm Site	Export Cables
Kincardine Offshore Windfarm	Operational	Complete	Kincardine Offshore Windfarm Ltd. (KOWL)	49.5 MW	110	40
Moray East Offshore Windfarm	Operational	Complete	Moray Offshore Windfarm (East) Ltd	950 MW	112	50
Moray West Offshore Windfarm	Pre-Construction	Consented	Moray Offshore Windfarm (West) Ltd	900 MW	127	75
Beatrice Offshore Windfarm	Operational	Complete	Beatrice Offshore Windfarm Ltd (SSE Renewables, Red Rock Power Limited, TRIG and Equitix)	588 MW	140	75
SeaGreen Offshore Windfarm	Under construction	Consented	TotalEnergies & SSE Renewables	Up to 5.6 GW	140	86
Inch Cape Offshore Windfarm	Pre-Construction	Consented	Inch Cape Offshore Limited (Red Rock Power Limited / ESB)	1 GW	163	99
Neart na Gaoithe Offshore Windfarm	Under construction	Consented	EDF Renewables / ESB	450 MW	191	127
MarramWind Floating Offshore Windfarm	Pre-Construction	Pre-Application	Scottish Power/Shell	Up to 3 GW	9	20
Buchan Offshore Windfarm	Pre-Construction	Pre-Application	BayWa r.e./Elicio/ BW ideol	Approximately 1 GW	49	58
Cleuaran Deas Ear Offshore Windfarm	Pre-Construction	Pre-Application	DEME Concessions, Qair Marine and Aspiravi International	Up to 1 GW	95	41
Broadshore Floating Offshore Windfarm	Pre-Construction	Pre-Application	Falck Renewables/ BlueFloat Energy	Not Publicly Available	42	38
Muir Mhòr Floating Offshore Windfarm	Pre-Construction	Pre-Application	Vattenfall/Fred. Olsen Seawind	Up to 798 MW	39	33
Campion Wind Floating	Pre-Construction	Pre-Application	Scottish Power/Shell	Up to 2 GW	59	61

Offshore Windfarm	Status	Development Phase	Developer/Owner	Generating Capacity	Distance from the Project (km)	
					Windfarm Site	Export Cables
Offshore Windfarm						
Morven Offshore Wind	Pre-Construction	Pre-Application	BP and EnBW	Up to 2.9 GW	105	74
Ossian Floating Offshore Windfarm	Pre-Construction	Pre-Application	Marubeni, SSE Renewables and CIP	Up to 2.6 GW	101	78
Stromar Floating Offshore Windfarm	Pre-Construction	Pre-Application	Falck Renewables/ BlueFloat Energy / Ørsted	Up to 3 GW	99	96
Caledonia Offshore Windfarm	Pre-Construction	Pre-Application	Ocean Winds (EDP Renewables & ENGIE)	Up to 1 GW	96	63
INTOG (E-a)	Pre-Construction	Pre-Application	Unknown	Unknown	61	69
INTOG (E-b)	Pre-Construction	Pre-Application	Unknown	Unknown	Within	Within
INTOG (NE-d)	Pre-Construction	Pre-Application	Unknown	Unknown	124	139



LEGEND

- Windfarm Site
- Offshore Export Cable Corridor
- ScotWind Offers
- Export Cable Routes
- Area where no projects will be considered
- Area where projects targeting oil and gas decarbonisation will be considered

Existing Offshore Windfarms

- Consent Authorised
- Fully Commissioned
- Under Construction
- In Planning

0 20
Kilometres

PROJECT: GREEN VOLT

TITLE: Figure 17.1 Windfarms in Proximity to Green Volt Offshore Wind Farm

VER	DATE	COMMENTS	DRAWN	CHECKED
001	13/01/2023		GC	CM

ARCGIS REF: PC2483_RHD_EIA_Offshore_Chpt_InfraMarineUsers
LAYOUT: PC2483-RHD-EI-OF-D-GS-0014

SCALE:	PAGE SIZE:	COORDINATE SYSTEM:
1:1,700,000	A4	WGS 1984 UTM Zone 30N

GREEN VOLT
Royal HaskoningDHV
Enhancing Society Together

17.6.2 Oil and Gas Operations

35. The Windfarm Site is situated within an area of the Outer Moray Firth in the North Sea which supports significant oil and gas production and extraction facilities. This oil and gas infrastructure comprises platforms, wells, sub-surface infrastructure and has been developed within licensed blocks managed by NSTA. There are currently blocks on offer through the 33rd Licencing Round (NSTA 2022b) and the Project will engage with potential operators should any licences close to the Project be assigned.

36. A combination of both operational and decommissioned oil and gas infrastructure is present within the Study Area. To enable the servicing and operations of these oil and gas activities, the operators utilise vessel and helicopter transportation to transit equipment and personnel from these facilities. These operations are assessed in further detail in **Chapter 14: Shipping and Navigation** and **Chapter 16: Aviation and Radar**.

37. The Windfarm Site is located on the former Ettrick and Blackbird fields, a marine brownfield site which is currently being decommissioned by China National Offshore Oil Corporation (CNOOC), located in blocks 20/2a and 20/3a of the United Kingdom Continental Shelf (UKCS) in the Outer Moray Firth (**Figure 17.2**). Both fields were predominantly oil reservoirs, produced via subsea wells to a Floating Production Storage and Offloading (FPSO) vessel. At the end of their production life, no viable alternative to decommissioning was identified. Production ceased in June 2016 and decommissioning of the fields is currently being finalised. The overall scope was to disconnect and remove the FPSO vessel, and the associated works at the subsea Xmas Trees and Gas Export Pipeline Ending Manifold.

38. Currently the oil and gas pipelines (commonly referred to as "flowlines") are still present. All buried flowlines will be left in-situ, with the ends cut and the seabed sections recovered to surface. The severed ends will be buried as per recommendations of the Comparative Assessment (CNOOC, 2017). Surveys will be carried out to confirm the as-left condition of the flowlines do not present a risk to other legitimate users of the sea. Remedial works (rock deposits) will be carried out on sections where survey data indicates a risk of exposure. Further information on the existing oil and gas infrastructure located in the Study Area is provided in **Chapter 1: Introduction** and **Chapter 5: Project Description** of this **Offshore EIA Report.**

39. The oil and gas infrastructure situated within the Windfarm Site comprises wells and sub-surface infrastructure associated with the decommissioned Ettrick and Blackbird oil and gas field. **Table 17.8** provides information on the existing oil and gas wells within the Windfarm Site.

40. As confirmed through discussions with NSTA and legal counsel, there is no agreed legal or regulator position regarding the need to apply defined exclusion zones between decommissioned oil and gas assets and newly installed wind farm assets. It is likely this stems from the fact the principles applied to oil and gas decommissioning requirements places primacy on returning the seabed to its original state for future marine users.

41. It is also of note that considerable responsibility remains with the oil and gas operator after decommissioning with respect to any interaction with abandoned equipment left in-situ. Therefore, there should be provision to allow ongoing monitoring for potential for hazards to other users of the sea and to ensure there is recovery of the environment after decommissioning.

42. The array pattern and position applied will deliberately avoid placing turbines and substructures directly above pipelines and umbilicals remaining in-situ, and abandoned well-centres at the seabed. The final offsets applied will be determined by collaboration with the oil and gas operator via a structured risk assessment approach. Any crossings will be finalised with the input and agreement with the oil & gas (O&G) operator.

43. There are currently no plans for CNOOC to remove the drill arisings that are present across the site. Due to the nature of water-based mud drill arisings and their discharge being mostly within the water column rather than at the seabed it is more likely for the drill cuttings to become widely dispersed as a thin veneer rather than forming piles, particularly when drilling was undertaken from a mobile offshore drilling unit rather than a fixed platform drilling package. The Project infrastructure can be actively microsited to avoid obstacles on the seabed as necessary. The decommissioning plans for Ettrick and Blackbird have not yet been completed, however, once finalised these will be interrogated to inform the micrositing exercise and cross-check drill arisings locations and any contamination levels.

Table 17.8 Existing Oil and Gas well status within the Windfarm Site (North Sea Transition Authority, 2022a)

ID[1]	Owner	Well Status[2]
20/02- 2	CNOOC Limited	AB3
20/02-1	CNOOC Limited	AB3
20/03- 3	CNOOC Limited	AB3
20/02a-E9	CNOOC Limited	Completed - Shut in
20/02a-E1	CNOOC Limited	Completed - Shut in
20/02a-E6	CNOOC Limited	Completed - Shut in
20/02a-E5	CNOOC Limited	AB1
20/02a-E4	CNOOC Limited	Completed - Shut in
20/02a-E3Z	CNOOC Limited	Completed - Shut in
20/02a-E3	CNOOC Limited	AB1
20/02a-E2	CNOOC Limited	AB1
20/02a-E2z	CNOOC Limited	Completed - Shut in
20/02a-E7Z	CNOOC Limited	Completed - Shut in
20/02a-E7	CNOOC Limited	AB1
20/02a-E8	CNOOC Limited	Completed - Shut in
20/02- 3	CNOOC Limited	AB3
20/02- 7	CNOOC Limited	AB3
20/02- 7Z	CNOOC Limited	AB3
20/03- 5	CNOOC Limited	AB3
20/02- 4	CNOOC Limited	AB3
20/02a-B2	CNOOC Limited	AB3
20/02a-B2A	CNOOC Limited	AB3
20/02a- 9	CNOOC Limited	AB3
20/02a- B3	CNOOC Limited	AB3
20/02a- 8	CNOOC Limited	AB3

[1] This ID references the associated Oil and Gas Authority designated licencing block that the 'well' is located within.
[2] AB1: The reservoir has been permanently isolated. The wellbore below the barrier is no longer accessible
AB2: All intermediate zones with flow potential have been permanently isolated. The wellbore below the barrier is no longer accessible
AB3: A fully abandoned well meaning the well origin at the surface has been removed and the well origin will never be used again.
Completed (Shut-in): A completed wellbore that is shut in either at the tree valves or subsurface safety valve. Normally this status will be only be applied if the wellbore is intended to be shut in for 90 days or more.

