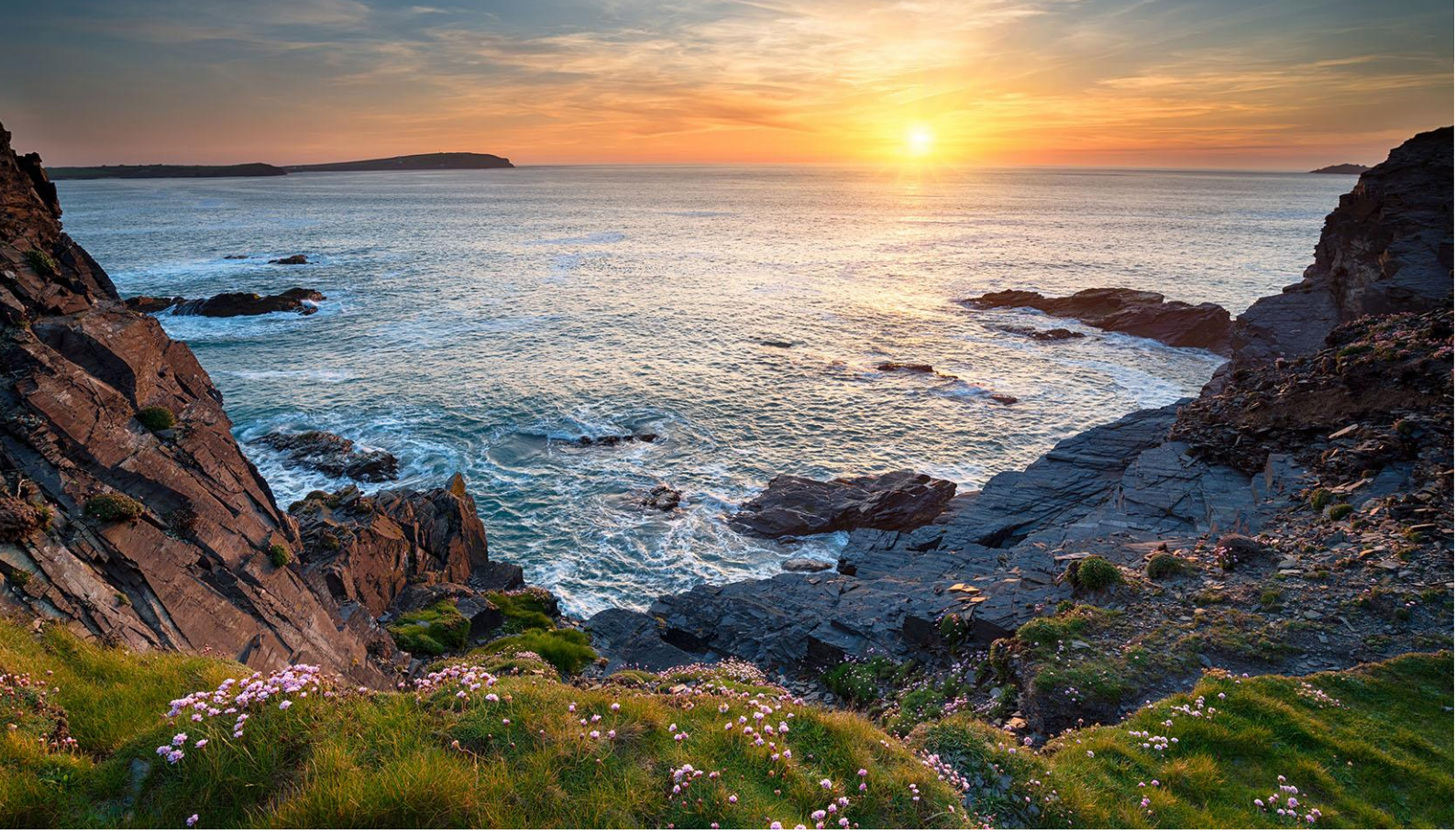

Eastern Green Link 3

Marine Environmental Appraisal

Appendix 6B: Water Framework Directive Assessment Report

Prepared for: Scottish Hydro Electric Transmission plc (SHE-T)

collaborative environmental advisers

Scottish & Southern Electricity Networks TRANSMISSION

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This document has been checked in line with internal quality control requirements.

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Abbreviations/Glossary

AHMWB	Artificial and Heavily Modified Waterbodies
Cefas	Centre for Environment, Fisheries, and Aquaculture Science
CEMP	Construction Environmental Management Plan
DCO	Development Consent Order
EA	Environment Agency
EC	European Commission
EGL	Eastern Green Link
GW	Gigawatt
HDD	Horizontal Directional Drill
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
HRA	Habitat Regulation Appraisal
INNS	Invasive Non-native Species
IROPI	Imperative Reasons of Overriding Public Interest
LSE	Likely Significant Effect
MLWS	Mean Low Water Springs
MPA	Marine Protected Area
NETS	National Electricity Transmission System
NM	Nautical Miles
RBMP	River Basin Management Plan
RIAA	Report to Inform Appropriate Assessment
RLB	Red Line Boundary
SAC	Special Areas of Conservation
SEPA	Scottish Environment Protection Agency
SHE-T	Scottish Hydro Electric-Transmission
SPA	Special Protection Areas
SSC	Suspended Sediment Concentration
SSEN-T	Scottish and Southern Electricity Networks Transmission
WFD	Water Framework Directive
ZoI	Zone of Influence

1. Introduction

The Eastern Green Link 3 (EGL 3) comprises a 2-Gigawatt (GW) High Voltage Direct Current (HVDC) link between Aberdeenshire in Scotland, and King's Lynn and West Norfolk, with a landfall on the Lincolnshire coastline, England. The Project comprises approximately over 700 km of subsea and underground HVDC cables between new converter stations at each end of the electricity transmission link. These in turn are connected to the existing National Electricity Transmission System (NETS) via High Voltage Alternating Current (HVAC) cables between the new converter stations and new substations. For the purposes of seeking the necessary consents, the Project has been split into different 'Schemes' i.e. English Onshore Scheme, English Offshore Scheme, Scottish Onshore Scheme and Scottish Offshore Scheme (with the latter hereinafter referred to as 'the Proposed Development'). Collectively all components are referred to as 'the Project'.

