GREEN VOLT

Green Volt Offshore Windfarm

Onshore Environmental Impact Assessment Report

Volume 1

GREEN VOLT

Non-Technical Summary

Onshore EIA Report: Volume 1

Document Code: FLO-GRE-NTS-0001		
Contractor Document Number:	FLO-GRE-NTS-0001	
Version Number:	00	
Date:	*03/08/23*	
Prepared by:	Olivia Selby	*Olivia Selby*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First Draft for Review	28/07/23
A2	Second Draft for Review	02/08/23
A3/00	Third Draft Review & Final	03/08/23

Contents

Acronyms

Acronyms	Description
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CTMP	Construction Traffic Management Plan
CO_2	Carbon Dioxide
CSM	Conceptual Site Model
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
GCR	Green Cat Renewables
GHG	Greenhouse Gas
GW	Gigawatt
GWDTE	Groundwater Dependent Terrestrial Ecosystems
GVA	Gross Value Added
HGV	Heavy Goods Vehicle
HVAC	High Voltage Alternating Current
IAQM	Institute of Air Quality Management
IEMA	Institute of Environment Management and Assessment
LCA	Landscape Character Areas
LDP	Local Development Plan
LGV	Low Goods Vehicle
LUC	Land Use Capability
MW	Megawatt
NGESO	National Grid Electricity System Operator
NGNDSS	National Grid New Deer Substation
NSR	Noise Sensitive Receptors

NTS	Non-Technical Summary
NVC	National Vegetation Classification
PAC	Pre-Application Consultation
PAL	Prime Agricultural Land
PWS	Private Water Supply
ROW	Right Of Way
SAC	Special Area of Conservation
SCRI	Scottish Crop Research Institute
SLA	Special Landscape Areas
SPA	Special Protection Area
SSEN	Scottish and Southern Electricity Networks
SSSI	Sites of Special Scientific Interest
SuDS	Sustainable Drainage Systems
UK	United Kingdom

Glossary

Term	Description
Applicant	Green Volt Offshore Windfarm Ltd.
Application Site Boundary	The extent of the area relating to the planning application.
Cable Route Corridor	The cable route corridor is the area within which the cable trench, haul road and all ancillary infrastructure will be. The working width of this corridor will be up to 80m in some locations will be required to allow access for excavating cable and drainage trenches, storage of topsoil and excavated soil, delivery of materials, transportation of personnel, and the presence of excavation and cable installation machinery and equipment
Development Plan	The Site is wholly within the Aberdeenshire Council area and therefore the Development Plan in this instance consists of the National Planning Framework 4 (NPF4) and the Aberdeenshire Local Development Plan 2023 (ALDP) (Aberdeenshire Council, 2023).
Landfall	The area where the subsea cables from the Green Volt Offshore Windfarm will make landfall. This area will contain the Trenchless Compound and any other ancillary infrastructure required.
Main Site Yard	The Main Site Yard is where staff will mobilise on workdays, and where they will park their personal transport before being transported to the work site.
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).
Mobilisation Areas	The mobilisation areas will be used to offload plant and materials to allow access to the Cable Route Corridor. Will also be used for temporary storage of construction materials.
National Development	One of the 18 developments and classes of development that are considered nationally significant by National Planning Framework 4
National Grid New Deer Substation	The existing national grid 400Kv substation located at New Deer.
Net Zero GHG	The balance is zero between the amount of greenhouse gas (GHG) that is produced and the amount that is removed from the atmosphere.
Offshore EIA Report	The EIA for the Green Volt Offshore Windfarm submitted to Marine Scotland in January 2023.
Offshore Export Cables	The cables which will bring electricity from the offshore substation platform to the Landfall or to the oil and gas platforms.

Offshore Project	Refers solely to the offshore element of the Project, which is being consented separately. This includes the Offshore windfarm and offshore export cable corridor.
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 Cables	The cables which will take power to and from the Proposed Substation south-west of New Deer and Green Volt Offshore windfarm.
Onshore EIA Report	The EIA Report for the Green Volt Onshore Infrastructure (Proposed Development).
Onshore Transition Jointing Pit	The interface between the offshore and onshore cable systems.
PM_{10}	Airborne particulate matter with an aerodynamic diameter less than 10 microns (µm).
Project	Green Volt Offshore Windfarm project as a whole, including associated onshore and offshore infrastructure development.
Proposed Development	Green Volt Onshore Infrastructure development including; the Landfall, the Cable Route Corridor, and the Substation Compound. Including all ancillary infrastructure.
Proposed Substation	The new Proposed Substation at the grid connection point located approximately 5.5km from New Deer and 0.45km south-east of the existing National Grid New Deer Substation.
Site	The area within the Application Site Boundary within which the Proposed Development lies.
Substation Compound	Part of the Proposed Development consisting of substation (grid transformers and HVAC switchgear and associated electrical equipment), temporary construction compound, drainage, and the proposed route of the connection to the SSE/National Grid Substation.
Trackout	The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network.
Trenchless Compound	A trenchless mechanism for the installation underground utilities such as cables.
Wave Buoys and LiDAR	Devices which capture oceanographic and atmospheric data, particularly wind, wave, tidal flow, direction and water temperature data.

Non-Technical Summary

1.1 Introduction

1. This document is the Non-Technical Summary (NTS) of the **Onshore Environmental Impact Assessment (EIA) Report** for the Proposed Development. The Offshore Project is assessed in a separate **Offshore EIA Report.** Together, the Combined Onshore and Offshore Green Volt Projects form the Green Volt Offshore Windfarm Project as a 'whole' (referred to as the 'Project' from hereon).
2. The NTS is a stand-alone document which provides a concise and accessible overview of the Proposed Development, the site selection process, and the main findings of the **Onshore EIA Report** in non-technical terms.
3. The **Onshore EIA Report** describes the potential onshore impacts of the Proposed Development and assesses the significance of their effect. The **Onshore EIA Report** also considers the impacts that may arise during the Proposed Development's construction, operation and decommissioning phases. The assessment also considers the potential cumulative impacts of other onshore construction projects either currently being constructed or in the development planning stage. For further information, the full **Onshore EIA Report** should be referred to.
4. Potential offshore environmental impacts are assessed in the **Offshore EIA Report** for the Offshore Project submitted to Marine Scotland in January 2023 as part of an application for consent pursuant to section 36 of the Electricity Act 1989 (along with associated marine licenses).

1.1.1 Project Overview

5. The Proposed Development is an onshore cable route and substation which will connect the Offshore Project to the National Grid. The Proposed Development commences at the Landfall location north of Peterhead and crosses Aberdeenshire for approximately 35km to the Substation Compound before the connection point at the National Grid New Deer Substation (NGNDSS), as shown on **Figure 1.1 Site Location**.
6. The Project will provide oil & gas (O&G) platforms in the Outer Moray Firth with renewable electricity, harnessed from the proposed Green Volt Offshore Windfarm. The Project will also provide renewable energy to the Scottish mainland via a subsea export cable that will connect onshore to the National Grid.
7. The Project aims to be operational by 2027 and creates the opportunity to mitigate approximately 500,000 tonnes of Carbon Dioxide (CO_2) annually. The Project contributes to reducing greenhouse gas by utilising wind energy, which will create a more sustainable and renewable energy based landscape in Scotland.
8. The Proposed Development will comprise the following key components:

- Landfall and associated infrastructure;
- Cable Route Corridor and associated infrastructure; and
- Substation Compound and associated infrastructure.

1.1.2 The Applicant

9. The Proposed Development is being developed by Flotation Energy Ltd (Flotation Energy) and Vårgrønn AS (Vårgrønn). Flotation Energy Ltd and Vårgrønn have formed the Applicant company, Green Volt Offshore Windfarm Limited, to progress the development of the Proposed Development.

- Flotation Energy is an offshore wind development company, headquartered in Edinburgh, United Kingdom (UK). Founded in 2018, the company is pioneering the development of both floating and fixed offshore wind in Scotland, the UK and Internationally. Flotation Energy's UK Projects include:
- Green Volt Offshore Windfarm (Floating);
- Morecambe Offshore Windfarm (480 MW offshore wind, awarded as part of the England and Wales Round 4 auction) (Fixed); and
- White Cross Floating Windfarm (100 MW offshore wind, South West England) (Floating).

10. Flotation Energy is also active in Europe and internationally, with a total offshore wind development pipeline of over 10 GW capacity. Flotation Energy is determined to play a central role in the transformation to renewable energy to confront the climate crisis, in line with targets made under the Paris Agreement. Flotation Energy is determined to play a crucial role in the transformation to renewable energy to combat the climate crisis, making a significant contribution to Scotland's 2045 net zero targets and the North Sea Transition Deal goal to reduce offshore emissions by a minimum of 50% by 2030.

11. Vårgrønn is a growing agile offshore wind company and was established as a joint venture between Italian energy major Eni Plenitude and the Norwegian private equity manager and offshore energy serial entrepreneur HitechVision.

1.1.3 Need for the Project

12. There is a demand for a range of energy sources within Scotland and the UK as a whole to ensure a sufficient clean, green energy supply at an affordable price. Renewable energy sources are particularly in high demand so that the legally binding commitments to combating climate change can be met successfully. As a result, renewable energy will have a higher percentage of the energy generation mix creating a more sustainable future. The Project demonstrates the potential to decarbonise existing oil and gas facilities in the Outer Moray Firth which in turn can make a significant contribution to CO_2 emissions reduction: whilst simultaneously securing a renewable energy supply to the National Grid.

13. The Project is proposed as a significant action towards achieving the objectives outlined in the UK North Sea Transition Deal. This Deal, signed in March 2021, represents a sector agreement between the UK government and the oil and gas industry. It acknowledges the ongoing importance of oil and gas in our energy supply during the transition to a Net Zero future. Recognising the need to reduce CO_2 emissions generated by offshore oil and gas production as early as possible: the Deal sets a target of at least a 50% reduction by 2030.

1.1.4 Regulatory and Policy Context

14. The main aim of the **Onshore EIA Report** is to ensure that the consent granting authority, in this case Aberdeenshire Council, make their decision in full knowledge of any effects on the onshore environment.

15. The Planning Statement accompanies the **Onshore EIA Report**, in line with the terms of the Town and Country Planning (Scotland) Act 1997 (Planning Act 1997) (Scottish Government, 1997a). The application would be a National Development. Section 3A(4)(b) of the Planning Act 1997 sets out that National Planning Frameworks may describe a development and designate it, or a class of development and designate each development within that class as a "national development". National Planning Framework 4 (Scottish Government, 2023a) (NPF4) includes 18 national developments, six of which support sustainable places. The Proposed Development would fall within the third category of: "Strategic Renewable Electricity Generation and Transmission Infrastructure".

16. The Site is wholly within Aberdeenshire Council area. Therefore, under Section 1 of the Planning Act 1997, Aberdeenshire Council will be the Planning Authority which will be the determining authority.

17. This planning application submission is wholly above Mean Low Water Springs and no offshore consents are required.

18. **Chapter 2 - Policy and Legislative Context** presents a review of the policy context and legislative framework underpinning the Proposed Development in order to detail any potentially significant environmental impacts. The chapter has a related but separate role to the Planning Statement. A review of the international, UK and national legislative and policy context regarding climate change is provided, highlighting how the Proposed Development relates to the targets and goals set out to address climate change.

19. The Project is considered in relation to terrestrial and marine (where relevant) legislation, policy and guidance. The terrestrial legislative and policy context for the Proposed Development are reviewed, this includes a review of the Development Plan which contains national and local planning policies.

20. While the **Onshore EIA Report** and planning application relate to onshore works only, the chapter provides some background on the wider regulatory context, including a review of the electrification of the oil and gas network which forms part of the context, describing why the onshore Landfall point, Cable Route Corridor and Proposed Substation are proposed.

1.1.5 Consultation

21. Consultation is an important feature in the EIA process and continues throughout the life cycle of a project from pre-application planning to consent and into development. Early discussion with regulators and stakeholders have been undertaken since the early stages of the Proposed Development.

22. The Applicant carried out extensive community and stakeholder consultation to inform all involved of the Proposed Development design and details. This Pre-Application Consultation (PAC) Report will be submitted in accordance with the requirements of the Town and Country Planning (Scotland) Act 1997 as amended and the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 as amended. The PAC Report also follows the requirements of Regulations 4—7b to ensure that the Proposed Development meets the regulatory requirements for all PAC activities.

23. The Applicant ensured there were several ways for stakeholders to participate in PAC such as:

- Submit feedback using our online feedback form or complete the same form at the event.
- Send an email to hello@greenvoltoffshorewind.com
- View the online exhibition https://greenvoltoffshorewind.com/exhibitions to understand the Proposed Development in their own time.
- Join live chat events.
- Attend in-person exhibitions, staffed by key members of the project team to enable questions to be answered on the day.
- An information leaflet was shared to allow attendees to follow up after the event with subject matter experts.

24. Feedback received during the PAC process included concerns surrounding different aspects of the Proposed Development; the Proposed Development as a whole, the cable route, and the substation location. Common concerns were landscape and visual impacts, drainage, and water supply impacts; and impacts on traffic and transport. More detail is provided in the **PAC Report**.

1.1.6 Site Selection and Assessment of Alternatives

25. The design process of the Proposed Development has been iterative and there have been many iterations between the identification of initial cable route options to the final Proposed Development. There have been five key design iterations that represent key milestones of the design evolution. These iterations are defined as follows:

- **Iteration 1** – Original Scoping: This iteration was submitted under the original scoping submission to Aberdeenshire Council in March 2022.
- **Iteration 2** – Rescope: This iteration was submitted under the second scoping submission to Aberdeenshire Council in December 2022.
- **Iteration 3** – Post-Exhibition: This iteration was designed following public exhibitions in January and March 2023 and was informed by feedback from these events.
- **Iteration 4** – Refined: This iteration formed the first refinement by the Applicant's engineering contractor in April 2023.
- **Iteration 5** – Planning: This iteration forms the final design submitted into planning and was finalised in June 2023 following final survey work and an engineering walkover survey.

26. The final design of the Proposed Development (Iteration 5) has been informed by a robust EIA and design iteration process, taking into account potential environmental effects, physical constraints, and technical considerations. The information used to inform the design iteration process includes consultation responses, feedback from public exhibitions, extensive baseline data and the EIA. This has ensured that potential adverse effects as a result of the Proposed Development have been minimised as far as is reasonably practicable. Iteration 5 and the details of all of the components of the final design are described in **Chapter 5 – Project Description**.

27. The Offshore Project, including the Wind Turbine Generators, the Offshore Substation Platform, the Subsea Cables and Wave Buoys and LiDAR are subject to a separate application. The Offshore EIA was prepared and

submitted to Marine Scotland for the Offshore Project in January 2023 as part of an application for consent pursuant to section 36 of the Electricity Act 1989 (along with associated marine licenses).

1.1.6.1 Grid Connection and Substation Compound

28. The assessment and identification of the grid connection location were undertaken by National Grid Electricity System Operator (NGESO) along with the transmission owner, who in this location is SSEN Transmission plc. This process resulted in the grid connection offer being made to the Applicant to connect at the NGNDSS. This offer was made in June 2021 by NGESO and was accepted. Once the grid connection was confirmed to be at the NGNDSS, Landfall options were identified.

1.1.6.2 Landfall locations

29. As detailed in the **Offshore EIA Report**, a number of areas were identified for Landfall, these generally fall into the two following categories. The St Fergus South Landfall Option which is located north of Peterhead with various possible locations for an onshore/offshore jointing pit and onward cable to the Proposed Substation. Locations to the north allow the Project to avoid the Buchan Ness to Collieston Special Protection Area (SPA) and Special Area of Conservation (SAC) but provide a more complex path onshore with a number of river crossings on route to the Substation Compound at New Deer. The NorthConnect Parallel Landfall Option: located south of Peterhead with various possible locations for an onshore/offshore jointing pit and onward cable to the Proposed Substation. Locations to the south may require crossing the Buchan Ness to Colliestone SPA and SAC. The St Fergus South Landfall Option and the NorthConnect Parallel Landfall Option are shown on **Figure 5.11** of the **Offshore EIA Report**.

30. A Landfall Feasibility Report has been undertaken (**Appendix 4.1** of the **Offshore EIA Report**) which considered potential Landfalls at both St Fergus South and NorthConnect Parrallel from a practical, constraint and feasibility perspective including environmental, cultural and technical considerations. Both Landfalls were considered feasible. It was understood that the final decision of Landfall location would be determined following a detailed evaluation by the team undertaking the **Onshore EIA Report**.

31. The confirmation that both Landfall options were feasible allowed for a number of options for Landfall locations both north and south of Peterhead and subsequent cable route options between the potential Landfalls locations and the grid connection to be explored during the design process of the Proposed Development. At the point of submitting the scoping report to Aberdeenshire Council, eleven Landfall location options both north and south of Peterhead were proposed. Landfall options were chosen that were in close proximity to the coast, would minimise the length of the Trenchless Crossing that would be required to bring the cable onto land from offshore.

1.1.6.3 Cable Route Corridor

32. Having identified a number of Landfall location options, four cable route options at 100m in width were identified, two starting from the Landfall options north of Peterhead and two starting from the Landfall options south of Peterhead, near Boddam.

33. Following the commencement of survey work, and consultation with stakeholders and landowners, the cable routes were refined into two route options, referred to as the Northern Cable Route Option and the Southern Cable Route Option. The Cable Routes were then further refined based on a number of environmental, technical and landowner constraints.

34. Through discussions between Green Cat Renewables and the Applicant, Cable Route Option 2 was deemed to be the preferred route option from the north and through a number of design changes, this evolved into the Northern Cable Route Option. The Northern Cable Route Option was taken forward in the Scoping Report submitted to Aberdeenshire Council in December 2022. This cable route was also the one that was presented at the first public exhibition. As discussed in detail in **Chapter 4 – Assessment of Alternatives**. The Northern Route Option evolved through various iterations to become the Cable Route Corridor and the final design that has become the Proposed Development.

1.1.7 The Environmental Impact Assessment (EIA) Process

35. This EIA has been carried out in accordance with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter referred to as the EIA Regulations). Further information on the regulatory framework is presented in **Chapter 2 - Regulatory and Policy Context** of this **Onshore EIA Report**.

36. Where specific guidance has been used it has been identified in the Legislation, Policy and Guidance section of each technical chapter within the **Onshore EIA Report**. The approach to the EIA also closely follows the requirements of guidance including:

- *Environmental Impact Assessment Handbook*; guidance for competent authorities, consultation bodies and other involved in the Environmental Impact Assessment process for Scotland (NatureScot, 2018);
- Institute of Environmental Management and Assessment (IEMA) *Environmental Impact Assessment Guide to Shaping Quality Development* (IEMA, 2015);
- relevant guidance issued by other government and non-governmental organisations; and
- receptor-specific guidance documents.

37. Open and extensive consultation with communities, stakeholders, and statutory bodies has been undertaken since late 2022, in order to inform and help shape the EIA processes of the onshore works for the Proposed Development. The results of the consultation to date have informed the approach to each assessment, as well as the alternatives considered and the site selection process.

38. All potential onshore impacts of the construction, operation or decommissioning of the Proposed Development have been identified and an assessment made on the significance of each potential effect using a standardised approach by EIA specialists.

39. Where the impact assessment identifies that an aspect of the Proposed Development is likely to give rise to significant environmental effects, mitigation measures are proposed to avoid or reduce them to acceptable levels and, if possible, enhance the environment. Mitigation will be agreed through ongoing consultation with the relevant authorities.

40. The **Onshore EIA Report** also considers the potential cumulative impacts of other onshore construction projects either currently being constructed or in the development planning stage.

1.1.8 Structure and Content of EIA Report

41. The **Onshore EIA Report** considers all onshore infrastructure including ancillary infrastructure. The **Onshore EIA Report** is comprised of three volumes:

- Volume 1: **Onshore EIA Report** Chapters (shown in **Table 1.1**)
- Volume 2: Figures
- Volume 3: Appendices

*Table 1.1 **Onshore EIA Report** Chapters*

EIA Technical Chapter	Chapter Number	Lead Author
Introduction	1	Green Cat Renewables
Regulatory and Policy Context	2	Green Cat Renewables
EIA Methodology	3	Green Cat Renewables
Assessment of Alternatives	4	Green Cat Renewables
Project Description	5	Green Cat Renewables
Ecology and Ornithology	6	IMTeco Ltd and GLM Ecology Ltd
Geology, Hydrology, Hydrogeology and Soils	7	Green Cat Renewables

EIA Technical Chapter	Chapter Number	Lead Author
Contaminated Land	8	Green Cat Renewables
Noise	9	Green Cat Renewables
Landscape and Visual	10	Green Cat Renewables
Cultural Heritage and Archaeology	11	Green Cat Renewables – peer reviewed by AOC Archaeology Group
Socio-economics, Tourism and Recreation	12	Green Cat Renewables
Traffic and Transportation	13	Pell Frischmann
Air Quality	14	Green Cat Renewables
Agricultural Land	15	Green Cat Renewables
Greenhouse Gas Assessment	16	Royal HaskoningDHV
Schedule of Mitigation	17	Green Cat Renewables

1.2 Description of Project

42. The Proposed Development is an onshore cable route approximately 35km in length running east to west from the Landfall approximately 1.25km north of Peterhead to the New Deer Substation Compound approximately 0.45km south-east of the NGNDSS.

43. The technical details of the Proposed Development are presented within three broad categories:

- **Landfall**: the point at which the offshore cables are physically brought ashore and the interface between the offshore and onshore infrastructure.
- **Cable Route Corridor**: The cable route corridor is the area within which the cable trench, haul road and all ancillary infrastructure will be.
- **Substation Compound**: consisting of substation (grid transformers and High Voltage Alternating Current (HVAC) switchgear and associated electrical equipment), construction compound, drainage, and the proposed route of the connection to the SSEN/National Grid New Deer Substation

44. There are two Main Site Yards within the Proposed Development, these will be the focal points of the construction phase of the Cable Route Corridor. These Main Site Yards is where staff will mobilise on workdays, and where they will park their personal transport before being transported to the work site.

45. There will be 10 Mobilisation Areas throughout construction which serve various functions based on the construction programme. More details are provided in **Chapter 5 - Project Description**.

1.2.1 Landfall

46. Key components of the Landfall are:

- A temporary Trenchless Compound.
- The Onshore Transition Jointing Pit.
- A Main Site Yard (Mobilisation Area 5)

47. The Landfall point of the Offshore Export Cables is situated around 1.25km to the north of Peterhead about 400 meters south of the village of Lunderton. A Trenchless Compound will be utilised to avoid the need for an open trench for the export cables coming from offshore to onshore. A Landfall Trenchless Compound will be constructed at the Landfall point.

48. The High Voltage Alternating Current Cables come onshore at the landfall point. The marine cables will be jointed with Onshore Cables at the Transition Jointing Pit. The offshore and onshore cable circuits will be connected in the Transition Jointing Pit at the Landfall point.

1.2.2 Cable Route Corridor

49. The Onshore Cables will take power to and from the Proposed Substation south-west of New Deer and the Offshore Project. A Working Cable Route Corridor width of approximately 50m and up to 100m in some locations will be required to allow access for excavating cable and drainage trenches, storage of topsoil and excavated soil, delivery of materials, transportation of personnel, and the presence of excavation and cable installation machinery and equipment.

1.2.3 Substation Compound

50. The Proposed Substation will be located in agricultural land approximately 5.5km south-east of New Deer and approximately 0.45km south of the NGNDSS on the west side of the road between Maryhill and Burnend of Gight.

51. The maximum building heights are 18m for the Dynamic Compensation Building and the Filter Building. The exact specification of the buildings will be determined during the detailed design phase. For the purpose of this EIA it has been assumed that equipment will be housed within buildings.

1.2.4 Construction Plan

52. Key Construction Activities and an indicative construction programme is outlined in **Table 1.2**.

Table 1.2 Green Volt Onshore Construction Programme, 2025—2027

200-007-PRG003 Rev01 Green Volt Onshore Cable Construction Programme																														
		Qtr. 2, 2025			Qtr. 3, 2025			Qtr. 4, 2025			Qtr. 1, 2026			Qtr. 2, 2026			Qtr. 3, 2026			Qtr. 4, 2026			Qtr. 1 2027			Qtr. 2 2027			Qtr. 3 2027		
Task Name	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Ja**	**Fe**	**M**	**A**	**M**	**J**	**J**	**A**	**S**
Contract Award																														
Substation Construction																														
Onshore Substation Civils Construction Works																														
Electrical Installation																														
Final Commissioning																														
Cable installation – Onshore																														
Mobilisation																														
Survey																														
Compounds Construction																														
ROW Preparation																														
Fencing																														
Top Soil Strip																														
Land Drainage (Pre-Con)																														
Haul Road																														
Crossings																														
Trench Excavation																														
Civils (Cable ducts, TJBs & JBs)																														
Backfill – Import & Export																														
Backfill																														
Cable Install																														
Land Drainage (Post-con)																														
Connections (Jointing)																														

GREEN VOLT

200-007-PRG003 Rev01 Green Volt Onshore Cable Construction Programme																																
		Qtr. 2, 2025			Qtr. 3, 2025			Qtr. 4, 2025			Qtr. 1, 2026			Qtr. 2, 2026			Qtr. 3, 2026			Qtr. 4, 2026			Qtr. 1 2027			Qtr. 2 2027			Qtr. 3 2027		
Task Name	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Ja**	**Fe**	**M**	**A**	**M**	**J**	**J**	**A**	**S**
Testing																																
Land Drainage (Post-con)																																
Haul Road (Removal)																																
Top Soil Re-instate																																
De-mobilisation																																
TRENCHLESS – Landfall (900m)																																
Mobilisation																																
Duct weld and test																																
HDD Drive # 1																																
Pull Back																																
Second HDD set-up																																
HDD Drive # 2																																
Pull Back																																
De-mobilisation																																
TRENCHLESS – RVX 14/1 (535m)																																
Mobilisation																																
Duct weld and test to West																																
HDD Drive 1																																
Pull Back																																
Second HDD set-up																																
HDD Drive 2																																
Pull Back																																
De-mobilisation																																
TRENCHLESS – DRLX 7/1 (425m)																																
Mobilisation																																

200-007-PRG003 Rev01 Green Volt Onshore Cable Construction Programme																														
		Qtr. 2, 2025			Qtr. 3, 2025			Qtr. 4, 2025			Qtr. 1, 2026			Qtr. 2, 2026			Qtr. 3, 2026			Qtr. 4, 2026			Qtr. 1 2027			Qtr. 2 2027			Qtr. 3 2027		
Task Name	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Ja**	**Fe**	**M**	**A**	**M**	**J**	**J**	**A**	**S**
Duct weld and test																														
HDD Drive 1																														
Pull Back																														
Second HDD set-up																														
HDD Drive 2																														
Pull Back																														
De-mobilisation																														

1.3 Onshore EIA Report

53. The **Onshore EIA Report** covers a wide range of physical, ecological and human environmental topics for which potential impacts have been assessed. Many of these technical assessments are related to each other and these links are highlighted within the **Onshore EIA Report**.

54. The topic assessments within the **Onshore EIA Report** have been undertaken in accordance with Aberdeenshire Council's (reference ENQ/2023/0008) Scoping Opinion given on 03 March 2023 **(Appendix 1.4)**. The response does not contain explicit confirmation that the development is EIA development, but this is inferred by the content of the response and the proposed scope of the **Onshore EIA Report**. Each of these topics **(Chapters 6-17)** has been summarised as part of this NTS.

55. A description of all mitigation measures and Proposed Development commitments is presented in **Chapter 17: Schedule of Mitigation**.

1.3.1 Ecology and Ornithology

1.3.1.1 Introduction

56. The Ecological Impact Assessment (EcIA) considers the potential effects of the Proposed Development on the habitats, species (avian and non-avian) and ecosystems present at the Site. It details likely significant effects and identifies appropriate mitigation and good practice methods to protect nature conservation interests.

1.3.1.2 Potential Effects

1.3.1.2.1 Construction Phase Potential Effects

57. The construction of the Proposed Development will cause the loss of and disturbance to habitats during construction and the effects may be both permanent and temporary. Permanent losses are straightforward to calculate based on the Proposed Development layout, but estimates of temporary losses, such as those caused by construction activities (e.g. vehicle movements and stockpiling) in the areas surrounding built infrastructure, are more difficult. However, temporary losses can be assumed to be relatively limited in extent, based on experience of the construction of similar developments, and so are assumed, on a precautionary principle basis, to equate to approximately 20% of the areas permanently lost. No International or National designated sites (SPA, SAC, Sites of Special Scientific Interest (SSSI)) are within the construction footprint or buffer zones.

58. The construction of the Proposed Development has the potential to adversely affect badgers directly or indirectly in a number of ways:

- Physical damage or loss of setts or foraging habitat from construction.
- Damage/destruction of routes potentially used by badgers while crossing the development footprint (severance).
- Disturbance caused by noise of construction of the Proposed Development.
- Direct injury or mortality.

59. The construction of the Proposed Development has the potential to adversely affect breeding birds directly or indirectly in a number of ways:

- Habitat displacement due to construction phase.
- Accidental nest site destruction during construction phase.
- Disturbance due to noise, light and human presence.

1.3.1.2.2 Operational Phase Potential Effects

60. The Proposed Development is not anticipated to involve any operations that will directly or indirectly effect badgers or breeding birds, therefore is considered to be 'not significant' in terms of the EIA Regulations.

1.3.1.2.3 Badger – Decommissioning Phase Potential Effects

61. Effects to badgers, breeding birds and their habitats from decommissioning works are anticipated to be of a similar nature to the construction phase effects, but of lower magnitude. Decommissioning effects to badgers,

breeding birds and their habitats are considered temporary, reversible, of negligible magnitude and considered to be 'not significant' in terms of the EIA Regulations.

1.3.1.3 Summary of Mitigation

62. Project assumptions of embedded mitigation measures in relation to good practice construction measures and pollution prevention controls, will be followed in order to safeguard the ecological receptors from any potential significant effect as a result of the Proposed Development. Additionally, micrositing, informed by the Ecological Clerk of Works, will help to further reduce impacts.

63. The ecological baseline has been considered throughout the design process of the Proposed Development, including design meetings and communications with specialists providing input to subsequent design iterations. This was with the aim to either eliminate or reduce the potential for any significant effects on receptors and following the 'mitigation hierarchy', as described in *Chartered Institute of Ecology and Environmental Management Guidance* (CIEEM, 2018). The mitigation hierarchy follows a sequence of avoidance, mitigation, compensation and enhancement measures to be identified as part of the EcIA.

1.3.2 Geology, Hydrology, Hydrogeology and Soils

1.3.2.1 Introduction

64. This chapter presents the impact assessment of the construction and operation of the Proposed Development on the hydrology and hydrogeology environments. This chapter also considers the potential cumulative effects that may arise from the Proposed Development in combination with other future developments, including consented and in-planning projects within 10km of the Proposed Substation and 2km around the Cable Route Corridor.

65. A desk-based study and site walkovers were conducted to establish the baseline hydrological environment of the Study Area, whereby potential impacts from the Proposed Development were identified.

1.3.2.1.1 Surface water features

66. The Study Area encompasses numerous watercourses that could be impacted by reduced water quality and quantity from development activities. Several waterbodies were also highlighted to be at high risk from river and surface water flooding, which has the potential to be elevated by unmitigated construction work.

1.3.2.1.2 Private Water Supply

67. The location of nearby Private Water Supply (PWS) obtained through discussions with Aberdeenshire Council and refined through a PWS questionnaire. Some PWS were found to be located <100m from the proposed cable route corridor. Unmitigated construction works has the potential to temporarily impact the water quantity and quality of any PWS within 250m of the Proposed Development.

1.3.2.1.3 Groundwater Units

68. Most of the Study Area is located upon the Mintlaw groundwater unit, although the western boundary traverses the Ellon groundwater unit, and the eastern boundary crosses the Fraserburgh groundwater unit. The various bedrocks underlying the sites can be mostly described as low productivity aquifers (2C), meaning that there is limited potential for construction activities to impact on the water quality of this groundwater unit and for any unmitigated contaminated groundwater to move outwith the vicinity of the Proposed Development.

1.3.2.1.4 Class 1 Peat

69. There are three pockets of Class 1 peat that are partially located within the Study Area. Class 1 Peat is considered to be of national importance and conservation value. The closest area of Class 1 peat is located c.80m to the north of the proposed Cable Route Corridor at its nearest point. Although the peatland is situated outwith the proposed Cable Route Corridor, due to its proximity, there is potential for the peat to be disturbed during construction activities.

1.3.2.1.5 Groundwater Dependent Terrestrial Ecosystems

70. The National Vegetation Classification (NVC) survey identified that there are Class 1 Groundwater Dependent Terrestrial Ecosystems (GWDTE) communities located within the study area, which are highly dependent on

groundwater. These habitats are of conservation value and may be impacted by excavation works for the Proposed Development.

1.3.2.2 Potential Effects

71. It was determined that there were five categories of sensitive receptor within the Study Area, these being: the Surface Water Features; the groundwater units; nearby PWS; three pockets of Class 1 peat; and Class 1 GWDTE communities.

72. It is anticipated that careful design of the site layout, and the implementation of the mitigation methods proposed, will ensure that any potential risks identified are avoided and the associated risk is reduced to acceptable levels.

1.3.2.3 Summary of Mitigation

1.3.2.3.1 Construction Mitigation

73. Prior to excavations, an end-use will be identified for the excavated material and an appropriate storage solution determined accordingly. Stored materials will be kept away from surface water bodies to minimise the possibility for sediments entering the aquatic environment.

74. There will be a drainage plan for the Proposed Development, which will consider drainage in relation to the construction of any cable joint bays, mobilisation areas, and site yards. Temporary drains will also be installed along the length of the proposed Cable Route Corridor during construction. Once confirmed, joint bays will be sited at areas with the lowest flood risk along the cable, where possible. Where appropriate, temporary silt fences will be installed downslope of construction works to filter runoff that is potentially carrying silt from excavations or stockpiles.

75. Standard procedures will be enforced by the Principal Contractor to protect the water quality and quality of any nearby PWS. Works carried out in proximity to any identified PWS shall be carried out in accordance with the mitigation set out in the Private Water Supply Risk Assessment within Appendix 7.1.

76. Any detailed reinstatement and restoration proposals will consider and mitigate all residual risks to environmental receptors.

77. Dewatering shall be avoided where possible to minimise impacts on sensitive habitat. However, formation of the Proposed Substation foundations may involve dewatering to temporarily lower the water table and enable work in the excavated areas.

1.3.2.3.2 Operation Mitigation

78. The surface water from the Proposed Substation and associated infrastructure will be managed by the implementation of a surface water drainage system. This will consist of various Sustainable Drainage Systems (SuDS) methods to safeguard the surrounding water environment.

79. Surface water flowing from the proposed access tracks will be captured by adjacent swales, which will also have check dams to allow the sediment to settle.

80. The installed underdrains and collector pipes will then direct the water to the SuDS Pond/Wetland for final treatment and storage before the water is then discharged into the adjacent Burn of Swanford at a rate that will mimic the existing greenfield runoff rate.

1.3.3 Contaminated Land

1.3.3.1 Introduction

81. This chapter assesses the likely potential sources of contamination along the Cable Route Corridor and creates a Conceptual Site Model, assessing source-pathway-receptor linkages, prepared in accordance with best practice, then assesses the risk that any sources identified could present an increased risk to any receptor identified via any pathway.

82. A desk study has been developed with the aid of a site reconnaissance to make an assessment of the existing conditions at the Site prior to any Site Works. In particular, a desk study is required in order to develop a

Conceptual Site Model (CSM) for the Site and the subsequent assessment of geoenvironmental risks using the Source-Pathway-Receptor model. This enables the design of an appropriate intrusive ground investigation, if this is shown to be required.

83. This chapter summarises the geoenvironmental features along each section of the route. Many of the features listed are too small and/or too distant from the route to be of any great significance. However, these are included for completeness. Where considered to be more significant, remarks have been added to the tables and a discussion is provided relating to the features considered most significant. Five areas have been identified as being of potentially higher risk and for these, a Groundsure report has been obtained to give wider background information.

1.3.3.2 Potential Effects

84. Wester Rora, Sandyknapps and Gordon Sawmills are areas of potentially higher risk however following construction, but it is considered that the risks to any receptor should be no greater than they were before construction for these areas.

85. A Groundsure report has been obtained for Gilkhorn Landfill as it is classified as potentially higher risk but given the distance between the route and this landfill, the landfill is not considered to present any significant risk to the construction. Routine monitoring for gas should suffice in the excavation.

86. The moss at Clockhill is the fifth and final area of potentially high risk. The route does not intersect the Clockhill Landfill. This significantly reduces any risks that this landfill may present, either to the Construction itself and indeed the risk that the excavation could create new pathways by which any contamination within the landfill could connect to any potential receptor (including the Water Environment) to this potential source. However, the landfill could contain contamination by metals, acids and alkalis, hydrocarbons (including fuel oils from dumped oil containers) and polyaromatic hydrocarbons. Some of these contaminants could present as mobile leachate.

87. A limited ground investigation will be undertaken on the route where close to this landfill, sampling and testing the soil and groundwater to ensure that the landfill is not causing contamination of the Water Environment. If it were, then the excavation and the cable track could offer a preferred route by which such contamination could migrate. However, the risk that this is the case is considered likely to be low, based on the information available at the present time, subject to further investigation.

1.3.3.3 Summary of Mitigation

88. For construction mitigation some limited geoenvironmental ground investigation is recommended in certain areas prior to construction. In addition, mitigation measures are proposed during or at an early stage of construction for five areas along the Cable Route Corridor. More detail can be seen in **Chapter 17 - Schedule of Mitigation.**

89. Regarding operation mitigation, it is considered very unlikely that any potential sources may present any significant risk to any receptor as a result of the cable route after the works are constructed and the excavation is backfilled.

1.3.4 Noise

1.3.4.1 Introduction

90. This chapter of the Onshore EIA Report considers the potential noise impacts associated with the construction and operation of the Proposed Development. The Assessment overview consists of:

- Construction noise considered both the construction of the Proposed Substation and the groundworks associated with the Cable Route Corridor.
- Operational noise attributable to the Proposed Development was represented in noise modelling software to assess the noise levels predicted to occur at nearby Noise Sensitive Receptor (NSR) locations.
- Previously conducted surveys have shown low background noise levels in the vicinity of the Proposed Development. Under these circumstances, the use of Noise Rating values was considered to be the appropriate assessment criteria.