44. **Table 17.9** provides further information on the existing oil and gas sub-surface infrastructure associated with Ettrick and Blackbird identified within the Windfarm Site, the majority of which have been removed. Cables and pipelines are discussed in **Section 17.6.4**.

Table 17.9 - Existing Oil and Gas Sub Surface Infrastructure within the Windfarm Site (North Sea Transition Authority, 2022a)

Sub Surface Infrastructure Description	Number	Owner	Sub Surface Infrastructure Status
FPSO	1	CNOOC Limited	Removed
Anchor Pile	9	CNOOC Limited	Abandoned
Valve	1	CNOOC Limited	Removed
Riser Base	4	CNOOC Limited	Removed
Subsea Buoy	1	CNOOC Limited	Removed
Pig Launch/Trap	1	CNOOC Limited	Removed
Manifold	2	CNOOC Limited	Removed
Wellhead	1	CNOOC Limited	Removed

45. Whilst Outer Moray Firth platforms will have the potential to use the Project's electricity, a key target for the project is the electrification of Buzzard. Buzzard is a large, relatively new facility with high power demand, and the closest oil and gas infrastructure to the Windfarm Site.

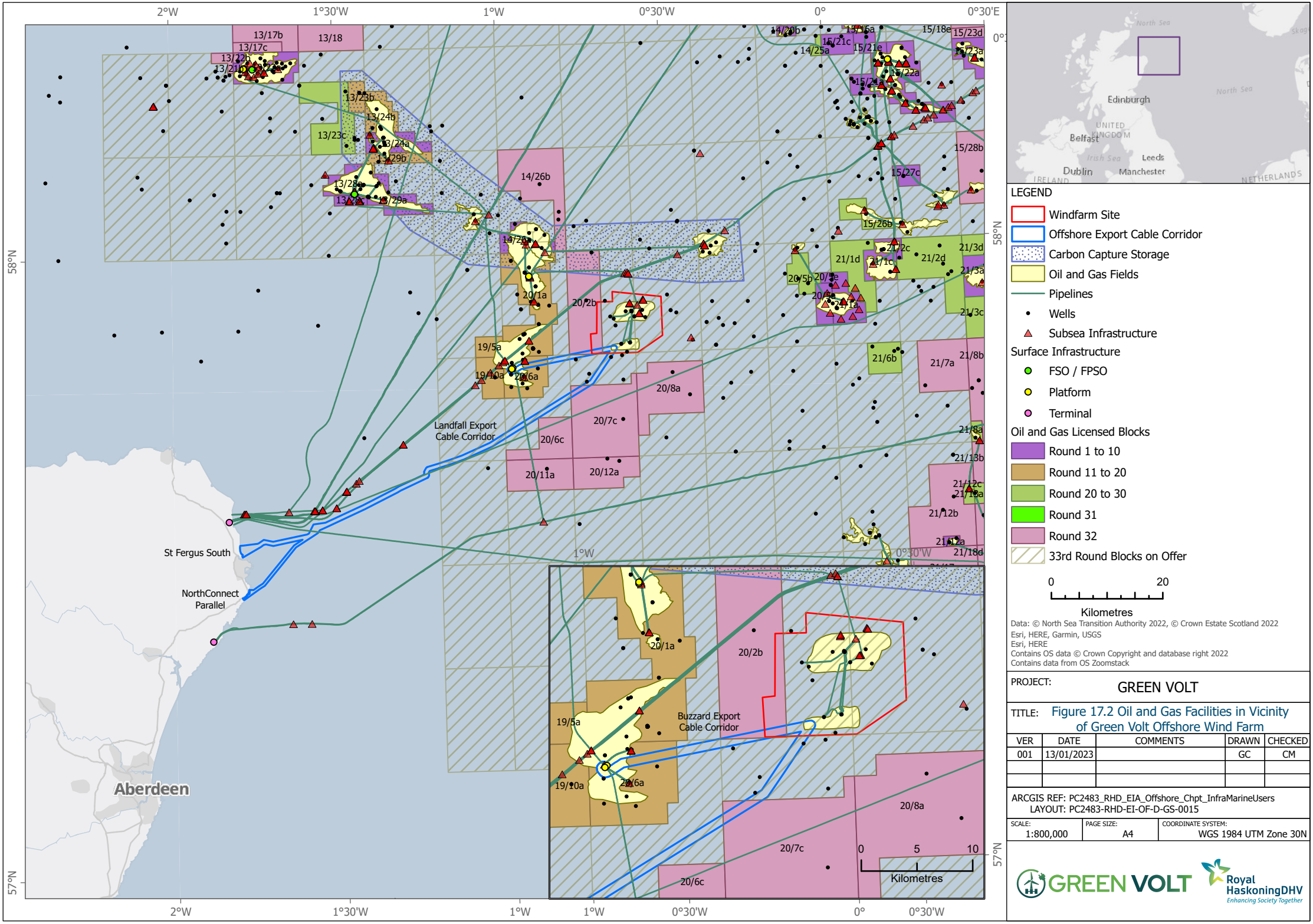
46. **Table 17.10** provides further information on the oil and gas platforms located within the Buzzard oil field and **Table 17.11** provides detail on those within the Study Area. **Figure 17.2** provides an overview of the existing oil and gas operations in the vicinity of the Project.

Table 17.10 - Oil and Gas Assets within the Buzzard Oil Field (North Sea Transition Authority, 2022a)

Block Number	Licence Number	Asset	Operator	Distance from the Project (km)	
				Windfarm Site	Buzzard Export Cable
20/6a	P986	Wellhead	CNOOC Petroleum Europe	14	0
20/6a	P986	Quarters Utilities Jacket	CNOOC Petroleum Europe	14	0
20/6a	P986	Production Jacket (terminus of Buzzard Export Cable Route)	CNOOC Petroleum Europe	14	0

Table 17.11 Oil and Gas Platforms within the wider Study Area (North Sea Transition Authority, 2022a)

Wider Study Area							
Block Number	Licence Number	Platform Name	Operator	Production Start Date	Production Finish Date	Distance from the Project (km)	
						Windfarm Site	Buzzard Export Cable
14/29b	P2345	Golden Eye (topsides and jacket removed)	Shell UK Ltd	2004	February 2011	11	24
20/1a	P928	Golden Eagle Wellhead Platform	Shell UK Ltd	March 2011	March 2011	13	19
20/1a	P928	Golden Eagle Process, Utilities and Quarters Platform	Shell UK Ltd	March 2011	March 2011	13	19



LEGEND

- Windfarm Site
- Offshore Export Cable Corridor
- Carbon Capture Storage
- Oil and Gas Fields
- Pipelines
- Wells
- Subsea Infrastructure

Surface Infrastructure

- FSO / FPSO
- Platform
- Terminal

Oil and Gas Licensed Blocks

- Round 1 to 10
- Round 11 to 20
- Round 20 to 30
- Round 31
- Round 32
- 33rd Round Blocks on Offer

0 20

Kilometres

PROJECT: GREEN VOLT

TITLE: Figure 17.2 Oil and Gas Facilities in Vicinity of Green Volt Offshore Wind Farm

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47. Oil and gas operations within UK territorial waters are managed through the awarding of licence blocks that enable operators to explore and develop designated areas of seabed, predominantly in the North Sea. These licences are distributed through the Petroleum Act 1998, which is overseen by the NSTA. Oil and gas operators have the opportunity to bid in licensing rounds which are managed by the NSTA.

48. The western edge of the Windfarm Site overlaps licence block 20/2b from Round 32 by 12.0 km^2 **(Figure 17.2**). The seaward production licence for this block is held by Finder Energy UK Ltd, which has been contacted by the Applicant as part of the PAC process. There are no development activities anticipated during this phase of the licence. The Windfarm Site also wholly overlaps with Round 33 blocks currently on offer (which themselves encompass a large region of the North Sea and Outer Moray Firth). In addition, the Buzzard Export Cable Corridor overlaps licence block 20/2b by 3.04 km^2 and licence block 20/6a by 6.36 km^2 on approach into the Buzzard Platform Complex. The Landfall Export Cable Corridor passes through the northwest corner of licence block 20/7c, overlapping by 2.59 km^2. There are also number of licence blocks identified within the wider Study Area. BCAs will be put in place prior to construction and are discussed in **Section 17.7.1**.

49. **Table 17.12** provides further information on the oil and gas licenced blocks located within the Buzzard field and that are present within the Study Area of this assessment. **Figure 17.2** shows the existing oil and gas licenced blocks within the Study Area.

Table 17.12 - Oil and Gas Licence Blocks within Study Area

Licence Block Number	Licence Reference	Licence Holder	Licence Block Start Date	Licence Block Finish Date	Distance from the Project (km)	
					Windfarm Site	Export Cable
Buzzard Oil and Gas Field						
19/10a	P986	CNOOC Petroleum Europe Limited	23/12/1998	23/12/2034	15.9	1.15
20/6a	P986	CNOOC Petroleum Europe Limited	23/12/1998	23/12/2034	8.2	0
19/5a	P928	CNOOC Petroleum Europe Limited	25/07/1995	25/07/2031	15.5	2.38
20/1a	P928	CNOOC Petroleum Europe Limited	25/07/1995	25/07/2031	6	0.66
Wider Study Area						
14/27b	P2481	Ithaca Energy (UK) Limited	15/07/2019	15/07/2045	17.1	26.5
14/26d	P2359	Tangram Energy Ltd	01/10/2018	01/10/2045	13.7	21.4
14/26a	P300	CNOOC Petroleum Europe Limited	27/07/1979	Information not available	12.4	20
20/4c	P2497	Jersey Petroleum Ltd	30/08/2019	30/08/2045	7	15.7
14/29b	P2345	Ithaca Energy (UK) Limited	01/10/2018	01/10/2045	10.1	23
14/29a	P2363	Encounter Oil Ltd	01/10/2018	01/10/2044	23.6	36.9
14/28	P2345	Ithaca Energy (UK) Limited	01/10/2018	01/10/2045	7.55	17.7
20/7c	P2528	Finder Energy UK Ltd. (60%) Dana Petroleum (E&P) Ltd.(40%)	01/12/2020	30/11/2048	3.7	0 (within)
20/6c	P2528	Finder Energy UK Ltd. (60%) Dana Petroleum (E&P) Ltd.(40%)	01/12/2020	30/11/2048	12.0	0.4