The Proposed Development comprises approximately 145 km of subsea HVDC cable from the landfall at Sandford Bay to the boundary with adjacent English waters. The subsea cable system would consist of two bundled HVDC cables and a fibre optic cable (up to the first offshore joint) for control and monitoring purposes. A Development Consent Order (DCO) under the Planning Act 2008 is being sought for the English Offshore Scheme. A Marine Licence is being sought for the development within Scottish Waters. The Scottish Ministers have devolved powers to grant the Marine Licence under the Marine (Scotland) Act 2010 (within territorial waters up to 12 nautical miles (NM) and the MCAA in the Scottish offshore region, beyond 12 NM.

This appendix should be read in conjunction with:

- **Chapter 3: Project Description**;
- **Chapter 4: Marine Environmental Appraisal Scope and Methodology**;
- **Chapter 6: Marine Physical Processes** which identifies the spatial extent of potential impacts from temporary sediment suspension and subsequent redeposition; and
- **Chapter 7: Intertidal and Subtidal Benthic Ecology** which identifies the extend of potential impacts on intertidal and subtidal benthic ecology receptors.

This Water Framework Directive (WFD) Assessment Report refers only to the Proposed Development. To support the Marine Licence Application, an assessment has been carried out to consider the effects of the Proposed Development in respect of the Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (the 'Water Framework Directive' (WFD)), which has been retained in UK law following the UK's exit from the European Union. The WFD is implemented in Scotland under the Water Environment and Water Services (Scotland) Act 2003 (HM Government, 2024). Other relevant legislation includes:

- Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR)
- Water Environment (Shellfish Water Protected Areas: Designation) (Scotland) Order 2013 and Water Environment (Shellfish Water Protected Areas: Designation) (Scotland) Order 2016
- Scotland River Basin District (Standards) Directions 2014
- Bathing Waters (Scotland) Regulations 2008
- Water Environment (Shellfish Water Protected Areas: Environmental Objectives etc.) (Scotland) Regulations 2013.
- The Scotland River Basin District (Quality of Shellfish Water Protected Areas) (Scotland) Directions 2015.
- The Scotland River Basin District (Quality of Shellfish Water Protected Areas) (Scotland) Directions 2021 - gov.scot (www.gov.scot)

Consideration of the WFD is required for projects which have the potential to adversely impact the chemical and/or ecological status of a waterbody or to prevent improvements that may otherwise result in a waterbody meeting its WFD objectives. The WFD aim is for all waterbodies to be at good status. In a WFD assessment consideration must be shown if an activity will:

- Cause or contribute to deterioration of status; and / or
- Jeopardise the waterbody achieving good status in the future.

Activities associated with the Proposed Development are considered to have the potential to impact the current or targeted status of WFD waterbodies with which it interacts in both Scottish and English waters. Thus, this WFD Assessment Report has been prepared with the aim of identifying the relevant WFD waterbodies located in proximity of the Proposed Development and undertaking an assessment of the potential effects of the Proposed Development on those waterbodies.

2. WFD Assessment Methodology

2.1. Background

The WFD entered into force in December 2000 and was largely transposed into Scottish law by the Water Environment and Water Services (Scotland) Act 2003 (HM Government, 2024). Coastal waters are limited to 3 nautical miles (NM) from Mean Low Water Springs (MLWS) as per Section 3(8) of the Water Environment and Water Services (Scotland) Act 2003.

The holistic approach of the WFD addresses a wide range of aspects and aims to protect the water environment. These aspects include:

- Hydromorphological – assesses elements such as water flow, sediment composition and movement, continuity and structure of habitats;
- Biological – including quality elements such as habitats, the abundance of fish, invertebrates or aquatic flora and by the presence of invasive species;
- Water quality – including environmental standards for supporting physio-chemical conditions, such as dissolved oxygen, phosphorus and ammonia;
- Chemical – defined by compliance with environmental standards for chemicals that are 'priority substances' and/or 'priority hazardous substances' in accordance with the Environmental Quality Standards Directive (2008/105/EC);
- Specific pollutants – assessing compliance with environmental standards for concentrations of pollutants; and
- Protected areas – assessing areas such as drinking water, shellfish waters and designated habitats.

The environmental objectives of the WFD are to:

- Prevent the deterioration of the status of the ecosystems whilst improving the ecological conditions of waters;
- Achieve at least Good Chemical and Ecological Status for surface waters and Good Chemical and Quantitative Status (as these terms are defined in the WFD) for groundwater bodies;
- Meet the requirements of WFD protected areas including Special Areas of Conservation (SACs), Special Protection Areas (SPAs), shellfish waters, bathing waters and nutrient sensitive areas;
- Promote sustainable use of water as a natural resource;
- Conserve habitats and species that depend directly on water;
- Make progress in reducing and/or phasing out the release of individual or groups of pollutants that present a significant threat to the aquatic environment;
- Continuously reduce the pollution of groundwater and prevent or limit the entry of pollutants; and
- Contribute to mitigating the effects of flood and droughts.