- The following assessment methodology, including the use of Noise Rating criteria, was agreed with Aberdeenshire Council Environmental Health prior to the commencement of this assessment.

1.3.4.2 Potential Impacts

1.3.4.2.1 Construction Noise

91. The assessment concluded that, for working daytime hours (Monday to Friday 07.00−19.00 and Saturdays 07.00−13.00), noise levels from construction activity are not significant for the majority of assessed NSRs.

92. Mitigation should be routinely applied for construction activities located at 50m or less from NSRs.

93. Approximately one third of NSRs, located >150m from construction activities, showed levels below the 55dB(A) cutoff criteria given for evening and weekend periods. With suitable mitigation employed, working at distances of >100m from NSRs should be possible, without significant impact, during these periods.

1.3.4.2.2 Operational Noise

94. The main contributor to NSR sound levels are the two Super Grid Transformers as these operate externally. Should the design specification undergo a significant amendment, the updated specification will be designed to meet the relevant BS8233:2014 internal noise criteria of NR20 and NR25 for project specific and cumulative operational noise, respectively.

95. This assessment concludes that the NR20 and NR25 criteria, as used in this assessment, would be consistent with NGNDSS limit criteria and would provide a suitable operational noise constraint, should the Proposed Development be approved.

1.3.4.3 Summary of Mitigation

1.3.4.3.1 Construction Mitigation

96. To minimise impact of construction noise, the contractor will employ best practicable means to reduce noise effects via maintaining equipment and limiting activities to daytime hours where possible.

97. Areas that have been identified as major crossings i.e., trenchless distances of over 200m that will employ the use of trenchless methodologies and have associated compounding activities, are expected to last for a little longer duration but these activities tend to be more distant from NSRs (than the other construction activities).

98. The Construction Environmental Management Plan includes a ‘Noise Management Plan’.

1.3.4.3.2 Operation Mitigation

99. Noise Impact Assessment results indicate that operational sound levels from the Proposed Development, both in isolation and cumulatively, meet the adopted limit criteria and are therefore judged to be acceptable.

100. If mitigation were to be required once final design specifications are known, then positioning of equipment and positioning of barriers close to external plant equipment (SGT1 and SGT2, Shunt Reactors and Cooling Equipment) may be considered to achieve operational noise compliance.

1.3.5 Landscape and Visual

1.3.5.1 Introduction

101. The purpose of this assessment has been to determine the landscape and visual effects of the Proposed Development on the existing landscape visual resource. The following landscape and visual receptors have been assessed.

- Landscape character, key characteristics, and elements.
- Landscape Designations.
- Views and visual amenity experienced by residents, tourists, recreational receptors, and road users.

102. The aim of the design and assessment process is to promote the best “environmental fit” for a development through consideration of the existing landscape resource, the potential landscape and visual effects and design alternatives. The assessment process will refer to landscape value, and in particular designated landscapes and related planning policy, as well as landscape character and capacity for development at this Site.

103. The chapter is split into Landscape effects for both construction and operation and Visual effects for both construction and operation.

1.3.5.2 Potential Effects

1.3.5.2.1 Landscape Effects

104. Construction of the Proposed Development will have the potential to directly impact four different Landscape Character Areas (LCA); Dunes and Beaches from Fraserburgh to Peterhead LCA, Eastern Coastal Agricultural Plain LCA, Wooded Estates Around Old Deer LCA, and the Agricultural Heartlands LCA. In addition to this, there are potential indirect impacts on the Northern Rolling Lowlands LCA. Direct and indirect impacts would be experienced by one landscape designation, the North-East Aberdeenshire Coast Special Landscape Area.

105. Once completed the majority of impacts on the Dunes and Beaches from Fraserburgh to Peterhead LCA, Eastern Coastal Agricultural Plain LCA, Wooded Estates Around Old Deer LCA, and the North-East Aberdeenshire Coast Special Landscape Area (SLA) would be reduced to a negligible level. Agricultural fields will be replanted with crops and any hedgerows or dry-stone dykes removed will be restored. The only permanent changes to these landscapes would be the loss of three small shelterbelts which would be replanted and a small manhole cover every 600m—1000m along the Cable Route Corridor to provide access to the link box. Visually these would only be apparent in the immediate area around them, typically within a few metres and would never be prominent nor sufficient additions to alter the character of the landscape.

1.3.5.2.2 Visual Effects

106. It is anticipated that there would be significant visual effects during construction from up to 35 residential properties, however the majority of properties along the Cable Route Corridor would not have significant effects due to a combination of distance, vegetation and/or topographical screening or direction apart from residential properties listed in **Table 10.12** in **Chapter 10 – Landscape and Visual Impact Assessment**. The significantly affected properties would only be affected for a short period of time as construction passes each particular dwelling.

107. The Cable Route Corridor would cross a number of key routes in the area, as such there will be temporary visual effects caused by construction activities, disruption to the landscape and movement of construction vehicles, and in some instances views of temporary facilities. All impacts will be temporary and highly localised, and all routes crossed by the cable will be constructed using trenchless construction methods.

108. Once construction is complete and as the landscape starts to reinstate, the visual impact experienced by receptors along the Cable Route Corridor would be negligible, the only remaining elements would be the jointing pits, which would be seen as a manhole cover in the ground every 600m—1000m. The only likely operational visual impacts would be experienced by receptors in the vicinity of the Proposed Substation. It is anticipated that four properties would be significantly visually affected by the impact of the Substation prior to any mitigation planting (discussed below).

1.3.5.3 Summary of Mitigation

1.3.5.3.1 Construction Mitigation

109. *As per* the Construction Execution Plan, during construction of the Cable Route Corridor and haul road topsoil will be stripped to its full depth and kept separate from the subsoil. The topsoil will be pulled back from the fence line using excavators to allow dozers to push it evenly back across the easement and leaving it generally level. During the reinstatement, hedge mounds will be replaced using an excavator and the topsoil will be given a final trim to leave it ready for reseeding by the landowner.

110. While the majority of the fields through which the Cable Route Corridor travels are arable fields and will be reseeded with crops by the landowner, there are a number of pasture fields with a rough grassland landcover. These will not be reseeded with crops and would potentially result in landscape scarring. While they can be reseeded with native grass, it is suggested that the original turves are saved and stored to help reinstatement work quicker and more effectively.

1.3.5.3.2 Operation Mitigation

111. Significant visual effects during operation would be as a result of the visual impact from the Proposed Substation. It was found that four properties would have significant visual impacts. These are Upper Mains of Asleid, Upper Mains of Asleid Cottage, Rowan Brae and Burnside. While none of these properties would have significant visual effects from the dwelling itself, all would have significant visual effects from the environs. In order to mitigate these effects planting is suggested along the western, eastern and southern edges of the Proposed Substation. Once vegetation reaches maturity, it will provide screening to these views. While it will not completely remove the visibility of the Proposed Substation, it will reduce it to a non-significant level.

112. There are three sections of notable tree removal as a result of the Cable Route Corridor. It is proposed that these are replanted at a 2:1 ratio to maintain the shelterbelts as landscape features important to the LCAs.

1.3.6 Cultural Heritage and Archaeology

1.3.6.1 Introduction

113. Cultural heritage is represented by a wide range of features, both above and below ground, which result from past human use of the landscape. The aim of this chapter study is to identify elements of cultural heritage value that may be impacted upon by the Proposed Development. A phased approach to the assessment was adopted which firstly looked at the physical impacts during construction. Then subsequently assessed the impacts on setting during construction and during operation.

1.3.6.2 Potential Effects

1.3.6.2.1 Physical Effects during Construction

114. Physical effects have the potential to occur from the construction of the Landfall, Cable Route Corridor, Mobilisation Areas, the Proposed Substation and all associated infrastructure.

115. There were no significant physical effects found on any features within the assessment area. There were 15 features found to be within the development footprint and may be subject to impacts from construction. The level of effect for physical impacts ranges from minor/negligible to moderate with some features having no impact.

116. Mitigation is proposed for a number of these features as outlined in **Section 1.3.6.3** below where impacts may be greater. This includes CAN11, CAN15, HER10 and HER12 among other features.

1.3.6.2.2 Effects on Setting during Construction

117. The chapter assesses temporary setting impact on nationally significant features such as Scheduled Monuments, Category A Listed Buildings, Gardens and Designed Landscapes, Inventory Battlefields and World Heritage Sites and regionally significant features such as Category B and C Listed Buildings and Conservation Areas resulting from the construction activities.

118. All effects on setting during construction would be temporary and limited to a restricted period of time. Upon completion, these effects would be fully restored, the landscape would return to a calmer state and the setting of the features and the ability to appreciate them would remain intact.

1.3.6.2.3 Effects on Setting during Operation

119. Setting effects during operation would only occur from the Proposed Substation. The Landfall and Cable Route Corridor would return to their current state with occasional maintenance vehicles requiring access which would be consistent with the baseline setting and vehicle movements in the area, given the agricultural nature of the surrounding landscape. As such, there would be no impact to the setting of the features along the route and the ability to appreciate and understand their setting would remain intact.

120. The level of effect for all the cultural heritage features assessed in this section are classified as either moderate or minor. The positioning of the Proposed Substation to the NGNDSS and its associated infrastructure means that it is in keeping with the current nature of the setting and is only marginally increasing the area occupied by substation infrastructure.

1.3.6.3 Summary of Mitigation

1.3.6.3.1 Construction Mitigation

121. Regarding physical impacts for construction mitigation, current proposals indicate that a number of features within the study will be outwith the area of ground-breaking and construction activity. Additionally, it also indicates that a number of features that are within the Application Site Boundary and mitigation is proposed for a number of these features. Mitigation proposed includes, trenchless crossings, fencing-off of features, re-planting, pre-construction site visits, and watching briefs.

122. It is possible that unknown archaeology may exist within the Application Site Boundary. Given the identified physical impacts and potential for unknown remains to survive in the Application Site Boundary, a programme of works may be required to be undertaken. This programme of archaeological works would be implemented to the satisfaction of Aberdeenshire Council's Archaeologist.

123. Setting effects would be temporary and for a short period of time, and the setting of the features would return to its previous condition upon completion and as such, no mitigation is proposed.

1.3.6.3.2 Operation Mitigation

124. Current proposals indicate that the majority of the features within the Study Area would not be impacted by the substation due to screening provided by the surrounding topography, vegetation and buildings.

125. However, LB07 would have visibility of the Proposed Development due to its elevated position and third-party intervisibility is likely to occur. As such, mitigation planting on the western side of the substation may be required. This planting would be appropriate with the vegetation in the surrounding area.

1.3.7 Socioeconomics, Tourism and Recreation

1.3.7.1 Introduction

126. This chapter considers onshore socio-economic, tourism and recreation impacts relating to the Proposed Development. The chapter outlines the legislation, policy, guidance, and the methodology used to assess and determine the potential effects of the Proposed Development on tourism and recreation. There is no recognised EIA legislation, policy, or guidance specific to assessing the effects of electricity infrastructure development applications on tourism and recreation. The methods used in the assessment were based upon previous experience and established EIA best practices, including those used in UK Government and industry reports within the renewable energy sector.

127. Green Cat Renewables (GCR) did not propose to include an assessment of the Proposed Development on the local economy in the Scoping Report issued to Aberdeenshire Council in December 2022 (**Appendix 1.4**). It was not included in the scope because it was felt that there would not be significant effects (adverse or beneficial) to the local economy as a result of the Proposed Development, due to a limited number of local economic receptors within the 5km study area. While it is expected that there will be jobs created and Gross Value Added (GVA) as a result of the construction phase of the Proposed Development it is not known yet how many local jobs might be created. This will be dependent on the contractor commissioned to install the Onshore Export Cable and the Proposed Substation and their work-force procurement methods.

1.3.7.2 Potential Effects

128. The assessment has highlighted impacts of a moderate significance during the construction phase, affecting recreational fishing locations and core paths within the study area. The impact on both recreational receptors is attributed to the construction traffic, visual and noise impacts relating to the construction works taking place.

129. To further assess the potential effects of the Proposed Development on tourism and recreation receptors within the Study Area a cumulative impact assessment has been carried out.

130. There might be a minor adverse impact on tourism and a moderate adverse impact on other potential infrastructure projects, due to short-term disruptions caused by the installation of the onshore HVAC cables. Nevertheless, these effects are considered non-significant in terms of EIA standards.

131. During the operation phase, the Proposed Development is expected to bring about minimal effects on other potential infrastructure projects, tourism, and recreation within the local area. Any negative impacts on tourism, recreation and other potential infrastructure development during the operation phase are deemed negligible.

1.3.7.3 Summary of Mitigation

132. Mitigation for the fishing locations during the construction phase will take the form of the implementation of the appropriate measures in the Construction Environmental Management Plan (CEMP) that will be developed and agreed prior to construction and the use of trenchless methodologies to reduce plant and installation time. The moderate effects on the three fishing locations will be temporary in nature.

133. Mitigation for the core paths during the construction phase will take the form of the implementation of appropriate measures within the Core Path Management Plan and Construction Traffic Management Plan (CTMP) that will be developed and agreed prior to construction and the use of trenchless methodologies to reduce plant and installation time. The moderate effects on the core paths will be temporary in nature.

134. No significant effects have been predicted for tourism or recreation during the operation phase, therefore no additional mitigation will be required.

135. Although not significant, it has been noted that accommodation types with higher occupancy rates will be avoided, where possible, during peak seasons.

1.3.8 Traffic and Transport

1.3.8.1 Introduction

136. This chapter provides an assessment of the potential effects of the Proposed Development on receptors along the transport routes resulting from vehicle movements associated with the construction, operation and decommissioning phases.

137. The Study Area includes local roads that are likely to experience increased traffic flows resulting from the Proposed Development. The Study Area for this assessment includes the A90 (T), A981, A952, A950, A948, A947, B9030, B9170, unnamed road at Rora Dairy, and an unnamed road at the NGNDSS, and other minor roads/tracks providing local access such as Woodside and Tortorston Road.

1.3.8.2 Potential Effects

138. The total traffic movements are anticipated to increase by over 30% at the unnamed road, at NGNDSS, the B9090 (91.8% increase), north-east of Auchnagatt (35.9% increase) and the unnamed road, at Rora Dairy (37.5%). The traffic flows are expected to increase by 302, 204 and 209 daily two-way movements, respectively, which sees an hourly increase of approximately 25, 17 and 17 trips per hour, respectively or less than two trips per minute on each of the road links, over a typical 12-hour shift. It should also be noted the construction phase is transitory in nature and the peak of construction activities is short- lived.

139. The results in this chapter indicate there are no road capacity issues with the addition of construction traffic associated with the Proposed Development and significant spare capacity exists within the trunk and local road network to accommodate all construction phase traffic.

140. The significance of the potential effects has been determined using the rules and thresholds discussed in the chapter. **Table 13.11** within the chapter summarises the significance on the receptors for the construction phase which range from moderate to major. For more details see **Chapter 13 - Traffic and Transport**.

1.3.8.3 Summary of Mitigation

1.3.8.3.1 Construction Mitigation

141. A Construction Travel Management Plan is proposed to help reduce the negligible traffic impact of the construction phase on the Study Area. This is not required under the assessment but is proposed to further reduce any transport and access issues on the network. Additionally, an Abnormal Load Transport Management Plan will be prepared post-consent to cater for all movements to and from the Proposed Development. A Staff Travel Plan will be deployed where necessary, to manage the arrival and departure profile of staff and to encourage sustainable modes of transport, especially car-sharing.

1.3.8.3.2 Operation Mitigation

142. The permanent Site access junction to the Proposed Substation will be well maintained and monitored during the operational life of the development. Regular maintenance will be undertaken to keep the access junction drainage systems fully operational and to ensure there are no run-off issues onto the public road network.

1.3.9 Air Quality

1.3.9.1 Introduction

143. The air quality chapter evaluates the impact of the Proposed Development on air quality during the construction phase. Potential sources of airborne pollutants have been identified and the pathways for those pollutants to cause exposure to nearby receptors have been appraised.

144. The principal pollutants with the potential to adversely impact nearby receptors addressed by this assessment are dust and particulate matter (PM_{10}) resulting from construction activities. Particular attention has been given to the sensitivity of nearby receptors in order to assess the significance of any potential impacts identified. The principal receptors are nearby human residents. Nearby sensitive ecological receptors have also been appraised.

1.3.9.2 Potential Effects

145. The potential dust emission magnitude for each category of works (demolition, earthworks, construction, and trackout) have been determined based on the scale of anticipated works.

146. Works will not take place simultaneously across the entire Proposed Development area; instead the Cable Route Corridor will be constructed in sections, therefore the receptors will not all be exposed to potential impacts at the same time.

1.3.9.2.1 Demolition

147. Given the potential volume of blasting and the presence of on-site crushing, the dust emission magnitude associated with demolition is anticipated to be large, prior to mitigation. As all blasting will take place below ground level, dust dispersion and therefore impacts are much less likely than if blasting was above ground. The likelihood of impacts will further be reduced by prioritising other methods of rock removal over blasting.

1.3.9.2.2 Earthworks

148. Given the large area of cable trenching to be excavated, the dust emission magnitude associated with earthworks is anticipated to be large prior to mitigation.

1.3.9.2.3 Construction

149. The largest source of potential dust emissions from construction will be related to the Substation Compound. The exact specifications for the substation buildings will be determined during the detailed design phase.

150. Overall, the dust emission magnitude associated with construction is anticipated to be medium prior to mitigation.

1.3.9.2.4 Trackout

151. The peak number of vehicle movements in a single day is estimated to occur in Month 5 of the Construction programme, with 143 Heavy Goods Vehicle (HGV) movements (72 inbound and 71 outbound) and 194 car/Low Goods Vehicle (LGV) movements (97 inbound and 97 outbound) in one day.

152. Given the estimated maximum number of outbound HGV movements in a single day is estimated to be 71, the Trackout magnitude is anticipated to be large prior to mitigation.

1.3.9.3 Summary of Mitigation

153. Mitigation measures are detailed in the chapter based upon the Institute of Air Quality Management (IAQM) list of mitigation measures with the aim to prevent any significant effects. With the recommended mitigation measures included in the CEMP, the risk of dust impacts is predicted to be negligible for each activity and the predicted effects are considered to be not significant. Occasional, short-term effects may still occur, for example

during particularly dry and windy weather conditions where high-sensitivity receptors are downwind of the Site, however, these are not expected to be frequent enough to be significant.

1.3.10 Agricultural Land

1.3.10.1 Introduction

154. This chapter assesses the potential changes and impacts to agricultural land resulting from the Proposed Development. Land within Scotland has been classified in order to better understand the capabilities of the land and its potential uses, particularly in reference to agriculture. The Macaulay Institute developed the Land Use Capability (LUC) system to assess land capability and rank it based on potential productivity and flexibility. This became the Macaulay Land Capability for Agriculture classification which is widely used across Scotland. The Macaulay Land Use Research Institute has since merged with the Scottish Crop Research Institute (SCRI) to form The James Hutton Institute

155. The study area is the Application Site Boundary which is primarily within arable land, extending from Peterhead (Landfall) through to New Deer (Substation Compound location). The purpose of this desk study is to classify this land under the Land Capability for Agricultural production within the Application Site Boundary.

1.3.10.2 Potential Effects

1.3.10.2.1 Construction

156. The trenchless methodology was chosen to minimise the impact of the Proposed Development. By choosing this method, it minimises any agricultural land disrupted through construction as the alternative is to create an open trench across the whole of the cable route. Any land that is disrupted during construction would be reinstated and allowed to naturally recover over time, minimising permanent damage.

1.3.10.2.2 Operation

157. The Substation Compound location, access track and SuDS Pond will be the only permanent feature resulting from the Proposed Development, as it will be required for long-term operation. The infrastructure will be sited on ~23.6ha (6.6%) of Class 3.1 land within the western Application Site Boundary, which is defined as Prime Agricultural Land (PAL) and will not be reinstated following the completion of construction works.

158. The maximum footprint of the Substation Compound, when compared to the availability of PAL throughout Aberdeenshire, accounts for a small percentage of PAL. It is considered that the operation of the Proposed Development will not result in adverse impacts on land use, and as such those impacts are considered negligible.

1.3.10.2.3 Decommissioning

159. The permanent structures associated with the Substation Compound will be removed upon decommissioning, allowing the land to naturally recover over time.

1.3.10.3 Summary of Mitigation

1.3.10.3.1 Construction Mitigation

160. During the construction phase, the affected topsoil and sub-soil will be treated and stored appropriately as not to cause damage and indirectly affect the soil quality. Care will be taken where possible throughout construction, and upon completion, any disturbed land will be reinstated as soon as possible. As previously stated, the majority of the construction phase is temporary, so any prime and non-prime agricultural land will only be impacted for the duration of the construction phase. Examples of mitigation measures to be implemented relevant to land are the Pollution Prevention Plan and the Emergency Response Procedure.

1.3.10.3.2 Operation Mitigation

161. No adverse impacts resulting from the operation stage of the development are anticipated. Additionally, the project lies within the criteria for essential infrastructure as outlined in NPF4 and the Aberdeenshire Local Development Plan (LDP). As such, there is no mitigation suggested for the operation of the Proposed Substation.

1.3.10.3.3 Decommisioning Mitigation

162. Where possible, existing access tracks and other infrastructure will be utilised in the decommissioning of the Substation Compound. It is anticipated that no additional agricultural land (outwith what is outlined in **Table 15.3** within **Chapter 15 – Agricultural Land**) will be further impacted following decommissioning. Further considerations will be outlined in the Decommissioning Plan, which will be produced prior to commencement of decommissioning.

1.3.11 Greenhouse Gas Assessment

1.3.11.1 Introduction

163. This chapter comprises a Greenhouse Gas (GHG) assessment for the Proposed Development. The assessment was undertaken in accordance with the Institute of Environmental Management and Assessment (IEMA) guidance *Guide: Assessing GHG Emissions and Evaluating their Significance* (IEMA, 2022).

1.3.11.2 Potential Effects

164. The Project as a whole is predicted to have beneficial effects in terms of GHG emissions and would contribute towards Scotland's and the UK's net zero targets. This was significant in EIA terms, in accordance with IEMA's (2022) *Guidance*.

1.3.11.3 Summary of Mitigation

165. The *IEMA GHG Guidance* (IEMA, 2022) notes the importance of embedded mitigation in minimising GHG emissions from a development. The IEMA GHG Management Hierarchy sets out a structure to eliminate, reduce, substitute and compensate (IEMA, 2022).

166. Project level GHG mitigation is being incorporated into the design development process for the Proposed Development wherever it is practicable to do so. Considering that the primary purpose of the Proposed Development is to generate low carbon renewable energy, the process of reducing GHG emissions is guided by the hierarchy summarised in **Chapter 16 – Green House Gas Assessment** in **Table 16.12**.

167. No further additional mitigation is recommended for the project.

1.3.12 Schedule of Mitigation

168. The Applicant has adopted a number of commitments as part of the Onshore EIA process, in order to avoid or reduce adverse effects on the environment during construction, operation and decommissioning of the Project. This chapter provides a summary of the proposed mitigation presented within the **Onshore EIA Report**.

1.4 Combined Onshore and Offshore Green Volt Projects Assessment

169. The **Onshore EIA Report** technical chapters detailed in this report only cover the onshore infrastructure associated with the Project.

170. A separate **Offshore EIA Report** provides an assessment of the Project's offshore infrastructure.

171. Where a technical topic is required to be assessed for both offshore and onshore, such as Tourism and Recreation, a separate chapter is provided in the **Onshore EIA Report**. The **Offshore EIA Report** was submitted to Marine Scotland in January 2023. To enable consideration of the onshore and offshore elements of the Project as a whole, an additional document was prepared. This additional document is the Summary of Offshore and Onshore Environmental Impact Assessments and provides a summary of the **Offshore EIA Report** and the predicted summary of the onshore EIA. It was submitted to the Scottish Ministers along with the offshore application documents and will be available on the Green Volt website. (As required, it will be updated upon completion of the **Onshore EIA Report**.)

1.5 Contact Us

172. This document provides a non-technical summary of the **Onshore EIA Report** for the proposed Green Volt Offshore Windfarm Project. If you wish to see more detailed, technical information, the initial Onshore Scoping Report for the Proposed Development can be found in **Appendix 1.1** and the Second EIA Scoping Report submitted December 2022 can be found in **Appendix 1.3**. The full **Offshore EIA Report** is available online at the following link:

Marine Licence - Green Volt Offshore Windfarm - Offshore Transmission Infrastructure (2 of 2) - East of Aberdeenshire Coast - 00010232 | Marine Scotland Information

173. The full **Onshore EIA Report** will be available on the Aberdeenshire Council planning portal once the application has been validated.

174. Once the application has been submitted to Aberdeenshire Council and acknowledged, public consultation will be undertaken. During this time the **Onshore EIA Report** will be publicly available. Visit the Project website to view the public exhibition, and please register your interest in the Project to receive updates:

https://greenvoltoffshorewind.com/

GREEN VOLT

Planning Statement

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-STM-0002	
Version Number:	00	
Date:	*Issue Date 02/08/23*	
Prepared by:	Dale Hunter	*Electronic Signature*
Checked by:	Corey Simpson	*Electronic Signature*
Approved by Client:		*Electronic Signature*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First draft for review	12/07/2023
A2	Second draft for review	28/07/23
A3	Final for review	31/07/23
00	Final	02/08/23

Contents

Acronyms

Acronyms	Description
ALDP	Aberdeenshire Local Development Plan 2023
BS	British Standard
CCC	Climate Change Committee
CEMP	Construction Environmental Management Plan
EGPS	Electricity Generation Policy Statement
EIA	Environmental Impact Assessment
EMR	Electricity Market Reform
EU	European Union
GHG	Greenhouse Gas
GWTDE	Groundwater Dependent Terrestrial Ecosystems
HSE	Health and Safety Execution
INTOG	Innovation and Targeted Oil and Gas
LCA	Landscape Character Area
LDP	Local Development Plan
LNCS	Local Nature Conservation Sites
LVIA	Landscape and Visual Impact Assessment
NGNDSS	National Grid New Deer Substation
NPF4	National Planning Framework 4
OWIG	Offshore Wind Industry Group
PAC	Pre-Application Consultation Report
PAWS	Plantations on Ancient Woodland Sites
ROC	Renewable Obligation Certificate
SAC	Special Area of Conservation
SEPA	Scottish Environmental Protection Agency

SLA	Special Landscape Areas
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
SuDS	Sustainable Drainage System
UK	United Kingdom
UNFCCC	United Nations Framework Convention on Climate Change

Glossary

Term	Description
Applicant	Green Volt Offshore Windfarm Ltd.
Cable Route Corridor	The cable route corridor is the area within which the cable trench, haul road and all ancillary infrastructure will be. The working width of this corridor will be up to 80m in some locations will be required to allow access for excavating cable and drainage trenches, storage of topsoil and excavated soil, delivery of materials, transportation of personnel, and the presence of excavation and cable installation machinery and equipment
Development Plan	The Site is wholly within the Aberdeenshire Council area and therefore the Development Plan in this instance consists of the National Planning Framework 4 (NPF4) and the Aberdeenshire Local Development Plan 2023 (ALDP) (Aberdeenshire Council, 2023).
Landfall	The area where the subsea cables from the Green Volt Offshore Windfarm will make landfall. This area will contain the Trenchless Compound and any other ancillary infrastructure required.
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).
National Development	One of the 18 developments and classes of development that are considered nationally significant by National Planning Framework 4
National Grid New Deer Substation	The existing national grid 400Kv substation located at New Deer.
Net Zero GHG	The balance is zero between the amount of greenhouse gas (GHG) that is produced and the amount that is removed from the atmosphere.
Offshore EIA Report	The EIA for the Green Volt Offshore Windfarm submitted to Marine Scotland in January 2023.
Offshore Project	Refers solely to the offshore element of the Project, which is being consented separately. This includes the Offshore windfarm and offshore export cable corridor.
Onshore Cables	The cables which will take power to and from the Proposed Substation south-west of New Deer and Green Volt Offshore windfarm.
Onshore EIA Report	The EIA Report for the Green Volt Onshore Infrastructure (Proposed Development).
Project	Green Volt Offshore Windfarm project as a whole, including associated onshore and offshore infrastructure development.

Proposed Development	Green Volt Onshore Infrastructure development including; the Landfall, the Cable Route Corridor, and the Substation Compound. Including all ancillary infrastructure.
Proposed Substation	The new Proposed Substation at the grid connection point located approximately 5.5km from New Deer and 0.45km south-east of the existing National Grid New Deer Substation.
Site	The area within the Application Site Boundary within which the Proposed Development lies.
Substation Compound	Part of the Proposed Development consisting of substation (grid transformers and HVAC switchgear and associated electrical equipment), temporary construction compound, drainage, and the proposed route of the connection to the SSE/National Grid Substation.
Trenchless Compound	A trenchless mechanism for the installation underground utilities such as cables.

Planning Statement

1.1 Introduction

1. This Planning Statement has been prepared by Green Cat Renewables Ltd on behalf of Green Volt Offshore Windfarm Ltd (the Applicant) to support an application for planning permission under section 25 of the Town and Country Planning (Scotland) Act 1997 (as amended) (Planning Act 1997)(Scottish Government, 1997a) submitted to Aberdeenshire Council. The application (the Application) is for the construction, operation and decommissioning of the Green Volt Onshore Infrastructure which includes the Landfall, the Cable Route Corridor and the Substation Compound (the Proposed Development). **Section 1.1.3** below provides a description of the onshore infrastructure which is the subject of the Application. A more detailed description of the Proposed Development can be found in **Chapter 5 – Project Description** of the Environmental Impact Assessment Report (EIA Report) and the Proposed Development is shown on the following figures:

   - Figure 5.1 – Overview of route – with and without constraints
   - Figure 5.1a – Overview of Figure sections
   - Figure 5.1b – Overview Section 1
   - Figure 5.1c – Overview Section 2
   - Figure 5.1d – Overview Section 3
   - Figure 5.1e - Overview Section 4
   - Figure 5.2 – Proposed Landfall Area
   - Figure 5.3 – Proposed Substation Area

2. Other Planning drawings include:

   - Drawing 12731-156-EIW-ZZ-XX-DR-C-91001-P01 – Typical Cross Section
   - Drawing 200-007-DRG-020-Rev A01 – Trenchless Road Crossing Typical Section
   - 200-007-DRG-021-Rev A01 Trenchless River Crossing Typical Section
   - 200-007-DRG-022 Rev A01 Transition Joint Bay Typical Arrangement
   - Drawing C4642 (1) 110 Drainage Concept
   - C4642 (1) 120 Control Building
   - C4642 (1) 121 DRC Building
   - C4642 (1) 122 Filter Building
   - C4642 (1) 123 GIS Switchgear Building
   - C4642 (1) 124 SGT
   - C4642 (1) 125 Shunt Reactor

1.1.1 Purpose of the Planning Statement

3. The purpose of this Planning Statement is to provide a planning appraisal of the Proposed Development in terms of the Development Plan and other material considerations. Section 25 of the Planning Act 1997 requires that when "*…making any determination under the planning Acts, regard is to be had to the development plan, the determination is, unless material considerations indicate otherwise, to be made in accordance with that plan.*"

4. Section 3ZA of the Planning Act 1997 provides that the "*purpose of planning is to manage the development and use of land in the long term public interest.*"

1.1.2 The Planning Statement and EIA Report

5. Throughout this Planning Statement, reference will be made to the various assessments within the EIA Report accompanying the Application. The EIA Report identifies and assesses the potential environmental effects of the Proposed Development, together with embedded and additional mitigation, and is relevant to the policy appraisal within this Planning Statement. Where relevant, the EIA Report should be read in conjunction with this Planning Statement.

1.1.3 The Proposed Development

6. The Proposed Development is the construction, operation and decommissioning of the Green Volt Onshore Infrastructure which includes the Landfall, the Cable Route Corridor and the Substation Compound.

7. The Proposed Development consists of three main elements:

   - **Landfall**: consisting of a working compound for the infrastructure required for Trenchless Crossings such as Horizonal Directional Drilling, an Onshore Transmission Jointing Pit and a Mobilisation Area.
   - **Cable Route Corridor**: including Cable Trenches along the route length with up to two parallel trenches to support the conduit, an Export Cable which would including up to six export cables and one fibre optic cable per bundle, a Haul Road of up to 35km, the Cable Route Corridor itself which would be up to 80m in width, and four Mobilisation Areas which would include storage.
   - **Substation Compound**: which includes a Temporary Construction Compound, the Proposed Substation, Super Grid Transformer, Reactors, a Control Building, a Dynamic Compensation Building, a Filter Building for 220kV and 400kW, associated sustainable drainage systems (SuDS) ponds and the connection to the NGNDSS.

8. A full description of the Proposed Development can be found in EIA Report, **Chapter 5 - Project Description**.

9. Details of the project design process can be found in the Design Statement and EIA Report, **Chapter 4: Assessment of Alternatives**.

10. The Application would be a National Development, as discussed in **Section 1.2.1.1** below.

11. The Application is for a temporary planning permission of 35 years.

1.1.4 The Site

12. The site of the Proposed Development (the Site) is approximately 35km in length running east to west from the Landfall, approximately 1.25km north of Peterhead, to the Substation Compound approximately 0.45km southeast of the National Grid New Deer Substation (NGNDSS).

13. The land use within the Site is dominated by agriculture, predominantly crossing through arable land and agriculturally improved grassland. There are also small patches of woodland, watercourses, and several roads of various classifications. There are no sizeable towns or settlements within the Site; however there are a number of dispersed properties and farms within the wider area.

14. A full description of the Site from Landfall to Substation can be found in EIA Report, **Chapter 5 – Project Description**.

15. Details of the site selection process can be found in the Design Statement and EIA Report, **Chapter 4 – Assessment of Alternatives**.

16. The Site is wholly within Aberdeenshire Council area. Therefore, under Section 1 of the Planning Act 1997, Aberdeenshire Council will the determining authority in respect of the Application.

17. The Proposed Development is wholly above Mean Low Water Springs. The Proposed Development constitutes the onshore elements of the wider project for the Green Volt Offshore Wind Farm. The offshore elements of project are subject to separate consenting requirements. Applications for the offshore consents have been sought.

1.1.5 The Applicant

18. The Applicant is Green Volt Offshore Windfarm Ltd, a joint venture between Flotation Energy Ltd (Flotation Energy) and Vårgrønn AS (Vårgrønn).

19. Flotation Energy is an offshore wind development company, headquartered in Edinburgh, UK. Founded in 2018, the company is pioneering the development of both Floating and Fixed Offshore Wind in Scotland, the UK and Internationally.

20. Vårgrønn is a growing agile Offshore Wind company and was established as a Joint Venture (JV) between Italian energy major Eni Plenitude and the Norwegian private equity manager and Offshore Energy serial entrepreneur HitechVision.

1.1.6 Structure of the Planning Statement

21. This Planning Statement:

- Sets out the relevant test under the Planning Act 1997.
- Identifies the Development Plan.
- Carries out an appraisal of the Proposed Development against all relevant policies within the Development Plan.
- Identifies other material planning considerations, and appraises the Proposed Development against them.
- Brings together the relevant conclusions and assesses the Proposed Development against the test established in section 25 of the Planning Act 1997.

22. **Appendix 1** provides the text of relevant provisions of the Development Plan.

1.2 The Development Plan

23. Section 25 of the Planning Act 1997 requires that when "*…making any determination under the planning Acts, regard is to be had to the development plan, the determination is, unless material considerations indicate otherwise, to be made in accordance with that plan.*" (underline emphasis added).

24. This section assesses the Proposed Development against provisions of the Development Plan.

25. The Development Plan in this instance consists of the National Planning Framework 4 (NPF4) and the Aberdeenshire Local Development Plan 2023 (ALDP) (Aberdeenshire Council, 2023). While section 4ZA of the Planning Act 1997 provides for Regional Spatial Strategies which would form part of the Development Plan, at the time of writing no Regional Spatial Strategies have been published and they are not considered further in this assessment.

26. Text of relevant provisions of the Development Plan can be found in Appendix 1.

27. The remainder of this section:

- Sets out all the relevant provisions within the Development Plan including the aims, objectives, and policies.
- Appraises the Proposed Development against them (**Table 1.1**).
- Determines whether the Proposed Development accords with the relevant policies and with the Development Plan as a whole.

1.2.1 National Planning Framework 4

28. The fourth National Planning Framework (NPF4) was published on 13 February 2023 (Scottish Government, 2023b). NPF4 is in force at the time of the submission of the Application and National Planning Framework 3 and Scottish Planning Policy are now superseded.

29. At the core of NPF4 is the need to decarbonise our energy and land use. This is confirmed in the introductory section of NPF4: "*We have already taken significant steps towards decarbonising energy and land use, but choices need to be made about how we can make sustainable use of our natural assets in a way which benefits communities.*"

30. NPF4 sets out the long-term spatial strategy for Scotland and national planning policies as part of the statutory Development Plan.

31. NPF4 contains six overarching spatial principles, as below, that are key in achieving the goal of sustainable, liveable and productive places:

- Just transition,
- Conserving and recycling assets,
- Local living,
- Compact urban growth,

- Rebalanced development, and
- Rural revitalisation.

32. In order to apply the spatial principles in practice, NPF4 outlines that the national spatial strategy will support the planning and delivery of place based outcomes, namely sustainable places, liveable places and productive places.

33. In relation to the connections between onshore and offshore infrastructure, NPF4 states: "*The interplay between land and sea will be critical, given the scale of offshore renewable energy resources*."

34. NPF4 is clear that "*[t]he global climate emergency and the nature crisis have formed the foundations for the spatial strategy as a whole*." Over-arching NPF4 Policy 1 expressly provides that when considering all development proposals *significant weight* will be given to the global climate and nature crises. NPF4 therefore directs the decision-maker to give significant weight towards the contribution that a proposed development will make towards renewable energy carbon reduction targets.