Licence Block Number	Licence Reference	Licence Holder	Licence Block Start Date	Licence Block Finish Date	Distance from the Project (km)	
					Windfarm Site	Export Cable
20/8a	P2528	Finder Energy UK Ltd. (60%) Dana Petroleum (E&P) Ltd.(40%)	01/12/2020	30/11/2048	2.5	6.4
20/11a	P2528	Finder Energy UK Ltd. (60%) Dana Petroleum (E&P) Ltd.(40%)	01/12/2020	30/11/2048	19.0	4.0
20/12a	P2528	Finder Energy UK Ltd. (60%) Dana Petroleum (E&P) Ltd.(40%)	01/12/2020	30/11/2048	18.6	9.9
20/2b	P2527	Finder Energy UK Ltd. (60%) Dana Petroleum (E&P) Ltd.(40%)	01/12/2020	30/11/2048	0 (within)	0 (within)
14/26b	P2571	Tangram Energy Ltd, Ithaca Energy (UK) Limited	01/12/2020	30/11/2048	10.6	18.7

50. There are no existing oil and gas platforms present in either offshore export cable corridor or Landfall options, and no exclusion zones will be in place at the time the Project is constructed. The final offsets from historic oil and gas asset locations applied will be determined by collaboration with the oil and gas operator via a structured risk assessment approach. Any pipelines or cables associated with oil and gas operations are addressed in **Section 17.6.4.3**.

17.6.3 Marine Disposal Sites

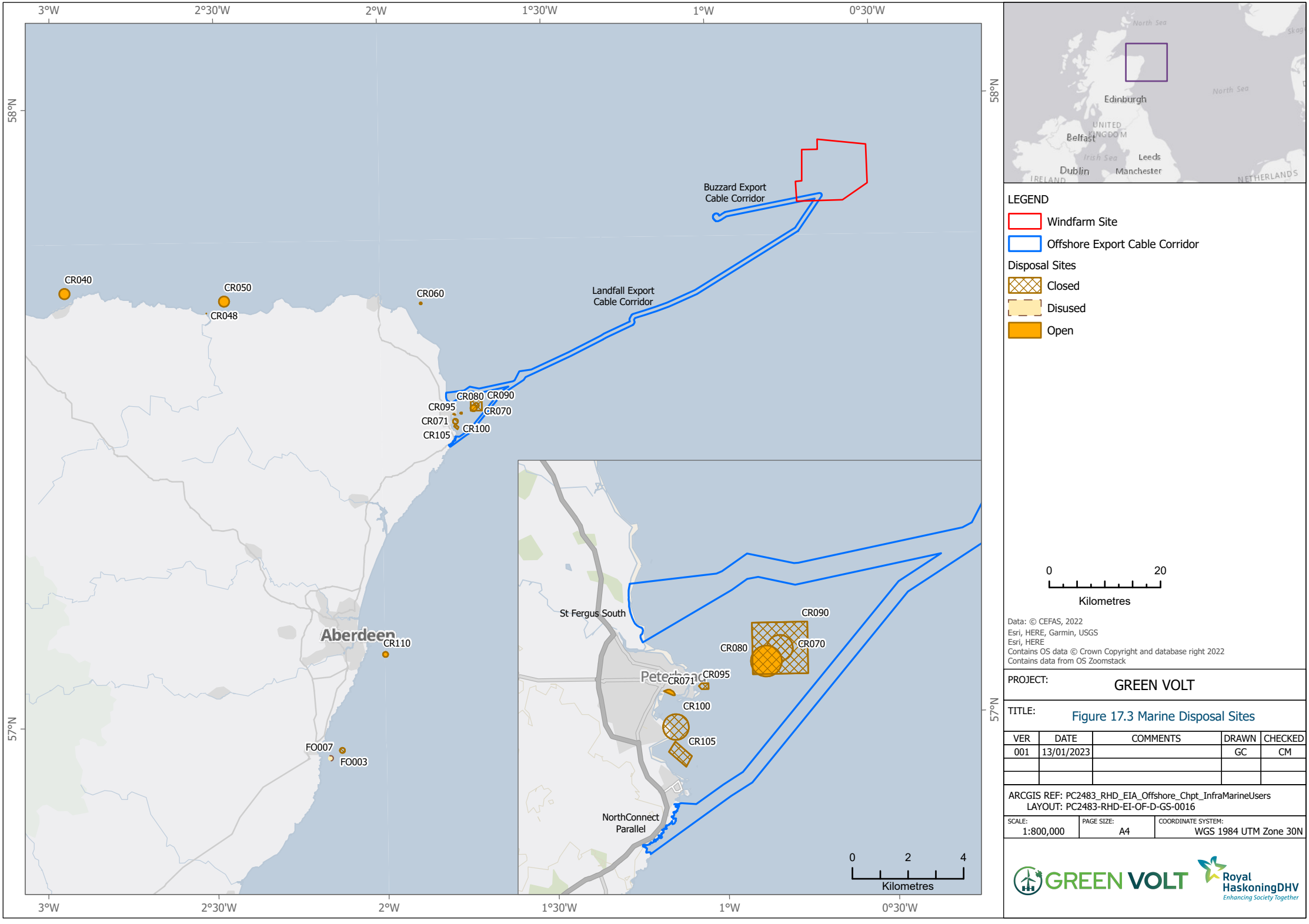
51. There are two open marine disposal sites within the Study Area located between the two landfall options, namely Peterhead (CR071) and North Buchan Ness (CR080). Peterhead (CR071) is located 2.12 km to the south of the St Fergus South Export Cable Corridor and 4.23 km to the north of the NorthConnect Parallel Export Cable Corridor. North Buchan Ness (CR080) is located 2.4 km to the south of the St Fergus South Export Cable Corridor and 1.17 km to the north of the NorthConnect Parallel Export Cable Corridor. Both these identified sites are used for the depositing of dredged spoil material, including dredged harbour material from Peterhead and / or Boddam Harbour.

52. There are two closed marine disposal sites that are situated within and overlapping the NorthConnect Parallel Export Cable Corridor, namely the South Buchan Ness B (CR105) disposal site and the South Buchan Ness (CR100).

53. There are three closed marine disposal sites which are situated between the St Fergus South and NorthConnect Parallel Export Cable Corridors. The closed marine disposal sites are Middle Buchan Ness (CR090), Middle Buchan Ness B (CR095) and disused marine disposal site Peterhead (CR070).

54. There are no marine disposal sites situated within the Study Area that are in close proximity to the Windfarm Site or Buzzard Export Cable Corridor.

55. Further information is provided in **Chapter 14: Shipping and Navigation** of this **Offshore EIA Report** to outline the potential impact of the Project's contracted vessels on the vessel operations associated with these existing marine disposal sites. **Figure 17.3** provides an overview of the existing marine disposal sites located within the Study Area.



PROJECT: GREEN VOLT

TITLE: Figure 17.3 Marine Disposal Sites

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17.6.4 Cables and Pipelines

17.6.4.1 Telecommunications

56. Both landfall options require crossing the out of use Peterhead to Egersund (Norway) telecommunication cable by both of the Landfall Export Cables. The Peterhead-Egersund is a very old cable, installed in 1868 and is now defunct.

57. There are no active telecommunication cables located within the Windfarm Site or Offshore Export Cable Corridors. The nearest telecommunication cable to the Landfall Export Cable Corridor is the Central North Sea Fibre Optic Cable, operated by BP. This cable is located to the south of the NorthConnect Parallel Export Cable Corridor, 6.12 km at its closest distance, connecting the land terminal at Cruden Bay to the Forties Charlie Platform, North Everest Platform and Ula Platform.

58. **Figure 17.4** provides an overview of the existing telecommunication cables located within the Study Area.

17.6.4.2 Electricity Cables

59. The North Sea is crossed by several cables which provide electrical supply between the UK and offshore oil and gas facilities and offshore wind projects. Additionally, interconnector cables provide electrical supply between the UK and European countries including Denmark and the Netherlands. An increasing amount of European interconnector projects are scheduled for development in the coming years. Potential impacts with proposed projects are considered in the Cumulative Impact Assessment in **Section 17.8**.

60. There are currently three electrical cables located within the southern extent of the Windfarm Site – two control umbilicals (PLU2447J12 and PLU2920) and one static umbilical to the Blackbird manifold (PLU2802). All three are recorded as not in use. All three will be crossed by inter-array cables:

- PLU2447J1 is crossed twice (treated as a single crossing with pipeline PL2446J12 as the cable and pipe have a separation distance of 20 m)
- PLU2802 is crossed once; and
- PLU2920 where there are two cables crossings in parallel, treated as two single crossings.

61. In addition, five decommissioned Ettrick flowlines to the (former) riser base (with notable rock deposits) are located within the Windfarm Site. These are not planned to be crossed by the Project's inter-array cables.

62. One operational control umbilical electrical cable, between Buzzard and Southern water injection (WI) Manifold (PLU2077), is present within the Buzzard Export Cable Corridor and will be crossed by both of the Buzzard Export Cables.

63. In addition to the Peterhead to Egersund telecommunication cable, there is one electrical cable crossing within the Landfall Export Cable Corridor. The Project's proposed NorthConnect Parallel Export Cable Corridor option (incorporating two Landfall Export Cables) will cross the existing offshore export cable for the operational Hywind Scotland Pilot Park, owned by Equinor. The export cable for Hywind has a landfall location at Peterhead, a distance of 0.74 km south of the St Fergus South landfall and 4.97 km north of the NorthConnect Parallel Landfall (**Figure 17.4**). The seabed at the crossing location is noted to be flat, consisting of gravelly sand and numerous boulders (NorthConnect, 2017). The Applicant has contacted Equinor as part of the PAC process and further engagement will be undertaken to seek agreement as part of the embedded mitigation against this potential interference to confirm a proximity and crossing agreement prior to construction commencing.