The WFD (as implemented by domestic law) requires that the Scottish Environment Protection Agency (SEPA) has developed a River Basin Management Plan (RBMP). As part of this process, all inland, transitional, and coastal waterbodies have been allocated status categories in order to help inform where waterbodies are at risk and/or protective/management measures are required. The RBMP was updated and published for use in December 2021 - 2027 (Scottish Environment Protection Agency, 2022).

2.2. Assessment Process

There is no guidance produced by SEPA for undertaking a WFD assessment in Scotland. Therefore, the assessment presented in this report follows the Environment Agency (EA) guidance for completing WFD assessments for coastal and transitional waters (Environment Agency, 2017) and the Planning Inspectorate's Advice (National Infrastructure Planning, 2024), and a three-stage approach has been adopted:

- **Stage 1 (Screening)** – Identify the extent to which the Proposed Development is likely to affect water bodies and provides clear justification for the 'screening out' of impacts from further assessment. Excludes any activities that do not need to go through the scoping or impact assessment stages;
- **Stage 2 (Scoping)** – The scope of assessment is agreed at this stage with consultation bodies. An initial assessment to identify the risk of the Proposed Development to receptors within the Zone of Influence such as morphology, habitats, fish, invasive non-native species (INNS) and protected areas. This stage concludes in the identification of those water bodies where a more detailed assessment is required at Stage 3.

- **Stage 3 (Impact Assessment)** - A more detailed assessment of the potential impacts of the activities on receptors identified at screening stage. This assessment identifies ways to avoid or minimise impacts, and demonstrates whether the activities may cause deterioration or jeopardise the waterbody achieving good status.

3. Project Description

Table 3-1: Activity description**Table 3-1** outlines the activities to be undertaken as part of the Proposed Development.

Table 3-1: Activity description

Your activity	Description, notes or more information
Applicant name	SHE-T operating and known as SSEN-T
Application reference number (where applicable)	*To be Confirmed*
Name of activity	Eastern Green Link 3; particularly the Proposed Development
Brief description of activity	The Project is being developed by NGET and SSEN-T. The Project comprises a 2-GW HVDC system linking Peterhead in Scotland and Norfolk in England. In English Waters a DCO under the Planning Act 2008 is being sought by the National Grid Electricity Transmission (NGET), whilst a Marine Licence under the MCAA 2009 and the Marine (Scotland) Act 2010 is being sought for EGL 3 in Scottish waters by SSEN-T.
Location of activity (central point XY coordinates or national grid reference)	The Proposed Development comprises approximately 145 km of subsea HVDC cable from the landfall at Sandford Bay to the boundary with adjacent English waters. The RLB for the Proposed Development is illustrated in **Figure 3-1 (Drawing reference C01494-EGL3-MEA-LOC-001-A) (from Chapter 3: Project Description)**
Footprint of activity (ha)	All works during construction, operation (including maintenance) and decommissioning that disturb the seabed will be within the RLB. Activities that disturb the seabed will generate a sediment plume e.g. horizontal directional drilling (HDD) exit pit excavation, seabed preparation, cable trenching. Calculations undertaken to inform the Marine Environmental Appraisal (MEAp) conclude that a change in suspended sediment concentrations would be noticeable up to 6.5 km from the works. As a linear infrastructure project this impact footprint will occur on either side of the RLB for the Proposed Development. The following footprints across all three waterbodies have been calculated: • Footprint from sediment dispersion (2 km buffer on RLB) = 9222.6 ha (92.23 km^2) • Footprint from underwater noise (5 km buffer (This is based on the Effective Deterrence Range (EDR) for geophysical survey for harbour porpoise) on RLB) = 7163.90 ha (71.64 km^2) A ZoI of 6.5 km (radial distance) has been used to calculate the maximum footprint of activity. This is the precautionary worst-case zone of influence for all activities (as established in the MEAp for, **Chapter 6: Marine Physical Processes**).
Timings of activity (including start and finish dates)	It is assumed that construction of the Proposed Development will commence at the earliest in 2028 and cover a period of 55 months of total construction time. Operation would commence in 2033 with periodical maintenance required during the operational phase of the Proposed Development. It is assumed that maintenance and repair activities could take place at any time during the life span of the Proposed Development.
Extent of activity (for example size, scale frequency, expected volumes of output or discharge)	**Chapter 3: Project Description** provides a detailed description of the construction, maintenance and decommissioning works to be undertaken. The maximum design parameters for construction works are outlined in **Table 3-9 in Section 3.5.1** of the Project Description chapter.
Use or release of chemicals (state which ones)	It is proposed that a trenchless technique such as horizontal directional drill (HDD) would be used at the landfall. The drilling fluids that would to be used for the HDD are likely to be a modified bentonite sourced from the list of notified chemicals (Cefas, 2025). All products used would be certified as being environmentally friendly. Bentonite is classified by the Centre for Environment, Fisheries and Aquaculture Science (Cefas) (scientific advisors to DESNZ) as posing little or no risk to the marine environment. The cables would be non-draining, containing no free liquid or gases that could be released into the marine environment even in the event of severe mechanical damage to the cables.