35. **Chapter 16 – Greenhouse Gas Assessment** outlines the Projects contributions to carbon reduction targets, including a saving of over 41.6 million tonnes of CO_2e over the lifetime of the Project. The time taken for the Project generated CO_2e to be paid back has been calculated at 1.39 years. The chapter concludes that the Project would be of beneficial significance in relation to reducing GHG emissions.

1.2.1.1 National Development

36. Section 3A(4)(b) of the Planning Act 1997 sets out that National Planning Frameworks may describe a development and designate it, or a class of development and designate each development within that class, as a "national development". NPF4 includes 18 national developments, six of which support sustainable places. The Proposed Development would fall within the third: "*Strategic Renewable Electricity Generation and Transmission Infrastructure*", part b) "*New and/or replacement upgraded on and offshore high voltage electricity transmission lines, cables and interconnectors of 132kv or more; and*" and "*New and/or upgraded Infrastructure directly supporting on and offshore high voltage electricity lines, cables and interconnectors including converter stations, switching stations and substations.*".

37. The designation, as outlined in the Statements of Need in Annex B of NPF4, confirms that National Developments are "*…significant developments of national importance that will help to deliver the spatial strategy.*" National development status does not grant planning permission; however, designation means that the principle of the development does not need to be agreed in later consenting processes.

38. Annex B of NPF4 also requires the likely impact of each National Development's lifecycle GHG emissions on achieving national GHG emissions reductions targets. This planning application submission includes **Chapter 16 - Greenhouse Gas Emissions** in order to assist the decision makers when further considering the assessment carried out in the NPF4 designation, providing more information on the nature and detail of the project being taken forward. The Project will result in major positive contribution to emissions reductions targets and the Proposed Development is an integral part of that.

39. Similarly, the Annex highlights that a Habitat's Regulations Appraisal has been carried out on NPF4 which identified the potential for effects on European designated sites depending on the nature of the individual projects and that the precise design, location and construction of the projects should be considered at project stage. Annex B states that all National Developments need to be considered carefully at project level and that all relevant statutory tests met. European protected sites are considered as part of **Chapter 6 – Ecology and Ornithology** and this chapter concludes that all relevant statutory tests are met.

40. The Statement of Need includes that additional electricity generation from renewables and electricity transmission capacity of scale is fundamental to achieving a net zero economy. It explains that the electricity grid will need substantial reinforcement including the addition of new infrastructure to connect and transmit the output from new on and offshore capacity to consumers in Scotland, the rest of the UK and beyond.

41. The Proposed Development is an important part of that context and gains support from the national development designation.

42. In a section that discusses the spatial principles adopted in NPF4 and the ways in which the principles should be applied in practice, NPF4 states that National Developments "*will be a focus for delivery…*".

43. NPF4 also includes national planning policies which form part of the Development Plan. An appraisal against NPF4 policies is included within the **Table 1.1** below.

1.2.2 Aberdeenshire Local Development Plan (2023)

44. The Aberdeenshire Local Development Plan (ALDP) directs decision-making on all land-use planning issues and planning applications in Aberdeenshire, sets out broad principles for development in the area and sets out planning policies. The spatial strategy within the plan highlights that Aberdeenshire is a diverse area that spans from the economically successful areas that provide homes and businesses around Aberdeen City, to areas of stunning character and natural beauty in the peripheral towns and countryside within Aberdeenshire.

45. **EIA Report Chapter 2 – Regulatory and Policy Context** highlights relevant planning policies considered when designing the Proposed Development, while this section appraises whether the Proposed Development is in compliance with the terms of the ALDP. The appraisal against the relevant policies is contained in **Table 1.1** below.

46. Non-policy considerations that are also raised by the plan, particularly in terms of spatial constraints that are highlighted by the mapping from the ALDP are discussed below:

- The Proposed Development is not located within any of the boundaries of the Aberdeenshire Green Belt as outlined in ALDP Appendix 4, and the Green Belt is not considered further.
- The Proposed Development, specifically the Landfall and part of the cable route is within the Coastal Zone (Map 16) as outlined in ALDP Appendix 5.
- The map Shaping Business Development shows that the Site is within the Energetica area and Regeneration Priority Area for Peterhead.
- The Proposed Development is not within any allocated sites and is not within any of the Settlement Statement areas.

47. It is noted that there is currently no published Supplementary Guidance to accompany the ALDP.

1.2.2.1 Areas Safeguarded or Identified as Areas of Search for Minerals Development

48. The Areas Safeguarded or Identified as Areas of Search for Minerals Development from Appendix 14 of the ALDP was consulted at an early stage of the design process. The cable route is considered to be sufficiently separated from any Areas of Search, the closest being approximately 900m from Gaval, Fetterangus (Areas of Search Map 10). The route is separated from the nearest Minerals – Safeguarding area by approximately 3.2km, Cairngall, Longside (Safeguarding Map 7).

1.2.3 Appraisal of Compliance with the Development Plan

49. In order to determine whether the Proposed Development is in accordance with the Development Plan, all relevant policies, as identified in **Table 1.1** have been responded to individually. The relevant policies have been set out in Appendix 1 of this Planning Statement.

Table 1.1 Appraisal of Compliance with the Development Plan

Policy	Appraisal
National Planning Framework 4	
Policy 1: Tackling the climate and nature crises	This policy gives significant weight to the global climate and nature crises and requires Local Development Plans that would be produced under NPF4 to address the global climate emergency and nature crisis by ensuring that the spatial strategy reduces emissions and adapts to current and future risks of climate change. The Proposed Development is part of the infrastructure required to facilitate the deployment of renewable energy infrastructure which would directly contribute to climate change mitigation. Section 1.21 above highlights that the carbon cost of the installation of the Project would be "paid back" within 1.39 years of Project

Policy	Appraisal
	completion. Therefore the Proposed Development is considered to gain significant material support from this policy.
Policy 2: Climate mitigation and adaptation	The Proposed Development supports renewable energy sources which directly reduce GHG emissions and material support from this policy is anticipated in terms of mitigating the effects of climate change. The Proposed Development has been designed with the current and future risks of Climate Change in mind.
Policy 3: Biodiversity	The Planning Application submission includes **Chapter 6 - Ecology and Ornithology** which covers a wide range of topics. a) Enhancement of biodiversity would be achieved through the enhancement of good quality habitat and effective hydrological connectivity to sensitive mire and swamp habitat and watercourses as part of the proposed Habitat Management Plans. b) It is noted in the policy that this is of particular importance for National Developments and EIA Developments. The chapter concludes that no likely significant ecological residual effects are predicted. The Applicant has committed to the provision of a Habitat Management Plan (HMP) to reduce adverse environmental effects and also to provide significant enhancements for important ecological features and biodiversity in general at the Proposed Development. i. **Chapter 6 - Ecology and Ornithology** provides a breakdown of each ecological receptor and has taken their local importance into account when assigning significance. ii. The HMP will detail the nature-based solutions utilised. iii. The methodology in **Chapter 6 - Ecology and Ornithology** sets out criteria for determining the nature of an effect, either positively (beneficial) or negative (detrimental). This is accompanied by proposed mitigation. iv. The HMP will set out significant biodiversity enhancement around Riverine Habitats through riparian planting and Terrestrial Habitats through hedge and tree planting. v. Local communities are anticipated to benefit from the enhancement works through planting around areas used for recreation including core paths and rights of way. c) N/A – Not a local development. d) No adverse effects, including cumulative adverse effects have been identified on biodiversity, nature networks or the natural environment. It is considered therefore that there would be no potential adverse impacts, including cumulatively and that the Proposed Development is in compliance with Policy 3.
Policy 4: Natural Places	Following on from the substantial assessment work carried out elsewhere in this submission, it is considered that the type, location and scale of the Proposed Development would not result in any unacceptable impacts on the natural environment. The following features are considered in the noted chapter with its associated conclusion: ▪ Special Area of Conservation and Special Protection Area – **Chapter 6 Ecology & Ornithology** –The chapter does not predict any likely significant ecological residual effects. ▪ National Park, National Scenic Area, Site of Special Scientific Interest (SSSI), National Nature Reserve and Ramsar sites – **Chapter 6 Ecology & Ornithology** and **Chapter 10 Landscape** – seven SSSIs were identified in the study area but no direct or indirect effects on the designation from the Proposed Development are anticipated, or the designation has been scoped out because of negligible impacts. No effect on the objective of the designation or overall integrity of the

Policy	Appraisal
	area, and no significant adverse effects on the qualities for which the area has been designated, are anticipated. There are no National Parks or National Scenic Areas in the study area. ▪ Local nature conservation sites – **Chapter 6 Ecology & Ornithology** – Three Local Nature Conservation Sites (LNCS) are identified in the study area, two of which are scoped out and the third is likely to have a negligible affect due to the cable passing under the designation using trenchless crossing. Due to embedded mitigation, no significant adverse effects are anticipated. This mitigation would be secured by controlling conditions. ▪ Local landscape area – **Chapter 10 Landscape** – No significant landscape impacts are anticipated outside of the construction and decommissioning phases of the Proposed Development. ▪ Species protected by legislation – **Chapter 6 Ecology & Ornithology** – Protected species surveys have been conducted for a range of species, all have been scoped out with the exception of badgers, but with mitigation in place the impact on badgers would be negligible in magnitude. ▪ Wild Land Areas – **Chapter 10 Landscape** does not highlight any Wild Land Areas in the study area. Further to the above, and taking into account each of the noted assessments and conclusions, it is considered that the Proposed Development is in compliance with the policy.
Policy 5: Soils	a) Disturbance of soils and undeveloped land, Protection of soils from compaction and erosion – embedded mitigation has been utilised to minimise disturbance of soils and undeveloped land as detailed in **Chapter 7 Geology, Hydrology, Hydrogeology and Soils**. a) Prime agricultural land – This aspect is considered in **Chapter 15 Agricultural Land**. Prime agricultural land is defined in the ALDP as classes 1, 2 and 3.1 of the Soil Survey for Scotland, Land Capability for Agriculture series. The location of the proposed Substation is essential given the locational requirements next to the existing NGNDSS. The chapter concludes that there would be no permanent impacts given that the Proposed Development is limited to 50 years and therefore subject to appropriate remediation controlled by planning conditions, no residual effects would result from the Proposed Development. It is considered that the Proposed Development meets the criteria in the policy for this aspect. b) Peatland, carbon rich soils and priority peatland habitat. **Chapter 7 Geology, Hydrology, Hydrogeology and Soils** considers these features including three pockets of Class 1 peat, and concludes that through good site design and subject to implementation of proposed mitigation measures, the potential risks identified are avoided and the associated risk is reduced to acceptable levels. It is concluded that the Proposed Development can be supported in this regard. c) Careful design and appropriate mitigation, and detailed site specific assessment have been used to conclude that adverse impacts have been avoided in line with the policy. d) N/A no commercial peat extraction proposed. Further to the above, it is considered that the Proposed Development is in compliance with the policy.
Policy 6: Forestry, woodland and trees	Areas of woodlands, including ancient woodlands have been avoided as part of the route selection process. Where areas of woodland are unavoidable, trenchless crossings are proposed. When it comes to individual trees, the planning application boundary includes an area to allow for micro-siting that can be used to avoid

Policy	Appraisal
	individual trees where possible. These topics are covered in more detail in **Chapter 6 - Ecology and Ornithology**. No woodland creation is proposed.
Policy 7: Historic assets and places	**Chapter 11 - Cultural Heritage & Archaeology** assesses both setting and physical impacts on the historic environment resource during construction and operation. Two study areas were utilised to identify potential features, and Outer Study Area of 500m and Inner Study Area of 50m. With careful route selection and appropriate mitigation measures, no permanent significant effects are anticipated. One significant effect is identified during the construction phase and one significant cumulative effect during the construction phase. These effects are temporary and for a short period of time. Other effects can be suitably mitigated with controlling conditions and the Proposed Development is considered to be in compliance with the policy.
Policy 8: Green belts	The Site is sufficiently separated from the Aberdeen Greenbelt (approximately 36km) that no impacts on it are anticipated.
Policy 10: Coastal development	a) There would be no need for further coastal protections as a result of the Proposed Development. The Proposed Development is designed to be supported in the long term in terms of climate change. b) The policy highlights that development at the coast will only be supported where the development is necessary to support net zero emissions and there is a locational need. The cable route connects the onshore and offshore elements of the Project, running through an area of the Aberdeenshire coast and is considered to meet the necessity test within the policy. c) N/A not a coastal defence measure d) See the **Design Statement** which discusses the interaction between the Proposed Development and the coast, particularly around the Landfall.
Policy 11: Energy	a) Part ii. of the policy, for "*enabling works, such as grid transmission and distribution infrastructure*" is part of the suite of renewable energy technology that the policy offers specific support for. This is considered to be a key element of material support in favour of the Proposed Development. b) N/A not a wind farm. c) The project has sought to maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities as described in **Chapter 12 Socio-Economics**. d) Policy 4 is considered in detail above. e) All relevant factors have been considered elsewhere in this Planning Statement and within the EIA Report. Categories which are not applicable include shadow flicker, aviation and seismological interests, impacts on telecommunication and broadcasting. f) The application is for temporary consent for the Proposed Development for 50 years. The Proposed Development is essential infrastructure required for the implementation of renewable energy infrastructure, in the form of the Green Volt Offshore Windfarm. While the Green Volt Offshore Windfarm is outwith the scope of this application, the benefits of the contribution of the proposal towards renewable energy generation targets and GHG emissions reduction targets, are considered to have significant weight in the decision making process, in line with the wording of part e) of the policy. In relation to connections to the grid, Policy 11 states that "*…consideration should be given to underground connections where possible.*" Given that the Proposed Development is for an underground cable, support is anticipated from this aspect of the policy. The only aspects of the development that are not underground are the Substation Compound and the access/maintenance points required.

Policy	Appraisal
Policy 18: Infrastructure first	a) The Proposed Development is a National Development as identified in NPF4. b) A key aspect of the design and route of the Proposed Development is the potential for interactions with other infrastructure. An extensive route selection process has been carried out as outlined in **Chapter 4 – Assessment of Alternatives** and the **Design Statement**. The conclusion of the route selection exercise is that the Proposed Development would not impact on other infrastructure through care route planning and mitigation measures.
Policy 22: Flood risk and water management	Flooding is considered in detail in **Chapter 7 – Geology, Hydrology, Hydrogeology and Soils**. a) There are areas at risk of surface and coastal flooding within the study area. The surface water areas are indicative of surface water ponding around topographical low points and small agricultural burns and drainage ponds. The coastal flooding is mostly along the coastline. The Proposed Development is considered to be essential infrastructure and nature of a linear feature such as a cable requires at some points to be in the vicinity of areas with a likelihood of flooding but the Proposed Development has been designed to be protected from effects of localised flooding. b) N/A not a small scale extension c) The Proposed Development has been designed in a way so as to avoid increasing the risk of flooding and utilises SuDS. No surface water connection to the public sewer is proposed. d) The Substation would connect to the public water supply. e) The Proposed Development utilises SuDS.
Policy 23: Health and safety	a) The Proposed Development is electricity infrastructure and no community facilities are proposed. a) Further to the assessments throughout the EIA Report and Planning Statement, no significant adverse effects on health and anticipated. b) N/A no public facilities are proposed. c) No significant adverse effects on air quality are anticipated as part of the Proposed Development, this is considered in detail in **Chapter 14 - Air Quality**. d) The potential for noise impacts as a result of the Proposed Development have been considered in **Chapter 9 – Noise** and unacceptable noise issues are not predicted. e) The environment we live in promotes the conditions which protect against suicide risk – this includes our psychological, social, cultural, economic and physical environment – the Proposed Development will be constructed to exacting safety standards and the criterion has no applicability to this Proposed Development. f) One of the key spatial constraints for the Cable Route Corridor is large scale gas pipelines. The potential risks and associated impacts have been fully considered as part of the design of the Proposed Development. Any such crossings will be implemented to exacting design and safety standards in consultation with the relevant undertaker and authorities. g) N/A not a hazardous substance consent application h) N/A no objections from the Health and Safety Executive, Office of Nuclear Regulation or Scottish Environmental Protection Agency. i) No licensed explosive sites have been identified in the immediate area of the Proposed Development during a contaminated land desk-based study and targeted walk over survey.
Aberdeenshire Local Development Plan 2023	
Policy R1 Special Rural Areas	The Site crosses the Coastal Zone as shown in Appendix 5 Coastal Zone, Map 16. The policy requires a justification for the use of coastal locations unless there are clear social, economic, environmental or community benefits. In this case, the Proposed

Policy	Appraisal
	Development connects the Green Volt Offshore Windfarm with onshore demand and the coastal location is considered to be required in terms of this policy. No adverse impacts on natural coastal processes or habitats are anticipated, given that the cable would use trenchless crossing under the LNCS area at Rattray Head to Peterhead. This is discussed further in **Chapter 6 - Ecology and Ornithology**. The Proposed Development is not within the Green Belt.
Policy R3 Minerals	The Proposed Development is not for the extraction of minerals and this policy is considered in relation to protection of important mineral development sites only. The Site is not in the vicinity of Areas of Search or Safeguarded Mineral sites. The Proposed Development is not anticipated to have any impact on the minerals landbank. This is discussed further in **Section 1.2.2.1** above.
Policy P1 Layout, Siting and Design	The Proposed Development is not a residential proposal. The Design Review Process and Masterplanning processes are not anticipated to be required for this type of development. The Site is not within any of the Settlements noted in ALDP Appendix 7. The Proposed Development has undergone appropriate public consultation events and the application is supported by a **Pre-Application Consultation (PAC) Report**. The six qualities of successful places are considered in detail in the **Design Statement** but appear to be less relevant to this type of development, in that no public footfall would be generated and, as a piece of utilitarian infrastructure has been designed to appear as indistinct as possible. In terms of measures to enhance biodiversity, this is discussed in **Chapter 6 - Ecology and Ornithology** which includes for significant biodiversity enhancement around Riverine Habitats through riparian planting and Terrestrial Habitats through hedge and tree planting as secured by the proposed Habitat Management Plan. In terms of the minimisation of waste, the operational development would not generate any waste, and construction activities will be controlled by a Construction Environment Management Plan (CEMP) which would include minimisation of waste. An Outline CEMP is included as **Appendix 5.1** to the EIA Report.
Policy P4 Hazardous and Potentially Polluting Developments and Contaminated Land	The assessments carried out in the EIA Report conclude that the Proposed Development would not cause a significant nuisance to neighbouring uses through for example air quality (discussed in **Chapter 14 - Air Quality**) or in terms of noise (discussed in **Chapter 9 - Noise**). By the nature of electrical infrastructure and the construction methods proposed, it is not anticipated that the development would result in significant pollution. Nor danger to the public or the environment is anticipated when best practice construction methods (as controlled by the draft CEMP) and best practice operations methods are used. In terms of hazardous developments, the Proposed Development is not considered to be hazardous by its nature. The Pipeline & Hazardous Development Consultation Zones Planning Advice PA2023-13 highlights criteria for when a Planning Authority would consult HSE on major hazard sites and major hazard pipelines, namely: ▪ Residential accommodation ▪ More than 250sqm of retail floor space ▪ More than 500sqm of office floor space ▪ More than 750sqm of floor space to be used for an industrial process ▪ Transport links, OR ▪ Which is otherwise likely to result in a material increase in the number of persons working within or visiting the notified area. The Proposed Development does not fit within any of these categories, and it is considered that the Site would not be an increased risk to public safety. Contaminated land is covered in **Chapter 8 - Contaminated Lands** which proposes mitigation in the form of targeted geoenvironmental ground investigation at five locations, testing for metals, pH, petroleum hydrocarbons, polyaromatic hydrocarbons, asbestos and organic matter content. Should any contamination be found, remediation would be implemented.

Policy	Appraisal
Policy E1 Natural Heritage	▪ Nature Conservation Sites – **Chapter 6 Ecology and Ornithology** identifies three LNCSs in the study area, two of which are scoped out and the third is likely to have a negligible affect due to the cable passing under the designation using trenchless crossing. No significant adverse effects on any LNCS is therefore anticipated. SPA, SAC and Ramsar Sites have been considered in NPF4 Policy 4 above, concluding that there are no likely significant ecological residual effects. The footprint of the site does cross any SSSI and seven SSSIs were identified in the study area, all of which were scoped out of the assessment due to predicted negligible impacts. The assessments did not identify any significant adverse effects on the qualities for which any SSSIs, National Nature Reserves or the Cairngorm National Park areas were designated. All areas of ancient woodland have been avoided by using trenchless crossings. With regards to LNCSs, three were identified in the assessment, two of which were scoped out and the third is anticipated to have negligible affects due to the cable passing under the designation using trenchless crossing methods. ▪ Protected Species – Protected species surveys have been carried out for a range of species. The Proposed Development has sought to avoid all unacceptable detrimental impacts on protected species. **Chapter 6 Ecology and Ornithology** identifies no such detrimental impacts subject to appropriate mitigation, including the implementation of a Badger Species Protection Plan. ▪ Wider Biodiversity and Geodiversity – Appropriate survey work by suitably qualified Ecologists have been conducted and provided as part of **Chapter 6 Ecology and Ornithology**. Biodiversity is at the core of the assessment and enhancement is to be provided as discussed previously.
Policy E2 Landscape	Potential landscape impacts during the construction of the Cable Route Corridor and Substation, and operational landscape and visual impacts as a result of the Substation are considered in **Chapter 10 Landscape**. Impacts from the Cable Route Corridor will be temporary and will return to the existing nature post construction. Additional mitigation has been suggested in order to minimise these impacts and ensure that the landscape character returns back to its original state as quick as possible. Significant effects were found on one LCA and one SLA, as well as a number of residential dwellings, however these effects would be short term and temporary. In terms of permanent impacts caused by the Substation, the assessment found that there would be no significant landscape effects and only three significant visual effects found on the closest residential dwellings. While these effects were found to be significant, they did not breach any residential amenity thresholds. In addition to this, an additional dwelling was found to have significant cumulative visual effects but the relevant residential amenity threshold was not breached. Proposed tree planting would reduce all of these effects to a non-significant level. No unacceptable effects are anticipated through the scale, location or design of the Proposed Development on key characteristics of the area, including natural landscape elements, features or the composition or quality of the landscape character are anticipated and the Proposed Development is considered to comply with this policy.
Policy E3 Forestry and Woodland	Forestry and Woodlands have been taken into account in the route selection process. Where areas of ancient woodlands are unavoidable, trenchless excavation will be used, potentially utilising Horizontal Directional Drilling to drill under the areas of woodland. This is discussed further in **Chapter 6 - Ecology and Ornithology**. The chapter concludes that the level of impact on woodland features and their NVC communities would be of negligible magnitude. As such it is considered that these areas would be protected and the Proposed Development complies with the policy.
Policy HE1 Protecting Listed Buildings, Scheduled	**Chapter 11 Cultural Heritage & Archaeology** assesses both setting and physical impacts on the historic environment resource during construction and operation. Two study areas were utilised to identify potential features, and Outer Study Area of

Policy	Appraisal
Monuments and Archaeological Sites (including other historic buildings) Policy HE2 Protecting Historic, Cultural and Conservation Areas	500m and Inner Study Area of 50m. With careful route selection and appropriate mitigation measures, no permanent significant effects are anticipated. One significant effect is identified during the construction phase and one significant cumulative effect during the construction phase. These effects are temporary and for a short period of time. Other effects can be suitably mitigated with controlling conditions and the proposed Development is considered to be in compliance with the policy.
Policy PR1 Protecting Important Resources	There are no anticipated significant negative effects as a result of the Proposed Development on important resources. The categories mentioned in the policy are considered in the following chapters: ▪ Air Quality – **Chapter 14 - Air Quality** – which concludes that subject to suitable mitigation measures contained in the CEMP, the risk of dust impacts are predicted to be negligible for each activity, and the predicted effects are considered to be not significant. ▪ Water Environment – **Chapter 7 – Geology, Hydrology, Hydrogeology and Soils** – the Proposed Development would not generate specific discharge to the water environment, only surface water runoff from the substation which utilises SuDS to ensure that the quality of the water maintains good ecological status. ▪ Prime Agricultural Land – **Chapter 15 - Agricultural Land** – The proposed development is for essential infrastructure. In addition, the Proposed Development is for a limited period of 50 years and there would be no permanent impact and therefore no residual effects. ▪ Open Space – The Proposed Development is not within any of the areas identified in the Settlement Statements and no impacts are anticipated. ▪ Trees and Woodland – **Chapter 6 - Ecology and Ornithology** - Areas of woodlands, including ancient woodlands have been avoided as part of the route selection process. Where areas of woodland are unavoidable, trenchless crossings are proposed. When it comes to individual trees, the planning application boundary includes an area to allow for micro-siting that would be used to avoid individual trees where possible. ▪ Minerals – The Proposed Development does not cross into any of the areas identified in Appendix 14, including Areas if Search or Safeguarded Mineral sites, discussed further in **Section 1.4.2.1** above. ▪ Peat and carbon rich soils – **Chapter 7 – Geology, Hydrology, Hydrogeology and Soils** considers these features including three pockets of Class 1 peat, and concludes that through good site design and subject to implementation of proposed mitigation measures, the potential risks identified are avoided and the associated risk is reduced to acceptable levels. It is concluded that the Proposed Development can be supported in this regard.
Policy PR2 Reserving and Protecting Important Development Sites	The route selection process has considered areas of land that are associated with future developments such as those identified in the policy and in the ALDP Safeguarding Resources map. The Proposed Development will not result in impacts on any of the areas of Reserved Land. As such the Proposed Development is in compliance with Policy PR2. With regards to National Developments, the policy specifically notes "*High-voltage electricity transmission infrastructure, including cabling, substations, and converter stations, will be at a range of locations…*" and the Proposed Development is anticipated to gain some material support from this policy.
Policy C2 Renewable Energy	The policy outlines specific renewable energy development types that it supports where they are located on appropriate sites and are of an appropriate design. The Proposed Development is directly associated with renewable energy development, namely offshore wind, and connecting the renewable energy of the Green Volt

Policy	Appraisal
	Offshore Windfarm with the national grid. It is considered that the support offered to renewable energy developments should be applied to infrastructure required to implement those energy developments, subject to the same assessment criteria. This planning application submission, as a whole, meets the tests of the policy. The list of topics to be considered in the policy text has been considered in depth in this Planning Statement with the exception of the tourism and recreation aspect, which is addressed in **Chapter 12 Socio-Economics**. The chapter notes potential disruption to the local road network during the transportation of associated infrastructure, machinery, and workforce, with some resultant visual/noise impacts. The chapter concludes that there would be minor or negligible effects on specific tourist attractions. With regards to recreation impacts, there are some moderate impacts anticipated on core paths and fishing during construction and decommissioning, but these impacts are short term during those works. The policy notes that the support for renewable energy technology is not "*…at the expense of other policies regarding Natural Heritage, the Historic Environment and Protecting Resources.*" Natural Heritage, the Historic Environment and Protecting Resources have been covered elsewhere in this Planning Statement as supported by the assessments contained within the EIA Report. The Climate Change map from the ALDP, associated with this policy includes a marker for "*National development sites – NRIP, Carbon capture & HV Transmission infrastructure*". One of which is at New Deer, where the proposed Substation is located, adjacent to the national grid connection (the NGNDSS). The Proposed Development would gain material support from this allocation. It is considered that this is one of the core policies that the Proposed Development would be considered against and this Planning Statement and has demonstrated that each of the criteria to be considered is acceptable and that the Proposed Development is in compliance with the policy and would gain material support from it.
Policy C3 Carbon Sinks and Stores	Disturbance of trees and peat have been minimised as far as possible in the design of the Proposed Development. **Chapter 16 - Greenhouse Gas Emissions** considers the carbon balance of the Proposed Development in detail and concludes that the Project as a whole would have significant beneficial effects in terms of GHG emissions and would contribute towards Scotland's and the UK's net zero targets. This is discussed further in Section 1.2.1 The Proposed Development is considered to comply with the policy and the carbon benefits are considered to provide strong material weight in favour of the Proposed Development in the planning balance.
Policy C4 Flooding	The planning application submission is accompanied by a Construction Execution Plan, an Outline CEMP and **Chapter 7 Geology, Hydrology, Hydrogeology and Soils**. There are areas at risk of surface and coastal flooding within the study area. The surface water areas are indicative of surface water ponding around topographical low points and small agricultural burns and drainage ponds. The coastal flooding is mostly along the coastline. The Proposed Development is considered to be essential infrastructure and nature of a linear feature such as a cable requires at some points to be in the vicinity of areas with a likelihood of flooding but the Proposed Development has been designed to be protected from effects of localised flooding. In summary it is considered that the Proposed Development will not significantly elevate the baseline risk of flooding and is in compliance with the policy.
Policy RD2 Developer Obligations	The Proposed Development is not anticipated to place a strain on: Strategic Transportation, Local Transport Infrastructure, Open Space and Access, Primary Education, Secondary Education, Community Facilities, Strategic Recycling and Waste Infrastructure, or Health and Care Facilities.

1.2.4 Conclusions on the Development Plan

50. The appraisal carried out in **Table 1.1**, demonstrates compliance with all relevant policies in the Development Plan and with the Development Plan as a whole.

51. In the event of any incompatibility of relevant provisions within NPF4 and the ADLP, the provisions of NPF4 as the more recent document, would prevail. However, no such incompatibility has been identified.

52. In terms of the statutory test in section 25 of the Planning Act 1997, the Proposed Development accords with the Development Plan and, subject to the consideration of material considerations below, planning permissions should be granted. In particular, the Proposed Development is an integral part of a large scale project, making very substantial contributions towards renewable energy production and reductions in greenhouse gasses emissions, as well as providing socio-economic benefits and biodiversity enhancements. Adverse effects are limited and subject to embedded and additional mitigation commitments

1.3 Other Material Considerations

53. To reiterate, section 25 of the Planning Act 1997 requires that when "*…making any determination under the planning Acts, regard is to be had to the development plan, the determination is, unless material considerations indicate otherwise, to be made in accordance with that plan.*" (underline emphasis added). This section assesses the other material considerations aspect of the section 25 test.

54. These other material considerations often take the form of national, regional or local policy or guidance documents on planning, climate change and energy. The planning history of a site is a material consideration and is included in this section.

1.3.1 Climate Change and Energy Context

55. The International, UK and National legislative and policy context for climate change and energy is discussed in detail in EIA Report **Chapter 2 – Regulatory and Policy Context**.

1.3.1.1 International

56. The UK is a signatory to the Kyoto Protocol that is linked to the United Nations Framework Convention on Climate Change (UNFCCC) (UNFCCC, 1997) and provides commitments for the State parties to reduce Greenhouse Gas (GHG) emissions. The Kyoto Protocol was adopted in Kyoto, Japan on 11 December 1997 and entered into force on 16 February 2005. The Protocol was amended in Doha, Qatar on 8 December 2012 and entered into force on 31 December 2020. Its commitments are reflected in The Climate Change Act 2008 (UK Government, 2008) and The Climate Change (Scotland) Act 2009 (Scottish Government, 2009) which includes interim targets.

57. COP21 (UNFCCC, 2015) took place in December 2015 in Paris at which 195 countries, the UK included, adopted the Global Climate Deal (The Paris Agreement). The Paris Agreement (UNFCCC, 2016) sets out the global action plan of limiting global temperature increase to below 2°C, while pursuing efforts to limit the increase to 1.5°C above pre-industrial average temperature.

58. COP26 (UNFCCC, 2021) took place in November 2021 in Glasgow where parties concluded that with current climate policies the world was not on track to meet the long-term temperature goal set out in the Paris Agreement, with a 2.7°C increase predicted following COP26.

59. Most recently, COP 27 (UNFCCC, 2022) took place in November 2022 in Sharm el-Sheikh, where countries agreed to return each year to strengthen commitments on cutting GHG emissions to attempt to strengthen their commitments to pursue efforts to keep the increase in temperature below 1.5ºC.

1.3.1.2 UK

1.3.1.2.1 The Climate Change Act 2008

60. The Climate Change Act 2008 (as amended by The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (UK Government, 2019)) sets out the framework for the UK to transition to a low-carbon economy. It places a duty on the UK government to ensure their net carbon account and GHG emissions are reduced by

100% by 2050 relative to 1990 levels (Net Zero) as legally underpinned by international agreements and commitments.

61. The Act includes a requirement for the Committee on Climate Change to report to the UK Parliament and each of the devolved administrations on:

- The progress that has been made towards meeting the carbon budgets that have been set under Part 1 and the target in section 1 (the target for 2050).
- The further progress that is needed to meet those budgets and that target.
- Confirmation as to whether those budgets and that target are likely to be met.

1.3.1.2.2 Net Zero Strategy: Build Back Greener

62. The Net Zero Strategy (UK Government, 2021a) from the UK Government is a strategy that sets out policies and proposals for decarbonising all sectors of the UK economy to meet the UK's Net Zero target by 2050.

63. The Net Zero Strategy promotes a green industrial revolution and a green economic recovery from the impact of COVID-19 with a focus on the position of the UK in the global green economy. It aims to keep the UK on track for the UK carbon budgets, the 2030 Nationally Determined Contribution, and Net Zero by 2050. It includes:

- decarbonisation pathways to Net Zero by 2050, including illustrative scenarios;
- policies and proposals to reduce emissions for each sector; and
- cross-cutting action to support the transition.

64. One of the key policies within the Strategy is the move towards 1GW of Floating Offshore Wind by 2030, in order to put the UK at the forefront of the technology. The Strategy also discusses prioritising critical system enablers, specifically the onshore infrastructure required for the installation of the offshore technology.

1.3.1.2.3 British Energy Security Strategy

65. The British Energy Security Strategy (UK Government, 2022) was published in April 2022, and sets out how Britain will accelerate homegrown power for greater energy independence, in response to energy pressures and the cost of living crisis caused by the COVID-19 pandemic and Russia's invasion of Ukraine in 2022.

The British Energy Security Strategy seeks to accelerate the deployment of Wind, new Nuclear, Solar and Hydrogen Power, whilst supporting the production of domestic oil and gas (O&G) in the nearer term – which could see 95% of electricity by 2030 being low-carbon.

66. The Strategy has set a target to reach 50GW of Offshore Wind by 2030, including 5GW of Floating Offshore Wind.

1.3.1.2.4 Powering-Up Britain: Energy Security Plan

67. The Powering Up Britain: Energy Security Plan (March 2023) (UK Government, 2023) from the UK Government complements the earlier Powering Up Britain and sits alongside Powering Up Britain: Net Zero Growth Plan. The Energy Security Plan outlines the steps that the UK Government's Department for Energy Security and Net Zero is taking to ensure the UK is more energy independent, secure and resilient.

68. The Energy Security Plan includes a commitment to launch a Floating Offshore Wind Manufacturing Investment Scheme and highlights the interconnectedness with the British Energy Security Strategy.

1.3.1.3 Scotland

1.3.1.3.1 The Climate Change (Scotland) Act 2009

69. The Climate Change (Scotland) Act 2009 (CC(S)A 2009) is legislation specifically implemented to reduce the GHG emissions in Scotland. The CC(S)A 2009 requires an interim reduction of GHG emissions by 42% and an 80% reduction target for 2050. This also required that the Scottish Ministers set annual targets, in secondary legislation, from 2010–2050.

1.3.1.3.2 The Climate Change (Emissions Reductions Targets) (Scotland) Act 2019

70. The Scottish Government is committed to ensuring secure, reliable and affordable energy supplies within the context of long-term decarbonisation of energy generation. Continued growth of the renewable energy sector in Scotland is an essential feature of the future clean energy system and a key driver of future economic growth.

The Scottish Government has set a range of targets and ambitions to cut GHG emissions and to generate more energy from renewable sources. The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 commits the Scottish Government to reach Net Zero emissions of all GHGs by 2045. It also sets out interim targets of to cut emissions by 75% by 2030, and 90% by 2040, against the 1990 baseline. Additionally, The Scottish Government has set a target to generate 50% of Scotland's overall energy consumption from renewable sources by 2030.

1.3.1.3.3 The Electricity Generation Policy Statement 2013

71. The Electricity Generation Policy Statement 2013 (EGPS 2013) (Scottish Government, 2013) examines the way in which Scotland generates electricity and considers the changes which will be necessary to meet the targets that the Scottish Government has established. The Scottish Government's policy on electricity generation is that Scotland's generation mix should deliver:

- a secure source of electricity supply;
- at an affordable cost to consumers;
- that can be largely decarbonised by 2030; and
- that achieves the greatest possible economic benefit and competitive advantage for Scotland, including opportunities for community ownership and community benefits.

1.3.1.3.4 Scotland's Energy Strategy

72. In 2017, the Scottish Government published Scotland's Energy Strategy: The Future of Energy in Scotland (Scottish Government, 2017b) that set a vision for how the energy system in Scotland would look in 2050. That vision was to see: "A flourishing, competitive, local and national energy sector, delivering secure, affordable, clean energy for Scotland's households, communities and businesses."

73. Since the publication of the 2017 Strategy, the Scottish Government has committed to achieving ambitious targets of Net Zero GHG emissions by 2045, and a 75% reduction by 2030 (Scottish Government 2020). The 2017 Strategy involves supplying 50% of Scotland's energy requirements from renewable sources and increasing energy productivity by 30% across the Scottish economy by 2030. The latest report by the Climate Change Committee (CCC, 2022) identifies that emissions in 2021 rose to some extent after the COVID-19 Pandemic but remain 10% below 2019 levels.

1.3.1.3.5 Draft Energy Strategy and Just Transition Plan – Delivering a fair and secure zero carbon energy system for Scotland 2023

74. The Draft Energy Strategy and Just Transition Plan (Scottish Government, 2023a) was introduced in a ministerial statement in Parliament in January 2023. It brings together plans for a Just Transition and the existing Energy Strategy from 2017. It is anticipated that this plan will supersede the Scottish Energy Strategy once adopted.

75. The draft Plan sets out actions to ensure that:

- People have access to affordable clean energy.
- Communities and places can participate and benefit from the Net Zero energy transition.
- We have a supportive policy environment, maximising the impact of government expenditure and attracting private investment.
- Scotland is home to a multi-skilled energy workforce, boosting our domestic supply chain and manufacturing capabilities.
- Scotland's Net Zero energy system is continuously innovative and competitive in domestic and international markets.