64. A number of proposed (not constructed) cables are also present within the vicinity of the Landfall Export Cable Corridor. The NorthConnect interconnector is a consented cable which, if installed, would connect the power grids of Norway and the UK, enabling the transfer of electrical power up to 1400 MW. The NorthConnect project's proposed route would run adjacent to the south-eastern corner of the Windfarm Site. The NorthConnect project intends to utilise two high voltage direct current (HVDC) cables to connect two onshore converter stations, one in the UK and the other in Norway. The Landfall Export Cable Corridor is planned to run to the north of NorthConnect consented route with the southern landfall option (known as the NorthConnect Parallel cable route) making landfall adjacent to it. As the Project will use high voltage alternating current (HVAC) there will be no interaction or cumulative impact regarding the EMF of these two projects as AC and DC fields do not combine (**Appendix 9.2**). The Applicant are undertaking ongoing consultation with NorthConnect to ensure that potential impacts to both projects' cables are understood and mitigated for.

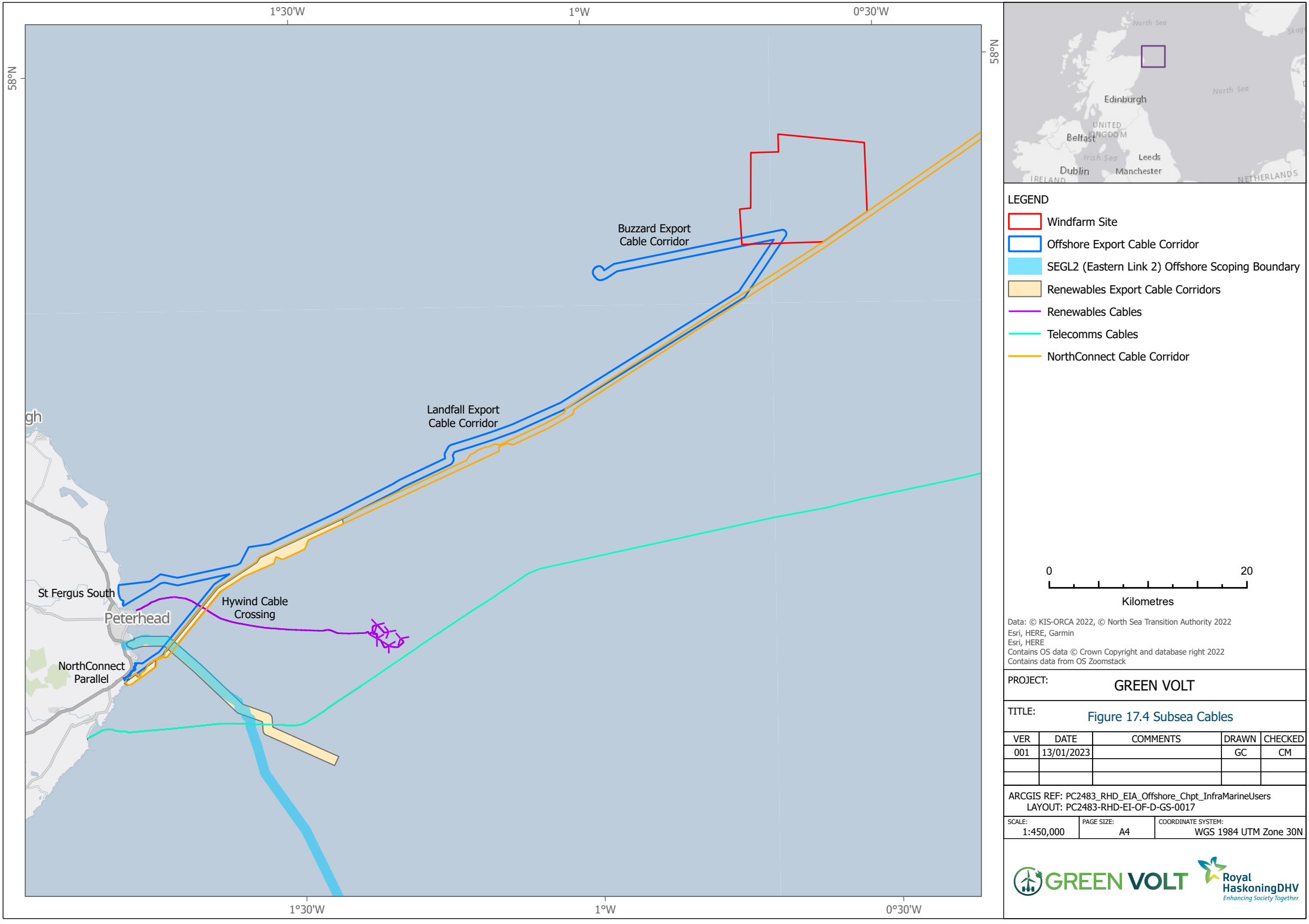
65. In addition, the proposed Eastern Green Link 2 HVDC Link project is proposing to install a sub-sea cable from Sandford Bay (Peterhead) to Drax (England) and, if installed, will cross the NorthConnect Parallel Export Cable Corridor. The Eastern Green Link 2 project is currently scheduled to start enabling works in 2025 with cable installation planned from 2026 / 2027 to be completed by 2029, and therefore construction activities may overlap with the Project, although current understanding is that Eastern Green Link 2 project will not be completed before the Project.

66. Further information is provided in **Chapter 5: Project Description** of this **Offshore EIA Report** to outline the approach to cable installation and describe the increase in construction vessels. **Figure 17.4** provides an overview of the existing electrical cables located within the Study Area.

67. **Table 17.13** provides further information on the electrical cables located across the Offshore Development Area.

Table 17.13 Summary of Telecommunication and Electricity Cables

Cable	Status	Overlap of Project area	Trajectory	Project's Interaction with Existing Cable
PLU2447J12 Control umbilical	Not in use	Windfarm Site	East west	Crossed twice (each location treated as single crossing with Cable PLU2246J12 in **Table 17.15** as the cable and pipe have a separation of 20m)
PLU2802 Static umbilical to Blackbird manifold	Not in use	Windfarm Site	North-south	Crossing
PLU2920 Control Umbilical (Well 20/02a-B2)	Not in use	Windfarm Site	East-west	Two cable crossings in Parallel (treated as two separate crossings)
PLU2077 Control Umbilical Buzzard Platform to Southern WI Manifold	Operational	Buzzard Export Cable Corridor	Northwest – southeast	Crossed by both Buzzard Export Cables
Peterhead – Egersund	Not in use	Landfall Offshore Export Cable Corridor	East -west	Crossed by both Landfall Export Cables
NorthConnect	Consented (not constructed)	Landfall Offshore Export Cable Corridor	Northeast – southwest	Consented but not constructed. Parallel (not crossed)
Hywind	Operational	NorthConnect Parallel Export Cable Corridor	East-west	Crossed by both Landfall Export Cables
Eastern Green Link 2	Pre-Consent (not constructed)	NorthConnect Parallel Export Cable Corridor	Northwest – southeast	Not consented and unlikely to be in place at time of Project cables installation



PROJECT: GREEN VOLT

TITLE: Figure 17.4 Subsea Cables

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17.6.4.3 Pipelines

68. The presence of the oil and gas industry within the North Sea requires infrastructure to connect offshore installations to onshore facilities. This offshore infrastructure consists of active and closed pipelines from existing or decommissioned oil and gas facilities. Decommissioned in-situ oil and gas pipelines located within the Windfarm Site from previous oil and gas operations remain on site as part of the Ettrick and Blackbird decommissioning works but have been flooded with sea water and are notably covered by rock deposits (Gardline, 2022). There are three planned pipeline crossings and two planned extended crossings within the Windfarm Site. These are:

- PLU2446J12 Control Umbilical (crossed twice, each crossing treated as a single crossing with cable PLU2447J1 due to a separation distance of 20m between pipe and cable);
- PL2919 WI pipeline (Well 20/02a-B2) (crossed once); and
- PL2799 7in Production pipeline from Blackbird manifold and PL2800 3in Gas lift pipeline to Blackbird manifold, each crossed twice as extended crossings (each classed as 1.5 crossings) to capture cable PLU2802 and both pipes at
    - a)100m separation distance; and
    - b) 180m separation distance.

69. The Ettrick export line and five decommissioned Ettrick flowlines are also present within the Windfarm Site but not anticipated to be crossed. Most of these existing pipelines have rock deposits on top of them.

70. The Buzzard Export Cable Corridor (incorporating two Buzzard Export Cables) from the Windfarm Site to Buzzard will cross two pipelines. These are:

- PL2076 Buzzard to southern WI Manifold pipeline (active); and

71. The PL2072 Buzzard to Captain Tee active gas pipeline is also within the Buzzard Export Cable Corridor but will not be crossed. The export cable terminus will be within the Buzzard field, the operator of which will coordinate the connection of the electricity cables to the oil and gas facility.

72. There are three operational oil and gas pipelines which cross the Landfall Export Cable Corridor (including landfall options) on approach to the Aberdeenshire coast. Firstly, the PL2074 ‘Buzzard to Forties Hot Tap’ is an oil pipeline (operated by CNOOC) which transports oil from the Buzzard oil and gas facility to shore. Secondly, the PL1270 28” Gas Export Line from Britannia is an active gas pipeline (operated by Harbour Energy) which transports gas from the Britannia offshore oil and gas facility. Finally, the PL208 ‘Fulmar A to St Fergus’ is an active gas pipeline (operated by Shell) which transports gas from the Fulmar A offshore oil and gas facility. These will all be crossed by both Landfall Export Cables.