	All vessels operating in the marine environment will have chemicals and hydrocarbons (fuel) onboard. Chemical and hydrocarbon use is regulated through standard legislation governing vessels. Environmental protection measures will be in place, secured through the Construction Environmental Management Plan (CEMP) and marine licence to prevent the release of chemicals and hydrocarbons to the marine environment.

3.1. Zone of Influence

The WFD applies to coastal waters for up to 3 NM from MLWS in Scotland. WFD waterbodies have been screened into this assessment using a Zone of Influence (ZoI) approach. **Chapter 8: Marine Physical Processes** concluded that the furthest distance that suspended sediment will be deposited from the Proposed Development is 13.6 km, dependent on peak flow speed. All sedimentation outside the Red Line Boundary (RLB) will be from fine particulates that will settle in 1 mm (at 6.5 km) or less (beyond 6.5 km) thicknesses, which is indistinguishable from background levels. Therefore, 6.5 km has been used as the maximum ZoI to assess whether the Proposed Development will have any significant adverse effects on coastal waterbodies. This is the precautionary worst-case ZoI for all activities.

3.2. Relevant Waterbodies

The ZoI, defined in **Section 3.1** has been used to identify the relevant waterbodies to be assessed in this WFD Assessment Report. Assuming the greatest ZoI of 6.5 km from the cable corridor within which all activities associated with the Proposed Development will be undertaken, the following waterbodies have been identified as potentially at risk, these are shown in **Figure 3-1 (Drawing reference C01494-EGL3-MEA-LOC-002-B):**

- Cairnbulg Point to the Ugie Estuary
- Ugie Estuary to Buchan Ness (Peterhead)
- Buchan Ness to Cruden Bay

The relevant waterbodies statistics as of 2023 are provided within **Table 3-2**: below.

Table 3-2: Characteristics of the relevant waterbodies.[1]

WFD Waterbody	Cairnbulg Point to the Ugie Estuary	Ugie Estuary to Buchan Ness (Peterhead)	Buchan Ness to Cruden Bay
Water body ID	200142	200131	200125
River basin district name	Scotland	Scotland	Scotland
Water body type (estuarine or coastal)	Coastal	Coastal	Coastal
Water body total area (ha)	12780	4630	5770
Water body area within the maximum potential ZoI (ha)	1250	4630	3420
Overall water body status	High Ecological Potential (2023)	Good Ecological Potential (2023)	High Ecological Potential (2023)
Ecological status	High (2023)	Moderate (2023)	High
Chemical status	Pass	Pass	Pass
Target water body status and deadline	Unknown	Good (2027)	Unknown
Hydromorphology status of water body	High	Moderate	High
Heavily modified water body and for what use	No	Yes, navigation	No

[1] https://informatics.sepa.org.uk/WaterClassificationHub/

WFD Waterbody	Cairnbulg Point to the Ugie Estuary	Ugie Estuary to Buchan Ness (Peterhead)	Buchan Ness to Cruden Bay
Phytoplankton status	High	High	High
WFD protected areas within 2 km	Southern Trench Marine Protected Area (MPA) (Nature Conservation) - 555703756	Buchan Ness to Collieston Coast SPA - UK9002491 Southern Trench MPA (Nature Conservation) - 555703756 Peterhead Lido Bathing Waters	Buchan Ness to Collieston Coast SPA - UK9002491

550000
600000
650000
700000
6400000
6350000
6300000

Cairnbulg Point to the Ugie Estuary Coastal Waterbody

Ugie Estuary to Buchan Ness (Peterhead) Coastal Waterbody

Buchan Ness to Cruden Bay Coastal Waterbody

0 1 2 3 KM

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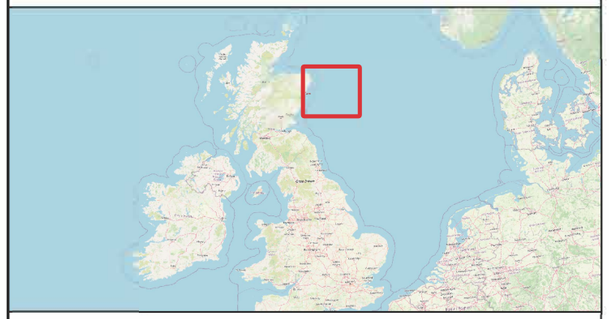
TRANSMISSION

Waterbody Catchments

C01494-EGL3-MEA-LOC-002-B



Legend

- Red Line Boundary
- WFD Study Area (6.5km buffer)

Coastal and Estuarine Waterbody Status

- High status / potential
- Good status / potential
- Moderate status / potential
- Poor status / potential
- 12NM Limit
- Scottish Adjacent Waters

0 12 24 36 KM
0 6 12 18 NM
N

Date	04/08/2025
Coordinate System	ETRS89 / UTM zone 30N
Projection	Universal Transverse Mercator (UTM)
Unit	meters
Scale at A3	1:600,000
Created	AN
Reviewed	JC
Authorised	JDM

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3.2.1. Conclusion

The Proposed Development or its potential maximum ZoI will intercept the Cairnbulg Point to the Ugie Estuary waterbody (200142), the Ugie Estuary to Buchan Ness waterbody (200131) and the Buchan Ness to Cruden Bay waterbody (200125) within Scottish territorial waters.

These three waterbodies will be taken forward to the assessment stage. In addition to this, all associated protected areas mentioned above are located within 6.5 km (the greatest ZoI as defined in **Section 3.1**) of the Proposed Development. The potential impacts on these designated sites have been assessed separately in accordance with the relevant regulations in **Chapter 5: Designated Sites** of the MEAp.