76. The Proposed Development aims to support each of those goals and the wider movement towards a Just Transition, this is discussed in **Chapter 12 – Socio Economics**. In terms of offshore development, the draft plan sets an ambition for 8–11GW of offshore wind in Scottish water by 2030 and seeks views on targets out to 2045.

1.3.1.3.6 Scotland's Offshore Wind Policy Statement

77. While principally focussed on offshore development, the Offshore Wind Policy Statement 2022 (Scottish Government, 2022) highlights analysis by the 2020 Committee on Climate Change that there is a need to development a strategy to encourage rapid development of onshore networks to connect offshore wind farms

to the National Grid. The Proposed Development will be vital to connect the Green Volt Floating Offshore Windfarm to the National Grid.

1.3.1.3.7 Scotland's Offshore Wind Route Map

78. The Offshore Wind Industry Group (OWIG) (consisting of industry, Scottish Government and public sector bodies) published Scotland's Offshore Wind Route Map in 2010 (Scottish Government, 2010), presenting an approach to identifying opportunities, challenges and priority recommendations for the offshore wind industry. The ambition of Scotland's offshore wind industry was highlighted.

79. Scotland's Offshore Wind Route Map highlights constraints in terms of access to the National Grid and the significant upgrades to National Grid infrastructure required in order to accommodate the level of offshore wind that is required to meet decarbonisation targets.

80. The function of the Proposed Development to connect the Offshore Project with the New Deer SSEN Transmission Substation and is considered to be part of the infrastructure required to ensure that the contributions from offshore wind are realised.

81. Scotland's Offshore Wind further identifies that offshore wind will make a significant contribution to meeting Scotland's renewable energy target of 50% of Scotland's electricity consumption coming from renewable sources by 2030 with a fully decarbonised energy system by 2050.

1.3.1.4 Aberdeenshire Council

82. Aberdeenshire Council's Climate Change Declaration has committed to a target of 75% reduction of its own GHG emissions by 2030 and Net Zero GHG emissions by 2045 from a 2010/2011 baseline year.

1.3.1.5 Climate emergency declaration

83. The Climate Change Secretary, on behalf of the Scottish Government declared a global climate emergency in May 2019 (Scottish Government, 2019) and followed with an amendment to the Climate Change Bill, now the 2019 Act.

84. Subsequent legislative, regulatory and policy updates from the Scottish Government have accelerated the push for tackling climate change. Two of the key elements to this are the targets within the Onshore Wind Policy Statement 2022 and policies within the National Planning Framework 4 (discussed in **Section 1.4.1)**.

85. After the publication of the National Planning Framework 4, Scottish Renewables, the industry body for the renewables industry in Scotland, is quoted in a speech by Ministers in Parliament (Scottish Government, 2023b) as saying Scotland has "probably…one of the most supportive planning regimes for renewables in the whole of Europe".

86. The Proposed Development represents infrastructure that will support the successful deployment of the renewable energy assets needed and this context is considered to have considerable weight in the planning balance.

1.3.1.6 Conclusions on Climate Change and Energy Context

87. The direction of travel is clear from international agreements through UK Government and Scottish Government legislation and policy, that further prioritisation must be given to the reduction of GHG emissions in a move towards Net Zero GHG emissions. The targets set by the various bodies have regularly strengthened and updated in response to the seriousness of the Climate Crisis and the urgent need to mitigate its adverse effects and increase energy security.

88. Climate change and associated energy policies are material considerations in determination of the Application. In emphasising the vital role of offshore wind development, the need for associated onshore infrastructure to deliver this renewable energy, and the urgency of the required delivery of this infrastructure, these material considerations provide substantial support to the Proposed Development.

89. While the weight to be afforded to material considerations is a matter for the decision-maker, the Applicant's position is that these material considerations lend substantial material weight in favour of the Proposed Development.

1.3.2 Site History

90. The Cable Route Corridor has been carefully planned to avoid interacting with extant permissions, allocated sites and settlements. As a result, the Site does not interact with any relevant planning applications.

1.3.3 Planning Advice Notes

91. Planning Advice Notes (PANs) (Scottish Government, no date) from the Chief Planner at the Scottish Government provide advice on good practice and other relevant information. The following PANs have been taken into account when forming the planning application submission in order to ensure the Proposed Development has considered all applicable topics.

- PAN 1/2013 Environmental Impact Assessment
- PAN 60 (2000) Planning for Natural Heritage
- PAN 61 (2001) Sustainable Urban Drainage Systems
- PAN 68 (2003) Design Statements
- PAN 75 (2005) Planning for Transport
- PAN 3/2010 Community Engagement
- PAN 1/2011 Planning and Noise
- PAN 2/2011 Planning and Archaeology
- PAN 51 Planning, Environmental Protection and Regulation (revised in 2006)

92. These Notes are considered to have some, minimal material weight in the planning balance and the Proposed Development aligning with these is considered to have some, minimal weight in favour of the Proposed Development in the planning balance.

1.3.4 Electrification of Oil and Gas Industry

93. One of the key functions of the Green Volt Offshore Wind Farm is the electrification of the offshore Oil and Gas industry, which has committed to $C0_2$ emissions reductions targets out to 2030 as part of the UK Government's commitment to Net Zero.

94. Crown Estate Scotland announced the Innovation and Targeted Oil and Gas (INTOG) (Crown Estate Scotland, 2022) Leasing Round 2022 with results announced in early 2023. The Applicant was awarded exclusivity in the INTOG leasing round in March 2023. INTOG has been designed to allow offshore wind developers to apply for the rights to build offshore wind farms specifically for the purpose of providing low-carbon electricity to power O&G installations and help decarbonise the sector.

95. In essence the Proposed Development supports the decarbonisation of a difficult to decarbonise area of the energy sector and some positive material weight in the planning balance is anticipated from this contribution.

1.3.5 Conclusions on Other Material Considerations

96. A range of topics have been identified which are considered to be material in planning terms. Of specific note is the considerable weight which should be attributed to the Climate Crisis and developments which will assist in combatting the Climate Crisis. Given that the Proposed Development contributes to climate change mitigation by supporting significant offshore wind energy development and the electrification of the offshore oil and gas industry, it is considered that significant material weight should be added to the planning balance in favour of the Proposed Development.

1.4 Benefits of the Proposed Development

97. The Proposed Development is associated with a wide range of benefits:

- This Planning Statement has demonstrated that there is a substantial need for this type of development which is part of the essential infrastructure required to supports the implementation of renewable energy generation assets – which help attain the legally binding Net Zero GHG emissions targets.
- The Proposed Development supports the decarbonisation of the offshore oil and gas industry through INTOG.

- Support for the implementation of renewable energy generation supports the security of electricity generation.
- A range of socio-economic benefits such as:
    - Capital expenditure in the area
    - Supply chain benefits
    - Direct and indirect employment
- Significant biodiversity enhancement resulting in an increase in biodiversity.
- As a National Development under the category of Strategic Renewable Electricity Generation and Transmission Infrastructure, the Proposed Development is considered to be a development type that, as described by NPF4 are "*of national importance that help to deliver the spatial strategy*" and a "*focus for delivery*".

98. Section 3ZA of the Planning Act 1997 describes that the "*purpose of planning is to manage the development and use of land in the long term public interest.*" A major component of the Proposed Development is the installation of an underground cable, where the majority of the impact from that development is during the construction phase. With appropriate mitigation and controlling conditions in place, it is considered that there would be a net positive influence on the long term public interest, particularly in terms of climate change.

1.5 Conclusion

99. This Planning Statement sets the relevant tests to be considered by decision makers, identifies the Development Plan, carries out an appraisal of compliance with the development plan and an appraisal of other material considerations which would influence the planning balance of the case.

100. The Proposed Development is an essential element of a substantial offshore wind farm project that will help to achieve UK and Scottish GHG emissions reductions targets.

101. The appraisals reference the comprehensive EIA Report which accompanies the planning application in order to assist with determining whether the Proposed Development is in compliance with the Development Plan.

102. As a National Development, and further to the conclusion reached by this Planning Statement that the Proposed Development is in compliance with the Development Plan, it is considered that the Proposed Development is of national importance and will help to deliver the spatial strategy, in line with the provisions of NPF4.

103. The appraisals in this Planning Statement conclude that the Proposed Development is in compliance with key Development Plan policies and with the Development Plan as a whole. Other material considerations add considerable weight to the planning balance in favour of the Proposed Development. As such, subject to the imposition of appropriate controlling planning conditions, planning permission should be granted.

1.6 References

- Scottish Government (1997a). The Town and Country Planning (Scotland) Act 1997. Available at https://www.legislation.gov.uk/ukpga/1997/8/contents [Accessed June 2023]
- Scottish Government (2013). The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013. Available at https://www.legislation.gov.uk/ssi/2013/155/regulation/9 [Accessed July 2023]
- Scottish Government (2023a). National Planning Framework 4. Available at https://www.gov.scot/publications/national-planning-framework-4/ [Accessed July 2023]
- Scottish Government (1997b). The Town and Country Planning (Use Classes) (Scotland) Order 1997. Available at https://www.legislation.gov.uk/uksi/1997/3061/schedule/made [Accessed June 2023]
- Scottish Government (1992). The Town and Country Planning (General Permitted Development) (Scotland) Order 1992. Available at https://www.legislation.gov.uk/uksi/1992/223/contents/made [Accessed June 2023]
- Scottish Government (2019). The Global Climate Emergency - Scotland's Response: Climate Change Secretary Roseanna Cunningham's statement. Available at https://www.gov.scot/publications/global-climate-emergency-scotlands-response-climate-change-secretary-roseanna-cunninghams-statement/ [Accessed June 2023]
- Scottish Government (2023b). Fourth National Planning Framework: Planning Minister's speech - 11 January 2023. Available at https://www.gov.scot/publications/fourth-national-planning-framework-planning-ministers-speech-11-january-2023/ [Accessed June 2023]
- Aberdeenshire Council (2023). Aberdeenshire Local Development Plan 2023. Available at https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2023/ [Accessed July 2023]
- Aberdeenshire Council (2017). Aberdeenshire Local Development Plan Supplementary Guidance Energetica 2017. Available at https://www.aberdeenshire.gov.uk/ldpmedia/3_Energetica.pdf [Accessed July 2023]

1.7 Appendix 1 – Provisions of relevant Development Plan policies.

Policy	Policy Text
National Planning Framework 4	
Policy 1: Tackling the climate and nature crises	When considering all development proposals significant weight will be given to the global climate and nature crises.
Policy 2: Climate mitigation and adaptation	a) Development proposals will be sited and designed to minimise lifecycle greenhouse gas emissions as far as possible. b) Development proposals will be sited and designed to adapt to current and future risks from climate change. c) Development proposals to retrofit measures to existing developments that reduce emissions or support adaptation to climate change will be supported.
Policy 3: Biodiversity	a) Development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats and building and strengthening nature networks and the connections between them. Proposals should also integrate nature-based solutions, where possible. b) Development proposals for national or major development, or for development that requires an Environmental Impact Assessment will only be supported where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrably better state than without intervention. This will include future management. To inform this, best practice assessment methods should be used. Proposals within these categories will demonstrate how they have met all of the following criteria: i. the proposal is based on an understanding of the existing characteristics of the site and its local, regional and national ecological context prior to development, including the presence of any irreplaceable habitats; ii. wherever feasible, nature-based solutions have been integrated and made best use of; iii. an assessment of potential negative effects which should be fully mitigated in line with the mitigation hierarchy prior to identifying enhancements; iv. significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty. Management arrangements for their longterm retention and monitoring should be included, wherever appropriate; and v. local community benefits of the biodiversity and/or nature networks have been considered. c) Proposals for local development will include appropriate measures to conserve, restore and enhance biodiversity, in accordance with national and local guidance. Measures should be proportionate to the nature and scale of development. Applications for individual householder development, or which fall within scope of (b) above, are excluded from this requirement. d) Any potential adverse impacts, including cumulative impacts, of development proposals on biodiversity, nature networks and the natural environment will be minimised through careful planning and design. This will take into account the need to reverse biodiversity loss, safeguard the

Policy	Policy Text
	ecosystem services that the natural environment provides, and build resilience by enhancing nature networks and maximising the potential for restoration.
Policy 4: Natural Places	a) Development proposals which by virtue of type, location or scale will have an unacceptable impact on the natural environment, will not be supported. b) Development proposals that are likely to have a significant effect on an existing or proposed European site (Special Area of Conservation or Special Protection Areas) and are not directly connected with or necessary to their conservation management are required to be subject to an "appropriate assessment" of the implications for the conservation objectives. c) Development proposals that will affect a National Park, National Scenic Area, Site of Special Scientific Interest or a National Nature Reserve will only be supported where: i. The objectives of designation and the overall integrity of the areas will not be compromised; or ii. Any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance. All Ramsar sites are also European sites and/ or Sites of Special Scientific Interest and are extended protection under the relevant statutory regimes. d) Development proposals that affect a site designated as a local nature conservation site or landscape area in the LDP will only be supported where: i. Development will not have significant adverse effects on the integrity of the area or the qualities for which it has been identified; or ii. Any significant adverse effects on the integrity of the area are clearly outweighed by social, environmental or economic benefits of at least local importance. e) The precautionary principle will be applied in accordance with relevant legislation and Scottish Government guidance. f) Development proposals that are likely to have an adverse effect on species protected by legislation will only be supported where the proposal meets the relevant statutory tests. If there is reasonable evidence to suggest that a protected species is present on a site or may be affected by a proposed development, steps must be taken to establish its presence. The level of protection required by legislation must be factored into the planning and design of development, and potential impacts must be fully considered prior to the determination of any application. g) Development proposals in areas identified as wild land in the Nature Scot Wild Land Areas map will only be supported where the proposal: i. will support meeting renewable energy targets; or, ii. is for small scale development directly linked to a rural business or croft, or is required to support a fragile community in a rural area. All such proposals must be accompanied by a wild land impact assessment which sets out how design, siting, or other mitigation measures have been and will be used to minimise significant impacts on the qualities of the wild land, as well as any management and monitoring arrangements where appropriate. Buffer zones around wild land will not be applied, and effects of development outwith wild land areas will not be a significant consideration.
Policy 5: Soils	a) Development proposals will only be supported if they are designed and constructed: i. In accordance with the mitigation hierarchy by first avoiding and then minimising the amount of disturbance to soils on undeveloped land; and

Policy	Policy Text
	ii. In a manner that protects soil from damage including from compaction and erosion, and that minimises soil sealing. b) Development proposals on prime agricultural land, or land of lesser quality that is culturally or locally important for primary use, as identified by the LDP, will only be supported where it is for: i. Essential infrastructure and there is a specific locational need and no other suitable site; ii. Small-scale development directly linked to a rural business, farm or croft or for essential workers for the rural business to be able to live onsite; iii. The development of production and processing facilities associated with the land produce where no other local site is suitable; iv. The generation of energy from renewable sources or the extraction of minerals and there is secure provision for restoration; and In all of the above exceptions, the layout and design of the proposal minimises the amount of protected land that is required. c) Development proposals on peatland, carbon rich soils and priority peatland habitat will only be supported for: i. Essential infrastructure and there is a specific locational need and no other suitable site; ii. The generation of energy from renewable sources that optimises the contribution of the area to greenhouse gas emissions reductions targets; iii. Small-scale development directly linked to a rural business, farm or croft; iv. Supporting a fragile community in a rural or island area; or v. Restoration of peatland habitats. d) Where development on peatland, carbon-rich soils or priority peatland habitat is proposed, a detailed site specific assessment will be required to identify: i. the baseline depth, habitat condition, quality and stability of carbon rich soils; ii. the likely effects of the development on peatland, including on soil disturbance; and iii. the likely net effects of the development on climate emissions and loss of carbon. This assessment should inform careful project design and ensure, in accordance with relevant guidance and the mitigation hierarchy, that adverse impacts are first avoided and then minimised through best practice. A peat management plan will be required to demonstrate that this approach has been followed, alongside other appropriate plans required for restoring and/ or enhancing the site into a functioning peatland system capable of achieving carbon sequestration. e) Development proposals for new commercial peat extraction, including extensions to existing sites, will only be supported where: i. the extracted peat is supporting the Scottish whisky industry; ii. there is no reasonable substitute; iii. the area of extraction is the minimum necessary and the proposal retains an in-situ residual depth of peat of at least 1 metre across the whole site, including drainage features; iv. the time period for extraction is the minimum necessary; and v. there is an agreed comprehensive site restoration plan which will progressively restore, over a reasonable timescale, the area of extraction to a functioning peatland system capable of achieving carbon sequestration.

Policy	Policy Text
Policy 6: Forestry, woodland and trees	a) Development proposals that enhance, expand and improve woodland and tree cover will be supported. b) Development proposals will not be supported where they will result in: i. Any loss of ancient woodlands, ancient and veteran trees, or adverse impact on their ecological condition; ii. Adverse impacts on native woodlands, hedgerows and individual trees of high biodiversity value, or identified for protection in the Forestry and Woodland Strategy; iii. Fragmenting or severing woodland habitats, unless appropriate mitigation measures are identified and implemented in line with the mitigation hierarchy; iv. Conflict with Restocking Direction, Remedial Notice or Registered Notice to Comply issued by Scottish Forestry. c) Development proposals involving woodland removal will only be supported where they will achieve significant and clearly defined additional public benefits in accordance with relevant Scottish Government policy on woodland removal. Where woodland is removed, compensatory planting will most likely be expected to be delivered. d) Development proposals on sites which include an area of existing woodland or land identified in the Forestry and Woodland Strategy as being suitable for woodland creation will only be supported where the enhancement and improvement of woodlands and the planting of new trees on the site (in accordance with the Forestry and Woodland Strategy) are integrated into the design.
Policy 7: Historic assets and places	a) Development proposals with a potentially significant impact on historic assets or places will be accompanied by an assessment which is based on an understanding of the cultural significance of the historic asset and/or place. The assessment should identify the likely visual or physical impact of any proposals for change, including cumulative effects and provide a sound basis for managing the impacts of change. Proposals should also be informed by national policy and guidance on managing change in the historic environment, and information held within Historic Environment Records. b) Development proposals for the demolition of listed buildings will not be supported unless it has been demonstrated that there are exceptional circumstances and that all reasonable efforts have been made to retain, reuse and/or adapt the listed building. Considerations include whether the: ii. building is no longer of special interest; iii. building is incapable of physical repair and re-use as verified through a detailed structural condition survey report; iv. repair of the building is not economically viable and there has been adequate marketing for existing and/or new uses at a price reflecting its location and condition for a reasonable period to attract interest from potential restoring purchasers; or v. demolition of the building is essential to delivering significant benefits to economic growth or the wider community. c) Development proposals for the reuse, alteration or extension of a listed building will only be supported where they will preserve its character, special architectural or historic interest and setting. Development proposals affecting the setting of a listed building should preserve its character, and its special architectural or historic interest. d) Development proposals in or affecting conservation areas will only be supported where the character and appearance of the conservation area and its setting is preserved or enhanced. Relevant considerations include the:

Policy	Policy Text
	ii. architectural and historic character of the area; iii. existing density, built form and layout; and iv. context and siting, quality of design and suitable materials. e) Development proposals in conservation areas will ensure that existing natural and built features which contribute to the character of the conservation area and its setting, including structures, boundary walls, railings, trees and hedges, are retained. f) Demolition of buildings in a conservation area which make a positive contribution to its character will only be supported where it has been demonstrated that: ii. reasonable efforts have been made to retain, repair and reuse the building; iii. the building is of little townscape value; iv. the structural condition of the building prevents its retention at a reasonable cost; or v. the form or location of the building makes its reuse extremely difficult. g) Where demolition within a conservation area is to be followed by redevelopment, consent to demolish will only be supported when an acceptable design, layout and materials are being used for the replacement development. h) Development proposals affecting scheduled monuments will only be supported where: ii. direct impacts on the scheduled monument are avoided; iii. significant adverse impacts on the integrity of the setting of a scheduled monument are avoided; or iv. exceptional circumstances have been demonstrated to justify the impact on a scheduled monument and its setting and impacts on the monument or its setting have been minimised. i) Development proposals affecting nationally important Gardens and Designed Landscapes will be supported where they protect, preserve or enhance their cultural significance, character and integrity and where proposals will not significantly impact on important views to, from and within the site, or its setting. j) Development proposals affecting nationally important Historic Battlefields will only be supported where they protect and, where appropriate, enhance their cultural significance, key landscape characteristics, physical remains and special qualities. k) Development proposals at the coast edge or that extend offshore will only be supported where proposals do not significantly hinder the preservation objectives of Historic Marine Protected Areas. l) Development proposals affecting a World Heritage Site or its setting will only be supported where their Outstanding Universal Value is protected and preserved. m) Development proposals which sensitively repair, enhance and bring historic buildings, as identified as being at risk locally or on the national Buildings at Risk Register, back into beneficial use will be supported. n) Enabling development for historic environment assets or places that would otherwise be unacceptable in planning terms, will only be supported when it has been demonstrated that the enabling development proposed is: ii. essential to secure the future of an historic environment asset or place which is at risk of serious deterioration or loss; and iii. the minimum necessary to secure the restoration, adaptation and long-term future of the historic environment asset or place.

Policy	Policy Text
	The beneficial outcomes for the historic environment asset or place should be secured early in the phasing of the development, and will be ensured through the use of conditions and/or legal agreements. o) Non-designated historic environment assets, places and their setting should be protected and preserved in situ wherever feasible. Where there is potential for non-designated buried archaeological remains to exist below a site, developers will provide an evaluation of the archaeological resource at an early stage so that planning authorities can assess impacts. Historic buildings may also have archaeological significance which is not understood and may require assessment. Where impacts cannot be avoided they should be minimised. Where it has been demonstrated that avoidance or retention is not possible, excavation, recording, analysis, archiving, publication and activities to provide public benefit may be required through the use of conditions or legal/planning obligations. When new archaeological discoveries are made during the course of development works, they must be reported to the planning authority to enable agreement on appropriate inspection, recording and mitigation measures.
Policy 8: Green belts	a) Development proposals within a green belt designated within the LDP will only be supported if: i. they are for: • development associated with agriculture, woodland creation, forestry and existing woodland (including community woodlands); • residential accommodation required and designed for a key worker in a primary industry within the immediate vicinity of their place of employment where the presence of a worker is essential to the operation of the enterprise, or retired workers where there is no suitable alternative accommodation available; • horticulture, including market gardening and directly connected retailing, as well as community growing; • outdoor recreation, play and sport or leisure and tourism uses; and developments that provide opportunities for access to the open countryside (including routes for active travel and core paths); • flood risk management (such as development of blue and green infrastructure within a “drainage catchment” to manage/mitigate flood risk and/or drainage issues); • essential infrastructure or new cemetery provision; • minerals operations and renewable energy developments; • intensification of established uses, including extensions to an existing building where that is ancillary to the main use; • the reuse, rehabilitation and conversion of historic environment assets; or • one-for-one replacements of existing permanent homes. And the following requirements are met: • reasons are provided as to why a green belt location is essential and why it cannot be located on an alternative site outwith the green belt; • the purpose of the green belt at that location is not undermined; • the proposal is compatible with the surrounding established countryside and landscape character; • the proposal has been designed to ensure it is of an appropriate scale, massing and external appearance, and uses materials that minimise visual impact on the green belt as far as possible; and

Policy	Policy Text
	• there will be no significant long-term impacts on the environmental quality of the green belt.
Policy 10: Coastal development	a) Development proposals in developed coastal areas will only be supported where the proposal: i. does not result in the need for further coastal protection measures taking into account future sea level change; or increase the risk to people of coastal flooding or coastal erosion, including through the loss of natural coastal defences including dune systems; and ii. is anticipated to be supportable in the longterm, taking into account projected climate change. b) Development proposals in undeveloped coastal areas will only be supported where they: i. are necessary to support the blue economy, net zero emissions or to contribute to the economy or wellbeing of communities whose livelihood depend on marine or coastal activities, or is for essential infrastructure, where there is a specific locational need and no other suitable site; ii. do not result in the need for further coastal protection measures taking into account future sea level change; or increase the risk to people of coastal flooding or coastal erosion, including through the loss of natural coastal defences including dune systems; and iii. are anticipated to be supportable in the long-term, taking into account projected climate change; or iv. are designed to have a very short lifespan. c) Development proposals for coastal defence measures will be supported if: i. they are consistent with relevant coastal or marine plans; ii. nature-based solutions are utilised and allow for managed future coastal change wherever practical; and iii. any in-perpetuity hard defense measures can be demonstrated to be necessary to protect essential assets. d) Where a design statement is submitted with any planning application that may impact on the coast it will take into account, as appropriate, long-term coastal vulnerability and resilience.
Policy 11: Energy	a) Development proposals for all forms of renewable, low-carbon and zero emissions technologies will be supported. These include: i. wind farms including repowering, extending, expanding and extending the life of existing wind farms; ii. enabling works, such as grid transmission and distribution infrastructure; iii. energy storage, such as battery storage and pumped storage hydro; iv. small scale renewable energy generation technology; v. solar arrays; vi. proposals associated with negative emissions technologies and carbon capture; and vii. proposals including co-location of these technologies. b) Development proposals for wind farms in National Parks and National Scenic Areas will not be supported. c) Development proposals will only be supported where they maximise net economic impact, including local and community socio-economic benefits such as employment, associated business and supply chain opportunities. d) Development proposals that impact on international or national designations will be assessed in relation to Policy 4. e) In addition, project design and mitigation will demonstrate how the following impacts are addressed:

Policy	Policy Text
	i. impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and shadow flicker; ii. significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/ or appropriate design mitigation has been applied, they will generally be considered to be acceptable; iii. public access, including impact on long distance walking and cycling routes and scenic routes; iv. impacts on aviation and defence interests including seismological recording; v. impacts on telecommunications and broadcasting installations, particularly ensuring that transmission links are not compromised; vi. impacts on road traffic and on adjacent trunk roads, including during construction; vii. impacts on historic environment; viii. effects on hydrology, the water environment and flood risk; ix. biodiversity including impacts on birds; x. impacts on trees, woods and forests; xi. proposals for the decommissioning of developments, including ancillary infrastructure, and site restoration; xii. the quality of site restoration plans including the measures in place to safeguard or guarantee availability of finances to effectively implement those plans; and xiii. cumulative impacts. In considering these impacts, significant weight will be placed on the contribution of the proposal to renewable energy generation targets and on greenhouse gas emissions reduction targets. Grid capacity should not constrain renewable energy development. It is for developers to agree connections to the grid with the relevant network operator. In the case of proposals for grid infrastructure, consideration should be given to underground connections where possible. f) Consents for development proposals may be time-limited. Areas identified for wind farms are, however, expected to be suitable for use in perpetuity.
Policy 18: Infrastructure first	a) Development proposals which provide (or contribute to) infrastructure in line with that identified as necessary in LDPs and their delivery programmes will be supported. b) The impacts of development proposals on infrastructure should be mitigated. Development proposals will only be supported where it can be demonstrated that provision is made to address the impacts on infrastructure. Where planning conditions, planning obligations, or other legal agreements are to be used, the relevant tests will apply. Where planning obligations are entered into, they should meet the following tests: • be necessary to make the proposed development acceptable in planning terms • serve a planning purpose • relate to the impacts of the proposed development • fairly and reasonably relate in scale and kind to the proposed development • be reasonable in all other respects Planning conditions should only be imposed where they meet all of the following tests. They should be: • necessary • relevant to planning

Policy	Policy Text
	• relevant to the development to be permitted • enforceable • precise • reasonable in all other respects
Policy 22: Flood risk and water management	a) Development proposals at risk of flooding or in a flood risk area will only be supported if they are for: i. essential infrastructure where the location is required for operational reasons; ii. water compatible uses; iii. redevelopment of an existing building or site for an equal or less vulnerable use; or. iv. redevelopment of previously used sites in built up areas where the LDP has identified a need to bring these into positive use and where proposals demonstrate that longterm safety and resilience can be secured in accordance with relevant SEPA advice. The protection offered by an existing formal flood protection scheme or one under construction can be taken into account when determining flood risk. In such cases, it will be demonstrated by the applicant that: • all risks of flooding are understood and addressed; • there is no reduction in floodplain capacity, increased risk for others, or a need for future flood protection schemes; • the development remains safe and operational during floods; • flood resistant and resilient materials and construction methods are used; and • future adaptations can be made to accommodate the effects of climate change. Additionally, for development proposals meeting criteria part iv), where flood risk is managed at the site rather than avoided these will also require: • the first occupied/utilised floor, and the underside of the development if relevant, to be above the flood risk level and have an additional allowance for freeboard; and • that the proposal does not create an island of development and that safe access/ egress can be achieved. b) Small scale extensions and alterations to existing buildings will only be supported where they will not significantly increase flood risk. c) Development proposals will: i. not increase the risk of surface water flooding to others, or itself be at risk. ii. manage all rain and surface water through sustainable urban drainage systems (SUDS), which should form part of and integrate with proposed and existing blue-green infrastructure. All proposals should presume no surface water connection to the combined sewer; iii. seek to minimise the area of impermeable surface. d) Development proposals will be supported if they can be connected to the public water mains. If connection is not feasible, the applicant will need to demonstrate that water for drinking water purposes will be sourced from a sustainable water source that is resilient to periods of water scarcity. e) Development proposals which create, expand or enhance opportunities for natural flood risk management, including blue and green infrastructure, will be supported.
Policy 23: Health and safety	a) Development proposals that will have positive effects on health will be supported. This could include, for example, proposals that incorporate opportunities for exercise, community food growing or allotments.

Policy	Policy Text
	b) Development proposals which are likely to have a significant adverse effect on health will not be supported. A Health Impact Assessment may be required. c) Development proposals for health and social care facilities and infrastructure will be supported. d) Development proposals that are likely to have significant adverse effects on air quality will not be supported. Development proposals will consider opportunities to improve air quality and reduce exposure to poor air quality. An air quality assessment may be required where the nature of the proposal or the air quality in the location suggest significant effects are likely. e) Development proposals that are likely to raise unacceptable noise issues will not be supported. The agent of change principle applies to noise sensitive development. A Noise Impact Assessment may be required where the nature of the proposal or its location suggests that significant effects are likely. f) Development proposals will be designed to take into account suicide risk. g) Development proposals within the vicinity of a major accident hazard site or major accident hazard pipeline (because of the presence of toxic, highly reactive, explosive or inflammable substances) will consider the associated risks and potential impacts of the proposal and the major accident hazard site/pipeline of being located in proximity to one another. h) Applications for hazardous substances consent will consider the likely potential impacts on surrounding populations and the environment. i) Any advice from Health and Safety Executive, the Office of Nuclear Regulation or the Scottish Environment Protection Agency that planning permission or hazardous substances consent should be refused, or conditions to be attached to a grant of consent, should not be overridden by the decision maker without the most careful consideration. j) Similar considerations apply in respect of development proposals either for or near licensed explosive sites (including military explosive storage sites).
Aberdeenshire Local Development Plan 2023	
Policy R1 Special Rural Areas	In order to safeguard the special nature of the green belt and coastal zone, development opportunities will be restricted and subject to the considerations set out in paragraphs R1.2 to R1.5. The boundaries of the green belt are shown on the proposals maps where applicable and in detail in Appendix 4, Boundaries of the Green Belt. The extent of the coastal zone is shown in detail in Appendix 5, Coastal Zone. In the green belt the following developments are permitted: • development associated with agriculture, woodland and forestry, fishing and horticulture; • development for a recreational use that is compatible with its agricultural or natural setting. The development of single huts not associated with a tourist proposal under Policy B3 Tourist Facilities will be prohibited; • development meeting a national requirement or established need, if no other suitable site is available; • intensification of an established use subject to the new development being of a suitable scale and form1; • accommodation within the immediate vicinity of the place of employment required for a worker in a primary industry, where the presence of a worker is essential to the efficient operation of the enterprise, and there is no suitable alternative residential accommodation available. • essential infrastructure such as digital communications infrastructure and electricity grid connections. In the coastal zone development must require a coastal location or there must be clear social, economic, environmental or community benefits arising. In either case

Policy	Policy Text
	there must be no coalescence of coastal developments or adverse impacts on natural coastal processes or habitats. We will approve development associated with coastal protection works where it is evidenced that the works respect natural processes and there will be no significant adverse impact on coastal processes or habitats, and that the development will not result in increased coastal erosion or flooding on the coastline. The full range of protection works and management options should be considered over the lifetime of the development to futureproof against relevant climate change projections. In both the green belt and coastal zone we will also allow: • the sensitive restoration, conversion or extension of a traditional vernacular building or other building of architectural merit; • replacement of a single non vernacular building within the curtilage of the building to be replaced, and for the same use. The replacement building must be consistent in scale, and no more intrusive than the existing building. In addition, it is generally expected that the new building will demonstrate a significant improvement in design to that of the existing building.
Policy R3 Minerals	We will only allow minerals development where sufficient information is provided to enable the full likely effects of the development to be assessed, together with proposals for appropriate control, mitigation and monitoring. At a minimum the following information must be provided to support the application: • Environmental Impact Assessment • details of phased working; • waste management; • land restoration and aftercare, including details of the timescales for such works; • details of the proposed use of the site after completion of the works. It is generally expected that all minerals developments will be fully restored to its previous use unless an alternative use is outlined at the outset; and • public road maintenance and restoration. This will require to be agreed with the Planning Authority before any planning application is approved. Proposals will need to address, amongst other considerations: • the effect on natural heritage, habitat and biodiversity; • habitat enhancement and restoration measures; • landscape and visual impacts; • the effect on the historic environment; • impacts on local communities, individual homes, sensitive receptors and economic sectors important to the local economy; • disturbance from noise, blasting and vibration, and artificial light; • potential pollution of land, air and water (surface and groundwater); • transport impacts; • disturbance of carbon rich soils; and • cumulative impacts with other minerals and landfill sites in the area. A statement from a suitably qualified professional outlining any benefits to the local and national economy as a result of the minerals development will be required as part of any planning application. Minerals development will not be permitted if a Transport Assessment shows that development will have significant negative transport impacts on local communities, or a Waste Management Plan does not show how secondary materials from mineral workings, such as overburden, waste rock and fines, will be reused. Where appropriate we will require financial guarantees through planning conditions or Legal Agreements to ensure that a high standard of site restoration and aftercare is provided. To mitigate environmental effects of mineral development, sustainable restoration of sites to beneficial use is sought, including ecological solutions. Such

Policy	Policy Text
	work should be undertaken at the earliest opportunity. Provision will be made for the monitoring and review of such guarantees as necessary. Where development would result in three or more consented mineral developments within a 5km radius of a settlement, consideration will be required of cumulative impacts and any adverse impacts identified should be adequately mitigated. All conditions attached to mineral permissions will be reviewed every 15 years unless postponed by written agreement with the Planning Authority to ensure that the development is not adversely affecting the natural or historic environment, landscape character or local amenity. A buffer distance restricting development around minerals sites will be agreed with the developer in consultation with the local community, prior to permission being granted. This will need to take into account the specific circumstances of the proposals, including factors such as site location, topography, expected duration of operations, and method of working. Protection of important minerals development sites is achieved through safeguarding minerals sites and areas of search for sand and gravel through Policy PR1 Protecting Important Resources and Appendix 14, Areas Safeguarded or Identified as Areas of Search for Minerals Development. We will seek to maintain a minerals landbank of permitted reserves for construction aggregates of at least 10 years during the Plan period, in all market areas through the identification of areas of search.
Policy P1 Layout, Siting and Design	Residential proposals that fall within the category of a major development will be required to participate in a Design Review Process. Other types of development, in terms of scale and nature, may be required to participate in a Design Review Process at the discretion of the Planning and Economy Service. Where possible these sites are specified in Appendix 7, Settlement Statements, or those that are likely to generate significant public interest. A Masterplan that has been subject to public consultation, must be prepared for all major housing and mixed-use developments (more than 50 homes, and/or more than 2 hectares of employment or retail development) or other developments of a size and scale deemed appropriate by the Planning Authority that merits the provision of a Masterplan. We will support: • new development on sites identified within Appendix 7, or other developments of a size and scale deemed appropriate by the Planning Authority, as requiring a development framework or Masterplan, OR • major developments (more than 50 homes, or more than 2 hectares of employment, retail or mixed-use development deemed appropriate as major development by the Planning Authority) if they keep to a previously agreed statement(s) on the proposed design for the site. Any previously agreed statement must have gone through a process that includes an appropriate level of consultation. Once agreed, a Masterplan shall remain valid for a period of 5 years, unless planning permission for the development has been granted and implemented. Design Statements and Masterplans must be written to reflect the whole of the allocated site. Only if there is a previously agreed development framework for the whole allocation will Masterplans be accepted for smaller parts of the site, and then only if it accords with the overarching Design Statement. We will assess all development, whether on sites we have allocated or elsewhere, using a process that includes appropriate public consultation. Certain proposals for a national or major development should meet the prescribed criteria/level of public and stakeholder engagement, as outlined in Planning Advice. We will only approve development designs that demonstrate the six qualities of successful places, which are: • distinctive with a sense of local identity through creation of a sense of place and the aesthetics of the design features and elements;

Policy	Policy Text
	• safe and pleasant, encouraging both activity and privacy, providing security and protecting amenity; • welcoming through visual appeal, style and the creation of a welcoming environment. • adaptable to future needs through the balance of land uses, building types, density, sizes and tenures (including housing for people on modest incomes), and the flexibility to adapt to the changing circumstances of occupants; • efficient in terms of resources used in terms of waste management, water use, heating and electricity, the use of recycled materials and materials with low embodied energy, and responding to local climatic factors associated with cold winds, rain, snow and solar gain; and • well connected - to create well connected places that promote intermodal shifts and active travel and are easy to move around. Further design guidance on how to meet these qualities is provided in the allocation summaries in Appendix 7, Appendix 8 Successful Placemaking Guidance and Appendix 9 Building Design Guidance. Measures require to be identified to enhance biodiversity in proportion to the opportunities available and the scale of the development opportunity. In very rare circumstances, when it is not practical to meet biodiversity net gain within a development site, we may require off-site contributions towards biodiversity enhancement within the settlement or near to the site. These obligations may be controlled by conditions. To accord with the Scottish Government Zero Waste Plan and the Circular Economy Strategy, a Site Waste Management Plan will be submitted to demonstrate that developers have minimised the generation of waste and maximised reuse and recycling during the construction and operational phases of new development. In line with the waste hierarchy, particular attention should be given to encouraging opportunities for reuse, refurbishment, remanufacturing and reprocessing of high value materials and products. These obligations may be controlled by conditions.
Policy P4 Hazardous and Potentially Polluting Developments and Contaminated Land	We will refuse development, even infill development, if there is a risk that it could cause significant pollution, create a significant nuisance (for example through impacts on air quality or noise), or present an unacceptable danger to the public or the environment. This includes developments we are told by the Health and Safety Executive or the Competent Authority to be near facilities they have identified as hazardous. Pipelines, agricultural buildings, wastewater treatment plants, waste disposal/treatment facilities and heavy industrial uses are all examples of development that could create a nuisance, pollution or hazard. In any circumstances where development of this kind is, on balance, considered acceptable by the appropriate authorities, satisfactory steps must be taken to mitigate any residual negative development impacts. In determining planning applications for development within the consultation zones for hazardous installations (including oil and gas pipelines), we will consult with, and take full account of advice from the Health and Safety Executive (HSE), the Competent Authority (in the case of Control of Major Accident Hazardous sites) and the facility's owners and operators, and will seek to ensure that any risk to public safety is not increased. Prospective applicants should check whether their proposed development is within the consultation zone of a major hazard site or a major accident hazard pipeline, and should seek further advice if this is the case. This confirmation and advice can be obtained from the HSE Planning Advice Web App at www.hse.gov.uk/landuseplanning/developers.htm or in Planning Advice, Pipeline and Hazardous Development Consultation Zones. Planning permission may be refused for potentially hazardous developments, or for other forms of development in close proximity to existing hazardous developments,

Policy	Policy Text
	in the event that insufficient information has been submitted to demonstrate the impacts or where the impacts are unclear or unknown. We will not allow development on land that is known or suspected to be contaminated unless appropriate site investigations have been undertaken to identify any actual or possible risk to public health or the environment (including possible pollution of the water environment), and effective remedial actions are proposed to ensure the site is made suitable for its new use. Where site conditions are appropriate, consideration should be given to both radioactive and non-radioactive sources of contamination. Where an Air Quality Assessment or a Noise Impact Assessment indicates that a proposed development could have a significant detrimental impact on air quality or noise levels, appropriate mitigation measures must be provided.
Policy E1 Natural Heritage	**Nature Conservation Sites** We will not allow new development where it may have an unacceptable adverse effect on a nature conservation site designated for its biodiversity, species, habitat, or geodiversity importance, except where the following circumstances apply. In the case of an existing or proposed Special Protection Area (SPA), existing, proposed or candidate Special Area of Conservation (SAC) or Ramsar Site, if it cannot be ascertained that the development would not adversely affect the integrity of the site, development will only be permitted where: • there are no alternative solutions; • there are imperative reasons of overriding public interest, that may, for sites not hosting a priority habitat type and/or priority species, be of a social or economic nature; and • compensatory measures have been identified and agreed to ensure that the overall coherence of the European site network is protected. Where the site hosts a priority habitat type and/or a priority species, the reasons must relate to human health, public safety or beneficial consequences of primary importance to the environment, or other reasons which, in the opinion of Scottish Ministers, are imperative reasons of overriding public interest. It should be noted that development not directly connected with, or necessary to, the conservation management of a European site, and which is likely to have a significant effect on the site (either individually or in combination with other plans or projects) will require to be subject to an appropriate assessment, in order to ascertain whether the development would not adversely affect the integrity of the site. Development that affects Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) or the Cairngorms National Park will only be permitted where a thorough assessment demonstrates that the objectives of designation and the overall integrity of the site will not be compromised, or any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance. In all cases, any impacts should be minimised through careful design and mitigation measures. For other recognised nature conservation sites (such as Local Nature Conservation Sites, nature reserves, designated wetlands, woodland in the Scottish Natural Heritage Ancient Woodland Inventory and the Native Woodland Survey of Scotland) the proposal's public benefits must clearly outweigh the nature conservation value of the site. In all cases, impacts must be minimised through careful design and mitigation measures. There will be a strong presumption against removing ancient semi-natural woodland or Plantations on Ancient Woodland Sites (PAWS). Where such woodland is present on or beside a development site, proposals should be designed to seek to accommodate and protect the woodland rather than remove it in part or entirely. We, along with others with an interest, including NatureScot, Royal Society for the Protection of Birds, Scottish Wildlife Trust and Aberdeen University, have identified 113 Local Nature Conservation Sites which are introduced by this Plan in Appendix 12, Local Nature Conservation Sites.