73. There are currently two oil and gas pipelines that make landfall close to the St Fergus South Landfall option but are not crossed in the landfall area of search. These two pipelines are the closed Miller to St Fergus pipeline operated by BP (uncrossed by the Project) and the active Fulmar A to St Fergus gas pipeline operated by Shell UK Limited, the same pipeline which crosses the St Fergus South Export Cable Corridor. The location of the onshore St Fergus gas terminal, 3.8 km north of the St Fergus South Landfall option, concentrates a large quantity of oil and gas pipelines in a small area of coastline. Due to the presence of the onshore gas terminal and the concentration of pipelines, the Project has routed away from this area during the offshore export cable corridor route selection process. Further information is available in **Chapter 4: Site Selection and Assessment of Alternatives** in this **Offshore EIA Report**. **Table 17.14** provides further information on these oil and gas pipelines. **Figure 17.4** provides an overview of the existing pipelines located within the Study

Area. **Section 17.7.1** and **Section 17.7.3.4** provide further information on the crossing agreements to be implemented as embedded mitigation.

Table 17.14 - Summary of Pipeline Information

Pipeline	Operational/Closed	Overlap of Project Area	Trajectory	Project's Interaction with Existing Cable
PL2446J12 WI pipeline (Well 20/02a-E8)	Closed	Windfarm Site	East-west	Crossed twice (each location treated as single crossing with Cable PLU2247J12 in **Table 17.15** as the cable and pipe have a separation of 20m)
PL2919 WI pipeline (Well 20/02a-B2)	Closed	Windfarm Site	North-south	Crossed twice
PL2799 7in Production pipeline from Blackbird manifold and PL2800 3in Gas lift pipeline to Blackbird manifold	Closed	Windfarm Site	North-south	Crossed twice (each location an extended crossing to capture cable PLU2802 and pipe (100m separation). 1.5 count caters for 150m space in between cable and pipe.
Ettrick export line (possibly PL2448)	Closed	Windfarm Site	North-south	Not crossed
Five decommissioned Ettrick flowlines	Closed	Windfarm Site	North-south	Not crossed
PL2074 Buzzard (P) to Forties Hot Tap	Operational	Landfall Export Cable Corridor	West-east	Crossed by both Landfall Export Cables
PL1270 28" Gas Export Line from Britannia	Operational	Landfall Export Cable Corridor	West-east	Crossed by both Landfall Export Cables
Fulmar (A) to StFergus	Operational	Landfall Export Cable Corridor	West-east	Crossed by both Landfall Export Cables
Miller to St Fergus	Closed	Landfall Export Cable Corridor	West-east	Parallel (not crossed)
PL2076 WI pipeline	Operational	Buzzard Export Cable Corridor	Northwest – southeast	Crossed by both Buzzard Export Cables
PL1270 28" gas export line from Britannia	Operational	Buzzard Export Cable Corridor	Northwest – southeast	Crossed by both Buzzard Export Cables
PL2072 Buzzard to Captain Tee gas export line	Operational	Buzzard Export Cable Corridor	North - south	Adjacent (not crossed)

17.6.4.4 Summary of cables and pipeline crossings in the Windfarm Site

Table 17.15 summarises the proposed cable and pipeline crossings within the Windfarm Site.

Table 17.15 Summary of Cable and Pipeline Crossings within the Windfarm Site

Crossing ref	Cable	Count	Pipeline	Count	Comment
C1	PLU2447J12	0	PL2446J12	1	Treated as a single crossing since the cable and pipeline have a separation 20m
C2	As per C1	0	As per C1	1	As per C1
C3	PLU2802	1	-		
C4	-	-	PL2919	1	

Crossing ref	Cable	Count	Pipeline	Count	Comment
C5	PLU2802	0	PL2799 (7") and PL2800 (3")	1.5	Extended crossing to capture cable and pipeline (100m separation). 1.5 count caters for 150m space in between cable and pipeline.
C6	-		As per C4	-	-
C7	As per C5	0	As per C5	1.5	Extended crossing to capture cable and pipeline (180m separation). 1.5 count caters for 150m space in between cable and pipeline.
C8	PLU2920	2	-		Note there are two cable crossings here in parallel. Treat as two single crossings.
Total number	**-**	**3**	**-**	**6**	**-**

17.6.5 Military Practice and Exercise Areas

74. Practise and Exercise Areas (PEXAs) are designated areas which are used for training and defence purposes by the Royal Navy, the Army, the Royal Air Force (RAF) and the Ministry of Defence (MoD). No PEXAs overlap with the Offshore Development Area.

    The closest PEXAs to the Project's St Fergus South Export Cable Corridor are located 23 km to the northwest (Northern Military Danger Area (MDA)) and 21 km to the south (Central MDA) of the NorthConnect Parallel Export Cable Corridor. The closest PEXAs to the Windfarm Site is located 73 km to the west (Moray Firth South) and 34 km to the south (Central MDA). At this distance, they are not relevant for this assessment. The closest military base to the Offshore Development Area is RAF Lossiemouth. Further information on the existing military sites located within the Study Area is available in **Chapter 16: Aviation and Radar** of this **Offshore EIA Report.**

17.6.6 Anticipated Future Trends

75. Scotland is considered to have the most abundant natural wind resource in Europe with around 25% of the continent's wind resource (Scottish Government, 2021). The deployment of offshore wind in Scotland is set to continue, with 26 GW announced in 2021 as part of the ScotWind leasing round contributing towards the UK target of achieving 50 Gigawatt (GW) of offshore wind in the UK by 2030 (see **Chapter 2: Need for the Project** for further details). In addition, the establishment of the INTOG Decarbonisation leasing round (for which this Project seeks an award of seabed rights) will support targets of the North Sea Transition Deal, which seeks to support the oil and gas industry in the transition to a low carbon future, including through platform electrification and offshore wind. With a majority of the ScotWind and INTOG leasing development sites situated within the North Sea, the offshore wind industry in the North Sea is likely to significantly increase in the next 10 to 20 years. This development of the offshore wind industry in Scotland will be supported by Scottish Government development plans such as '*Scotland's National Marine Plan*' (Scottish Government, 2015) and the '*Sectoral Marine Plan for Offshore Wind Energy*' (Scottish Government, 2020) and the Initial Plan Framework Sectoral Marine Plan for Offshore Wind for INTOG (Scottish Government 2022).

76. The oil and gas industry has seen a period of slow decline in recent years, and it is expected that this trajectory will continue into the future with a focus on decommissioning activities of the current existing infrastructure by oil and gas operators. In the meantime, with an increasing focus on achieving net zero targets, an increased interest in INTOG projects and CCS it is anticipated that the oil and gas industry will reduce emissions from existing facilities.

77. It is not predicted that there will be a substantial increase in the number of marine disposal sites that are located within the vicinity of the Project in the North Sea. It is anticipated that the closed marine disposal sites will remain so.

78. It is expected that the electrical transmission infrastructure in the North Sea will increase substantially in the future with the development of new offshore wind projects through the ScotWind and INTOG leasing rounds. The cable routes associated with these offshore wind farms could potentially be near the Project's infrastructure as a number of projects will seek to identify landfall locations along the Aberdeenshire coast to connect to existing onshore substations. An additional increase in electrical cables is likely to occur through the further integration of European electrical grids by interconnectors positioned throughout the North Sea. In addition, the Offshore Transmission Network Review is currently in progress to deliver improvements in the way that offshore generation and interconnectors are connected to the onshore transmission network.

79. There are currently plans to increase the electrical connectivity of European countries' electrical grids through interconnector cables to enable an increase in energy security and transfer of renewable electricity. Several interconnectors are also proposed between England and Scotland as part of upgrades to the transmission networks. These projects are likely to lead to an increase in interconnector cables deployed within the North Sea and Scottish territorial waters.

17.7 Potential Impacts

80. This technical chapter has identified potential impacts for infrastructure and other marine users as part of this assessment. These potential impacts have been identified following extensive stakeholder consultation with MS-LOT and statutory stakeholders through the submission of an **Offshore Scoping Report** (**Appendix 1.2**) and resulting **Scoping Opinion** (**Appendix 1.1**). The responses provided as part of the **Scoping Opinion** have been incorporated into identifying the potential impacts of this assessment.

81. **The full** list of potential impacts assessed is provided in **Table 17.17** and **Table 17.20.**

82. Table 17.16 presents the impacts that were proposed to be scoped out in the **Offshore Scoping Report** and the impacts that the **Scoping Opinion** require to be scoped in for the **Offshore EIA Report.** Following submission of the Scoping Report, recreational receptors are now considered within **Chapter 19: Socioeconomics, Tourism and Recreation.** The full list of potential impacts assessed is provided in **Table 17.17** and **Table 17.20.**

Table 17.16 Potential impacts scoped in or out of the EIA for Infrastructure and Other Marine Users

Potential Impact	Construction		O&M		Decommissioning	
	Scoping Report	Scoping Opinion	Scoping Report	Scoping Opinion	Scoping Report	Scoping Opinion
Displacement of recreational sailing and motor cruising, recreational fishing (boat angling) and other recreational activities (diving vessels) due to safety zones and advisory safety distances in the array area and proposed export cable corridor may result in a loss of recreational resource (now considered within the EIA in **Chapter 19: Socioeconomics, Tourism and Recreation**).	✓	✓	✓	✓	✓	✓
Installation of the export cable, including associated safety distances, may temporarily affect or restrict access to the Hywind Scotland offshore export cable.	✓	✓	✓	✓	✓	✓
Installation of export cable, including safety distances, may temporarily affect or restrict access to the oil pipeline.	✓	✓	✓	✓	✓	✓

83. These potential impacts have been assessed through a number of impact pathways, as set out in in **Table 17.17.**

Table 17.17 Potential impact pathways on Infrastructure and other marine user receptors

Green Volt Project Phase	Potential Impact Pathways
Construction	• Disturbance of existing offshore wind farms • Disturbance of oil and gas operational and decommissioning activities • Disturbance of marine disposal sites • Disturbance of existing subsea electrical cables
O&M	• Disturbance of existing offshore wind farms • Disturbance of oil and gas operational and decommissioning activities • Disturbance of marine disposal sites • Disturbance of existing subsea electrical cables
Decommissioning	• Disturbance of marine infrastructure

17.7.1 Embedded Mitigation

84. The Project will incorporate mitigation measures into the construction, operation and decommissioning phases to mitigate any potential impacts associated with the Project. A combination of industry standards and the Project's specific mitigation measures will be included.