4. Assessment

4.1. Stage 1: Screening

The SEPA RBMP guidance provides a list of low-risk activities that enable further assessment stages to be excluded; however, the Proposed Development does not fulfil the requirements of these and therefore no activities can be screened out. Stage 2 of the assessment process (Scoping) must therefore be completed for all waterbodies from Section 3.2.4.

4.2. Stage 2: Scoping

To determine which receptors may be at risk from activities associated with the Proposed Development, a scoping assessment has been carried out. Receptors that are screened into the assessment will therefore need to be assessed in Stage 3 – Impact Assessment. Receptors are defined in accordance with EA guidance (Environment Agency, 2017) and are based on the waterbody's quality elements and also include consideration of INNS. This section of the WFD Assessment Report is structured in accordance with the scoping template produced by the EA (2017).

4.2.1. Hydromorphology

Hydromorphology concerns the physical characteristics of estuaries and coastlines. Hydromorphology quality elements include the size, shape and structure of the waterbody, and the flow and quantity of water and sediment. Impacts on hydromorphology include changes to morphological conditions (e.g., variation, the seabed sediment structure) and tidal patterns (e.g., dominant currents and wave exposure). A 'high' hyrodomorphological status means that a water body has strong natural physical characteristics with minimal anthropogenic influence.

Table 4-1: provides specific risk information relating to hydromorphology to determine which waterbodies and potential risks should be taken forward to Stage 3 – Impact Assessment.

Table 4-1: Specific Risk Information - Hydromorphology

Assess further if the Proposed Development:	Cairnbulg Point to the Ugie Estuary	Ugie Estuary to Buchan Ness (Peterhead)	Buchan Ness to Cruden Bay
Could impact on the hydromorphology (for example morphology or tidal patterns) of a water body at high status.	**Requires impact assessment.** This waterbody has a 'high' hydromorphological status which means it is at potential risk from the Proposed Development.	**Impact assessment not required.** This waterbody has a 'moderate' hydromorphological status which means it is not at potential risk.	**Requires impact assessment.** This waterbody has a 'high' hydromorphological status which means it is at potential risk from the Proposed Development.
Could significantly impact the hydromorphology of any water body.	The MEAp presented in **Chapter 6: Marine Physical Processes** concluded that this would not significantly impact sediment transport and no impacts on any water bodies are anticipated.		
Is in a waterbody that is heavily modified for the same use as your activity.	**Impact assessment not required.** This waterbody is not assessed as being heavily modified.	**Impact assessment not required.** The waterbody is designated as heavily modified due to navigation; however this is	**Impact assessment not required.** This waterbody is not assessed as being heavily modified.

		not the same use as the Proposed Development and therefore has been scoped out.	

4.2.2. Biology

4.2.2.1. Habitats

In order to establish the risks of the Proposed Development to habitats, the EA guidance (Environment Agency, 2017) classifies habitats into higher and lower sensitivity. Higher sensitivity habitats, such as chalk reef, mussel beds, polychaete reef, subtidal kelp or seagrass beds, have a low resistance to human pressures and a lower recovery rate. Lower sensitivity habitats, such as cobbles, gravels and shingle, subtidal boulder and rocky reefs, have a medium to high resistance to human pressure, resulting in a higher recovery rate.

Table 4-2: provides specific risk information relating to benthic habitats to determine which waterbodies and potential risks should be taken forward to Stage 3 – Impact Assessment.

Table 4-2: Specific Risk Information - Habitats

Consider if the footprint of the Proposed Development is:	**Cairnbulg Point to the Ugie Estuary**	**Ugie Estuary to Buchan Ness (Peterhead)**	**Buchan Ness to Cruden Bay**
0.5 km² or larger?	**Yes.** The ZoI of the Proposed Development exceeds 0.5 km² within this waterbody.		
1% or more of the waterbody's area?	**Yes.** The ZoI of the Proposed Development exceeds 1% or more within this waterbody's area.		
Within 500 m of any higher sensitivity habitat?	**No.** No higher sensitivity habitats identified in this waterbody.	**Yes.** *Sabellaria spinulosa* 'low' reef was observed between KP 548 to KP 561.	**No.** No higher sensitivity habitats identified in this waterbody.
1% or more of any lower sensitivity habitat?	**Yes**. The footprint of the activities of the Proposed Development affects 1% or more of lower sensitivity habitats including subtidal coarse sediment, and mixed sediment (see **Chapter 7: Intertidal and Subtidal Benthic Ecology**).		
Impact assessment required?	**Requires impact assessment as yes to one or more questions.**		

4.2.2.2. Fish

In order to establish risks of the Proposed Development to fish, the EA guidance requires consideration as to whether fish are at risk, but only if the activities are within an estuary or could prevent fish entering an estuary.

Table 4-3: provides specific risk information relating to fish to determine which waterbodies and potential risks should be taken forward to Stage 3 – Impact Assessment.