Policy	Policy Text
	Protected Species Development must seek to avoid any unacceptable detrimental impact on protected species. A Protected Species Survey to inform the assessment of impacts will be required where there is reason to believe protected species may exist on or adjacent to the site. The submission of Species Protection Plans detailing appropriate avoidance and mitigation measures may be required. Development affecting any protected species will only be permitted when it can be justified in accordance with the relevant protected species legislation. Lists of species protected by legislation are available from NatureScot. Development affecting species listed in schedule 5 of the Wildlife and Countryside Act will not be approved unless: • the proposal will give rise to, or contributes towards the achievement of, a significant social, economic or environmental benefit; and • there is no other satisfactory solution; and • there is no significant negative impact on the conservation status of the species. Development affecting any European Protected Species will not be approved unless: • it is required for imperative reasons of overriding public interest; and • there is no other satisfactory solution; and • the population will be maintained at a favourable conservation status in its natural range. **Wider Biodiversity and Geodiversity** A baseline ecological or geological survey must be prepared for all developments and other proposals where there is evidence to suggest that a habitat, geological feature or species of importance may exist on or adjacent to the site. This baseline survey must be provided by a suitably qualified ecologist or geologist, as appropriate. A number of criteria will be used to consider the biodiversity impacts of a development, including whether it will affect habitats or species listed in: Schedule 2 or 4 of the Habitats Regulations; or the Scottish Biodiversity List; or North East Scotland Biodiversity Partnership Local Important Species; or other species or habitats of importance to biodiversity; or Groundwater Dependent Terrestrial Ecosystems (GWDTE). We will only approve development proposals: • when a baseline ecological survey has been carried out; • when the development has been designed to avoid impacts where possible; • where impacts cannot be avoided the public benefits clearly outweigh the ecological or geological value of the site; and • where an ecological or geological management plan is provided that includes necessary mitigation and compensation measures to result in ecological net gain. Development will not be allowed if it fragments habitats or is not designed to minimise any adverse impact on the site's environmental quality, ecological status, or viability. Policy P1 also says that all developments should identify measures that will be taken to enhance biodiversity (including woodlands) in proportion to the potential opportunities available and the scale of the development. In circumstances when it is not practical to deliver positive effects for biodiversity within a development site, we may require off-site contributions towards biodiversity enhancement within the settlement. Such measures may be secured by planning obligations or conditions.
Policy E2 Landscape	We will refuse development that causes unacceptable effects through its scale, location or design on key characteristics, natural landscape elements, features or the composition or quality of the landscape character as defined in the Landscape Character Assessments produced by NatureScot. These impacts can be either alone or cumulatively with other recent developments. A Landscape and Visual Impact Assessment (LVIA) may be required to assess the effects of change on a landscape

Policy	Policy Text
	that could be experienced should a development proposal be approved. Appropriate mitigation should be identified. Development that has a significant adverse impact on the qualifying interests of a Special Landscape Area will not be permitted unless it is adequately demonstrated that these effects are clearly outweighed by social, environmental or economic benefits of at least local importance. Appendix 13 on Special Landscape Areas is also intended to be used as a guide by prospective developers in assessing potential impact. Development, in terms of its location, scale, design, materials and landscaping, should be of a high standard and enhance the special qualities and character of the Special Landscape Area.
Policy E3 Forestry and Woodland	Aberdeenshire's forests and native and semi-natural woodland areas are valued and enjoyed by both residents and visitors and must continue to be resilient to the effects of climate change. They must be protected and, where appropriate, enhanced to safeguard the environment, habitats, species and local culture, whilst benefitting and supporting the local and national economy. We will promote and support the forestry industry while strongly protecting and enhancing trees and woodlands in the planning and construction of built development. To achieve this, there will be a presumption against the removal of safe and healthy trees, noncommercial woodlands and hedgerows. Criteria in the Scottish Government's policy on Control of Woodland Removal will be used to determine the acceptability of woodland removal. Development is also required to continue to ensure that opportunities are taken to promote the role of woodlands in providing opportunities for community development, education and recreational access, protecting and enhancing environmental quality and biodiversity, landscape and historic assets. Working with partners a Forestry and Woodland Strategy has been prepared as Planning Advice that sets out key issues and opportunities for forests and woodlands under the following themes: • Aid the resilience of trees and woodlands to the negative effects of climate change and tree disease. • Promote trees and woodlands to aid Scotland in mitigating and adapting to climate change. • Support expansion of Aberdeenshire's woodland coverage in line with Scottish Government targets. • Promote and support the forestry industry. • Strongly protect and enhance trees and woodlands in the planning and construction of built development. • Identify woodlands of high nature conservation value. • Promote and support the role of woodlands in providing opportunities for community development, education and recreational access. • Promote new woodland creation and/or enhancement including the restoration of important woodlands e.g. ancient and semi-natural woodlands, and management practice which protects and enhances environmental quality and biodiversity. • Promote management practices that provide a focus for new planting and restocking whilst also protecting and enhancing the landscape, and historic assets where applicable. A map of Preferred Areas for New Woodland Creation has been included in the Aberdeenshire Forestry and Woodland Strategy to identify where new woodlands could go to maximise benefits and promote integrated land use.

Policy	Policy Text
Policy HE1 Protecting Listed Buildings, Scheduled Monuments and Archaeological Sites (including other historic buildings)	We will resist development that would have an adverse impact on the character, integrity or setting of listed buildings, or scheduled monuments, or other archaeological sites. If adverse impact is unavoidable, it should be minimised and justified. We will protect all listed buildings contained on the statutory list of Buildings of Special Architectural or Historic Interest for Aberdeenshire, all scheduled monuments contained on the statutory schedule of Monuments for Aberdeenshire and undesignated archaeological sites in Aberdeenshire. We will encourage their protection, maintenance, enhancement, and appropriate active use and conservation. **Listed Buildings** Alterations to listed buildings should be of the highest quality, and respect any features of special architectural, cultural or historic interest in terms of design, materials, scale, and setting. A Design Statement is required to support any proposed development and demonstrate how the proposal addresses paragraphs HE1.1 and The Design Statement should outline the details of the proposal, the significance of the building and justify that the proposal protects and respects the listed building. The demolition of a listed building will not be permitted unless there is clear evidence to show that the building is no longer of special interest, is incapable of repair or there are overriding environmental or socio-economic reasons not to retain it. It must be satisfactorily demonstrated that every effort has been made to continue the present use or find a suitable new use, with or without an appropriate adaptation of the building. **Scheduled Monuments and Archaeological Sites** Development on nationally or locally important monuments or archaeological sites, or having an adverse impact on the integrity of their setting, will only be allowed if there are exceptional circumstances, including those of a social or economic nature, and there is no alternative site. It is the developer's responsibility to provide information on the nature and location of the archaeological features, including details of any mitigation measures proposed, prior to determination of the planning application. Where preservation of the site in its original location is not possible, the developer must arrange for the full excavation and recording of the site in advance of development to satisfy Aberdeenshire Council that the impacts from development have been fully mitigated.
Policy HE2 Protecting Historic, Cultural and Conservation Areas	**Conservation Areas** We will resist development, including change of use or demolition, which would fail to preserve or enhance the character or appearance of a conservation area. This applies both to developments within the conservation area and proposals outwith that would affect its character or appearance. We will seek retention, restoration, and sympathetic adaptation of unlisted buildings which contribute positively to the special architectural or historic interest of the area, in preference to allowing their demolition. The design, scale, layout, siting and materials used in development within a conservation area must be of the highest quality and respect the individual characteristics for which the conservation area was designated. Development should be in accordance with any agreed Conservation Area Management Plan or Appraisal. All details must be provided under the cover of a full application and any trees (including veteran trees and trees outside of woodlands) contributing to the character and appearance should be retained. Homeowners and business owners within the conservation area boundaries automatically have certain Permitted Development Rights removed. Appendix 11 provides details on the additional controls within the conservation areas in Aberdeenshire.

Policy	Policy Text
	Battlefields, Inventory Gardens and Designed Landscapes Development affecting an inventory battlefield or inventory garden and designed landscape7 will only be permitted if: the proposal would not have an adverse impact that compromises the objectives of the designation of an inventory garden or designed landscape, or the key landscape characteristics and special qualities of an inventory battlefield; or, any significant adverse effects are outweighed by long-term social or economic benefits of overriding public importance and there is no alternative site for the development. These conditions may also apply to developments outwith the designated sites. In either case, measures and mitigation must be taken to conserve and enhance the essential characteristics of the site as appropriate. All development affecting the character and/or the appearance of an inventory battlefield or inventory garden and designed landscape must be justified through a Design Statement and/or Landscape Management Plan.
Policy PR1 Protecting Important Resources	We will not approve developments that have a negative effect on important environmental resources associated with air quality, the water environment, important mineral deposits, prime agricultural land, peat and other carbon rich soils, open space, and important trees and woodland. In all cases development which impacts on any of these features will only be permitted when public economic or social benefits clearly outweigh any negative effects on the protected resource, and there are no reasonable alternative sites. **Air Quality** New developments should not have a significant adverse impact on air quality. An Air Quality Assessment may be required to demonstrate that the development has no significant adverse impact on air quality, and that appropriate mitigation to minimise any adverse effects can be provided and implemented. **Water Environment** New development, including aquatic engineering works, which will generate discharges or other impacts on water bodies (including wetlands), or which could affect the water quality, quantity, flow rate, botanical richness, ecological status, riparian habitat, protected species or flood plains of water bodies (including their catchment area) must not prejudice water quality or flow rates, or their ability to achieve or maintain good ecological status. Any such developments must contribute to the objectives set against the relevant water bodies through the river basin management process as well as the relevant freshwater opportunities identified within the North East Scotland Biodiversity Partnership Habitat Statements. Opportunities for the improvement of water quality, physical enhancement of waterbodies and for the creation, enhancement and management of habitats shall be required where feasible to contribute to the improvement of the overall status of the water body. Any aquatic engineering works must be capable of being consented under Controlled Activity Regulations and construction work shall be undertaken in line with Construction Site Licensing Regulations. Adequate buffer strips will be required adjacent to waterbodies in order to protect and enhance all waterbodies within or adjacent to development sites, and these should be integrated positively into the green-blue infrastructure of the site and surrounding area. Wetlands are specifically protected under the Water Framework Directive. Phase 1 Habitat Surveys should be used to identify if wetlands are present. If present, then the more detailed National Vegetation Classification Survey should be completed to identify if there are Ground Water Dependent Terrestrial Ecosystems (GWDTE) present. If GWDTE are present, the developer should avoid them (with a buffer), or further assessment and appropriate mitigation will be required.

Policy	Policy Text
	Prime Agricultural Land Prime agricultural land is defined as classes 1, 2 and 3.1 of the Soil Survey for Scotland, Land Capability for Agriculture series. Land falling within this classification should not be developed unless it is essential, allocated in the Local Development Plan or an independent assessment of the site confirms a lesser quality of land. For clarity, time-limited proposals for renewable energy generation or mineral extraction may be acceptable on prime agricultural land providing the site will be restored and returned to its original status. In addition, small-scale development proposals that are directly linked to a rural business may be permissible where they are located on prime agricultural land. **Open Space** Development will not normally be permitted on any area of open space, including outdoor sports facilities and buffer strips along watercourses, unless the new use is ancillary to the use as open space. Important areas of open space are identified as "protected land" within Appendix 7, Settlement Statements. Exceptionally, the development of essential community infrastructure may be allowed if it will not result in a deficit of open space of the type affected within the settlement, as evidenced by the Open Space Audit, or prejudice the continuity of a green-blue network. Where loss of open space occurs as the result of a new development then replacement must be made of an appropriate type, quantity, accessibility and quality within the settlement. Any new development that adversely impacts on the use and/or provision of outdoor sports facilities will be required to provide suitable replacement to the satisfaction of the Planning Authority. In such cases Sport Scotland will be consulted. **Trees and Woodlands** This policy establishes a strong presumption in favour of retaining woodland on development sites. Development resulting in the loss of, or serious damage to, trees and woodlands of significant ecological, recreational, historical, landscape or shelter value will not normally be permitted. In order to determine whether there are significant public benefits that would outweigh any loss or damage to trees and woodlands, the developer must submit a Tree Survey to BS 58377. Where necessary an Ecological Survey and assessment by a suitably qualified professional of the biodiversity and amenity value of the woodland and habitat, including both its current and potential future benefits, should be submitted. For any proposals involving the removal of trees or woodland, the Scottish Government Control of Woodland Removal Policy will apply. Where development is considered appropriate, damage to existing trees must be minimised and there must be no unnecessary fragmentation of existing or potential woodlands networks. Compensatory planting must also be undertaken to an agreed standard in order to mitigate the impact of the removal on landscape, sequestered carbon, character, amenity and ecological diversity. New planting should be located to enhance connectivity with existing and proposed green infrastructure. Woodland Management Plans are required for all new woodlands. **Minerals** We identify important mineral safeguarded sites where other types of development should not generally be allowed, and wider areas of search where mineral resources should not be sterilised by inappropriate developments. Major non-minerals developments will be permitted in the areas of search if an opportunity is given for the extraction of mineral resources before the development commences. On safeguarded sites non-mineral developments will be refused unless they are small-scale and ancillary to existing uses, or of a temporary nature. Safeguarded sites and

Policy	Policy Text
	areas of search are identified on the adjacent proposals map and detailed in Appendix 14, Areas Safeguarded or Identified as Areas of Search for Minerals Development. **Peat and carbon rich soils** Commercial extraction of peat will only be permitted in those areas suffering historic, significant damage through human activity and where the conservation value is low and restoration is impossible. This resource is protected under Policy C3 Carbon Sinks and Stores which refers to soils defined by Scottish Natural Heritage's Carbon and Peatland map 2016 as Classes 1, 2 and 5 and greater than 0.5m deep.
Policy PR2 Reserving and Protecting Important Development Sites	We will protect and not allow alternative development on sites that may reasonably be needed in the future for: • delivering improvements to transportation including projects identified in the Settlement Statements, the Aberdeen City and Shire Strategic Development Plan, the Local or Regional Transport Strategy, or the Strategic Transport Projects Review, routes recognised in the Core Paths Plan network, closed railways and their abutments, embankments and cuttings, existing airports and airfields and operational areas of ports and harbours; • generating and providing energy; • waste management facilities; • education facilities; • cemeteries; • other community facilities and infrastructure; and • sites to support the national developments identified in the National Planning Framework. National developments that directly affect the area covered by this Plan include proposals for contribution to capturing and storing carbon and making use of heat generation. Carbon Capture is specifically promoted at the St Fergus Gas Terminal but also at other locations associated with the pipeline from the central belt to St Fergus. High-voltage electricity transmission infrastructure, including cabling, substations, and converter stations, will be at a range of locations but are expected to include sites associated with the electricity substation south of Peterhead. Where we know about the above, we have identified them in the relevant Settlement Statements typically identified as 'Reserved Land'.
Policy C2 Renewable Energy	We will support renewable energy developments, including solar, wind, biomass (energy from biological material derived from living, or recently living organisms) and hydroelectricity projects, as well as energy storage projects, which are in appropriate sites and of the appropriate design. Assessment of the acceptability of such developments will take account of any effects on: socio-economic aspects; renewable energy targets; greenhouse gas emissions; communities; landscape and visual aspects; natural heritage; carbon rich soils; the historic environment; tourism and recreation; aviation, defence, telecommunications and broadcasting interests; road traffic; hydrology; and opportunities for energy storage. We treat biomass schemes as industrial processes suitable for business land. These may be hazardous developments through their impact on air quality. This support is not at the expense of other policies regarding Natural Heritage, the Historic Environment and Protecting Resources. **Wind Energy** We will approve wind energy developments in appropriate locations taking into account the spatial framework mapping at the end of this section. Detailed guidance is set out in the Strategic Landscape Capacity Assessment for Wind Energy in Aberdeenshire Final Report 2014. This guidance remains relevant but is not a substitute for detailed assessment of the landscape impact of specific development proposals.

Policy	Policy Text
	All wind farms must be appropriately sited and designed and avoid unacceptable environmental effects, taking into account the cumulative effects of existing and approved wind turbines. All wind turbines sites must be appropriate for use in perpetuity at the scale being proposed. Amendments to include larger blades or towers are likely to require a new application. Full repowering, where the wind turbines are dismantled and new wind turbines are installed, is likely to require revision of environmental information and a new planning application. Lifetime extension, where new technology is installed, or components are upgraded and replaced but the overall external layout of a wind farm remains unchanged (e.g. hub height, siting, size), may not require a new application provided the scale and predicted impacts are no greater than those anticipated from the original proposal. Existing infrastructure, including turbine bases, should be reused where possible. The existence of a planning permission for a wind turbine will be a material consideration for proposals for repowering existing wind turbines. Turbines must not compromise health and safety or adversely affect aircraft or airfields (including radar and air traffic control systems, flight paths and Ministry of Defence low flying areas) and/or telecommunications. Unacceptable significant adverse effects on the amenity of dwellinghouses, such as from noise, or on tourism and recreation interests including core paths and other established routes used for public walking, riding or cycling, or to protected species should also be avoided. **Solar Panels** We will approve applications for solar panel arrays greater than 4kW if: • their cumulative impact with other arrays, including siting and design, has been assessed and can be dismissed; • account has been taken of glint and glare issues; • it has been demonstrated that any significant impacts will have a duration of less than five minutes on any receptor in any one day; • there are no objections from the Ministry of Defence, the National Air Traffic Services or civil airport operators; • boundary treatments limit vehicular access to the site through means designed to make any security fencing unobtrusive and screen the development. **Hydro–Electric Schemes** We will approve hydro-electric schemes if they are located, sited and designed to have no unacceptable individual or cumulative impact on the water or wider natural environment, taking account of the relevant criteria set out in paragraph C2.1. In all cases mitigation will be required to protect river flow, river continuity for fish and provide for sediment transfer, and otherwise comply with the "Guidance for developers of run-of-river hydro-power schemes" published by SEPA. **On-farm Biomass Facilities** Appropriate on-farm biomass energy production facilities will generally be supported. These may be hazardous developments through their impact on air quality. This support is not at the expense of other policies regarding Natural Heritage, The Historic Environment and Protecting Resources. In all cases a suitable method of vehicular access must be provided to the satisfaction of Aberdeenshire Council. **Renewable Energy Technologies** Other renewable energy developments are required to relate well to the source of the renewable energy required for operation and satisfactory steps must be taken to mitigate any negative impacts on occupiers of affected properties. In all cases, conditions, bonds, or other Legal Agreements may be imposed to remove visible renewable energy structures whenever the planning permission expires or the project ceases to operate for a period agreed with the proposer and included as a condition on the planning permission.

Policy	Policy Text
Policy C3 Carbon Sinks and Stores	We will protect carbon sinks and stores, such as woodland and high-carbon peat rich soils (defined by Scottish Natural Heritage's Carbon and Peatland map 2016 as Class 1, 2 and 5, and greater than 0.5m depth), from disturbance or destruction. Development proposals that may result in the loss of, or disturbance to, peat will only be permitted if tools such as the "Carbon Calculator" demonstrate that the development will, within its lifetime, have no net effect on CO2. Removal of woodland will only be permitted if an equal area is replanted, preferably as part of the open space requirement and as part of the green-blue network in the settlement, so as to maintain the carbon balance. We support the development of carbon capture and storage developments, including proposals for woodland that can store carbon for long periods of time. In line with the National Planning Framework, we also support the development of carbon networks aimed at storing CO2 in offshore oil and gas fields, especially around Peterhead and the gas fired power station.
Policy C4 Flooding	Flood Risk Assessments should be undertaken in accordance with SEPA Technical Flood Risk Guidance and will be required for development in the indicative medium to high category of flood risk of 0.5% or greater annual probability (1 in 200 years or more frequent). Assessments may also be required in areas of lower annual probability (0.1%-0.5% annual probability) in circumstances where other factors indicate a potentially heightened risk or there are multiple sources of potential flooding. Assessments should include an allowance for freeboard and climate change. Development should not increase flood risk vulnerability and should avoid areas of medium to high risk, functional floodplain or other areas where the risks are otherwise assessed as heightened or unacceptable except where: • It is a development to alleviate flooding or erosion of riverbanks or the coast; • It is consistent with the flood storage and conveyance function of a floodplain; It would otherwise be less affected by flooding (such as a play area or car park); • It is essential infrastructure. The location is essential for operational reasons for example for water-based navigation, agriculture, transport or utilities infrastructure and an alternative lower risk location is not available." If development is to be permitted on land assessed as at a medium to high risk of flooding it should be designed to be flood resilient for the lifetime of the development (this is normally a minimum of 100 years for residential development) and use construction methods to assist in the evacuation of people and minimise damage. It must not result in increased severity of flood risk elsewhere through altering flood storage capacity or the pattern and flow of flood waters. Buffer strips, for enhancement of the watercourse and necessary maintenance, must also be provided for any water body. These measures may also be required in areas of potentially lower risk of flooding (annual probability of more than 1:1000 years) or in coastal areas below the 10 metre contour should evidence demonstrate a heightened risk. In such areas land raising and/or excavations will only be permitted if it is for a flood alleviation measure, it is linked to the provision and maintenance of direct or indirect compensatory flood water storage to replace the lost capacity of the functional floodplain, and it will not create any inaccessible islands of development during flood events or result in the need for flood prevention measures elsewhere. We will not approve development that may contribute to flooding issues elsewhere. Sustainable Urban Drainage principles apply to all sites. We are opposed to the enclosed culverting of watercourses for land gain and will actively seek to discourage such proposals. We encourage the daylighting (or de-culverting) of existing culverted watercourses.
Policy RD2 Developer Obligations	Where, by itself or cumulatively, development would give rise to the need for new or improved infrastructure or services, and this is not to be directly provided as an

Policy	Policy Text
	integral part of the development, planning obligations or other appropriate means to secure such provision may need to be put in place. Planning obligations, including those securing financial contributions, must meet each of the five tests set out in paragraph 14 of Planning Circular 3/2012. Planning obligations must: • be necessary to make the proposed development acceptable in planning terms; • serve a planning purpose; • relate directly or cumulatively to the proposed development; • fairly and reasonably relate in scale and kind to the proposed development; • be reasonable in all other respects. It is not possible to indicate all the circumstances where planning obligations are appropriate. The settlement statements in Appendix 7 indicate the nature of infrastructure or service provision necessary in connection with development proposed in this plan, where these are known. Paragraphs RD2.7 to RD2.16 below give guidance in relation to certain categories of infrastructure and services. This policy takes no account of development on sites not identified in the Plan which may result in a need for infrastructure which is not expected at this time. We provide further guidance on developer obligations in Appendix 7. Supplementary Guidance on Developer Obligations and Affordable Housing will be prepared. This will provide further detail on the items for which financial or other contributions, including affordable housing, will be sought; the circumstances (locations, types of development) where they will be sought; and the levels of developer contributions or methodologies for their calculation. Information will be provided on the transport and related infrastructure required in association with allocations in the plan. Where the exact requirements for site specific infrastructure are not known, the guidance will include as much detail as possible and set out clearly how, when and by whom, this information will be provided. A copy of the Supplementary Guidance, which the council wishes to adopt, will be submitted to Scottish Ministers within 12 months from the date the local development plan is adopted. If we know the specific location of new infrastructure, this has been shown on the proposals maps and in Appendix 7 in the form of reserved sites. Our Delivery Programme provides information on phasing developments in terms of infrastructure needs, and we will give details of those needs as we identify them in the Masterplanning process. In all cases we will review the need for and scale of any contribution in the light of circumstances at the time the planning application is made. Early discussion should take place between Aberdeenshire Council, developers and the relevant authorities to make sure that investment in necessary new infrastructure is dealt with in a timely way. **Strategic Transportation** We may need contributions towards transportation improvements as shown in Appendix 7, Supplementary Guidance and the Delivery Programme. These could include work on the trunk road network and in Aberdeen City. The Aberdeen City and Shire Strategic Development Plan has prepared a cumulative transport appraisal to inform their strategic transport advice. This could also include improvements to rail infrastructure. **Local Transportation Infrastructure** We may need contributions to fully address the effect of individual developments. We may also need contributions if more than one development affects transportation infrastructure. We provide details of this in Appendix 7 and Supplementary Guidance. All new development within a settlement may be required to contribute to any identified need. **Open Space and Access**

Policy	Policy Text
	In very rare circumstances, when it is not practical to meet the open space obligations within the Plan on the development site, we may ask for contributions elsewhere in the settlement towards those items identified in the Open Space Audit as being locally lacking or to improve the main path network in the local area as shown in the Core Paths Plan. **Primary Education** We may need contributions to ensure there are adequate primary school places for an increase in the number of school pupils likely to result from new residential developments. We give details in Appendix 7 and Supplementary Guidance. All new housing developments within a primary school catchment may be required to contribute to any identified need. **Secondary Education** We will also need to ensure there are adequate secondary school places to fully accommodate pupils expected as a result of proposed development, as shown in Appendix 7 and Supplementary Guidance. **Community Facilities** We may need contributions to deal with the effects of a development on communities where a specific shortfall is identified. We give details of this in Appendix 7 and Supplementary Guidance. Community facilities are generally public assets such as halls, libraries, or sports and recreational facilities. For larger developments providing the land for building these facilities is commonly needed as well as a proportionate contribution to the construction costs. **Strategic Recycling and Waste Infrastructure** We may need contributions for facilities in line with details in Appendix 7 and Supplementary Guidance. This could involve the developer contributing towards strategic recycling and waste infrastructure that benefit residents within the catchment area. Appendix 15 lists the settlements within the catchment area of each strategic recycling and waste infrastructure. **Health and Care Facilities** The Council recognises that the scale of proposed development may also impact on other infrastructure including health facilities. Appendix 7 and Supplementary Guidance provide information on where such provision may be required. Whilst it may be appropriate to seek contributions for such provision, any requirement would need to be considered on a case by case basis. **Other Off-Site Contributions** In exceptional circumstances, we may also need off-site contributions towards affordable housing needs and public open space, as set out in Policy H2 Affordable housing and Policy P2 Open space and access in new development. In exceptional circumstances, we may also need to enhance biodiversity or protect geodiversity in proportion to the opportunities available and the scale of the development opportunity, as set out in the general biodiversity Policy P1.7.

GREEN VOLT

Design and Access Statement

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-STM-0003	
Version Number:	00	
Date:	02/08/23	
Prepared by:	Dale Hunter	*Dale Hunter*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	Issued for Client Review	29/06/2023
A2	Final for review	01/08/2023
00	Final	*02/08/2023*

Contents

Acronyms

Acronym	Description
DAS	Design and Access Statements
EIA	Environmental Impact Assessment
FBW	Formartine and Buchan Way
ha	Hectares
LDP	Local Development Plan
MLWS	Mean Low Water Springs
NGESO	National Grid Electricity System Operator
NGNDSS	National Grid New Deer Substation
NRHE	National Record of the Historic Environment
OHL	Overhead Lines
PAC	Pre-Application Consultation
PWS	Private Water Supplies
SAC	Special Area of Conservation
SPA	Special Protection Area
SSEN	Scottish and Southern Electricity Networks
SSSI	Sites of Special Scientific Interest

Glossary

Term	Description
Applicant	Green Volt Offshore Windfarm Ltd.
Application Site Boundary	The extent of the area relating to the planning application.
Cable Route Corridor	The cable route corridor is the area within which the cable trench, haul road and all ancillary infrastructure will be. The working width of this corridor will be up to 80m in some locations will be required to allow access for excavating cable and drainage trenches, storage of topsoil and excavated soil, delivery of materials, transportation of personnel, and the presence of excavation and cable installation machinery and equipment
Development Plan	The Site is wholly within the Aberdeenshire Council area and therefore the Development Plan in this instance consists of the National Planning Framework 4 (NPF4) and the Aberdeenshire Local Development Plan 2023 (ALDP) (Aberdeenshire Council, 2023).
Landfall	The area where the subsea cables from the Green Volt Offshore Windfarm will make landfall. This area will contain the Trenchless Compound and any other ancillary infrastructure required.
Mean Low Water Springs	The height of Mean Low Water Springs (MLWS) is the average of the water levels of each pair of successive low waters during that period of about 24 hours in each semi-lunation (approximately every 14 days), when the tidal range is greatest (spring range).
Mobilisation Areas	The mobilisation areas will be used to offload plant and materials to allow access to the Cable Route Corridor. Will also be used for temporary storage of construction materials.
National Development	One of the 18 developments and classes of development that are considered nationally significant by National Planning Framework 4
National Grid New Deer Substation	The existing national grid 400Kv substation located at New Deer.
Offshore EIA Report	The EIA for the Green Volt Offshore Windfarm submitted to Marine Scotland in January 2023.
Offshore Project	Refers solely to the offshore element of the Project, which is being consented separately. This includes the Offshore windfarm and offshore export cable corridor.
Onshore Cables	The cables which will take power to and from the Proposed Substation south-west of New Deer and Green Volt Offshore windfarm.
Onshore EIA Report	The EIA Report for the Green Volt Onshore Infrastructure (Proposed Development).

Project	Green Volt Offshore Windfarm project as a whole, including associated onshore and offshore infrastructure development.
Proposed Development	Green Volt Onshore Infrastructure development including; the Landfall, the Cable Route Corridor, and the Substation Compound. Including all ancillary infrastructure.
Proposed Substation	The new Proposed Substation at the grid connection point located approximately 5.5km from New Deer and 0.45km south-east of the existing National Grid New Deer Substation.
Site	The area within the Application Site Boundary within which the Proposed Development lies.
Substation Compound	Part of the Proposed Development consisting of substation (grid transformers and HVAC switchgear and associated electrical equipment), temporary construction compound, drainage, and the proposed route of the connection to the SSE/National Grid Substation.
Trenchless Compound	A trenchless mechanism for the installation underground utilities such as cables.

Design and Access Statement

1.1 Introduction

1. This Design and Access Statement has been prepared by Green Cat Renewables Ltd on behalf of Green Volt Offshore Windfarm Ltd (the Applicant) to support an application for planning permission submitted to Aberdeenshire Council. The Application ('the Application') is for the construction, operation and decommissioning of the Green Volt Onshore Infrastructure which includes the Landfall, the Cable Route Corridor and the Substation Compound (the Proposed Development). A more detailed description of the Proposed Development can be found in **Chapter 5 – Project Description** of the Environmental Impact Assessment Report (EIA Report) and the Proposed Development is shown on the following figures:

   - Figure 5.1 – Overview of route – with and without constraints
   - Figure 5.1a – Overview of Figure sections
   - Figure 5.1b – Overview Section 1
   - Figure 5.1c – Overview Section 2
   - Figure 5.1d – Overview Section 3
   - Figure 5.1e - Overview Section 4
   - Figure 5.2 – Proposed Landfall Area
   - Figure 5.3 – Proposed Substation Area

2. Other Planning drawings include:

   - Drawing 12731-156-EIW-ZZ-XX-DR-C-91001-P01 – Typical Cross Section
   - Drawing 200-007-DRG-020-Rev A01 – Trenchless Road Crossing Typical Section
   - 200-007-DRG-021-Rev A01 Trenchless River Crossing Typical Section
   - 200-007-DRG-022 Rev A01 Transition Joint Bay Typical Arrangement
   - Drawing C4642 (1) 110 Drainage Concept
   - C4642 (1) 120 Control Building
   - C4642 (1) 121 DRC Building
   - C4642 (1) 122 Filter Building
   - C4642 (1) 123 GIS Switchgear Building
   - C4642 (1) 124 SGT
   - C4642 (1) 125 Shunt Reactor

3. This Statement explains:

   - The approach adopted and design principles utilised.
   - How the legislative and policy context has been considered.
   - The appraisal process for the spatial context and constraints of the site, and how these have been considered.
   - The public engagement undertaken on the design and the resultant influence on the final design.
   - The approach adopted in terms of the policy adopted for access to disabled people.

4. This document is structured from general to specific – from general Design Principle discussions to those principles applied to the specific Proposed Development and Site.

5. The Public Consultation exercise is discussed in the **Green Volt PAC Report** that accompanies the planning application and is also included in **Iteration 3: Post Exhibition**, below.

1.1.1 The Proposed Development

6. The Proposed Development commences at the Mean Low Water Springs (MLWS) north of Peterhead and crosses Aberdeenshire for approximately 35km to the connection point at the Substation Compound. The final Proposed Development comprises three categories:

- **Landfall**: The area where the subsea cables from the Green Volt Offshore Windfarm will make landfall. This area will contain the Trenchless Compound and any other ancillary infrastructure required.
- **Cable Route Corridor**: contains the underground circuits, comprising 2 cables in trefoil arrangements in up to 2 separate trenches, which transmit the energy generated by the offshore wind turbines from the Landfall to the grid connection point.
- **Substation Compound**: Part of the Proposed Development consisting of substation (grid transformers and High Voltage Alternating Current switchgear and associated electrical equipment), temporary construction compound, drainage, and the proposed route of the connection to the SSE/National Grid Substation.

7. Each of these are described in detail in **Chapter 5 - Project Description**.

1.1.2 Access

8. This Design and Access Statement principally relates to the design of the Proposed Development. The only areas of the Proposed Development that have floor space and the potential for physical restrictions for access for disabled people would be the Substation, but the restrictions would apply to all users due to it being an operational electrical substation. The internal layout of the substation buildings is not considered to be "*development*" under the terms of the Town and Country Planning (Scotland) Act 1997 (as amended) and is not considered further in design terms.

1.2 Legislative Framework

9. The Town and Country Planning (Scotland) Act 1997 (Scottish Government, 1997) (as amended) requires, under section 32, that regulations must:

> *"…require that an application for planning permission of such description as is specified in the regulations or order is to be accompanied by a statement (either or both and if both then either in one document or in two)—*
>
> *(i) about the design principles and concepts applied to the development,*
> *(ii) about how issues relating to access for the disabled to the development have been dealt with,"*

10. The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 (as amended) (Scottish Government, 2013), regulation 13 specifies that planning applications for National developments require to be accompanied by Design and Access Statements (DAS).