85. As part of the site selection and design process the Project has identified and avoided existing marine infrastructure in the Offshore Development Area, including minimising the number cable and pipeline crossings. This has required a combination of consultation, desk-based research and offshore surveys. This reduces the potential of the Project's infrastructure interfering with existing marine infrastructure. Details of the site selection process are provided in **Chapter 4: Site Selection and Assessment of Alternatives** of this **Offshore EIA Report**.

86. As discussed in **Section 17.6.2**, there is no agreed legal or regulator position regarding the need to apply defined exclusion zones between decommissioned oil and gas assets and newly installed wind farm assets. The array pattern and position applied will deliberately avoid placing turbines and substructures directly above pipelines and umbilicals remaining in-situ, and abandoned well-centres at the seabed. The final offsets applied will be determined by collaboration with the oil and gas operator via a structured risk assessment approach. Positioning of wind farm equipment on the seabed such as moorings and inter-array cables will also avoid interaction where possible, however, there is a strong likelihood that crossings will be necessary. Such crossings will be finalised with the input and agreement with the oil and gas operator since they will be legally responsible for the notification process and the ongoing liability associated with the decommissioned equipment affected by the crossing.

87. Any offshore wind projects within Scottish waters can submit a Safety Zone application to Marine Scotland which will require other marine users to keep a minimum safe distance from a Project contracted vessel or marine infrastructure, such as incomplete offshore wind foundations. The purpose of the Safety Zones is to protect infrastructure that is being installed or vessels which require a large area to operate safely.

88. Safety Zones will be applied for by the Project as per relevant legislation (Energy Act 2004 and Electricity Regulations 2007) and the Department for Business, Energy and Industrial Strategy (BEIS) Guidance on Applying for Safety Zones (BEIS), 2011) to mitigate any potential impacts and to ensure safe and effective construction, operation and maintenance of the wind farm. Safety zones for construction, major operation and maintenance and decommissioning will be agreed with MS-LOT and located around any structure where construction work is underwater, partially completed structures where work is not underway and completed structures. These are likely to include:

- 50m radius Safety Zone around each turbine location during the operation phase; and
- 500m radius Safety Zone around each turbine location during the construction phase.

89. The Project will additionally ensure that there are appropriate communications to inform other marine users of the progression of the works and the notification of significant construction events which have the potential to temporarily restrict areas for safety purposes. These measures are detailed in **Chapter 14: Shipping and Navigation** and will include:

- A marine coordination centre to monitor vessels contracted by the Project and other marine vessels. This centre will be monitored 24/7 and enable other marine users to contact personnel associated with the Project about any identified issues.
- Notice to Mariners (NtMs) will be issued to provide updates to other marine users of the construction works that are currently being undertaken and any planned in the near future. Any persons can be added to the NtM distribution list as required.

- A notification will be produced in the Kingfisher news bulletin or when a significant construction event is planned to occur with the Project.
- Any cardinal or marker buoys associated with the Project will be communicated to the necessary stakeholders and informed through NtMs, United Kingdom Hydrographic Office (UKHO) and Northern Lighthouse Board (NLB). The information will include detailed maps and coordinates to enable the continuing navigational safety for other marine users.
- Details will be provided to UKHO to facilitate appropriate marking of Project infrastructure on appropriate UKHO Admiralty Charts.

90. As detailed in **Chapter 16: Shipping and Navigation**, a series of plans will be developed to protect other marine users, including:

- Vessel Management Plan;
- Navigational Safety Plan;
- Marine Pollution Contingency Plan;
- Development Specification and Layout Plan; and
- Lighting and Marking Plan.

91. Further mitigation measures will be incorporated for the relevant phases of Project development including:

- Pre-construction surveys will be implemented by the Project in order to identify any potential hazards within the Windfarm Site and offshore export cable corridors. These will include geophysical surveys to identify seabed hazards such as discarded fishing gear, wrecks or unidentified objects and magnetometer surveys to identify for the presence of UXO devices. Any identified UXO devices would be avoided through micrositing or require a subsequent UXO clearance campaign. Further information on the intended pre-construction campaigns is outlined in **Chapter 5: Project Description** and **Appendix 5.2, 5.3 and 5.4** of this **Offshore EIA Report.**
- All cables will be installed and maintained in line with current standard industry guidance and good practice (e.g. Department for Energy and Climate Change (DECC), 2011, and others as appropriate) that provide guidance on proximity of cables to existing assets and coordination with other operators. The Project will comply with all cabling industry standards in locations where the cables are buried.
- Inter-array, offshore service platform (OSP) interconnector and offshore export cables will be buried beneath the seabed to a burial depth of 0.6 m to 1.5 m, wherever practicable, in line with current guidance at time of construction. Cable protection measures will be applied in areas where burial is not possible, e.g. where the cables are required to cross existing cables or in areas where hard seabed are encountered. This will enable a reduction in the potential for interactions between other marine users and the deployed cabling infrastructure associated with the Project. This is particularly important to enable potential fishing activities in the locations where the cabling infrastructure has been buried (see **Chapter 13: Commercial Fisheries** for further details). Cable protection will be monitored as per cable suppliers' recommendations, and in agreement with power purchase customers.
- Owners and operators of existing or proposed infrastructure and licence blocks (including oil and gas companies, other wind farm developers, and electrical and telecommunication cable and pipeline operators) are, and will continue to be, consulted by the Applicant and commercial and technical cable crossing agreements and / or BCAs will be put in place where required.

- Crossing and proximity agreements will be agreed post-consent with the relevant asset owners. It will be the responsibility of the respective Pipeline Operators to inform the NSTA and also the OPRED's Offshore Decommissioning Unit (OPRED-ODU) to see if any updates to existing Pipeline Works Authorisations (PWAs) or decommissioning plans are required. Cable crossings will be perpendicular (or as close as possible to 90°) to minimise the physical interaction and therefore limit the risk of damage to the existing cable.
- The Project will comply with all cabling industry standards in locations where the cables are buried. Further information on the intended pre-construction campaigns is outlined in **Chapter 5: Project Description** of this **Offshore EIA Report.**
- **Appendix 5.1** considers the risk of Wind Turbine Generators (WTGs) breaking free of moorings or any associated issues during tows. In line with MCA's Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA & Health and Safety Executive (HSE), 2017) ongoing TPV will be undertaken for all mooring systems (including modification) In addition, the Applicant will put a GPS in place, which will be continuously monitored, with capability of being tracked via Automatic Identification Systems (AIS) in the event of a loss of WTG. Each WTG will also have an alarm system in place, whereby an alert will be provided to the Marine Coordination Centre in the event that any floating substructure leaves a pre-defined ringfenced alarm zone. This means in the unlikely event that a floating substructure suffers total loss of station and drifts outside of its alarm zone, the Applicant would be made aware, and would be able to track its position and make the necessary emergency arrangements. The Navigational Risk Assessment (**Appendix 14.1**) concludes therefore this impact would be broadly acceptable.

17.7.2 Worst Case Scenario

92. In relation to infrastructure and other marine users, the worst case parameters are those that have the greatest potential impact upon existing and planned infrastructure and other users of the sea during construction, operation and decommissioning.

93. The worst case assumptions for infrastructure and other marine users are outlined in **Table 17.18.** This is also described in further detail in **Chapter 5: Project Description** of this **Offshore EIA Report.**

Table 17.18 - The Project's Worst Case Assumptions

Impact	Parameter	Notes
Construction		
Disturbance of existing offshore wind farms	• Up to 35 wind turbines; • Up to 134 km of inter-array cables; • 1 offshore OSP; • Up to 1 Lidar; • Up to 2 wave buoys; • Up to 1 permanent vessel mooring buoy; • 2 export cables to Buzzard and 2 export cables to landfall; • Export cable length to landfall of 120 km (per cable), 240 km total; • Export cable length to Buzzard of 30 km (per cable) 60 km (total); • Up to 3 cable and 6 pipeline crossings in Windfarm Site; • Up to 2 cable and 4 pipeline crossings in Buzzard Export Cable Corridor; • Up to 4 cable and 6 pipeline crossings in Landfall Export Cable Corridor (including landfall options); and • Increased vessel activity.	Subject to discussion with operators. Proximity agreements will be agreed post-consent with the relevant asset owners.
Disturbance to oil and gas operations		
Disturbance of marine disposal sites		
Disturbance of existing subsea cables and pipelines		Subject to discussion with operators. Crossing and proximity agreements will be agreed post-consent with the relevant asset owners.

Impact	Parameter	Notes
	Maximum total construction period offshore: 3 years	
Operation and maintenance		
Disturbance of existing offshore wind farms	• The presence of wind turbines and platform, Lidar, wave buoys, scour protection, permanent vessel moorings, array cables, inter-connector cables and cable protection; and • Increased vessel traffic during maintenance. Anticipated design lifetime: 35 years	Subject to discussion with operators. Proximity agreements will be agreed post-consent with the relevant asset owners.
Disturbance to oil and gas operations		
Disturbance of marine disposal sites		
Disturbance of existing subsea cables and pipelines		Subject to discussion with operators. Crossing and proximity agreements will be agreed post-consent with the relevant asset owners.
Decommissioning		
Disturbance of existing offshore wind farms	• WTG to be removed; • Substructures and foundations to be removed; • Increased vessel activity; and • Discussions will be held with stakeholders and regulators to determine the exact locations where offshore cables and scour protection should be removed. Cables may be left in situ if considered appropriate, or they may be wholly or partially removed. Throughout the project life-cycle, the burial depth will be closely monitored.	Subject to discussion with operators. Proximity agreements will be agreed post-consent with the relevant asset owners.
Disturbance to oil and gas operations		
Disturbance of marine disposal sites		
Disturbance of existing subsea cables and pipelines		Subject to discussion with operators. Crossing and proximity agreements will be agreed post-consent with the relevant asset owners.

17.7.3 Potential Impacts during Construction

94. This section of the assessment provides information on the potential impacts from the construction of the Project on the infrastructure and other marine users.