Table 4-3: Specific Risk Information - Fish

Consider if the Proposed Development:	**Cairnbulg Point to the Ugie Estuary**	**Ugie Estuary to Buchan Ness (Peterhead)**	**Buchan Ness to Cruden Bay**
Is in an estuary and could affect fish in the estuary, outside the estuary but could delay or prevent fish entering it or could affect fish migrating through the estuary	The location of the Proposed Development is not within in an estuary, although there are a number of estuaries and rivers located nearby. There are several impact pathways during the phases of the Proposed Development that have the potential to influence fish movement. These include:		

Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or a change in depth or flow)	• Construction: underwater noise, temporary increase and deposition of suspended sediments • Operation: underwater noise, temporary increase and deposition of suspended sediments and electromagnetic changes. • Decommissioning: underwater noise, temporary increase and deposition of suspended sediments.
Could cause entrainment or impingement of fish	The activities are not anticipated to significantly affect fish movement or act as a physical barrier, as assessed in **Chapter 8: Fish and Shellfish**. Despite this, the Proposed Development has the potential to affect spawning and nursery grounds for fish species and therefore an **requires an impact assessment.**

4.2.3. Water Quality

Water quality impacts relate to changes in water clarity, temperature salinity, nutrients, oxygen levels, nutrients and microbial patterns that occur for longer than the duration of a spring neap tidal cycle (approx. 14 days). Whetherthe waterbodies in question have a history of harmful algal blooms, or bad, poor or moderate phytoplankton status must also be considered within this section.

Table 4-4: provides specific risk information relating to water quality to determine which waterbodies and potential risks should be taken forward to Stage 3 – Impact Assessment.

Table 4-4: Specific Risk Information - Water Quality

Consider if the Proposed Development:	Cairnbulg Point to the Ugie Estuary	Ugie Estuary to Buchan Ness (Peterhead)	Buchan Ness to Cruden Bay
Could affect water clarity, temperature, salinity, oxygen levels, nutrients or microbial patterns continuously for longer than a spring neap tidal cycle (about 14 days)?	**Impact assessment not required.** Activities of the Proposed Development, such as HDD and cable trenching activities, have the potential to generate sediment plumes that may impact water clarity. **Chapter 6: Marine Physical Processes** concluded that the furthest distance that suspended sediment will be deposited from the Proposed Development is 13.6 km, dependent on peak flow speed. All sedimentation outside the RLB will be from fine particulates that will settle in 1 mm (at 6.5 km) or less (beyond 6.5 km) thicknesses, which is indistinguishable from background levels		
Is the waterbody with a phytoplankton status of moderate, poor or bad?	**Impact assessment not required.** All waterbodies have a 'high' plankton status.		
Is in a waterbody with a history of harmful algae?	**Impact assessment not required.** None of the waterbodies have a history of harmful algae.		

4.2.4. Protected Areas

Potential impacts to protected areas relates to any WFD protected areas that are at risk from the activities of the Proposed Development. WFD protected areas include Special Areas of Conservation, Special Protection Areas, shellfish waters, bathing waters and nutrient sensitive areas.

The ZoI in respect of the assessment of protected sites is underpinned by **Chapter 6: Marine Physical Processes** which concluded that the furthest distance that suspended sediment will be deposited from the Proposed Development is 13.6 km, dependent on peak flow speed. All sedimentation outside the RLB will be from fine particulates that will settle in 1 mm (at 6.5 km from the plume source) or less thicknesses, which is indistinguishable from background levels. Additionally, Sinclair et al. (2023) reported that 90 % of sediments suspended during cable laying activities are predicted to resettle within 1 km of the RLB and Gooding et al. (2012) suggests that fine particles may travel 1-2 km from the source. The ZoI for this assessment is therefore set at a precautionary 2 km on the basis that beyond this suspended sediment concentrations are indistinguishable above background levels.

Table 4-5: provides specific risk information relating to protected areas to determine which waterbodies and potential risks should be taken forward to Stage 3 – Impact Assessment.

Table 4-5: Specific Risk Information - Protected Areas

Consider if the Proposed Development is:	Cairnbulg Point to the Ugie Estuary	Ugie Estuary to Buchan Ness (Peterhead)	Buchan Ness to Cruden Bay
Within 2 km of any WFD protected area.	**Requires impact assessment.** Southern Trench MPA (Nature Conservation) - 555703756	**Requires impact assessment.** Buchan Ness to Collieston Coast SPA - UK9002491 Southern Trench MPA (Nature Conservation) - 555703756 Peterhead Lido Bathing Waters.	**Requires impact assessment.** Buchan Ness to Collieston Coast SPA - UK9002491

4.2.4.1. Invasive Non-native species

The accidental introduction of INNS has the potential to cause detrimental changes to habitats by out-competing native species and introducing diseases which could result in mortality.

Table 4-6: provides specific risk information relating to INNS to determine which waterbodies and potential risks should be taken forward to Stage 3 – Impact Assessment.

Table 4-6: Specific Risk Information - Invasive Non-native Species

Consider if the Proposed Development could:	Cairnbulg Point to the Ugie Estuary	Ugie Estuary to Buchan Ness (Peterhead)	Buchan Ness to Cruden Bay
Introduce or spread INNS	**Impact assessment not required.** During construction, operation and decommissioning of the Proposed Development, project vessels with follow all relevant guidelines (GB Non-native Species Secretariat, 2015). This includes using vessel cleaning facilities and the use of anti-fouling paint. Project vessels and contractors will comply with the International Convention for the Control and Management of Ships' Ballast water and Sediments and all seabed deposits will be inert with no biologically active material. Project vessels will complete a biosecurity risk assessment prior to arriving on site which will include factors such as origins of the vessels and ensuring that relevant equipment is cleaned before use. Compliance with the above regulations should be sufficient to minimise the risk to the environment. No external cable protection will be deposited within the waterbody. These measures will ensure that INNS are not introduced as a result of the Proposed Development.		

4.2.5. Summary

Where no risk to potential receptors have been identified as part of this scoping stage, Stage 3 – Impact Assessment does not need to be completed. The potential risks to receptors that the scoping exercise concluded need to be taken forward for detailed impact assessment for each of the relevant waterbodies is provided in **Table 4-7**:.