11. The purpose and required contents of a Design and Access Statement are outlined in regulation 13, (4) and (5) as described below:

> *(4) A design statement is a written statement about the design principles and concepts that have been applied to the development and which—*
> *(a) explains the policy or approach adopted as to design and how any policies relating to design in the development plan have been taken into account;*
> *(b) describes the steps taken to appraise the context of the development and demonstrates how the design of the development takes that context into account in relation to its proposed use; and*
> *(c) states what, if any, consultation has been undertaken on issues relating to the design principles and concepts that have been applied to the development and what account has been taken of the outcome of any such consultation.*
>
> *(5) A design and access statement is a document containing both a design statement and written statement about how issues relating to access to the development for disabled people have been dealt with and which—*
> *(a) explains the policy or approach adopted as to such access and, in particular, how—*
> *(i) policies relating to such access in the development plan have been taken into account; and*

> *(ii) any specific issues which might affect access to the development for disabled people have been addressed;*
> *(b) describes how features which ensure access to the development for disabled people will be maintained; and*
> *(c) states what, if any, consultation has been undertaken on issues relating to access to the development for disabled people and what account has been taken of the outcome of any such consultation.*

1.2.1 Policy Context – The Development Plan

12. The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 requires Design and Access Statements to explain how any policies relating to design in the Development Plan have been taken into account as discussed in **Section 1.1.1** above. The Development Plan is discussed in detail in the **Planning Statement** which accompanies the planning application, including an appraisal of compliance of the Proposed Development with the Development Plan and other material considerations including climate change and energy.

13. In summary, the Development Plan consists of National Planning Framework 4 (NPF4) (Scottish Government, 2023) and the Aberdeenshire Local Development Plan 2023 (LDP) (Aberdeenshire Council, 2023).

14. This Design and Access Statement provides an appraisal of the Proposed Development against the relevant design policies of the Development Plan, to assist Aberdeenshire Council in considering the rationale for the design decisions taken as part of the design process.

1.2.1.1 National Planning Framework 4

15. NPF4 Policy 14 Design, Quality and Place states that the development proposal must be designed to improve the quality of an area regardless of scale, and that development proposals that are poorly designed, are detrimental to the amenity of the surrounding area or are inconsistent with the six qualities of successful places will not be supported. The six qualities of successful places have been updated from previous instances of the six qualities that are outlined and described in **Table 1.1** of Appendix 1.

16. The Proposed Development is not of a type that would create new public spaces with public footfall. As such, consideration must be had to avoiding creating impacts that could negatively affect the qualities of developments in the area. The Proposed Development is a piece of essential infrastructure that has specific health and safety and operational requirements in terms of design. More specifically, the cable would be buried under agricultural land during operation, and it will not have an impact on any of the qualities. However, the appraisal has been provided in areas where the assessment appears appropriate but is limited to that scope.

17. Policy 10 Coastal Development describes that proposed developments in coastal zone areas will only be supported where they do not result in a requirement for further coastal protection measures, increase the risk of coastal flooding or erosion including the loss of natural coastal defences such as dunes. The policy requires that the project can be supported in the long term, taking into account projected climate change. It notes that proposals will only be supported where they are necessary to support Net Zero emissions, it is essential infrastructure or there is a specific locational need and no other suitable site, amongst other factors. The policy states that where a design statement is submitted as part of a planning application that may impact on the coast, it must consider long-term coastal vulnerability and resilience.

18. The Proposed Development is essential infrastructure required to connect a substantial offshore wind farm with onshore users and the national grid. The coastal location is essential as part of that connection. The post-construction Landfall is a relatively small area in relation to the coastal area and the onshore and offshore cables would be underground resulting in no impacts on the appearance of the area. The Landfall would be resilient to climate change impacts and is not an anticipated result in additional coastal flooding or erosion impacts given that the Proposed Development will be built to exacting standards.

1.2.1.2 Aberdeenshire Local Development Plan 2023

19. The Aberdeenshire Local Development Plan promotes the highest standards of design and this is one of the core policy outcomes of the plan. The vision for Aberdeenshire within the Plan includes the promotion of Aberdeenshire as:

- an area of high-quality of life and distinctive places
- where new developments are designed as effectively as possible to improve this,
- a place which will help deliver Sustainable, low-carbon places, and
- contribute positively towards the health and wellbeing of its residents.

20. Policy P1 Layout, Siting and Design discuss a range of design processes for developments and highlights specifically the six qualities of successful places. Appendix 8 Successful Placemaking Design Guidance, and Appendix 9 Building Design Guidance both discuss and expand on the six qualities of successful places, namely:

- Distinctive – developments with a sense of local identity through creation of a sense of place and the aesthetics of the design features and elements.
- Safe and pleasant – new development encourages both activity and privacy, providing security and protecting amenity.
- Welcoming – through ease of movement around the site, visual appeal, style, and the creation of a welcoming environment.
- Adaptable – to future needs through the balance of land uses, building types, density, sizes and tenures (including housing for people on modest incomes), and the flexibility to adapt to the changing circumstances of occupants.
- Resource efficient – in terms of waste management, water use, heating and electricity, the use of recycled materials and materials with low embodied energy and responding to local climatic factors associated with cold winds, rain, snow and solar gain.
- Well connected – to create well connected places that promote intermodal shifts and active travel, and are easy to move around.

21. Given that the Proposed Development is for utilitarian infrastructure that does not draw public footfall, many of the criteria are not applicable in this instance. For some of the criteria, the opposite is true – the design of the Proposed Development is intended to be as *indistinct* as possible in order to prevent landscape and visual effects. However, the Proposed Development has been appraised against the relevant criteria of Appendix 8 and 9 of the Aberdeenshire Local Development Planning **Table 1.2** of Appendix 1.

22. Policy R1 Special Rural Areas safeguards the special nature of areas such as the Coastal Zone. The policy describes that development proposals in the Coastal Zone, need to have a locational requirement for being in the Coastal Zone, or there must be a clear social, economic, environmental or community benefit arising from it in order to be supported by the policy. The Proposed Development is essential infrastructure required to connect a substantial offshore wind farm with onshore users and the national grid. The Coastal Zone location is considered to be essential.

1.3 Design Principles

23. The following design principles were adopted when reviewing potential designs for the Proposed Development.

1.3.1 Site Selection and Design Process

24. Best practice site selection and design processes involves two main phases:

- Consideration of the overall design objectives; and
- Iterative site selection phase, that looked at site-specific constraints and opportunities.

1.3.2 Key Site Criteria

25. Key criteria when undertaking the design process included:

- The ability to accommodate a final cable route corridor of approximately 60m wide plus any additional area required for construction compounds.
- Preference for the shortest length in route in order to minimise the overall footprint and the number of receptors that will be affected.
- Avoid populated areas where possible.
- Avoid key sensitive features such as SPAs, SACs, SSSI's, historic designations, flood zones, drinking water protected areas, quarries, military activities, contaminated land, and other infrastructure.

1.3.3 Iterative Design Process

26. Multiple iterations of the design are arrived at during the design process in order to further refine the site and ensure that the optimal layout has been arrived at.

1.4 Scene Setting

1.4.1 Site Context

27. The Proposed Development is located from the Landfall just north of Peterhead to the Proposed Substation location near the National Grid New Deer substation (NGNDSS) in Aberdeenshire as shown in **Figure 1.1**.

28. The Site, which is defined by the Application Site Boundary in **Figure 1.1**, occupies an area of approximately 360 hectares (ha) and the land use is predominantly agricultural farmland. There are a number of roads, water courses, overhead lines (OHLs) and pipelines which bisect the Site. The surrounding area is rural with land largely used for arable crops such as wheat, barley, carrots and potatoes.

29. The area around the Proposed Substation is predominantly characterised by scattered farmsteads with occasional dwellings. Field boundaries are generally open with some tree belts and woodland areas. The area around the existing NGNDSS is characterised by the juxtaposition of the existing large scale electricity infrastructure and the relatively small scale agricultural uses in the wider area.

1.4.2 Background to Development

30. The assessment and identification of the grid connection location was undertaken by National Grid Electricity System Operator (NGESO) along with the transmission owner, who in this location is SSEN Transmission plc. This process resulted in the grid connection offer being made to the Applicant to connect at NGNDSS. This offer was made in June 2021 by NGESO and was accepted. Once the grid connection was confirmed to be at the NGNDSS Landfall options were identified. As detailed in the Offshore EIA Report, two general areas were identified for Landfall. The St. Fergus South Landfall Option that is located north of Peterhead with various possible locations for an onshore/offshore jointing pit and onward cable to the NGNDSS. Locations to the north allow the project to avoid the Buchan Ness to Collieston Special Protection Area (SPA) and Special Area of Conservation (SAC) but provide a more complex path onshore with a number of river crossings on route to the Substation Compound at New Deer. The NorthConnect Parallel Landfall Option: located south of Peterhead with various possible locations for an onshore/offshore jointing pit and onward cable to the NGNDSS. Locations to the south may require crossing the Buchan Ness to Colliestone SPA and SAC. The St. Fergus South Landfall Option and the NorthConnect Parallel Option are shown on **Figure 5.11** of the **Offshore EIA Report**.

31. A Landfall Feasibility Report has been undertaken (Appendix 4.1 of the Offshore EIA Report) that considered potential Landfall locations at both the St Fergus South are and the NorthConnect Parallel area from a practical, constraint and feasibility perspective including environmental, cultural and technical considerations. Both Landfall areas were considered feasible. It was understood that the final decision of Landfall location would be determined following a detailed evaluation by the team undertaking the **Onshore EIA Report**.

32. The confirmation that both Landfall options were feasible allowed for a number of options for Landfall locations both north and south of Peterhead and subsequent Cable Route Corridor options between the potential Landfalls locations and the grid connection to be explored during the design process of the Proposed Development. These are outlined in more detail below.

1.5 Constraints

1.5.1 Initial Constraints Review

33. The initial desktop review from available data highlighted that they key constraints of the area from the two Landfall areas to the NGNDSS. Known constraints in the area are shown in **Figure 4.1** and includes:

- Existing infrastructure in the form of:
    - Transmission scale OHLs and associated energy infrastructure;
    - St Fergus Gas Terminal;

    - Operational and Proposed renewable energy infrastructure; and
    - Major gas pipelines.
- Ecological and Hydrological designations and sensitive receptors such as:
    - Ancient Woodland Inventory;
    - Geological Conservation Review Sites;
    - SSSI, SPA, SAC and RAMSAR Sites; and
    - Class 1 Peat
- Historic Designations such as:
    - Nationally significant features including Scheduled Monuments, Category A Listed Buildings and Gardens and Designed Landscapes.
    - Regionally significant features including Category B Listed Buildings, Category C Listed Buildings and Conservation Areas; and
    - NRHE Sites.
- Recreation features such as:
    - Core Paths, most notably the FBW;
    - NCR1; and
    - Golf Courses.
- Landscape Designations such as:
    - Special Landscape Areas and
    - Gardens and Designed Landscapes.
- Settlements, most notably:
    - Peterhead;
    - Boddam;
    - Longridge;
    - Mintlaw;
    - Maud;
    - New Deer;
    - Stuartfield; and
    - St Fergus.

34. From the initial constraints review, it was highlighted that the most optimal areas for the Landfall areas would be to the north of Peterhead to the south of St Fergus, and to the south of Peterhead to the north of Boddam.

1.6 Design Solution and Alternatives

35. This section summarises **Chapter 4 - Assessment of Alternatives** of the **Onshore EIA Report**. Alternative Cable Route Corridors and siting of related infrastructure has been considered in detail in that chapter in relation to the requirements within The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (Scottish Government, 2017), Regulation 5.-(2)(d) *"a description of the reasonable alternatives studied by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment".*

1.6.1 Iterations

36. The design process of the Proposed Development has been iterative and there have been many iterations between the identification of initial cable route options to the final Proposed Development. There have been five key design iterations that represent key milestones of the design evolution. These iterations are shown in **Figures 4.2—4.6** and are defined as follows:

1.6.1.1 Iteration 1 – Original Scoping

37. This iteration was submitted under the original scoping submission to Aberdeenshire Council in March 2022. It includes 11 Landfall locations, four cable routes and four potential substation locations as shown in **Image 1-1** below.

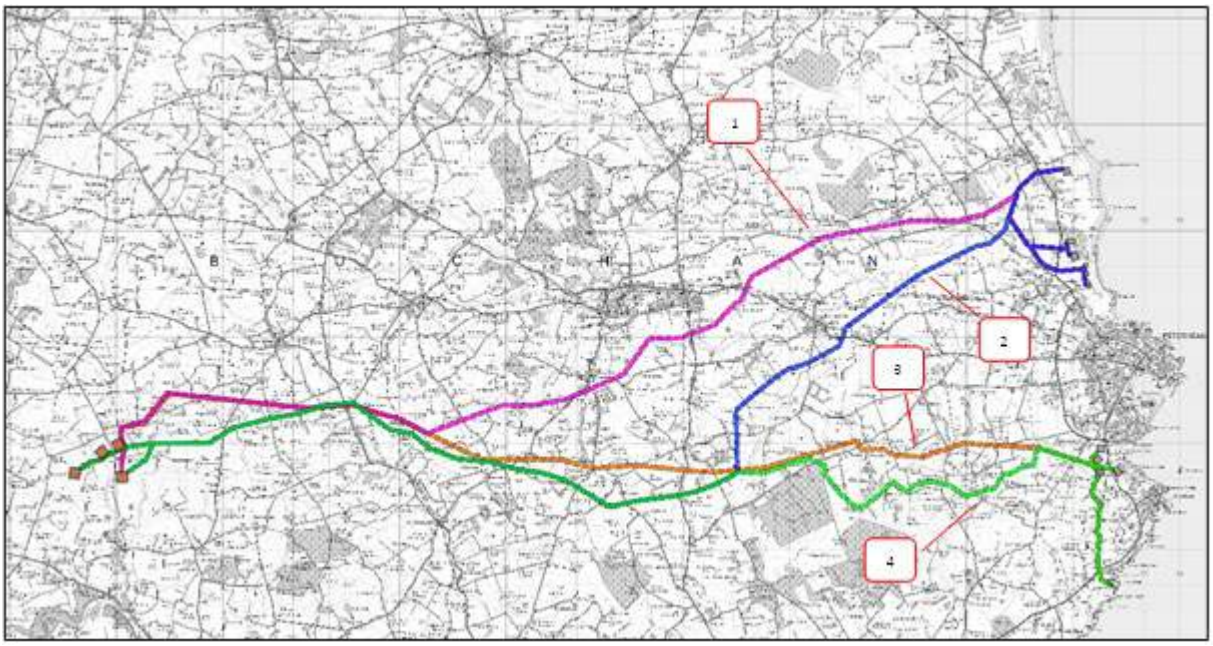

Image 1-1 – Location of the Four Cable Route Corridors as Part of Iteration 1

1.6.1.2 Iteration 2 – Rescope

38. This iteration was submitted under the second scoping submission to Aberdeenshire Council in December 2022. After three design reviews, the iteration culminated in two cable routes and two Landfall points as shown in **Image 1-2** below.

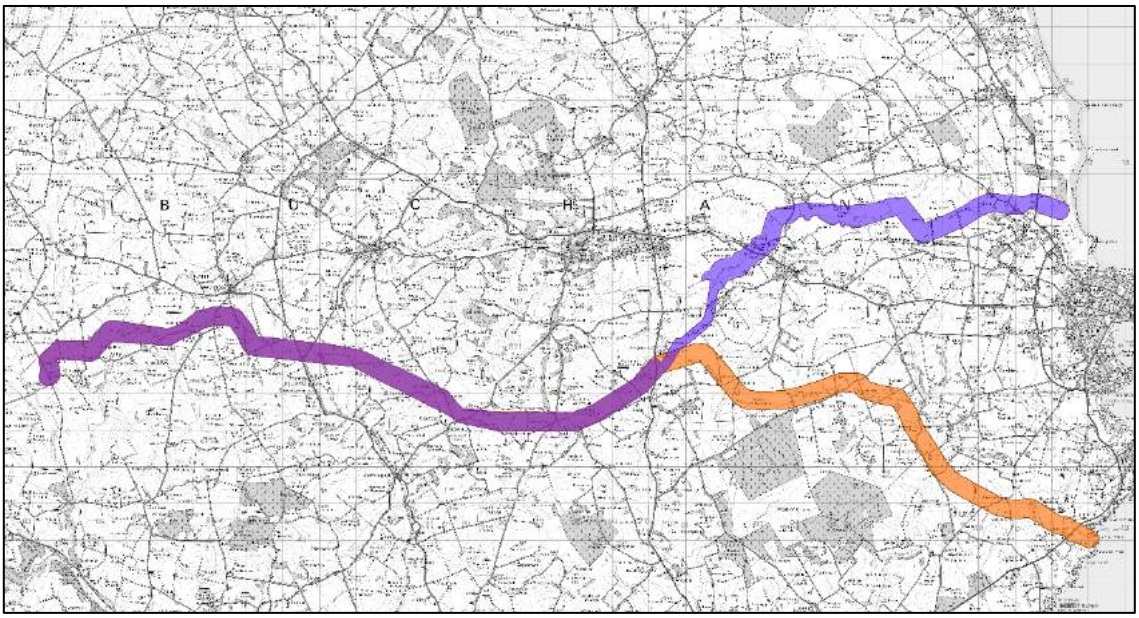

Image 1-2 - Design Review 3 Cable Route Options

1.6.1.3 Iteration 3 – Post-Exhibition

39. This iteration was designed following Public Exhibitions in January and March 2023 and was informed by feedback from these events. The southern cable route was discounted and further information from the public exhibitions assisted with the next level of detail required for the design. An example of the constraints taken into account as part of the cable route analysis is shown in **Image 1-3** below.

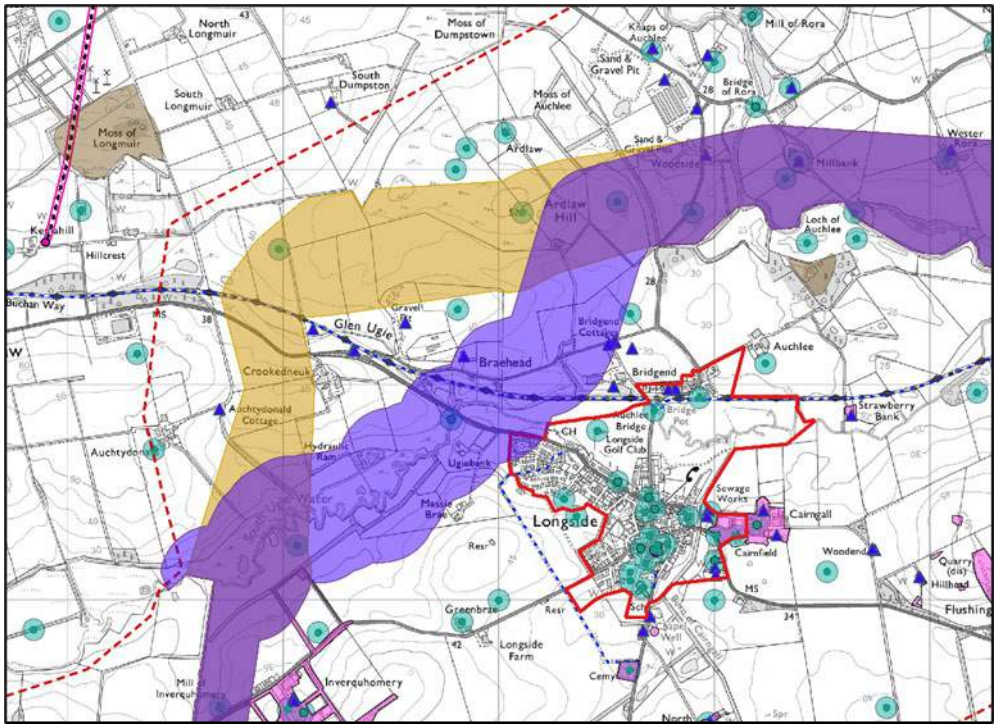

Image 1-3 – Cable Route Corridor being rerouted around Longside – purple indicates the Iteration 2 route and the yellow indicates the iteration 3 reroute

1.6.1.4 Iteration 4 – Refined

40. This iteration formed the first refinement by the Applicant's engineering contractor in April 2023, and took into account further information available. An example of the updates in order to avoid impacts on Private Water Supplies (PWS) is shown in **Image 1-4** below.

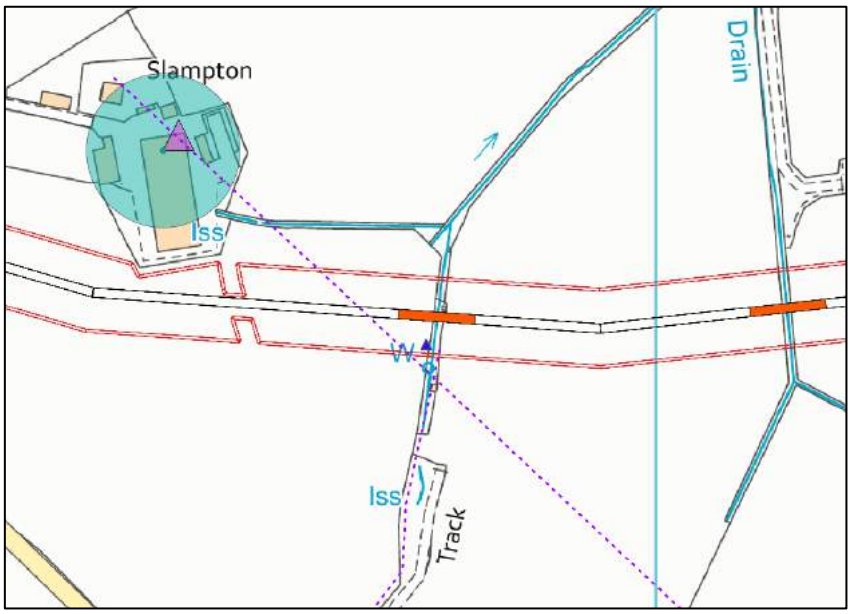

Image 1-4 – Example of a PWS (blue triangle) that will require mitigation

1.6.1.5 Iteration 5 – Planning

41. This iteration forms the final design submitted into planning and was finalised in June 2023 following final survey work and an engineering walkover survey. The iteration ensured the most efficient use of the corridor, including reducing the number of landowners impacted by the Proposed Development as shown in **Image 1-5** below.

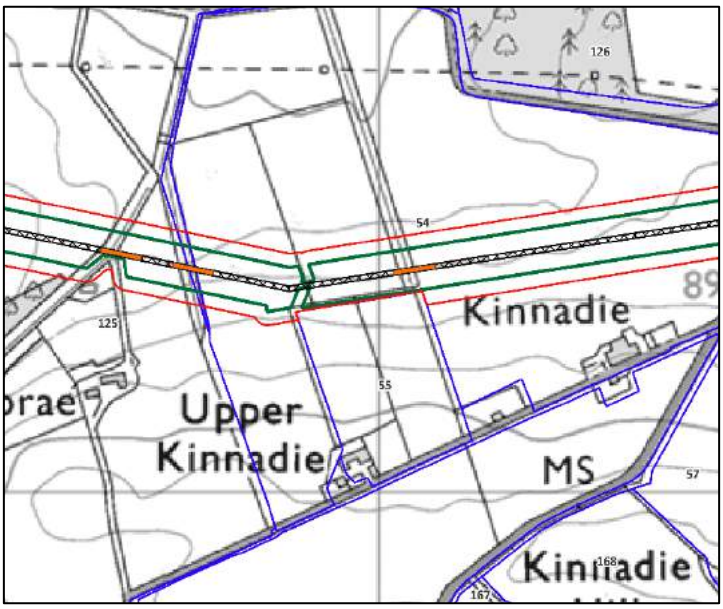

Image 1-5 – Example of where the redline boundary is cut around smaller land holdings, in this instance, landholding 55

1.6.2 Landfall

42. Eleven initial Landfall points were considered, with six to the north of Peterhead and five to the south. In the second design iteration, landing points were discounted due to:

- buried gas infrastructure around St Fergus;
- the presence of granite and dolerite dykes making trenchless crossing methods more difficult;
- offshore congestion;
- access constraints;
- The potential length of trenchless crossings; and
- utilities in the area.

43. A handful of the options were combined to form the Northern Landing Area and the one remaining southern point was named the Southern Landing Area.

44. The third iteration removed the southern Landing point and the northern point remained. The fourth iteration further refined the northern Landfall.

1.6.3 Cable Route

45. Following the commencement of survey work, and consultation with stakeholders and landowners, the cable routes were refined into two route options. The cable routes were then further refined based on several environmental, technical, and landowner constraints.

46. In the early design iterations, four cable routes were considered including connections to each of the Landfall points to the north and south of Peterhead. In iteration 2 this was reduced to two routes. The third iteration removed the Southern Cable Route Option due to residential constraints and the presence of Class 1 Peat. The route itself was manoeuvred around landowner constraints and shifted away from residential properties to avoid potential impacts on PWS amongst other potential impacts.

47. In the Fourth Iteration, the cable trench and other components could be closely defined within the wider corridor. This included further design amendments to reflect and prevent impacts on sensitive ecology and hydrological receptors, landowner constraints, archaeological features, PWS and specific infrastructure such as

overhead lines and gas pipes. The fifth iteration further refined the route with input from the engineering team, including providing more information on associated infrastructure such as construction compounds, lay down, and Mobilisation Areas.

1.6.4 Substation Compound

48. The grid connection for the Proposed Development has been allocated at the NGNDSS, as such, the land surrounding the existing NGNDSS was searched for an optimal Proposed Substation locations for the Proposed Development, proximity to the existing NGNDSS was key to siting the Proposed Substation in order to minimise the length of cable that would be required for connection, thus limiting the environmental impact incurred from connection.

49. The site search highlighted Class 1 Peat and Ancient Woodland in the area and proximity to residential areas that would need to be considered.

50. Initially four potential locations were outlined but these were all discounted during the Second Iteration after a site visit determined that a closer location to the existing NGNDSS could prevent visual impacts on neighbouring receptors. A fifth location was identified and then refined in later iterations closer to the vicinity of the existing NGNDSS. The Proposed Substation includes appropriate drainage design for the type and scale of the Substation Compound.

1.7 Conclusion

51. This Design Statement sets out the design principles adopted during the design process, the legislative framework, and policies that have been considered, the consultations undertaken with stakeholders through the PAC process, and the appraisal undertaken of the context of the Proposed Development. Consideration of access to and within the site for disabled people has been taken into account.

52. The design, on account of the above influencing factors, evolved during the design process as discussed in this document. The final design is outlined in detail in **Chapter 5 - Project Description**.

1.8 References

The Scottish Government (1997). The Town and Country Planning (Scotland) Act 1997. Available at https://www.legislation.gov.uk/ukpga/1997/8/contents [Accessed June 2023]

The Scottish Government (2013). The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013. Available at https://www.legislation.gov.uk/ssi/2013/155/contents/made [Accessed June 2023]

The Scottish Government (2023). National Planning Framework 4. Available at https://www.gov.scot/publications/national-planning-framework-4/ [Accessed June 2023]

Aberdeenshire Council (2023). Aberdeenshire Local Development Plan 2023. Available at https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2023/ [Accessed June 2023]

The Scottish Government (2017) The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at https://www.legislation.gov.uk/ssi/2017/102/contents/made [Accessed June 2023]

1.9 Appendix 1

Table 1.1 - NPF4 Qualities of a Successful Place Appraisal

Quality of a Successful Place	Appraisal
Healthy: Supporting the prioritisation of women's safety and improving physical and mental health.	The Proposed Substation would be fenced and screened to prevent access and so that the visual presence of the substation in the area is reduced.
Pleasant: Supporting attractive natural and built spaces.	Through siting the Proposed Substation adjacent to the existing NGNDSS, the extent of the utilitarian infrastructure in the wider area is minimised to a specific location.
Connected: Supporting well-connected networks that make moving around easy and reduce car dependency	The Proposed Substation building requires to be connected into the existing NGNDSS, meaning that the relatively remote location is required, and public access will not be permitted for health and safety reasons.
Distinctive: Supporting attention to detail of local architectural styles and natural landscapes to be interpreted, literally or creatively, into designs to reinforce identity.	There are technical requirements for the specification of the equipment to be utilised, but in areas where there are options for design, such as in the design of buildings, colours and materials will be selected to ensure that the Proposed Development is as indistinct as possible.
Sustainable: Supporting the efficient use of resources that will allow people to live, play, work and stay in their area, ensuring climate resilience, and integrating nature positive, biodiversity solutions.	The Proposed Development connects the offshore wind farm with the National Grid and promotes efficient use of resources and climate resilience. The Proposed Development would result in Biodiversity Net Gain and this is fully detailed **Chapter 6 – Ecology and Ornithology**.
Adaptable: Supporting commitment to investing in the long-term value of buildings, streets and spaces by allowing for flexibility so that they can be changed quickly to accommodate different uses as well as maintained over time.	The Proposed Substation is utilitarian in nature and is not anticipated to be used for other purposes for the foreseeable future. The layout will have sufficient access for the maintenance and replacement of equipment as necessary allowing for long-term use.

Table 1.2 - LDP Qualities of a Successful Place Appraisal

Quality of a Successful Place	Appraisal
Distinctive – developments with a sense of local identity through creation of a sense of place and the aesthetics of the design features and elements.	
Fits within local context and pattern of development, respecting surrounding character.	Discussed in detail in **Chapter 10 - Landscape**. The Proposed Substation is located adjacent to existing NGNDSS and is not introducing a new use to the area.
Development makes provision for a variety within the built form in terms of density, house types & sizes and, where appropriate, mixed uses.	The most applicable factor in this category is the variety in build form in terms of density. The Proposed Substation has been designed with many smaller buildings and plant, rather than one monolithic structure. The intention is to break up any large areas into smaller areas to prevent massing issues and visual impacts.
Height, footprint and proportions respect surrounding area and can be accommodated within the site.	The Proposed Substation proportions have been kept to a minimum at the conceptual design stage in order to limit its presence within the area.
Materials and colour enhance the character and visual appeal of the area.	The materials and colours for the Proposed Substation buildings will be chosen to minimise the presence of the Substation in the area.
Sympathetic boundary treatments define public and private space, using existing features where possible.	Boundary treatments will be for screening and security purposes.
Fits within local context and pattern of development, respecting surrounding character, setting and identity.	The Proposed Substation is part of the pattern of electricity works in the area. Discussed in detail in **Chapter 10 - Landscape**
Safe and Pleasant – new development encourages both activity and privacy, providing security and protecting amenity.	
Protection and retention of surrounding amenity.	**Chapter 10 - Landscape**
Site is free from flooding and remedial action for contaminated land.	A SuDS pond is proposed adjacent to the Proposed Substation and forms part of the wider drainage strategy for the site. Further details on flooding are provided in **Chapter 7 – Hydrology** and contaminated land is addressed in **Chapter 8– Contaminated Land**.
Siting, layout and orientation should respond to the site context. Buildings have active frontages.	The tie-ins between the existing NGNDSS
Developments should connect to the mains public water supply and public sewer. Where a private water supply or drainage arrangement is proposed, all technical information and reasons for not connecting to a public water supply or sewer, as well as details of adoption agreements with Scottish Water or lifetime maintenance proposals should be provided.	Foul water from the welfare on site has been included in the drainage design for the site.
Welcoming – through ease of movement around the site, visual appeal, style, and the creation of a welcoming environment.	
Should not result in adverse overshadowing or a loss of sunlight/daylight to neighbouring sites and properties.	The Proposed Substation is sufficiently separated from neighbouring properties that there will be no overshadowing or loss of daylight for neighbouring properties and their curtilages.
Should not be overbearing.	The scale of the buildings of the Proposed Substation is unavoidable but the materials, colours, screening and siting have been utilised to prevent appear overbearing in the locality.

Quality of a Successful Place	Appraisal
Buildings have active frontages	The buildings of the Proposed Substation have been designed to be as indistinct as possible and sited in locations to be away from public views to minimise visual impacts.
Adaptable – to future needs through the balance of land uses, building types, density, sizes and tenures (including housing for people on modest incomes), and the flexibility to adapt to the changing circumstances of occupants.	
Buildings are flexible and functional and can adapt to change for future needs.	Design will reflect the operational requirements of the electrical infrastructure and access will be available for upgrades in future to ensure longevity of the use of the Proposed Development.
Flood resilience designed in where required.	Flood resilience is a core part of the substation design as discussed in **Chapter 7 Hydrology**.
Provides connections to potential future development sites.	The connection between the Proposed Substation and the NGNDSS has been designed to ensure that future cable routes can use the same corridor. The Landfall location and cable route corridor has also been designed to enable other Offshore Wind Farms Landfalls here. The concrete plinth utilised will be flexible for future maintenance and upgrading.
Provides connections to existing sites.	The Proposed Substation has been sited immediately adjacent to the existing NGNDSS.
Buildings are flexible and functional and can adapt to change for future needs, with sufficient space to extend in future (including garages and outbuildings).	The footprint of the Proposed Substation has been designed to accommodate appropriate current and future operational needs.
Resource Efficient – in terms of waste management, water-use, heating and electricity, the use of recycled materials and materials with low-embodied energy, and responding to local climatic factors associated with cold winds, rain, snow and solar gain.	
Proposal protects and enhances existing open space and natural environment including green-blue networks, habitats, biodiversity, landscape, planting, buffer strips and water features through landscaping and street design.	The landscape design for the Proposed Substation has been considered in detail in **Chapter 10 - Landscape**.
Materials are distinctive, durable, and sustainably sourced as outlined in a supporting design statement.	Final material sourcing will be subject to technical design phases. The materials are intended to appear sympathetic to the character of the surrounding area.
Incorporates appropriate and functional Sustainable Drainage Systems techniques.	SuDS have been adopted throughout the Proposed Development.
Development contains and/or enhances existing landscaping and green-blue infrastructure.	The landscape design for the Proposed Substation has been considered in detail in **Chapter 10 Landscape**.
Well Connected – to create well connected places that promote intermodal shifts and active travel, and are easy to move around.	
Well connected to surrounding roads and destinations to provide a choice of travel and routes for pedestrians, cyclists, and public transport (including links to core paths, public transport and near to amenities).	The construction of the cable route has been designed in a way to minimise disruption to any public roads and path networks, this aspect is considered in detail in the accompanying **Construction Traffic Management Plan**.
Car parking meets Council standards and either incorporates or is adaptable to provide electric car charging points	The car parking will be fully in compliance with applicable road standards.
Provision for safe and functional cycle parking and storage.	Cycle parking and storage will be fully in compliance with applicable standards.

Quality of a Successful Place	Appraisal
Separate customer and service access points for commercial developments.	No customer access points are required.
Paths are accessible for all and well-lit and overlooked.	Paths internal to the site will be appropriately lit and accessible for operational purposes.
Sites are suitably accessible in accordance with Council standards, with adequate visibility.	The access to the site will be design to applicable roads standards.