17.7.3.1 Impact C1: Disturbance of Existing Offshore Wind Farms

95. The construction of the Project has the potential to interfere with activities at the other offshore wind farm projects within the Study Area. Depending on the port chosen as an engineering and construction base, movements of vessels contracted to undertake construction activities associated with the Project have the potential to interfere with the routine operations and activities of the operational Hywind Scotland Pilot Park, located to the south-east of the Windfarm Site. The Project's activities could also interact with works for operational Moray Firth wind farms, including Beatrice, Moray East or Moray West. Any conflicts with vessel and/or aviation activities, including increased vessel activity and helicopter operations associated with the oil and gas industry are addressed in

Chapter 14: Shipping and Navigation and **Chapter 16: Aviation and Radar** of this **Offshore EIA Report.**

96. Embedded mitigation measures as detailed in **Section 17.7.1**, (including site selection, management plans, the use of NtMs and other notifications of planned activity, appropriate lighting, marking and charting of each wind farm and marine co-ordination of all offshore wind farm activities) and ongoing consultation between the other wind farm companies and any nominated contractors will act to reduce or avoid potential impacts.

97. The NorthConnect Parallel Export Cable Corridor will cross Hywind's export cable corridor. The Applicant will agree a cable crossing agreement with Equinor in advance of construction, as further discussed in **Impact 4: Disturbance of Existing Cables and Pipelines** below.

98. In conclusion, the sensitivity of existing offshore wind farms to disturbance from construction of the Project is considered to be high given implications for human safety, and with the application of embedded mitigation measures the magnitude of the impact is assessed as negligible, with construction activities being relatively short-term and temporary. The resulting significance of the effect is **minor adverse**. No additional mitigation is required.

17.7.3.2 Impact C2: Disturbance of Oil and Gas Operations

99. The Project is located on the decommissioned Ettrick and Blackbird oil fields. Prior to decommissioning of the fields, studies were undertaken to determine various alternative production strategies to extend the life of the Ettrick and Blackbird fields, which were deemed uneconomic and unviable. Location of the Windfarm Site upon a decommissioned field has been designed to avoid interactions with oil and gas industry activities. The Windfarm Site slightly overlaps with licence block 20/2b (Round 32) but it is not anticipated there will be any development activities during this phase of the licence. The Buzzard Export Cable Corridor crosses licence blocks 20/2b (Round 11-20) and 20/6a on approach to Buzzard and the Landfall Export Cable Corridor overlaps 20/7c (Round 32). BCAs will be put in place as required. The Windfarm Site is located wholly within INTOG Lease Area E-b, identified as suitable for potential offshore wind development for the oil and gas industry (Marine Scotland, 2021).

100. Furthermore, the purpose of the Project is to generate and supply renewable electricity to enable the complete electrification of oil and gas installations in the outer Moray Firth area, to contribute to decarbonisation of the oil and gas sector through the replacement of traditional energy sources with renewable energy to meet Scotland's energy targets (see **Chapter 2: Need for the Project**). The Project supports the oil and gas sector in making significant changes in the way it currently operates to tackle climate change and will be the first collaborative development of its kind between oil and gas and offshore wind industries, with positive benefits for Scottish energy production. The Project also has capacity for additional oil and gas installations in the Outer Moray Firth area to become electrified and contribute towards net zero.

101. Decommissioning activities will be completed within the Ettrick and Blackbird oil fields prior to construction of the Project, and therefore the Project will not interfere with these activities within the Windfarm Site. The operators of the Buzzard facilities will co-ordinate the connection of the Buzzard Export Cable to the platform complex with minimal interference to their own operations.

102. The development of the Project has the potential to interact with the presence of other existing oil and gas operational and decommissioning activities within the wider Study Area. This interaction has the potential to occur from the increase in the Project's construction and supporting vessels coinciding with existing oil and gas vessel routes. However, by implementing open communication between operators and developers, and developing management plans, crossing and proximity agreements, the Project is not anticipated to create stranded assets, as the Project is relatively small in scale. In addition, the Applicant is not aware of any applications for blocks that coincide with the Offshore Development Area from the 33rd licence round (due to close 12th January 2023). These assumptions

are based on the current oil and gas licence round in the Study Area and any already planned developments within the vicinity of the Project. With safety zones around wind farm infrastructure and increased vessel traffic (transiting crew, monitoring surveys and maintenance vessels), access to oil and gas infrastructure may be temporarily interrupted. Therefore, the sensitivity of the receptor is high. Any conflicts with vessel and/or aviation activities, including increased vessel activity and helicopter operations associated with the oil and gas industry are addressed in **Chapter 14: Shipping and Navigation** and **Chapter 16: Aviation and Radar** of this **Offshore EIA Report**.

103. To mitigate this potential interaction with existing oil and gas operational and decommissioning activities, the Project will distribute project construction updates through NtMs, Kingfisher bulletins etc (see **Chapter 14: Shipping and Navigation** for details). This will enable the Project to manage and coordinate the contracted construction and support vessels around the existing oil and gas operations. Additional consultation will also be undertaken with all relevant oil and gas operators to establish communication operations which will enable the marine coordination centre to operate efficiently.

104. Following embedded mitigation measures (**Section 17.7.1**) and ongoing liaison with other industries, the sensitivity of oil and gas operations to disturbance from the construction of the Project is judged to be medium, and with the application of embedded mitigation measures the magnitude of impact is assessed as negligible, with construction activities being relatively short term and temporary. Therefore, the effect significance is **minor adverse**. No additional mitigation is required.

17.7.3.3 Impact C3: Disturbance of Marine Disposal Sites

105. The development of the Project has the potential to interact with the vessel operations of the existing marine disposal sites, with these sites focused within the area of seabed between the St Fergus South and NorthConnect Parallel Export Cable Corridors. This potential interaction is likely to be associated with the installation of the export cables within either of the offshore export cable corridors when several cable installation vessels will be operating within the nearshore area.

106. To mitigate this potential temporary interuption with the vessel operations of the existing marine disposal sites, the Project will implement mitigation methods to reduce the likelihood of the Project's contracted vessels impeding existing vessel routes. This will include distributing NtMs to inform other marine users of the Project's vessel movements and separate consultation with the operators of the existing marine disposal sites. These measures will reduce the potential for any of the Project's construction vessels to disturb the vessels transiting to and from the marine disposal sites. Further details are presented in **Chapter 14: Shipping and Navigation**.

107. The sensitivity of marine disposal activities to disturbance from construction of the Project is therefore judged to be low, and with the application of embedded mitigation measures the magnitude of the impact is assessed as negligible, with construction activities being relatively short-term and temporary. The resulting significance of the effect is **negligible**. No additional mitigation is required.

17.7.3.4 Impact C4: Disturbance of Existing Subsea Cables and Pipelines

108. Within the Windfarm Site, three cable and six pipeline crossings are required during installation of the inter-array cables. The installation of the Buzzard Export Cables will require crossing two cables and four pipelines, and the installation of the Landfall Export Cables will require crossing four cables and six pipelines.

109. Construction activities, such as for offshore cable installation as well as vessel anchoring and debris clearing or UXO removal operations also have the potential to interact with submarine cables and oil and gas pipelines.

110. In the event of existing offshore cables and pipelines being damaged during the installation of the Project's export cables disruption to gas and power distribution may arise. As embedded mitigation, where the Offshore Export Cables cross an existing cable or pipeline, a cable crossing agreement will be put in place and agreed with the asset owner, as detailed in **Section 17.7.1**. It is expected that a small layer of rock deposits will be placed over the existing asset for protection. The cables will then be laid perpendicularly (or as close to that as possible) across this and covered by a second post-lay layer of rock/mattresses to ensure that the cables remain protected and in place. Any significant impact will be avoided by the application of industry standard mitigation, supported by crossing agreements between the respective companies which would require agreement on the crossing design such that it would be sufficient to protect all of the subsea cable assets. Any cable crossing agreements would be implemented in accordance with the Carbon Trust Cable Burial Risk Assessment guidance and DECC (Carbon Trust, 2015; DECC 2011). Pipeline and cable crossings are common across the UKCS, and there are established mechanisms for controlling the level of impact to both parties. Beyond the cable crossing points, agreements will also be reached on the effective exclusion areas around all crossed assets such that no damage would occur from construction activities, vessel anchoring etc.

111. The Project has been designed to minimise the number of cable crossings through the site selection process. Further information on this site selection process has been provided in **Chapter 4: Site Selection and Assessment of Alternatives** of this **Offshore EIA Report.** The sensitivity of existing subsea cables to disturbance from construction of the Project is judged to be high given the difficulty and costs associated with cable repair however by undertaking crossing agreements, the magnitude of impact would be reduced to negligible. Given the high receptor sensitivity and negligible magnitude, the effect would be of **minor adverse**. No additional mitigation is required.

17.7.4 Potential Impacts during Operation and Maintenance

112. This section of the assessment provides information on the potential impacts from the operation of the Project on the infrastructure and other marine users.

17.7.4.1 Impact O1: Disturbance of Existing Offshore Wind farms

113. It is expected that the number of vessels associated with the operation and maintenance phase of the Project will be significantly reduced in comparison to the construction phase. The vessels will operate from agreed port(s) in north-east Scotland. A number of operation and maintenance vessels will be required by the Project to provide services to the Windfarm Site and the offshore export cables if necessary. Exceptional maintenance activity may be necessary and may require the use of large vessels and the use of a temporary safety zone.

114. Any interactions with vessel and/or aviation activities, including increased vessel activity and helicopter operations associated with the wind farm industry are addressed in **Chapter 14: Shipping and Navigation** and **Chapter 16: Aviation and Radar**.

115. The Project will implement embedded mitigation measures of NtMs, a marine coordination centre, use of predetermined vessel transit routes and safety zones to reduce the potential interactions and it is therefore considered the potential for disturbance by the operational Project's operation and maintenance activities at other offshore wind farm sites is limited.

116. The sensitivity of existing offshore wind farms to disturbance from the operation and maintenance of the Project is deemed to be medium, and with the application of embedded mitigation measures the magnitude of impact is assessed to be negligible. As such, the resulting effect significance is **minor adverse**. No additional mitigation is required.