Table 4-7: Potential Risks to be Assessed in Stage 3 - Impact Assessment

Receptor	Cairnbulg Point to the Ugie Estuary	Ugie Estuary to Buchan Ness (Peterhead)	Buchan Ness to Cruden Bay
Hydromorphology	**Yes, taken forward to Stage 3 Impact Assessment.**	**No, not taken forward to Stage 3 Impact Assessment.**	**Yes, taken forward to Stage 3 Impact Assessment.**

Receptor	Cairnbulg Point to the Ugie Estuary	Ugie Estuary to Buchan Ness (Peterhead)	Buchan Ness to Cruden Bay
	This waterbody has a 'high' hydromorphological status, putting it at potentially at risk from the Proposed Development.	The Proposed Development does not present a potential significant hydromorphology risk to this waterbody.	This waterbody has a 'high' hydromorphological status, putting it at potentially at risk from the Proposed Development.
Biology: habitats	**Yes, taken forward to Stage 3 Impact Assessment.** The Proposed Development's footprint exceeds 0.5 km², 1% of the waterbody and affects more than 1% of lower sensitivity habitat.	**Yes, taken forward to Stage 3 Impact Assessment.** The Proposed Development's footprint exceeds 0.5 km², 1% of the waterbody, affects more than 1% of lower sensitivity habitat and contains observed Sabellaria spinulosa 'low' reef habitat between KP 548 to KP 561.	**Yes, taken forward to Stage 3 Impact Assessment.** The Proposed Development's footprint exceeds 0.5 km², 1% of the waterbody and affects more than 1% of lower sensitivity habitat.
Biology: fish	**Yes, taken forward to Stage 3 Impact Assessment.** Despite the activities of the Proposed Development not being within an estuary, nor being anticipated to delay or prevent fish entering any estuaries or significantly affect migrating fish, the Proposed Development has the potential to effect spawning and nursery grounds for fish species.		
Water quality	**No, not taken forward to Stage 3 Impact Assessment.** The Proposed Development does not have the impact to significantly affect water quality and sufficient environmental protection measures will be in place, secured through the CEMP and marine licence to prevent the release of chemicals and hydrocarbons to the marine environment.		
Protected areas	**Yes, taken forward to Stage 3 Impact Assessment.** The activities of the Proposed Development are within 2 km of a number of WFD protected areas.		
Invasive non-native species	**No, not taken forward to Stage 3 Impact Assessment.** The design of the Proposed Development and its embedded mitigation result in a low risk of spreading or introducing INNS.		

4.3. Stage 3: Impact Assessment

The impact assessment below is written in the context of the embedded mitigation measures, which are summarised in **Chapter 15: Schedule of Mitigation,** within the respective receptor chapters in the MEAp, being included throughout the lifetime of the Proposed Development (design, construction, operation and decommissioning). This impact assessment has been based on the detailed impact assessments presented in the MEAp (See **Chapter 6: Marine Physical Processes, Chapter 7: Intertidal and Subtidal Benthic Ecology** and **Chapter 8: Fish and Shellfish**).

4.3.1. Hydromorphology

Both the Cairnbulg Point to the Ugie Estuary waterbody and the Buchan Ness to Cruden Bay were identified by the Stage 2 – Scoping assessment as being at potential risk by the Proposed Development due to their 'high' hydromorphological status. Therefore, a Stage 3: Impact Assessment is required.

Chapter 6: Marine Physical Processes provides an assessment of the impacts on subtidal and intertidal morphology during construction phases. As such for the WFD, it concludes that the Proposed Development's effect on the hydromorphology, including the changes in Suspended Sediment Concentration (SSC), has been assessed to be **Negligible** and **Not Significant** as the predicted increases in SSC and sedimentation are small in comparison to natural processes in the area.

4.3.2. Biology

4.3.2.1. Habitats

The three waterbodies, the Cairnbulg Point to the Ugie Estuary, Ugie Estuary to Buchan Ness (Peterhead) and Buchan Ness to Cruden Bay have been identified by the Stage 2 – Scoping assessment as being potentially at risk from the Proposed Development. This is due to the Proposed Development's footprint exceeding 0.5 km², more than 1% of the waterbodies' area and covering 1% more of lower sensitivity habitat. Additionally, the Ugie Estuary to Buchan Ness (Peterhead) waterbody has observed 'low' *Sabellaria spinulosa* reef between KP 548 and KP 561, which is an Annex I biogenic reef habitat, giving it a higher sensitivity.

Chapter 7: Intertidal and Subtidal Benthic Ecology provides an environmental assessment of the impacts of the temporary/ permanent habitat loss, seabed disturbance and temporary increase and deposition of suspended sediments. It concludes that the effect on subtidal sands and gravels has been assessed to be **Minor** and **Not Significant**. The Proposed Development's impact on *Sabellaria spinulosa* 'low' reef has been deemed to be **Moderate** and **Significant** due to the potential temporary / permanent habitat loss during the construction and operation phases. Construction activities will be planned and implemented in a manner that should avoid interference with the Annex I *Sabellaria spinulosa* reefs as far as possible, and pre-construction surveys will inform the exact location of these habitats, ensuring accurate micro-routing within the 500m cable corridor to avoid any interaction with the Annex I habitat where possible. For the WFD this mitigation, in combination with the common presence of Annex I *Sabellaria spinulosa* reefs in the North Sea, the localised and temporary nature of the Proposed Development associated seabed disturbance and the fact that the impact is likely to also occur under natural conditions has led to the significance of the effect to be assessed as **Minor** and **Not Significant**. Additionally, the area of direct physical disturbance is limited to a maximum width of 25 m per cable within the installation corridor, with the area of disturbance being spatially limited and the seabed expected to return to pre-installation conditions under natural processes.