GREEN VOLT

Acronyms and Glossary

Onshore EIA Report: Volume 1

Acronyms

Acronym	Description
AC	Alternating Current
ACAS	Aberdeenshire Council Archaeology Service
ACM	Asbestos Containing Material
ADT	Average Daily Traffic
AIL	Abnormal Indivisible Load
ALDP	Aberdeenshire Local Development Plan 2023
AOD	Above Ordnance Datum
AQ	Air Quality
AQIA	Air Quality Impact Assessment
ATC	Automatic Traffic Count
AWI	Ancient Woodland Inventory
BBS	Breeding Birds Surveys
BEIS	Department for Business, Energy and Industrial Strategy
BGS	British Geological Survey
BNG	British National Grid
BoP	Balance of Plant
BS	British Standard
CAT	Cognitive Abilities Test
CBC	Common Bird Census
CBS	Cement Bound Sand
CCC	Climate Change Committee
CC(S)A 2009	Climate Change (Scotland) Act 2009
CCPu	Climate Change Plan Update 2018-2032
CCRA	Climate Change Risk Assessment
CEMP	Construction Environmental Management Plan
CEP	Construction Execution Plan
CES	Crown Estate Scotland
CfD	Contracts for Difference
CH_4	Methane

Acronym	Description
CIEEM	Chartered Institute of Ecology and Environmental Management
CLA	Contaminated Land Assessment
CLEA	Contaminated Land Exposure Assessment
CLVIA	Cumulative Landscape and Visual Impact Assessment
CMS	Construction Method Statement
CO_2	Carbon Dioxide
COP	United Nations Climate Change Conference of the Parties
COP21	21st Climate Change Conference of the Parties
COP22	22nd Climate Change Conference of the Parties
COSHH	Control of Substances Hazardous to Health
CPP	Construction Phase Plan
CSM	Conceptual Site Model
CTMP	Construction Traffic Management Plan
DESNZ	Department of Energy Security and Net Zero
DfT	Department for Transport
DIA	Drainage Impact Assessment
DMP	Dust Management Plan
DMRB	Design Manual for Road and Bridges
DNO	Distribution Network Operator
DRC	Dynamic Reactive Compensation
DSA	Desk Study Area
DTM	Digital Terrain Model
DSEAR	Dangerous Substances Explosive Atmosphere Regulations
DWPA	Drinking Water Protected Area
EA	Environment Agency
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
EGPS	Electricity Generation Policy Statement
EHS	Environmental Health Service
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
EMP	Environmental Management Plan

Acronym	Description
EMR	Electricity Market Reform
EMS	Energy Management Systems
ESA	Ecological Study Area
EU	European Union
EUPS	European Union Protected Species
FBW	Formartine and Buchan Way
GB	Great Britain
GBR	General Binding Rule
GCR	Green Cat Renewables
GCRS	Geological Conservation Review Sites
GDL	Garden and Designed Landscape
GHG	Greenhouse Gas
GIS	Gas-Insulated Switchgear
GIS Software	Geographic Information Systems
GPDO	The Town and Country Planning (General Permitted Development) (Scotland) Order 1992 (as amended)
GRP	Glass Reinforced Plastic
GVA	Gross Value Added
GVEC	Green Volt Electrical System
GW	Gigawatt
GWDTE	Groundwater Dependent Terrestrial Ecosystems
GWh	Gigawatt Hours
GWP	Global Warming Potential
ha	Hectares
HDD	Horizontal Directional Drilling
HDPE	High Density Polyethylene
HER	Historic Environment Records
HES	Historic Environment Scotland
HFC	Hydrofluorocarbons
HGV	Heavy Goods Vehicle
HPS	Hydrogen Policy Statement
HRA	Habitat Regulations Appraisal
HVAC	High Voltage Alternating Current

Acronym	Description
IAC	Inter-Array Cable
IAQM	Institute of Air Quality Management
ICE	Inventory of Carbon and Energy
IEF	Important Ecological Features
IEMA	Institute of Environment Management Assessment
INTOG	Innovation and Targeted Oil and Gas
IUCN	International Union of Conservation Nature
JNCC	Joint Nature Conservation Committee
LB	Listed Buildings
LBAP	Local Biodiversity Action Plan
LBS	Local Biodiversity Sites
LCA	Landscape Character Area
LCT	Landscape Character Type
LDP	Local Development Plan
LEPS	Local Energy Policy Statement
LGV	Light Goods Vehicle
LNCS	Local Nature Conservation Sites
LNR	Local Nature Reserves
LPA	Local Planning Authority
LUC	Land Use Capacity
LV	Low Voltage
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Sites
MCAA	Marine and Coastal Access Act
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MLURI	Macaulay Land Use Research Institute
MOT	Ministry of Transport
MPA	Marine Protected Areas
MS-LOT	Marine Scotland Licensing Operations Team
MW	Megawatt
N_2O	Nitrous Oxide

Acronym	Description
NCN	National Cycle Network
NCR	National Cycle Routes
NF_3	Nitrogen Trifluoride
NGESO	National Grid Electricity System Operator
NGNDSS	National Grid New Deer Substation
NIA	Noise Impact Assessment
NIEA	Northern Ireland Environment Agency
nm	Nautical Miles
NMP	National Marine Plan
NPF3	Third National Planning Framework
NPF4	National Planning Framework 4
NPS	National Planning Statement
NPS EN-5	National Policy Statement for Electricity Network Infrastructure
NRHE	National Record of the Historic Environment
NRMM	Non-Road Mobile Machinery
NRTF	National Road Traffic Forecasts
NSR	Noise Sensitive Receptors
NR	Noise Rating
NTS	Non-Technical Summary
NTS Deal	North Sea Transition Deal
NVC	National Vegetation Classification
NVZ	Nitrate Vulnerable Zone
NWSS	Native Woodland Survey Scotland
O&G	Oil & Gas
OD	Outer Diameter
OGUK	Oil & Gas UK
OH	Overhead
OHL	Overhead Lines
OS	Ordnance Survey
OSP	Offshore Substation Platform
oTMMP	Overarching Traffic Management and Monitoring Plan
OWIG	Offshore Wind Industry Group

Acronym	Description
PAC	Pre-Application Consultation
PAN	Planning Advice Notice
PC 3/2013	Planning Circular 3/2013
PFC	Perfluorocarbons
PIA	Physical Infrastructure Access
PM_{10}	Particle Matter
PMP	Peat Management Plan
POAN	Proposal of Application Notice
PPE	Personal Protective Equipment
PPP	Pollution Prevention Plan
PRA	Potential Root Assessments
PV	Photovoltaic
PWS	Private Water Supply
PWSRA	Private Water Supply Risk Assessment
RA	Risk Assessment
RAF	Royal Air Force
RAMS	Risk Assessment Method Statement
ROC	Renewable Obligation Certificate
ROW	Right Of Way
RSA	Road Safety Audit
RSS	Regional Spatial Strategies
s.36	Section 36
SAC	Special Area of Conservation
SCCAP1	First Scottish Climate Change Adaptation Programme
SCCAP2	Second Scottish Climate Change Adaptation Programme
SCRI	Scottish Crop Research Institute
SEPA	Scottish Environmental Protection Agency
SERAD	Scottish Executive Rural Affairs Department
SF_6	Sulphur Hexafluoride
SGT	Super Grid Transformer
SLA	Special Landscape Areas
SM	Scheduled Monument

Acronym	Description
SMP-OWE	Sectoral Marine Plan for Offshore Wind Energy
SOCC	Species of Conservation Concern
SP=EED	Successful Planning = Effective Engagement and Delivery
SPA	Special Protection Area
SPEN	Scottish Power Energy Networks
SPL	Sound Pressure Level
SSCL	Substation Connection Loop
SSEN	Scottish and Southern Electricity Networks
SSSI	Sites of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SWMP	Site Waste Management Plan
TAN	Technical Advice Notice
TCC	Temporary Construction Compounds
TMP	Traffic Management Plan
TPC	Travel Plan Coordinator
TS	Transport Scotland
TS2020	Scottish Tourism Alliance (2020) Tourism Scotland
UK	United Kingdom
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UXO	Unexploded Ordnance
WEWS	Water Environment and Water Services
WFD	Water Framework Directive
WHO	World Health Organisation
WTG	Wind Turbine Generators
XLPE	Crosslinked Polyethylene
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility

Glossary

Term	Description
Applicant	Green Volt Offshore Windfarm Ltd.
Application Site Boundary	The extent of the area relating to the planning application.
Cable Route Corridor	The cable route corridor is the area within which the cable trench, haul road and all ancillary infrastructure will be. The working width of this corridor will be up to 80m in some locations will be required to allow access for excavating cable and drainage trenches, storage of topsoil and excavated soil, delivery of materials, transportation of personnel, and the presence of excavation and cable installation machinery and equipment.
Cable Testing	Cable testing is performed periodically to assess the electrical integrity of the cables.
Cable Trench	A trench along the whole Cable Route Corridor below ground level where onshore cables will be housed in ducts.
Development Plan	The Site is wholly within the Aberdeenshire Council area and therefore the Development Plan in this instance consists of the National Planning Framework 4 (NPF4) and the Aberdeenshire Local Development Plan 2023 (ALDP) (Aberdeenshire Council, 2023).
Earthworks	Processes of soil stripping, ground levelling, excavation, and landscaping.
Jointing Pit and Link boxes	Jointing Pits will house the joints between individual lengths of cable. Each Jointing Pit associated with a single circuit will require a separate smaller concrete enclosure: viz. a Link Box.
Just Transition	Framework to ensure the benefits of a green economy are shared fairly and inclusively with every stakeholder concerned.
Landfall	The area where the subsea cables from the Green Volt Offshore Windfarm will make landfall. This area will contain the Trenchless Compound and any other ancillary infrastructure required.
Landfall Export Cable Corridor	The area in which the export cables will be laid, from the perimeter of the Windfarm Site to landfall.
Link Boxes	Link Boxes house the cross-bonded cable sheath connections between cable cores that help reduce circulating currents in the cable sheaths and consequently lower the running temperatures within the cables.
Main Site Yard	The Main Site Yard is where staff will mobilise on workdays, and where they will park their personal transport before being transported to the work site.

Marine and Terrestrial Planning	Marine plan boundaries extend up to Mean High Water Springs. Terrestrial planning boundaries extend down to Mean Low Water Springs, with the exception of fish farming which extends out to 12 nautical miles. This planning consults both areas as there is therefore an overlap of planning jurisdictions in the inter-tidal area and for aquaculture.[1]
Marine Planning	A process where ocean users make informed and united decisions so marine resources are used sustainably.
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).
Mean Low Water Springs	The height of Mean Low Water Springs (MLWS) is the average of the water levels of each pair of successive low waters during that period of about 24 hours in each semi-lunation (approximately every 14 days), when the tidal range is greatest (spring range).
Mobilisation Areas	The mobilisation areas will be used to offload plant and materials to allow access to the Cable Route Corridor. Will also be used for temporary storage of construction materials.
National Development	One of the 18 developments and classes of development that are considered nationally significant by National Planning Framework 4
National Grid New Deer Substation	The existing national grid 400Kv substation located at New Deer.
Net Zero GHG	The balance is zero between the amount of greenhouse gas (GHG) that is produced and the amount that is removed from the atmosphere.
North Route Option	Northern cable route corridor from south of St Fergus to new National Grid New Deer Substation (Iteration 2).
North-East Marine Region	The North-East Marine region includes the Shetland Islands, the north-eastern extent of the Orkney islands, and covers the east mainland coastline, including the Moray Firth area, as far south as Peterhead.
Offshore EIA Report	The EIA for the Green Volt Offshore Windfarm submitted to Marine Scotland in January 2023.
Offshore Export Cables	The cables which will bring electricity from the offshore substation platform to the Landfall or to the oil and gas platforms.
Offshore Infrastructure	All of the infrastructure associated with the Offshore Project, including wind turbine generators, offshore substation platform and all inter-array and export cables.

1.

[1] '*Planning Circular 1/2015: relationship between the statutory land use planning system and marine planning and licencing*', June 2015

Offshore Project	Refers solely to the offshore element of the Project, which is being consented separately. This includes the Offshore windfarm and offshore export cable corridor.
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 Cables	The cables which will take power to and from the Proposed Substation south-west of New Deer and Green Volt Offshore windfarm.
Onshore EIA Report	The EIA Report for the Green Volt Onshore Infrastructure (Proposed Development).
Onshore transition Joining Pit	The interface between the offshore and onshore cable systems.
PM_{10}	Airborne particulate matter with an aerodynamic diameter less than 10 microns (µm).
Polyaromatic hydrocarbons	A class of chemicals that occur naturally in coal, crude oil, and gasoline.
Project	Green Volt Offshore Windfarm project as a whole, including associated onshore and offshore infrastructure development.
Proposed Development	Green Volt Onshore Infrastructure development including; the Landfall, the Cable Route Corridor, and the Substation Compound. including all ancillary infrastructure.
Proposed Substation	The new Proposed Substation at the grid connection point located approximately 5.5km from New Deer and 0.45km south-east of the existing National Grid New Deer Substation.
Safety zones	An area around a structure or vessel which must be avoided.
Site	The area within the Application Site Boundary within which the Proposed Development lies.
Southern Route Option	Southern cable route corridor from south of Boddam to new National Grid New Deer Substation (Iteration 2).
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 Option	Northern landfall option where the offshore export cables come ashore.
Substation Compound	Part of the Proposed Development consisting of substation (grid transformers and HVAC switchgear and associated electrical equipment), temporary construction compound, drainage, and the proposed route of the connection to the SSE/National Grid Substation.

Trackout	The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network.
Trenchless Compound	A trenchless mechanism for the installation underground utilities such as cables.
Wave Buoys and LiDAR	Devices which capture oceanographic and atmospheric data, particularly Wind, wave, tidal flow, direction and water temperature data.
Windfarm Site	The area within which the wind turbine generators, offshore substation platform and inter-array cables will be present.

GREEN VOLT

1

Chapter 1

Introduction

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-REP-0009-01	
Version Number:	00	
Date:	02/08/2023	
Prepared by:	Corey Simpson (GC)	*Corey Simpson*
Checked by:	Rob Collin (GC)	*Rob Collin*
Approved by Client:	Tom Harrison	*Tom Harrison*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	Issued for Review (IFR)	24/04/2023
A2	Issued for second review	03/07/2023
A3	Issued for third review	16/07/2023
00	Final for issue	02/08/23

Contents

1 Introduction

1.1 Introduction to the Project

1. For the purpose of this Enviornmental Impact Assessment (EIA) Report, it is important to define the different aspects of the project which are referenced throughout. Key aspects include:
2. The Project – refers to the holistic overview of the windfarm project, comprimising all elements both onshore and offshore.
3. The Proposed Development – refers soleing to the onshore elements of the Project, which this is the focus of this EIA Report.
4. The Offshore Project – refers solely to the offshore elements of the Project, which is being consented separately.
5. Green Volt Offshore Windfarm Ltd (hereinafter referred to as 'the Applicant') is applying to Aberdeenshire Council under the Town and Country Planning (Scotland) Act 1997 (As Amended) seeking planning permission for the Onshore Infrastructure for the Green Volt Floating Offshore Wind Farm (hereinafter referred to as the 'Proposed Development'). The Proposed Development is an onshore cable route that will connect the Green Volt Offshore Windfarm (the Offshore Project) to the National Grid. The Proposed Development commences at the Mean Low Water Springs (MLWS) north of Peterhead and crosses Aberdeenshire for approximately 35km to the connection point at the Substation Compound shown on **Figure 1.1 Site Location.**
6. The Proposed Development will comprise the following key components:
   - Landfall and associated infrastructure;
   - Cable Route Corridor and its associated infrastructure; and
   - Substation Compound and its associated infrastructure.
7. A full description of the Proposed Development is provided in **Chapter 5 - Project Description**. The Landfall is centred on British National Grid (BNG) reference (NK 11421 49014). The Cable Route Corridor crosses Aberdeenshire roughly west, first towards Longside, before turning south to Millbrook where it heads west towards the existing National Grid New Deer Substation (NGNDSS) at (NJ 83394 44235).

1.1.1 The Site

8. The Proposed Development is located from the Landfall just north of Peterhead to the Proposed Substation Compound location near the NGNDSS in Aberdeenshire as shown in **Figure 1.1**. The Application Site Boundary) represents the area for which the Applicant is seeking planning permission. The Site is the area within the Application Site Boundary and the Proposed Development lies within the Site.
9. The Site occupies an area of approximately 360 hectares (ha) and the land-use is predominantly agricultural farmland. There are a number of roads, water courses, overhead lines (OHLs) and pipelines which bisect the Site. The surrounding area is rural with land largely used for arable crops such as wheat, barley, carrots and potatoes. However, the grassland and arable land is intersected by smaller areas of coniferous forestry, heathland, and farmhouses.
10. The Site lies between 9–144 meters (m) above ordnance datum (AOD). The highest point is at the Standing Stones at North Mains of Auchmaliddie.

1.1.2 Proposed Development and Green Volt Offshore Wind Farm

11. The Proposed Development supports the Offshore Project that will provide oil & gas (O&G) platforms in the outer Moray Firth with up to 560 MW of renewable electricity, harnessed from the proposed Offshore Project. A number of outer Moray Firth platforms will have the potential to use the Offshore Project, and discussions are ongoing with the oil and gas platform operators regarding planned electrification. Focusing the initial design

around the provision of renewable electricity to offshore oil and gas platforms provides an exciting opportunity to maximise potential emission savings through the decarbonisation of their onboard power generation.

12. The Offshore Project has an operational target date of 2027. The Offshore Project enables 500,000 tonnes of CO_2 per year to be reduced by renewable energy generation (including at least 300,000 tonnes of CO_2 from oil and gas assets within the area). Any surplus power produced by the Proposed Development will be transmitted onshore to the National Grid.

13. This document is the **Onshore Environmental Impact Assessment (EIA) Report** for the onshore components of the Green Volt Floating Offshore Wind Farm only. An aligned **Offshore EIA Report** was prepared and submitted for the Offshore Project in January 2023 as part of an application for consent pursuant to section 36 of the Electricity Act 1989 (along with associated Marine Licenses).

14. The Proposed Development will connect the Offshore Project to the National Grid onshore. The Offshore Project will have the potential to provide renewable electricity to multiple existing oil and gas (O&G) facilities in the North Sea to decarbonise O&G operations. There is demand for the provision of renewable electricity to existing O&G facilities that is supported by the UK Government and throughout the wider industry, particularly in light of the North Sea Transition Deal that was agreed in March 2021.

15. This North Sea Transition Deal accompanies the Government commitment made in November 2020 for 40GW of Offshore Wind power by 2023 including 1GW of Floating Offshore Wind (HM Government, 2020). A key commitment within this deal was a joint Government and O&G sector investment of up to £14–16bn by 2030 in new technologies to reduce carbon emissions by 50% against a 2018 baseline by 2030. This includes up to £3bn to replace fossil fuel-based power supplies on O&G platforms with renewable energy, most notably offshore wind. The Offshore Project will be essential in meeting these ambitious targets.

16. Marine Scotland has undertaken a Spatial Planning exercise for Innovation and Targeted Oil and Gas (INTOG) Projects, and an Initial Plan Framework was published in August 2021. The Crown Estate Scotland's (CES) INTOG Leasing Round was announced in August 2021 and has been developed in alignment with Marine Scotland's *Initial Plan Framework*. The INTOG Leasing Round was designed to allow developers to apply for the rights to build offshore wind farms specifically for the purpose of providing renewable electricity to power O&G facilities. The Applicant participated in the INTOG leasing round and was awarded area exclusivity in March 2023.

1.2 Purpose of this Onshore EIA Report

17. This **Onshore EIA Report** describes the potential environmental impacts of the Proposed Development and assesses the significance of their effect, along with suggesting mitigation measures that can be implemented to minimise these effects. It considers impacts that may arise from Construction, Operations (including likely planned Maintenance activities) and Decommissioning of the Proposed Development.

18. The report includes a cumulative impact assessment with the offshore elements of the Green Volt Floating Offshore Windfarm (albeit these will be negligible for the most part) so that a holistic impact of the wider project can be assessed, and any additional programmes/projects located in proximity. Cumulative impacts alongside other programmes/projects in the vicinity of the Proposed Development that are in currently in planning or are being constructed have also been simultaneously assessed.

19. The purpose of this **Onshore EIA Report** is to provide the necessary information and outcome of the EIA undertaken as required by the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. It is required to support the Applicant in obtaining planning consent under the Town and Country Planning (Scotland) Act 1997.

20. Further details on the requirements for undertaking this EIA are presented in **Chapter 3 - EIA Methodology**. This EIA process and **Onshore EIA Report** has been informed by a scoping process with Aberdeenshire Council. An initial Scoping Report (**Appendix 1.1**) was submitted to Aberdeenshire Council in March 2022 and an initial Scoping opinion (**Appendix 1.2**) was received in May 2022. Following a discussion with the Planner at Aberdeenshire Council, it was agreed that a new scoping exercise should be undertaken given the changes to the proposed Cable Route Corridors. A new Scoping Report (**Appendix 1.3**) was submitted in December 2022 and a new Scoping opinion (**Appendix 1.4**) was received in March 2023. Consultation feedback from

communities, stakeholders and individuals has been used to inform the design of the Proposed Development and its associated impact assessment within the **Onshore EIA Report**. A full description of the consultation undertaken throughout the EIA process is provided in **Chapter 3 - EIA Methodology**.

1.3 The Applicant and Project Team

21. The Proposed Development is being developed by Flotation Energy Ltd (Flotation Energy) and Vårgrønn AS (Vårgrønn). Flotation Energy Ltd and Vårgrønn have formed the Applicant company (Green Volt Offshore Windfarm Ltd), to progress the development of the Proposed Development.

22. Flotation Energy is an Offshore Wind development company, headquartered in Edinburgh, UK. Founded in 2018, the company is pioneering the development of both Floating and Fixed Offshore Wind in Scotland, the UK and Internationally.

23. Flotation Energy's UK-based projects are:

- Green Volt Floating Offshore Windfarm (560MW, Scotland);
- Morecambe Fixed Offshore Windfarm (480MW, awarded as part of the England & Wales Round 4 Auction);
- White Cross Floating Offshore Windfarm (100MW, South-West England), And
- CENOS Floating Offshore Windfarm (up to 1400MW, Scotland).

24. Flotation Energy is also active in Europe and internationally, with a total Offshore Wind development pipeline of over 10GW capacity. Flotation Energy is determined to play a central role in the transformation to Renewable Energy to confront the climate crisis, in line with targets made under the UN Climate Change Conference (COP21) Paris Agreement 2016. The Paris Agreement is a legally binding international treaty on Climate Change. (The Paris Agreement | UNFCCC Accessed 6 July 2023).

25. Vårgrønn is a growing agile Offshore Wind company and was established as a joint venture between Italian energy major Eni Plenitude and the Norwegian private equity manager and Offshore Energy serial entrepreneur HitechVision.

26. Green Cat Renewables Ltd (GCR) has been commissioned by the Applicant as the Environmental Consultant to lead the **Onshore EIA Report**. GCR is an environmental and engineering consultancy focused on all aspects of development support, based in Scotland. With a team of 80 staff spread across 3 offices, the company's multi-disciplinary resource base spans all stages of project delivery: from feasibility and concept development through to planning, engineering, project management and operational asset management.

27. While much of the company's experience is within the Renewables sector, GCR's emphasis is on supporting farmers, landowners and developers in a wide range of Renewable projects.

28. GCR also have development expertise in helping a range of businesses find suitable energy solutions to aid economic viability in a climate where energy costs are forecast to continue to rise.

29. A full list of the GCR lead authors responsible for each technical area within this **Onshore EIA Report** is provided in further detail in **Table 1.1** overleaf.

30. GCR has been supported in preparing this **Onshore EIA Report** by IMTeco Ltd, GLM Ecology Ltd, Pell Frischmann and Royal HaskoningDHV as specialist subconsultants.

31. In line with the EIA Regs, reg 5(5) the **Onshore EIA Report** and technical assessments which inform it have been undertaken by a suitably-qualified project team. **Table 1.1** overleaf presents the EIA Project Team and associated specialist roles.

Table 1.1 The EIA Team

EIA Technical Chapter	Chapter Number	Lead Author
Introduction	1	Green Cat Renewables
Regulatory and Policy Context	2	Green Cat Renewables
EIA Methodology	3	Green Cat Renewables
Assessment of Alternatives	4	Green Cat Renewables
Project Description	5	Green Cat Renewables
Ecology and Ornithology	6	IMTeco Ltd and GLM Ecology Ltd
Geology, Hydrology, Hydrogeology and Soils	7	Green Cat Renewables
Contaminated Land	8	Green Cat Renewables
Noise	9	Green Cat Renewables
Landscape and Visual	10	Green Cat Renewables
Cultural Heritage and Archaeology	11	Green Cat Renewables (peer reviewed by AOC Archaeology Group)
Socio-economics, Tourism and Recreation	12	Green Cat Renewables
Traffic and Transportation	13	Pell Frischmann
Air Quality	14	Green Cat Renewables
Agricultural Land	15	Green Cat Renewables
Climate Change and Greenhouse Gas (GHG) Assessment	16	Royal HaskoningDHV
Schedule of Mitigation	17	Green Cat Renewables

1.4 Content of Planning Submission

1.4.1 Structure of the Green Volt Onshore EIA Report

32. The application for Planning Permission comprises:

- Green Volt Onshore EIA Report;
- Non-Technical Summary (NTS);
- Design & Access Statement (DAS);
- Planning Statement; and
- Pre-Application Consultation (PAC) Report.

33. The **Onshore EIA Report** is organised into three volumes. The planning submission documents are as follows:

- **Non-Technical Summary**
- **Volume 1: EIA Report**
    - Chapter 1: Introduction
    - Chapter 2: Regulatory and Policy Context
    - Chapter 3: EIA Methodology

- Chapter 4: Assessment of Alternatives
- Chapter 5: Project Description
- Chapter 6: Ecology and Ornithology
- Chapter 7: Geology, Hydrology, Hydrogeology and Soils
- Chapter 8: Contaminated Land
- Chapter 9: Landscape and Visual
- Chapter 10: Cultural Heritage and Archaeology
- Chapter 11: Socio-economics, Tourism and Recreation
- Chapter 12: Traffic and Transportation
- Chapter 13: Air Quality
- Chapter 14: Agricultural Land
- Chapter 15: Climate Change and Greenhouse Gas (GHG) Assessment
- Chapter 16: Schedule of Mitigation

- **Volume 2:** Figures
- **Volume 3:** Appendices

34. The **Onshore EIA Report** technical chapters as detailed in **Table 1.1** only cover the Proposed Development's onshore infrastructure.

35. A separate **Offshore EIA Report** detailing the assessment of the Offshore Project's infrastructure was submitted previously as part of a section 36 consent application. However, the following chapters provide an assessment of both offshore and onshore infrastructure:

- **Chapter 15 - Climate Change and Greenhouse Gas (GHG) Assessment**

36. Summaries of both the **Offshore** and **Onshore Environmental Impact Assessments** and the **Offshore EIA Report** are available on the Green Volt website[1].

1.5 References

HM Government (2020) *Ten Point Plan for a Green Industrial Revolution*, November 2020. Available at: https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution (Accessed 20/04/2023)

UNFCCC (2016) *The Paris Agreement*. Available at: The Paris Agreement | UNFCCC (Accessed 6/7/23)

1. [1] https://greenvoltoffshorewind.com/

GREEN VOLT

2

Chapter 2

Regulatory and Policy Context

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-REP-0009-02	
Version Number:	00	
Date:	02/80/23	
Prepared by:	Dale Hunter	*Dale Hunter*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tom Harrison	*Tom Harrison*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	Issued for Review (IFR)	20/06/2023
A2	Issued for Second Review	03/07/2023
A3	Issued for Third Review	31/07/23
00	Final	02/08/23

Contents

2 Regulatory and Policy Context

2.1 Introduction

1. Chapter 2 of the **Onshore Environmental Impact (EIA) Report** presents a review of the policy context and legislative framework underpinning the Proposed Development (in this instance the Proposed Development refers to the onshore elements of the Green Volt Floating Offshore Windfarm above Mean High Water Springs (MHWS)) only. The **Onshore EIA Report** has been produced in order to detail the potentially significant environmental impacts identified during the EIA process. Further legislation and policies specific to each EIA topic are outlined in the relevant technical chapters (Chapters 6–17) of this **Onshore EIA Report**. It is noted that Chapter 2 does not assess the Proposed Development under the terms of the Town and Country Planning (Scotland) Act 1997 (Planning Act 1997) (Scottish Government, 1997).
2. A separate Planning Statement has been provided with an appraisal of whether the Proposed Development is in compliance with the Development Plan, and whether other material considerations indicate otherwise.
3. This application for consent under onshore regimes refers to the offshore policy and legislative context because the context recognises the interconnectedness of the onshore and offshore work, and it provides a background to the proposed onshore works. For clarity, while offshore policies are referenced for context, the **Onshore EIA Report** is for onshore works only.

2.2 Requirement for Environmental Impact Assessment

4. The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (EIA Regulations 2017) (Scottish Government, 2017a) sets out various criteria of development that are to be considered as 'EIA development'. Regulation 6 of the EIA Regulations considers that a development is an EIA development in the following circumstances:
   - A Screening Opinion, or Screening Direction has been adopted by the Local Planning Authority (LPA) or Scottish Government respectively, that the development is an EIA development.
   - If no Screening Opinion or Direction has been adopted, the submission of an EIA report to the determining authority by a developer.
5. A submission was made to Aberdeenshire Council requesting a Screening Opinion under Regulation 8 of the EIA Regulations and a Scoping Opinion under Regulation 17 of the EIA Regulations.
6. A formal Scoping response was received from Aberdeenshire Council (reference ENQ/2023/0008) on 3 March 2023 (**Appendix 1.4**). The response does not contain explicit confirmation that the development is EIA development, but this is inferred by the content of the response and the proposed scope *per se* of the EIA Report.

2.3 Climate Change and Energy

2.3.1 International Context

2.3.1.1 United Nations Framework Convention on Climate Change

7. The UK is a signatory to the Kyoto Protocol that is linked to the United Nations Framework Convention on Climate Change (UNFCCC) (UNFCCC, 1997) and provides commitments for the State parties to reduce Greenhouse Gas (GHG) emissions. The Kyoto Protocol was adopted in Kyoto, Japan on 11 December 1997 and entered into force on 16 February 2005. The Protocol was amended in Doha, Qatar on 8 December 2012 and entered into force on 31 December 2020. Its commitments are reflected in The Climate Change Act 2008 (UK Government, 2008) and

The Climate Change (Scotland) Act 2009 (Scottish Government, 2009) which includes interim targets (**Section 2.3.2.1** and **Section 2.3.3.1** respectively).

8. COP21 (UNFCCC, 2015) took place in December 2015 in Paris at which 195 countries, the UK included, adopted the Global Climate Deal (The Paris Agreement). The Paris Agreement (UNFCCC, 2016) sets out the global action plan of limiting global temperature increase to below 2°C, while pursuing efforts to limit the increase to 1.5°C above pre-industrial average temperature.

9. COP26 (UNFCCC, 2021) took place in November 2021 in Glasgow where parties concluded that with current climate policies the world was not on track to meet the long-term temperature goal set out in the Paris Agreement, with a 2.7° C increase predicted following COP26.

10. Most recently, COP 27 (UNFCCC, 2022) took place in November 2022 in Sharm el-Sheikh, where countries agreed to return each year to strengthen commitments on cutting GHG emissions to attempt to strengthen their commitments to pursue efforts to keep the increase in temperature below 1.5°C.

2.3.2 Wider UK Legislation and Policy

2.3.2.1 The Climate Change Act 2008

11. The Climate Change Act 2008 (as amended by The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (UK Government, 2019)) sets out the framework for the UK to transition to a low-carbon economy. It places a duty on the UK government to ensure their net carbon account and GHG emissions are reduced by 100% – by 2050 relative to 1990 levels (Net Zero) as legally underpinned by international agreements and commitments.

12. The Act includes a requirement for the Committee on Climate Change to report to the UK Parliament and each of the devolved administrations on:

- The progress that has been made towards meeting the carbon budgets that have been set under Part 1 and the target in Section 1 (the target for 2050).
- The further progress that is needed to meet those budgets and that target.
- Confirmation as to whether those budgets and that target are likely to be met.

2.3.2.2 The Energy Act 2013

13. The Electricity Market Reform (EMR) Policy and Energy Act 2013 (UK Government, 2013) introduced the Contracts for Difference (CfD) allocation framework with the aim of providing long-term revenue stabilisation for new low-carbon energy initiatives, replacing the previous Renewable Obligation Certificate (ROC) system. The CfD scheme is the Scottish Government's main mechanism for supporting low-carbon electricity generation. The Auction Framework drives developers to deliver competitive projects at a Low-level Energy Cost, thereby reducing the subsidy required with the aim of ultimately lowering the cost to the consumer.

2.3.2.3 Net Zero Strategy: Build Back Greener

14. The *Net Zero Strategy* (UK Government, 2021a) from the UK Government is a strategy that sets out policies and proposals for decarbonising all sectors of the UK economy to meet the UK's Net Zero target by 2050.

15. The *Net Zero Strategy* promotes a green industrial revolution and a green economic recovery from the impact of COVID-19 with a focus on the position of the UK in the global green economy. It aims to keep the UK on track for the UK carbon budgets, the 2030 Nationally Determined Contribution, and Net Zero by 2050. It includes:

- Decarbonisation pathways to Net Zero by 2050, including illustrative scenarios.
- Policies and proposals to reduce emissions for each sector.
- Cross-cutting action to support the transition.

16. One of the key policies within the *Net Zero Strategy* is the move towards 1GW of Floating Offshore Wind by 2030, in order to put the UK at the forefront of the technology. The *Net Zero Strategy* also discusses prioritising critical system enablers, specifically the onshore infrastructure required for the installation of the offshore technology.

2.3.2.4 British Energy Security Strategy

17. The *British Energy Security Strategy* (UK Government, 2022) was published in April 2022, and sets out how Britain will accelerate homegrown power for greater energy independence, in response to energy pressures and the cost of living crisis caused by the COVID-19 pandemic and Russia's invasion of Ukraine in 2022.

    The *British Energy Security Strategy* seeks to accelerate the deployment of Wind, New Nuclear, Solar and Hydrogen Power, whilst supporting the production of domestic Oil & Gas (O&G) in the nearer term – which could see 95% of electricity by 2030 being low-carbon.

18. The Strategy has set a target to reach 50GW of Offshore Wind by 2030, including 5GW of Floating Offshore Wind.

2.3.2.5 Powering-Up Britain: Energy Security Plan

19. The *Powering Up Britain: Energy Security Plan* (March 2023) (UK Government, 2023) from the UK Government complements the earlier *Powering Up Britain* and sits alongside *Powering Up Britain: Net Zero Growth Plan.* The *Energy Security Plan* outlines the steps that the UK Government's Department for Energy Security and Net Zero is taking to ensure the UK is more energy independent, secure and resilient.

20. The *Energy Security Plan* includes a commitment to launch a Floating Offshore Wind Manufacturing Investment Scheme and highlights the interconnectedness with the *British Energy Security Strategy*.

2.3.3 National Context

2.3.3.1 The Climate Change (Scotland) Act 2009

21. The Climate Change (Scotland) Act 2009 (CC(S)A 2009) is legislation specifically implemented to reduce the GHG emissions in Scotland. The CC(S)A 2009 requires an interim reduction of GHG emissions by 42% and an 80% reduction target for 2050. This also required that the Scottish Ministers set annual targets, in secondary legislation, from 2010–2050. To satisfy this requirement, the Climate Change (Annual Targets) (Scotland) Order 2010 (Scottish Government, 2010a) outlined the first set of annual GHG emissions reduction targets for the period of 2010–2022. Following this period, The Climate Change (Annual Targets) (Scotland) Order 2011 (Scottish Government, 2011) outlines the targets for 2023–2027. Following EU Exit, accountability under EU Regulations, including the Renewable Energy Directive, no longer apply to the UK as a withdrawn EU Member State. The CC(S)A 2009 and The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 (Scottish Government, 2019) (**Section 2.3.3.2**) enact Scotland's legal commitments to reducing GHG emissions.

2.3.3.2 The Climate Change (Emissions Reductions Targets) (Scotland) Act 2019

22. The Scottish Government is committed to ensuring secure, reliable and affordable energy supplies within the context of long-term decarbonisation of energy generation. Continued growth of the renewable energy sector in Scotland is an essential feature of the future clean energy system and a key driver of future economic growth. The Scottish Government has set a range of targets and ambitions to cut GHG emissions and to generate more energy from renewable sources. The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 commits the Scottish Government to reach Net Zero emissions of all GHGs by 2045. It also sets out interim targets of to cut emissions by 75% by 2030, and 90% by 2040, against the 1990 baseline. Additionally, The Scottish Government has set a target to generate 50% of Scotland's overall energy consumption from renewable sources by 2030.

2.3.3.3 National Planning Framework 4 (NPF4)

23. The National Planning Framework 4 (NPF4) is discussed in detail in **Section 2.5.2** below but in terms of Climate Change and energy. However, at the core of the framework are the twin global crises relating to climate and nature – Policy 1 of the framework states "*When considering all development proposals significant weight will be given to the global climate and nature crises.*" Policy 2 further develops this theme, and requires the minimisation of lifecycle GHG emissions, adaptation to the current and future risks from climate change, and proposals for retrofit measures to existing developments in order to reduce emissions or support adaptation to climate change. Policy 11 regards energy which encourages, promotes and facilitates all forms of renewable energy development, both onshore and offshore. This includes new and replacement transmission and distribution infrastructure.

2.3.3.4 The Electricity Generation Policy Statement 2013

24. The Electricity Generation Policy Statement 2013 (EGPS 2013) (Scottish Government, 2013) examines the way in which Scotland generates electricity and considers the changes which will be necessary to meet the targets that the Scottish Government has established. The Scottish Government's policy on electricity generation is that Scotland's generation mix should deliver:

- A secure source of electricity supply
- At an affordable cost to consumers
- That is largely decarbonised by 2030
- And achieves the greatest possible economic benefit and competitive advantage for Scotland, including opportunities for community ownership and community benefits

2.3.3.5 Scotland's Energy Strategy

25. In 2017, the Scottish Government published *Scotland's Energy Strategy: The Future of Energy in Scotland* (Scottish Government, 2017b) that set a vision for how the energy system in Scotland would look in 2050. That vision was to see: "A flourishing, competitive, local and national energy sector, delivering secure, affordable, clean energy for Scotland's households, communities and businesses."

26. Since the publication of the 2017 *Strategy*, the Scottish Government has committed to achieving ambitious targets of Net Zero GHG emissions by 2045, and a 75% reduction by 2030 (Scottish Government 2020). The 2017 *Strategy* involves supplying 50% of Scotland's energy requirements from renewable sources and increasing energy productivity by 30% across the Scottish economy by 2030. The latest report by the Climate Change Committee (CCC, 2022) identifies that emissions in 2021 rose to some extent after the COVID-19 Pandemic but remain 10% below 2019 levels.

2.3.3.6 Draft Energy Strategy and Just Transition Plan – Delivering a fair and secure zero carbon energy system for Scotland 2023

27. The Draft Energy Strategy and Just Transition Plan (Scottish Government, 2023a) was introduced in a ministerial statement in Parliament in January 2023. It brings together plans for a Just Transition and the existing Energy Strategy from 2017. It is anticipated that this plan will supersede the *Scottish Energy Strategy* once adopted.

28. The draft Plan sets out actions to ensure that:

- People have access to affordable clean energy.
- Communities and places can participate and benefit from the Net Zero energy transition.
- We have a supportive policy environment, maximising the impact of government expenditure and attracting private investment.
- Scotland is home to a multi-skilled energy workforce, boosting our domestic supply chain and manufacturing capabilities.
- Scotland's Net Zero energy system is continuously innovative and competitive in domestic and international markets.

29. The Proposed Development aims to support each of those goals and the wider movement towards a Just Transition, this is discussed in **Chapter 12 – Socio Economics**. In terms of offshore development, the draft plan sets an ambition for 8–11GW of offshore wind in Scottish water by 2030 and seeks views on targets out to 2045.

2.3.3.7 Scotland's Offshore Wind Policy Statement

30. While principally focussed on offshore development, the *Offshore Wind Policy Statement 2022* (Scottish Government, 2022) highlights analysis by the 2020 Committee on Climate Change that there is a need to development a strategy to encourage rapid development of onshore networks to connect offshore wind farms to the National Grid. The Proposed Development will be vital to connect the Green Volt Floating Offshore Windfarm to the National Grid.

2.3.3.8 Scotland's Offshore Wind Route Map

31. The Offshore Wind Industry Group (OWIG) (consisting of industry, Scottish Government and public sector bodies) published *Scotland's Offshore Wind Route Map* in 2010 (Scottish Government, 2010), presenting an

approach to identifying opportunities, challenges and priority recommendations for the offshore wind industry. The ambition of Scotland's offshore wind industry was highlighted, "with 25% of Europe's offshore wind potential, the manufacturing, supply chain, job creation and training opportunities present Scotland with huge scope for sustainable economic growth".

32. *Scotland's Offshore Wind Route Map* highlights constraints in terms of access to the National Grid and the significant upgrades to National Grid infrastructure required in order to accommodate the level of offshore wind that is required to meet decarbonisation targets.