1.1.1.1 Impact O2: Disturbance of Oil and Gas Operations

117. Following the decommissioning of Ettrick and Blackbird infrastructure, there is not anticipated to be further exploration or development as further extraction is not considered to be viable from this field. However, with potential safety zones around wind farm infrastructure and increased vessel traffic (transiting crew, monitoring surveys and maintenance vessels), access to other existing oil and gas infrastructure may be disrupted within the wider Study Area. Vessel traffic during operation and maintenance is unconfirmed at this stage as it will depend on the technologies used for the turbines, substructures and mooring systems.

118. In the event offshore export cable repairs are required during the operation and maintenance phase, associated impacts would be similar in nature to the construction impacts but limited to specific locations and often shorter in duration. Exceptional maintenance activity may be required and may necessitate the use of large vessels and the use of a temporary 500 m safety zone.

119. Following embedded mitigation measures (**Section 17.7.1**) and ongoing liaison with other industries, the sensitivity of oil and gas activities to disturbance from the operation and maintenance of the Project is judged to be medium, and with the application of embedded mitigation measures the magnitude of impact is assessed as negligible. The resulting effect significance is **negligible to minor adverse**. No additional mitigation is required. Furthermore, there may be future opportunities for oil and gas platforms to connect into the Project, with associated positive impacts on the oil and gas industry.

120. Impacts to associated vessels and/or aviation is addressed **in Chapters 14: Shipping and Navigation and Chapter 16: Aviation and Radar** respectively.

17.7.4.2 Impact O3: Disturbance of Marine Disposal Sites

121. Increased vessel traffic (transiting crew, monitoring surveys and maintenance vessels) has potential to disrupt vessels accessing marine disposal sites. Vessel traffic during operation and maintenance is unconfirmed at this stage as it will depend on the technologies used for the turbines, substructures and mooring systems.

122. In the event offshore cable repairs are required during the operation and maintenance phase, associated impacts would be similar in nature to the construction impacts but limited to specific locations and often shorter in duration. Exceptional maintenance activity may be required and may necessitate the use of large vessels and the use of a temporary 500 m safety zone.

123. Following embedded mitigation measures (**Section 17.7.1**) and ongoing liaison with other industries, the sensitivity of other marine disposal sites to disturbance from the operation and maintenance of the Project is judged to be low, and with the application of embedded mitigation measures the magnitude of impact is assessed as negligible. The resulting effect significance is **negligible**. No additional mitigation is required.

124. Impacts to associated vessels is addressed **in Chapters 14: Shipping and Navigation.**

17.7.4.3 Impact O4: Disturbance of Existing Subsea Cables and Pipelines.

125. The operation of the Project is not anticipated to have any significant effects upon existing subsea cables or pipelines. Should operators wish to install subsea cables or pipelines in the future that cross or are near the operational Project (for example Eastern Green Link 2, NorthConnect interconnector or other INTOG or Scotwind wind farms), it is expected that the Applicant and any such operator would enter discussions and be steered by advice from relevant authorities.

126. If it becomes necessary to replace or repair some part of the existing subsea cables (either that owned by the Applicant or another operator) maintenance activities would be carried out in line with standard

industry methods and good practice, and under any relevant commercial agreement such that no impact on existing subsea cables and pipelines would occur.

127. The sensitivity of existing subsea cables and pipelines to disturbance from the operation and maintenance of the Project is judged to be medium, and with the application of embedded mitigation measures the magnitude of the impact is assessed as negligible. The resulting effect significance is **minor adverse**. No additional mitigation is required.

17.7.5 Potential Impacts during Decommissioning

128. Impacts upon infrastructure and other users during decommissioning are anticipated to be similar to those assessed during construction of the wind farm, with an incremental reduction of impact as individual wind turbines are removed from the site.

129. Decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning. Offshore, this is likely to include removal of all of the wind turbine components, floating substructures, mooring systems, removal of some or all of the array cables and offshore export cables. Scour and cable protection may be wholly or partially removed. A description of decommissioning activities is provided in **Chapter 5: Project Description**. This section provides an overview of the potential impacts.

17.7.5.1 Impact D1: Disturbance of all Marine Infrastructure

130. To minimise environmental impacts, some of the Project's infrastructure may be disconnected and left in situ on the seabed. It is proposed that the surface infrastructure, the wind turbines and floating platforms, would be disconnected and removed from the Project's site for decommissioning onshore. Some subsea infrastructure, such as the scour protection and cables, may be left in situ as discussed in **Chapter 5: Project Description**. This will be agreed upon with any regulators at the time of decommissioning.

131. Impacts to vessels are discussed in **Chapter 14: Shipping and Navigation**. The Project would implement the same embedded mitigation measures as proposed for the construction phase for reducing the disturbance of existing marine infrastructure (including wind farms, oil and gas infrastructure, disposal sites, pipelines and cables) during any decommissioned approach. Therefore, the sensitivity and magnitude of impact would be comparable to those identified for the construction and operation phase. The effect significance from Project decommissioning on disturbance to existing marine infrastructure has been identified as **negligible to minor adverse**. No additional mitigation is required.

17.8 Assessment of Cumulative Impacts

132. The assessment of cumulative impacts determines the potential impacts that could occur between the Project and other existing or planned developments associated with infrastructure and other marine users. This approach to the CIA is outlined further in **Chapter 6: EIA Methodology** of this **Offshore EIA Report**. Potential cumulative impacts to vessels are discussed in **Chapter 14: Shipping and Navigation**.

133. The potential cumulative impacts of the Project on infrastructure and other users have been assessed to be non-significant or able to be fully mitigated through consultation with the relevant parties (i.e. through the development of crossing and proximity agreements or similar) for construction, operation and decommissioning phases. All other parties (i.e. another wind farm operator, cable or pipeline operator or oil and gas operator) that interact with the same receptor will also need to demonstrate no impact (i.e. through avoidance) or agree mitigation with the operators.

134. The Offshore Export Cable Corridor runs adjacent to the consented NorthConnect cable route. An EMF study (**Appendix 9.2**) has been undertaken to better understand the implications of

electromagnetic fields on neighbouring cables which concludes there will be no interaction or cumulative impact between the two projects as AC and DC fields do not combine. An agreement will be made between NorthConnect and the Applicant to mitigate against any adverse impacts predicted on any current or future consented power cables prior to construction and operation.

135. Therefore, no project will have a direct impact on another user, and by extension it is considered that there will be no pathways for cumulative impacts.

17.9 Transboundary Impacts

136. The international asset projects considered for transboundary impacts associated with this technical chapter is the Peterhead to Egersund telecommunication cable (not in use) and the NorthConnect interconnector project (consented, not constructed). The telecommunication cable is discussed and assessed in **Sections 17.6.4.2 and 17.7.3.4.** A description of the NorthConnect project and the Project's potential impacts associated with NorthConnect are discussed and assessed in **Sections 17.6.4.2** and **17.8** respectively. No transboundary impacts are anticipated during any phase of the Project.

17.10 Inter-relationships

137. **Table 17.19** below provides further information on the possible inter-relationships of the potential impacts associated with the infrastructure industry and other marine users.

Table 17.19 - Infrastructure and Other Marine Users Inter-Relationships

Topic and description	Related Chapter	Where addressed in this Chapter
Disturbance of existing offshore wind farms	**Chapter 14: Shipping and Navigation** **Chapter 16: Aviation and Radar**	**Sections 17.7.3.1, 17.7.4.1** and **17.7.5.1**
Disturbance of oil and gas operational and decommissioning activities	**Chapter 14: Shipping and Navigation** **Chapter 16: Aviation and Radar** **Appendix 5.1 Major Accidents and Disasters**	**Sections 17.7.3.2** and **17.7.5.1**
Disturbance of marine disposal sites	**Chapter 7: Marine Geology Oceanography and Physical Processes** **Chapter 8: Marine Sediment and Water Quality**	**Sections 17.7.3.3, 17.7.4.2 and 17.7.5.1**
Disturbance of existing subsea electrical cables	**Chapter 7: Marine Geology Oceanography and Physical Processes** **Chapter 8: Marine Sediment and Water Quality** **Chapter 9: Benthic Ecology** **Chapter 10: Fish and Shellfish Ecology** **Appendix 5.1 Major Accidents and Disasters**	**Sections 17.7.3.4**, **17.7.4.3** and **17.7.5.1**

17.11 Summary

138. **Table 17.20** below provides further information on the potential impacts associated with the infrastructure and other marine users as part of this technical chapter assessment.

Table 17.20 - Potential Impacts Identified for the Infrastructure and Other Marine Users

Potential Impact	Receptor	Value/ Sensitivity	Magnitude of Impact	Significance of Effect	Mitigation	Residual Effect
Construction						
C1: Disturbance of existing offshore wind farms	Vessels	High	Negligible	Minor adverse	No additional mitigation required	Minor adverse – not significant
C2: Disturbance of oil and gas operational and decommissioning activities	Oil and gas activities	Medium	Negligible	Minor adverse	No additional mitigation required	Minor adverse– not significant
C3: Disturbance of marine disposal sites	Vessels	Low	Negligible	Negligible	No additional mitigation required	Negligible – not significant
C4: Disturbance of existing subsea electrical cables	Subsea electrical cables	Negligible	Negligible	Negligible	No additional mitigation required	Negligible – not significant
Operation						
O1: Disturbance of existing offshore wind farms	Vessels	Medium	Negligible	Minor adverse	No additional mitigation required	Minor adverse – not significant
O2: Disturbance of oil and gas operational and decommissioning activities	Oil and gas activities	Medium	Negligible	Minor adverse	No additional mitigation required	Negligible to Minor adverse – not significant
O3: Disturbance of marine disposal sites	Vessels	Low	Negligible	Negligible	No additional mitigation required	Negligible– not significant
O4: Disturbance of existing subsea electrical cables	Sub-sea electrical cables	Medium	Negligible	Minor adverse	No additional mitigation required	Minor adverse – not significant
Decommissioning						
D1: Disturbance of marine infrastructure	Vessels, oil and gas activities, subsea cables and pipelines	Up to High	Negligible	Negligible to Minor adverse	No additional mitigation required	Negligible to Minor adverse – not significant

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