4.3.2.2. Fish

The Proposed Development is not within an estuary. However, **Chapter 8: Fish and Shellfish** has identified that within the three waterbodies, several species are known to have spawning and/or nursery grounds that overlap with the Proposed Development's ZoI. These species include:

- Herring
- Sandeel
- Shellfish
- Elasmobranchs

Chapter 8: Fish and Shellfish provides an environmental assessment of the likely significant effects (LSE) on fish and shellfish resulting from the construction, operation (including maintenance) and decommissioning of the Proposed Development. It provides assessments for the following impact pathways of relevance to the waterbodies:

- Temporary habitat loss/seabed disturbance;
- Permanent habitat loss;
- Temporary increase and deposition of suspended sediments;
- Underwater noise;
- Changes in distribution of species;
- Electromagnetic changes / barrier to species movement; and
- Temperature increases due to the presence of operational cables.

As such for the WFD, The assessment has concluded that the significance of the effects are assessed as **Negligible** and **Not Significant** on fish and shellfish from the Proposed Development alone during construction, operation and decommissioning, provided design and control measures are implemented.

4.3.3. Protected Areas

The following WFD protected areas are associated with the Cairnbulg Point to the Ugie Estuary, Ugie Estuary to Buchan Ness (Peterhead) and Buchan Ness to Cruden Bay waterbodies and fall within 2 km of the Proposed Development:

- Buchan Ness to Collieston Coast SPA – UK9002491
- Southern Trench MPA (Nature Conservation) - 555703756
- Peterhead Lido Bathing Waters

4.3.3.1. Buchan Ness to Collieston Coast SPA

The Proposed Development's maximum ZoI crosses the Buchan Ness to Collieston Coast SPA in both the Ugie Estuary to Buchan Ness (Peterhead) and Buchan Ness to Cruden Bay waterbodies. The Habitats Regulation Appraisal (HRA) process, outlined in **Appendix 5a: HRA Screening**, considered the effects of the Proposed Development on the site. HRA screening concluded that the Proposed Development could have an LSE on the SPA and that an Appropriate Assessment should be conducted by the authority (being MD-LOT in the case of the Proposed Development). A Report to Inform Appropriate Assessment (RIAA) has been provided with the MEAp. It concludes that mitigation can be adopted such that the Proposed Development would not have an adverse effect on the integrity of the SPA alone or in-combination with other projects. Therefore, a Stage 3 Assessment of Alternative Solutions and subsequently a Stage 4 Assessment of Imperative Reasons of Overriding Public Interest (IROPI), will not be required..

4.3.3.2. Southern Trench MPA

The Proposed Development's maximum ZoI crosses the Southern Trench MPA in both the Cairnbulg Point to the Ugie Estuary and Ugie Estuary to Buchan Ness (Peterhead) waterbodies. The Stage 1 MPA Assessment process, outlined in **Appendix 5c: MPA Screening**, considered the effects of the Proposed Development on the site. The Stage 1 MPA Assessment concluded that the Proposed Development would not have an adverse effect on the integrity of the MPA alone and in-combination with other projects and therefore was screened out.

4.3.3.3. Peterhead Lido Bathing Waters

The Proposed Development's maximum ZoI crosses the Peterhead Lido Bathing Waters in the Ugie Estuary to Buchan Ness (Peterhead) waterbody. **Chapter 6: Marine Physical Processes** concluded that overall, changes to intertidal and subtidal morphology, including changes in SSC, are predicted to be localised, and short lived within the designated bathing water. The predicted increases in SSC and sedimentation are small in comparison to natural processes in the area and therefore has been assessed to be **Minor** and **Not Significant** for the WFD

4.3.4. Deterioration

The WFD Guidance Assessment (Environment Agency, 2017) defines deterioration in accrodance with EU case law as "when the status of at least one quality element falls by one class". If a quality element is already at the lowest status, any reduction in its condition is counted as deterioration.

The potential effects associated with the activities of the Proposed Development will be limited both spatially and temporally, with no deterioration in the classification of the Cairnbulg Point to the Ugie Estuary, Ugie Estuary to Buchan Ness (Peterhead) and Buchan Ness to Cruden Bay waterbodies expected to occur.

The Proposed Development would:

- Not result in a reduction of the WFD classification of any waterbodies;
- Not put at risk the good status or potential of any waterbodies; and
- Not inhibit any waterbodies from progressing towards good status or potential.

5. Conclusions

The WFD Assessment Report indicates that potential exists for spatially and temporally limited effects on the Cairnbulg Point to the Ugie Estuary, Ugie Estuary to Buchan Ness, and Buchan Ness to Cruden Bay, waterbodies as a result of activities associated with the Proposed Development.

However, the assessment concludes that, with the implementation of the Proposed Development as described in **Chapter 3: Project Description**, and embedded mitigation measures, the Proposed Development will not:

- Result in the deterioration of the waterbodies;
- Put at risk the good status of the waterbodies or the potential of any waterbodies; and
- Inhibit any waterbodies from progressing towards good status or potential.

Thus, the activities of the Proposed Development are assessed as in compliance with the requirements of the WFD and relevant RBMPs.

6. References

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