33. The function of the Proposed Development to connect the Offshore Project with the National Grid New Deer Substation (NGNDSS) and is considered to be part of the infrastructure required to ensure that the contributions from offshore wind are realised.

34. *Scotland's Offshore Wind* further identifies that offshore wind will make a significant contribution to meeting Scotland's renewable energy target of 50% of Scotland's electricity consumption coming from renewable sources by 2030 with a fully decarbonised energy system by 2050.

2.4 Electrification of Oil and Gas Industry

2.4.1 North Sea Transition Deal

35. As part of the UK's commitment to Net Zero (**Section 2.3.2**) the oil and gas industries through Oil and Gas UK (OGUK) has committed to the North Sea Transition Deal (UK Government, 2021b) that calls for significant reductions in the emissions caused by oil and gas production. For Scope 1 emissions that relate to those derived from the process of O&G extraction, the UK O&G industry has committed to reductions of:

- 10% CO_2 reduction by 2025
- 25% CO_2 reduction by 2027
- 50% CO_2 reduction by 2030

36. The Proposed Development will directly aid in meeting these target reductions.

2.4.2 Innovation and Targeted Oil and Gas (INTOG) Leasing Round

37. In August 2021, Crown Estate Scotland announced the Innovation and Targeted Oil and Gas (INTOG) (Crown Estate Scotland, 2022) Leasing Round 2022 with results announced in early 2023. The Applicant was awarded exclusivity in the INTOG leasing round in March 2023. INTOG has been designed to allow offshore wind developers to apply for the rights to build offshore wind farms specifically for the purpose of providing low-carbon electricity to power O&G installations and help decarbonise the sector. INTOG expects to support the delivery of smaller (<100MW) innovation projects, and specifically targets larger (>100MW) projects that seek to support the decarbonisation of the O&G sector, such as the Green Volt Offshore Windfarm.

38. The Applicant has applied for a site lease in accordance with the INTOG process. At the time of preparing this **Onshore EIA Report**, the Project boundary falls entirely within the proposed area of search identified by the INTOG process. Green Volt Offshore Windfarm will still require the appropriate Marine Licences and s.36 consent under the Marine (Scotland) Act 2010 and the Electricity Act 1989, respectively, for the offshore elements of the development. The relevant offshore consent applications for Green Volt Offshore Windfarm were submitted to Marine Scotland in January 2023.

2.5 Terrestrial Planning

2.5.1 Town and Country Planning (Scotland) Act 1997

39. The principle terrestrial planning act in Scotland is the Town and Country Planning (Scotland) Act 1997 (Planning Act 1997) as amended. The consenting regime for the onshore elements of the Project is discussed in **Section 2.7**. It is the Planning Act 1997 under which the planning application will be determined.

40. Section 25 of the Planning Act 1997 requires that when: "making any determination under the planning Acts, regard is to be had to the development plan, the determination is, unless material considerations indicate otherwise, to be made in accordance with that plan."

2.5.2 The Development Plan

2.5.2.1 National Planning Framework 4

41. The fourth National Planning Framework (NPF4) was adopted by the Scottish Government on 13 February 2023 (Scottish Government, 2023b). NPF4 is in force at the time of the submission of this application and National Planning Framework 3 and Scottish Planning Policy are now superseded.

42. NPF4 brings together the long-term spatial strategy with national planning policies as part of the statutory Development Plan. NPF4 contains six overarching spatial principles, as below, that are key in achieving the goal of sustainable, liveable and productive places:

- Just transition
- Conserving and recycling assets
- Local living
- Compact urban growth
- Rebalanced development
- Rural revitalisation

43. Policy 1 of the NPF4 gives a clear direction by stating that significant weight should be given to tackling the climate and nature crises. This statement recognises the important role of the NPF4 in achieving the ambitious targets for climate change and sets out the significant shifts in policies that are required to achieve net-zero emissions by 2045. This is further developed by Policy 2 which promotes climate mitigation and adaptation.

44. In relation to the connections between onshore and offshore infrastructure, NPF4 states: "*The interplay between land and sea will be critical, given the scale of offshore renewable energy resources.*"

45. NPF4 includes pertinent planning policies that should be taken into consideration as part of the assessment process and the assessment is likely to consider:

- Policy 1: Tackling the climate and nature crises
- Policy 2: Climate mitigation and adaptation
- Policy 3: Biodiversity
- Policy 4: Natural Places
- Policy 5: Soils
- Policy 6: Forestry, woodland and trees
- Policy 7: Historic assets and places
- Policy 8: Green belts
- Policy 10: Coastal development
- Policy 11: Energy
- Policy 18: Infrastructure first
- Policy 22: Flood risk and water management
- Policy 23: Health and safety

46. NPF4 notes that the Proposed Development is a national development, which are significant developments of national importance that help to deliver the spatial strategy. It develops this further in the statement of need, that additional electricity generation from renewables and electricity transmission capacity of scale is fundamental to achieving a net zero economy.

2.5.2.2 Aberdeenshire Local Development Plan 2023

47. Aberdeenshire Local Development Plan 2023 (Aberdeenshire Council, 2023) has been developed to direct decision-making on all land-use planning issues and planning applications in Aberdeenshire and sets out broad principles for development in the area. The spatial strategy within the plan highlights that Aberdeenshire is a diverse area that spans from the economically successful areas that provide homes and businesses around Aberdeen City, to areas of stunning character and natural beauty in the peripheral towns and countryside within Aberdeenshire.

48. Planning policies that have been taken into consideration as part of the assessment process include:

- Policy R1 Special Rural Areas
- Policy R3 Minerals
- Policy P1 Layout, Siting and Design
- Policy P4 Hazardous and Potentially Polluting Developments and Contaminated Land
- Policy E1 Natural Heritage
- Policy E2 Landscape
- Policy E3 Forestry and Woodland
- Policy HE1 Protecting Listed Buildings, Scheduled Monuments and Archaeological Sites (including other historic buildings)
- Policy HE2 Protecting Historic, Cultural and Conservation Areas
- Policy PR1 Protecting Important Resources
- Policy PR2 Reserving and Protecting Important Development Sites
- Policy C2 Renewable Energy
- Policy C3 Carbon Sinks and Stores
- Policy C4 Flooding
- Policy RD2 Developer Obligations

2.5.3 Planning Advice Notes

49. Planning Advice Notes (PANs) (Scottish Government, no date) from the Chief Planner at the Scottish Government provide advice on good practice and other relevant information. The following PANs have been taken into account when forming the planning application submission and identifying any potentially significant environmental effects.

- PAN 1/2013 Environmental Impact Assessment
- PAN 60 (2000) Planning for Natural Heritage
- PAN 61 (2001) Sustainable Urban Drainage Systems
- PAN 68 (2003) Design Statements
- PAN 75 (2005) Planning for Transport
- PAN 3/2010 Community Engagement
- PAN 1/2011 Planning and Noise
- PAN 2/2011 Planning and Archaeology
- PAN 51 Planning, Environmental Protection and Regulation (revised in 2006)

2.6 Marine Planning

2.6.1 Scottish Context

2.6.1.1 National Marine Plan (NMP)

50. Scotland's National Marine Plan (NMP) (Scottish Government, 2015a) was adopted and published in 2015. The NMP covers both Scottish inshore waters (out to 12 nautical miles (nm)), and offshore waters (12-200nm). It also applies to the exercise of both reserved and devolved functions.

51. The NMP highlights alignment between Marine and Terrestrial Planning will be achieved through consistency with the National Planning Framework and Local Development Plans.

52. The NMP describes that in developing onshore infrastructure associated with offshore infrastructure, cognisance must be had of community cohesion and reducing social disparity, whilst promoting health and wellbeing.

2.6.1.2 Sectoral Marine Plan INTOG

53. One of the key policy drivers for the Green Volt Floating Offshore Wind Farm is the Scottish Government's Sectoral Marine Plan - Offshore Wind Energy (SMP-OWE) for INTOG, which was published in August 2021, and updated in February 2022. The SMP lays down an Initial Plan Framework that outlines a set planning framework and the areas of seabed that will form the spatial footprint for the Crown Estate Scotland leasing process. It describes the next stages in the planning process that relate to the Scottish Government's responsibility as the responsible marine planning authority.

2.6.1.3 Marine Development

54. Other than in relation to certain specified matters (such as O&G industry activities) the Scottish Ministers have executively devolved powers over marine planning, marine licensing and nature conservation in the offshore marine region (12–200nm) in accordance with the Marine and Coastal Access Act 2009 (MCAA 2009) (as amended) (UK Government, 2009). The Marine (Scotland) Act 2010 (Scottish Government, 2010b) applies to the Scottish inshore region (0–12nm).

2.6.1.4 Regional Marine Plans

55. The NMP sets the wider context for Marine Planning within Scottish waters and includes what should be considered when creating local, regional marine plans. Eleven Scottish Marine Regions have been created that cover areas extending out to 12nm as defined by the Scottish Marine Regions Order 2015 (Scottish Government, 2015b) that came into force on 13 May 2015 and as a basis for regional marine planning, to be taken forward by marine planning partnerships. The Project's Floating Offshore Windfarm Site falls outside 12nm; however, the export cable will run through the North East Marine Region with the Landing Point and onshore cable route being within the East Region. It is noted that the region boundaries cover both the landmass of Scotland as well as the marine environment.

2.7 Consenting Regime

56. Planning permission is required for the Proposed Development under section 28 of the Planning Act 1997, as amended. The determining authority in this instance is Aberdeenshire Council given that the spatial extent of the Proposed Development is wholly within the Aberdeenshire Council area.

57. The development is an EIA development as defined by Regulation 6.(2)(b) of the EIA Regulations, as amended, following the Screening and Scoping exercise with Aberdeenshire Council (ENQ/2023/0008). As such, the *Green Volt Onshore EIA* has been provided as part of the planning application submission. The *Green Volt Onshore EIA* has been prepared based on advice provided in the Scoping Opinion, and the outcomes of additional ongoing consultation with statutory consultees and stakeholders on the Proposed Development.

2.8 References

Scottish Government (1997). The Town and Country Planning (Scotland) Act 1997. Available at https://www.legislation.gov.uk/ukpga/1997/8/contents [Accessed June 2023]

Scottish Government (2017a) The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at https://www.legislation.gov.uk/ssi/2017/102/contents/made [Accessed June 2023]

UNFCCC (1997). Kyoto Protocol to the United Nations Framework Convention on Climate Change. Available at https://unfccc.int/kyoto_protocol [Accessed July 2023]

UK Government (2008). Climate change Act 2008. Available at https://www.legislation.gov.uk/ukpga/2008/27/contents [Accessed July 2023]

Scottish Government (2009). Climate Change (Scotland) Act 2009. Available at https://www.legislation.gov.uk/ukpga/2008/27/contents [Accessed July 2023]

UNFCCC (2015). The twenty-first session of the Conference of the Parties (COP), Paris. Available at https://unfccc.int/event/cop-21 [Accessed July 2023]

UNFCCC (2016). The Paris Agreement. Available at https://unfccc.int/process-and-meetings/the-paris-agreement [Accessed July 2023]

UNFCCC (2021). The twenty-sixth session of the Conference of the Parties (COP), Glasgow. Available at https://webarchive.nationalarchives.gov.uk/ukgwa/20230401054904/https:/ukcop26.org/ [Accessed July 2023]

UNFCCC (2022). The twenty-seventh session of the Conference of the Parties (COP), Sharm El-Sheikh. Available at https://unfccc.int/cop27 [Accessed July 2023]

UK Government (2019). The Climate Change Act 2008 (2050 Target Amendment) Order 2019. Available at https://www.legislation.gov.uk/ukdsi/2019/9780111187654 [Accessed July 2023]

UK Government (2013). Energy Act 2013. Available at https://www.legislation.gov.uk/ukpga/2013/32/contents [Accessed July 2023]

UK Government (2021a). Net Zero Strategy: Build Back Greener. Available at https://www.gov.uk/government/publications/net-zero-strategy [Accessed July 2023]

UK Government (2022). British energy security strategy. Available at https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy [Accessed July 2023]

UK Government (2023). Powering Up Britain: Energy Security Plan. Available at https://www.gov.uk/government/publications/powering-up-britain/powering-up-britain-energy-security-plan [Accessed July 2023]

Scottish Government (2010a). The Climate Change (Annual Targets) (Scotland) Order 2010. Available at https://www.legislation.gov.uk/sdsi/2010/9780111010303 [Accessed July 2023]

Scottish Government (2011). The Climate Change (Annual Targets) (Scotland) Order 2011. Available at https://www.legislation.gov.uk/ssi/2011/scottish 3/contents/made [Accessed 2011]

Scottish Government (2019). Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. Available at https://www.legislation.gov.uk/asp/2019/15/enacted [Accessed July 2023]

Scottish Government (2013). Electricity generation policy statement 2013. Available at https://www.gov.scot/publications/electricity-generation-policy-statement-2013/ [Accessed July 2023]

Scottish Government (2017b). The future of energy in Scotland: Scottish energy strategy. Available at https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/ [Accessed July 2023]

Scottish Government (2023a). Draft Energy Strategy and Just Transition Plan. Available at Draft Energy Strategy and Just Transition Plan [Accessed July 2023]

Scottish Government (2022). Onshore wind: policy statement 2022. Available at https://www.gov.scot/publications/onshore-wind-policy-statement-2022/pages/15/ [Accessed July 2023]

Scottish Government (2010). Scotland's offshore wind route map: developing Scotland's offshore wind industry to 2020. Available at https://www.gov.scot/publications/scotlands-offshore-wind-route-map-developing-scotlands-offshore-wind-industry/ [Accessed July 2023]

UK Government (2021b). North Sea Transition Deal. Available at https://www.gov.uk/government/publications/north-sea-transition-deal [Accessed July 2023]

Crown Estate Scotland (2022). INTOG leasing round. Available at https://www.crownestatescotland.com/scotlands-property/offshore-wind/intog-leasing-round [Accessed July 2023]

Scottish Government (2023b). National Planning Framework 4. Available at https://www.gov.scot/publications/national-planning-framework-4/ [Accessed July 2023]

Aberdeenshire Council (2023). Aberdeenshire Local Development Plan 2023. Available at https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2023/ [Accessed July 2023]

Scottish Government (no date). Planning advice notes (PANs). Available at https://www.gov.scot/collections/planning-advice-notes-pans/ [Accessed July 2023]

Scottish Government (2015a). Scotland's National Marine Plan. Available at https://www.gov.scot/publications/scotlands-national-marine-plan/ [Accessed July 2023]

UK Government (2009). Marine and Coastal Access Act 2009. Available at https://www.legislation.gov.uk/ukpga/2009/23/contents [Accessed July 2023]

Scottish Government (2010b). The Marine (Scotland) Act 2010. Available at https://www.legislation.gov.uk/asp/2010/5/contents [Accessed July 2023]

Scottish Government (2015b). The Scottish Marine Regions Order 2015. Available at https://www.legislation.gov.uk/ssi/2015/193/contents/made [Available July 2023]

GREEN VOLT

3

Chapter 3

EIA Methodology

Onshore EIA Report: Volume 1

Document Code: FLO-GRE-REP-0009-03		
Version Number:	00	
Date:	*Issue Date 03/08/2023*	
Prepared by:	Corey Simpson	*Corey Simpson*
Checked by:	Rob Colin	*Rob Colin*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	Issued for client review	12/05/2023
A2	Second review	18/07/2023
A3	Final review	27/07/23
00	Final	*03/08/2023*

Contents

3 EIA Methodology

3.1 Introduction

1. This chapter describes the methodology and approach applied to the **Onshore Environmental Impact Assessment (EIA) Report** chapters for the Green Volt Onshore Infrastructure (Proposed Development).
2. This EIA has been carried out in accordance with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter referred to as the EIA Regulations). Further information on the regulatory framework is presented in **Chapter 2- Regulatory and Policy Context** of this **Onshore EIA Report**.
3. The approach to the EIA also closely follows the requirements of guidance including:
   - Environmental Impact Assessment Handbook; guidance for competent authorities, consultation bodies and other involved in the Environmental Impact Assessment process for Scotland (NatureScot, 2018);
   - Institute of Environmental Management and Assessment (IEMA) Environmental Impact Assessment Guide to Shaping Quality Development (IEMA, 2015);
   - Relevant guidance issued by other government and non-governmental organisations; and
4. Receptor-specific guidance documents. Where specific guidance has been used it has been identified in the **Legislation, Policy and Guidance** section of each technical chapter within the **Onshore EIA Report**.
5. EIA is statutory process governed by UK law. It is a means of drawing together in a systematic way, an assessment of the likely significant environmental impacts arising from a proposed development. This section presents an overview of the methodology to be utilised for the production of the EIA Report. It outlines the methodology for the identification and evaluation of potential likely significant environmental effects, both for the Proposed Development itself and cumulatively with the offshore elements of the Green Volt Offshore Wind Farm and with other developments.

3.2 Requirement for EIA

6. The EIA Regulations are specifically relevant to the Proposed Development. Onshore substations are classified as Schedule 2 development under the EIA Regulations. Given the extent of the cable route corridor it was determined that an EIA was required for the Proposed Development related to the Offshore windfarm. The criteria for considering whether a Schedule 2 development requires the preparation of an EIA is set out in Schedule 3 of the EIA Regulations. Schedule 4 of the EIA Regulations provides details of the information to be included within the **Onshore EIA Report**. This was confirmed by the Scoping Opinion received from Aberdeenshire Council in December 2022.
7. **Table 3.1** below sets out how the 'Information for inclusion in the EIA Reports' required under Schedule 4 of the EIA Regulations has been provided within this Onshore EIA Report.

Table 3.1 – Information required within the Onshore EIA Report

Required Information (EIA Regulations)	Location of Information within the Onshore EIA Report
1. A description of the development, including in particular: (a) a description of the location of the development; (b) a description of the physical characteristics of the whole development, including where relevant, requisite demolition works, and the land-use requirements during the construction and operational phase;	The Proposed Development is described in **Chapter 5 - Project Description**. This includes a description of construction activities and associated works, and the operational phase, including maintenance. The Site Location is shown in **Figure 1.1** and the site layout/Proposed Development is illustrated in **Figures 5.1, 5.2 and 5.3**.

Required Information (EIA Regulations)	Location of Information within the Onshore EIA Report
(c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases).	Expected residues and emissions are addressed in **Chapter 16 - Greenhouse Gas Assessment**.
2. A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	**Chapter 4 - Assessment of Alternatives** describes the process by which the final Landfall, Cable Route Corridor and Substation Compound were chosen to become the final Proposed Development. The chapter also discusses the various alternatives considered and why they were discounted.
3. A description of the relevant aspects of the current state of the environment (the "baseline" scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of relevant information and scientific knowledge.	A description of the current environment and the baseline is provided within each technical chapter of the **Onshore EIA Report** (**Chapters 6** to **16**).
4. A description of the factors specified in regulation 4(3) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.	The receptors likely to be significantly affected by the Proposed Development are provided in each of the technical chapters of the **Onshore EIA Report** (**Chapters 6** to **16**). This is informed by the Scoping Opinion and consultation feedback.
5. A description of the likely significant effects of the development on the environment resulting from, inter alia: (a) The construction and existence of the development, including, where relevant, demolition, including, where relevant, demolition works; (b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources; (c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;	The potential likely significant effects arising from the construction and operation of the Proposed Development, along with the measures required to mitigate these, and the predicted significant residual effects are provided in each of the technical chapters of the **Onshore EIA Report** (**Chapters 6 to 16**). This includes detailing the nature and duration of the potential likely significant effects. **Chapter 5 – Project Description** provides details relating to 5. (a). **Chapter 6 – Ecology and Ornithology**, **Chapter 7 – Geology, Hydrology, Hydrogeology and Soils** and **Chapter 15 – Agricultural Land** provide details relating to 5 (b). **Chapters 9 – Noise**, **Chapter 14 – Air Quality** and **Chapter 16 – Greenhouse Gas Assessment** provide details relating to 5 (c).

Required Information (EIA Regulations)	Location of Information within the Onshore EIA Report
(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters); (e) the cumulation of effects with other existing and/or approved development, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; (f) the impact of the development on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the development to climate change; and (g) the technologies and the substances used. The description of the likely significant effects on the factors specified in regulation 4(3) should cover the direct effects and any indirect, secondary, cumulative transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established as Union or Member State level which are relevant to the development including in particular those established under Council Directive 92/43/EEC and Directive 2009/147/EC.	**Chapter 9 – Noise**, **Chapter 11 – Cultural Heritage and Archaeology** and **Chapter 14 – Air Quality** provide details relating to 5 (d). **Chapters 6 – 16** each provide an assessment of cumulative effects. **Chapter 16 – Greenhouse Gas Assessment** provides details relating to 5 (f). **Chapter 5 – Project Description** provides details relating to the technologies and substances used. Cumulative effects are provided in each technical chapter of the **Onshore EIA Report**. The overall approach and methods used for the EIA are provided in this **Chapter 3 - EIA Methodology**. The specific approaches and methods used for each technical assessment are included within the relevant technical chapters of the **Onshore EIA Report** (**Chapters 6 to 16**).
6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	The general approach to the EIA is described in **Chapter 3 - EIA Methodology**. The methods used for each technical assessment are included within the relevant technical chapter of the **Onshore EIA Report** (**Chapters 6** to **16**).
7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.	The overall approach to mitigation is included within **Section 3.6 - Mitigation** of this chapter. Specific mitigation measures are included within each technical chapter of the **Onshore EIA Report** (**Chapters 6** to **16**) and the committed mitigation measures are detailed in **Chapter 17 - Schedule of Mitigation**.
8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned.	Scoped out of the **Onshore EIA Report**. See **Appendix 1.4 - Scoping Opinion**
9. A non-technical summary of the information provided under paragraphs 1 to 8.	The NTS is provided as a stand-alone document as part of the planning application.

Required Information (EIA Regulations)	Location of Information within the Onshore EIA Report
10. A reference list detailing the sources used for the descriptions and assessments included within the EIA Report.	References are provided at the end of each chapter of the **Onshore EIA Report**.

3.3 Consultation

8. Consultation is a key component of the EIA process, and continues throughout the lifecycle of a development, from its initial stages through to consent, construction, operation, and de-commissioning. This section details the consultation process undertaken during the design and EIA process.

3.3.1 Scoping

9. An initial **Scoping Report** (**Appendix 1.1**) was submitted to Aberdeenshire Council in March 2022 and an initial **Scoping Opinion** (**Appendix 1.2**) received May 2022. Following discussions with the planning officer at Aberdeenshire Council, it was agreed that a new scoping exercise should be undertaken given the changes to the proposed cable route corridors. A new **Scoping Report** (**Appendix 1.3**) was submitted in (December 2022) and a new **Scoping Opinion** (**Appendix 1.4**) was received in March 2023. A summary of key issues raised during consultation, both as part of the Scoping Opinion and in response to additional pre-application consultation, has been included in each technical chapter of the **Onshore EIA Report** (**Chapters 6-16**) as applicable.

10. The EIA for the Proposed Development has been informed by the Scoping Opinions provided by Aberdeenshire Council, ongoing consultation with statutory bodies and other stakeholders as well as consultation with local communities. A list of all statutory and non-statutory stakeholders consulted during scoping and preparation of the **Onshore EIA Report** is provided in the **Onshore Pre-Application Consultation (PAC) Report** which is submitted as a separate document to the **Onshore EIA Report** as part of the planning application.

3.3.2 Pre-Application Consultation Report

11. **Chapter 2- Regulatory and Policy Context** provides the basis for undertaking pre-application consultation. Section 35B of the Town and Country Planning (Scotland) Act 1997 (hereafter referred to as the (the 1997 Act) applies to the Proposed Development. This requires the Applicant for certain types of developments to notify the planning authority (Aberdeenshire Council), no less than 12 weeks in advance of the substation of the application. Under the section 35B of the 1997 Act, applicants are also required to hold at least two consultation events at which stakeholders and members of the public may provide comments to the Applicant.

12. As per the 1997 Act, two rounds of public consultation events have taken place as follows:

- Online exhibitions on (23 January and 27 February). Online information is still available at: https://openplans.uk/greenvolt2023/
- In-person event at New Deer St. Kanes Parish Church (25 January and 1 March 2023)
- In-person event at Longside Parish Church (26 January and 2 March 2023)

13. Further details of the pre-application consultation, including feedback received during the consultation is contained within the **Onshore PAC Report**.

3.3.3 Requirement for Competent Experts

14. Green Cat Renewables (GCR) is a renewable energy consultancy focused on all aspects of development support, primarily based in Scotland but with extensive UK wide experience and a growing presence in North America.

15. GCR offer the full range of support and services, tailored to the Client's needs, to economically deliver any scale of renewable energy project, from initial feasibility and planning to construction and commissioning.

16. With a team of over 70 staff, the company's multi-disciplinary resource base spans all stages of project delivery from site searching, feasibility and concept development, through to planning, engineering, project management and operational asset management. The company's experience profile includes 500MW+ of wind, 200MW+ of solar, and 20MW+ of hydro projects, totalling over 120 consented projects.

17. The team undertaking the EIA for the Proposed Development are predominantly GCR professional consultants. The team is comprised of an EIA professional who take the lead role in the co-ordination and management of the EIA. The EIA lead is supported by a wider team of technical specialists taking responsibility for the data collection data analysis and technical impact assessment.

18. The technical assessments are led by a lead technical author who is a recognised expert in their field and has significant experience in the preparation of impact assessments. The lead author takes responsibility for the quality of the data gathered; the assessment methodology to be undertaken, the impact assessments made and any proposed mitigation measures. The lead author is usually supported by a team of consultants and their work is subject to both technical and consistency review by a Project Director and the EIA lead.

19. Some of the technical assessments and/or associated EIA chapters are undertaken by specialist technical consultancies outside of GCR. Authorship of each chapter is detailed in **Table 1.1** of **Chapter 1 – Introduction**, with technical support and chapters being originated by external authors being summarised below.

- GLM – Author: **Chapter 6 – Ecology and Ornithology**
- Pell Frischmann – Author: **Chapter 13 – Traffic and Transportation**
- Royal HaskoningDHV – Author: **Chapter 16 – Greenhouse Gas Assessment**
- National Grid – Author: EMF Report – **Appendix 5.2**

3.4 Assessment Methodology

20. The individual methodologies for assessing each EIA topic area are described in more detail in each of the individual chapters of the EIA Report. The following sections briefly outline the overarching assessment methodology to be undertaken.

21. The main steps in the EIA assessment process for the Proposed Development have been:

- Summary of the relevant legislation, policy and guidance documents used to inform the assessment;
- Discussion of the results of consultation for each technical chapter;
- Identification of the chapter specific assessment methodology;
- Identification of the existing baseline conditions at the Site and surroundings area;
- Prediction of the likely environmental effects (both adverse and beneficial) associated with the construction, operation and decommissioning of the Proposed Development;
- Identification of mitigation to avoid, prevent or reduce or, if possible, offset adverse effects;
- Assessment of the significance of any residual effects after mitigation, in relation to the sensitivity of the feature impacted upon and the magnitude of the effect predicted, in line with the methodology identified in **Section 3.5.2**;
- Summary of potential significant effects

3.4.1 Design Envelope

22. The 'Design Envelope' approach has been adopted for the EIA of the Proposed Development. The Design Envelope sets out maximum (or minimum as appropriate) parameters for various components of the Proposed Development. This results in a realistic worst-case development that can then be assessed, ensuring that the potential significant effects represent the worst-case scenario. This realistic worst-case scenario may vary depending on the specific receptor, therefore each technical chapter (**Chapters 6-16**) states the parameters that have been assessed. When the detailed design is finalised at a later stage, it will fit within the parameters set out in **Chapter 5 - Project Description**. This ensures that the final design will not cause a worse impact than what has been assessed throughout each technical chapter.

23. The Design Envelope has been developed through a design process that is described in further detail in **Chapter 5 - Project Description**.

3.4.2 Identification of Environmental Baseline

24. A review of the current environmental conditions was undertaken to determine the appropriate baseline for assessment. In the majority of assessments this involved the following;

- Determining the realistic worst-case parameters for each assessment receptor;
- Definition of an appropriate study area, based on guidance and best practice;
- A review of currently available information relating to the development study area;
- Identification of likely potential impacts;
- Outline further data/survey/monitoring undertaken to obtain relevant information if required to support assessment;
- Review information to ensure suffcient data is available to provide a robust assessment.

3.4.3 Assessment of Effects

25. The methods for predicting the nature and magnitude of any potential impacts vary dependent on the subject area. Quantitative methods of assessment can predict values that can be compared against published thresholds and indicative criteria in Government guidance and standards. Where it is not possible to use a quantitative method, a qualitative assessment method was utilised, these assessments rely on the experience and professional judgement of the technical specialist.

26. The factors specified in Regulation 3A (3) of the EIA Regulations have been considered in the EIA including:

- The magnitude and spatial extent of the impact (for example, geographical area and size of the population likely to be affected);
- The nature of the impact;
- The intensity and complexity of the impact;
- The probability of the impact;
- The expected onset, duration, frequency and reversibility of the impact;
- Cumulative impacts with the impact of other existing and/or approved development(s); and
- The possibility of effectively reducing the impact.

27. Effects have been assessed taking account of the predicted magnitude of change and the sensitivity of the receptor. **Table 3.2** is used as a guide to determine an overall significance of effect using the relationship between the sensitivity of the identified receptor and the anticipated magnitude of an impact/change. The magnitude of impact/change for each effect has been identified and predicted as a deviation from the established baseline conditions. The sensitivity of the receptor/receiving environment to change has been determined using professional judgement, consideration of existing designations and quantifiable data, where possible. Each technical chapter has defined what constitutes a particular level of magnitude of change and sensitivity of receptor and this is defined within each technical chapter. In some instances professional judgement and experience has been used to inform the assessment based on previous experience.

Table 3.2 – Matrix for evaluating the significance of an effect

		Magnitude			
		High	Medium	Low	Negligible
Sensitivity	High	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Low	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

28. The following terms are used in the **Onshore EIA Report**, unless other stated, to determine the level of effects predicted to occur:

- Major beneficial or adverse effect – where the Proposed Development would result in a significant improvement (or deterioration) of the existing environment;

- Moderate beneficial or adverse effect – where the Proposed Development would result in a noticeable improvement (or deterioration of the existing environment;
- Minor beneficial or adverse effect – where the Proposed Development would result in a small improvement (or deterioration) of the existing environment; and
- Negligible – where the Proposed Development would result in no discernible improvement (or deterioration) of the existing environment

29. Using professional judgement and with reference to the Guidelines for EIA (IEMA, 2004), the assessments within the **Onshore EIA Report** consider effects of moderate and greater to be significant, while those of minor significance and less to be not-significant. Where there are deviations from this criteria these will be clearly stated within the individual technical chapters.

30. Summary tables that outline the predicted effects associated with each receptor, the appropriate mitigation measures required to address those effects. Overall residual effects which account for any mitigation measures are provided at the end of each technical chapter of the **Onshore EIA Report**. Distinction has also been made between direct and indirect, short and long term, permanent and temporary, beneficial and adverse effects.

3.5 Mitigation

31. The aim of proposing mitigation measures is to avoid, reduce and offset any significant adverse environmental effects arising from the Proposed Development, as identified throughout the **Onshore EIA Report**. There are different types of mitigation used in this **Onshore EIA Report**, embedded mitigation and additional mitigation.

3.5.1 Embedded Mitigation

32. Embedded mitigation comprises of both design features and construction good practice. These measures are assumed to be in place prior to undertaking the EIA and for part of the Proposed Development. Embedded mitigation can include:

- Minimising potential permanent effects of the Proposed Development through design
- Construction good practice, such as those measures identified in the Outline construction environmental management plan (CEMP) and the Construction Execution Plan (CEP)

33. **Chapter 5 - Project Description** describes the Proposed Development including a high level discussion of the construction methodology which includes embedded mitigation.

3.5.2 Additional Mitigation Measures

34. Where possible, reasonable steps will be taken during the design process to avoid the creation of significant adverse effects. Where these cannot be avoided completely, appropriate mitigation will be proposed to avoid or reduce the impacts to acceptable levels. This mitigation can include:

- Changes to the Proposed Development design;
- Physical measures applied on Site; and
- Measures to control particular aspects of the construction or operation phases.

35. Mitigation measures are presented as commitments in order to ensure a level of certainty as to the environmental effects of the Proposed Development. There are various ways in which a level of certainty can be ensured, such as through the use of planning conditions.

36. A schedule of all of the mitigation measures proposed within this **Onshore EIA Report** is presented within **Chapter 17 - Schedule of Mitigation**.

3.5.3 Enhancement

37. Similar to the inclusion of mitigation measures, where opportunities for environmental enhancement are proposed, these have been included within the summary of environmental commitments reported at the end of each technical chapter and within **Chapter 17 - Schedule of Mitigation**. Enhancement measures are also proposed in **Chapter 6 – Ecology and Ornithology.**

3.6 Cumulative Effects

38. Cumulative effects are those which result from incremental changes cause by past, present or reasonably foreseeable future actions resulting from the introduction of the Proposed Development in-combination with other developments.

39. Schedule 4, Regulation 5(e) of the EIA Regulations states that the **Onshore EIA Report** should include a description of the likely significant effects of the development on the environment resulting from *"the cumulation of effects with other existing and/or approved development, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources".*

40. Regulation 5, paragraph 2 refers to the need to assess *"the factors specified in regulation 4 (3) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.* This is referring to the topic-specific factors.

41. An assessment of cumulative effects has been undertaken in line with the EIA Regulations and current guidance as appropriate. It considers the two types of cumulative effects as described below.

3.6.1 In-Combination Effects

42. In-combination effects are the combined effect of the Proposed Development together with other reasonably foreseeable developments on a common receptor.

43. Development proposals which have been included in the cumulative assessment are listed in **Table 3.3** below. The criteria for developments being included are those which are classified as major developments or EIA development which have planning applications submitted, approved or are under construction, and are located within a 10km radius of the Proposed Substation and 2km from the Cable Route Corridor. Following a review of both the Energy Consents Unit (ECU) portal and the Aberdeenshire planning portal on 10 July 2023 it was confirmed at the time that there were seven developments which met the criteria identified. These developments are also shown in **Figure 3.1**.

44. Cumulative effects have been considered in detail and in accordance with guidance related to each topic. Where the list of cumulative developments may differ from that identified below it has been specified within the individual chapter.

Table 3.3 – Developments to be considered in Cumulative Assessment

No.	Application Reference	Location	Description
1	ECU00003226	South of St. Fergus	Kirkton Solar PV Farm and Energy Storage Facility
2	APP/2020/0369	Land At Inverugie Meadows South Ugie Peterhead	Residential Mixed Use Development Comprising up to 800 Residential Homes (25% affordable), a Local Neighbourhood Centre, Land Reserved for Employment Purposes, a Primary School and a Possible Future Rail Halt, Associated Roads and Drainage Infrastructure, New Landscaping and Open Spaces and a Local Nature Reserve
3	APP/2019/0421	Land At Mains Of Buthlaw Peterhead	Formation of Footpath

No.	Application Reference	Location	Description
4	ECU00000649	Within Application Site Boundary north of NGNDSS	New pair of terminal towers to connect into New Deer Substation
5	ECU00000677*	Stretches across cumulative search area	North East 400 kV Overhead Line Reinforcement Works
6	ECU00003242	South of Middlehill	Overhead Line ERE224 - Dam Brig Of Allathan, New Deer, Turriff, Aberdeenshire, AB53 6YU
7	ENQ/2019/0563	Site OP1 And OP2 Maud Aberdeenshire	Residential Development

** Development ECU00000677 is consented, however construction is currently underway. As a result, it is assumed that any construction work for this development would be completed well in advance of work commencing on the Proposed Development and would not have cumulative construction impacts.*

3.6.2 Effect Interactions

45. Effect interactions are the combined or synergistic effects as a result of the Proposed Development on a particular receptor which may collectively cause a more significant effect than individually. A theoretical example is the culmination of disturbance from dust, noise, vibration, artificial light, human presence and visual intrusion on sensitive fauna adjacent to a construction site.

46. The cumulative effect interactions assessment is presented within each individual technical chapter (**Chapters 6-16).**

3.7 References

Institute of Environmental Management and Assessment (IEMA) (2015). IEMA Environmental Impact Assessment Guide to Shaping Quality Development.

NatureScot (2018). Environmental Impact Assessment Handbook; guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process for Scotland, version 5. Available at Publication 2018 - Environmental Impact Assessment Handbook V5.pdf (nature.scot) [Accessed May 2023]

Green Cat Renewables Ltd. (March 2022). Green Volt Offshore Wind Farm – Onshore Infrastructure – EIA Scoping Report.

Green Cat Renewables Ltd. (December 2022). Green Volt Offshore Wind Farm – Onshore Infrastructure – EIA Scoping Report.

GREEN VOLT

4 Chapter 4

Assessment of Alternatives

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-REP-0009-04	
Version Number:	00	
Date:	Issue Date 02/08/23	
Prepared by:	Isla Ferguson	*Isla Ferguson*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tom Harrison	*Tom Harrison*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	Issued for client review	05/05/2023
A2	Issued for client review	23/06/2023
A3	Issued for client review	30/07/23
A4	Final	02/08/23

Contents

4 Assessment of Alternatives

4.1 Introduction

1. Chapter 4 details the Site selection and design process that was undertaken for the Proposed Development. The chapter outlines the key criteria considered during the site selection and design process; the evolution that the Design has taken; and the alternatives that were considered to reach the final design iteration, 'Iteration 5 — Planning Iteration of the Proposed Development'.
2. Regulation 5 of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regs 2017 requires that information appertaining to Alternative Sites considered through the Site selection process is provided in any submitted Environmental Impact Assessment (EIA) (Scottish Government, 2017):
3. *Reg 5: '(2)An EIA report is a report prepared in accordance with this regulation by the developer which includes (at least) –*
4. *[…]*
5. *(d) a description of the reasonable alternatives studied by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;*
6. *[…]"*
7. The design process of the Proposed Development has been iterative and there have been many iterations between the identification of initial cable route options to the final Proposed Development. There have been five key design iterations that represent key milestones of the design evolution. These design iterations are shown in **Figures 4.1–4.4b** and are defined as follows:

   - **Iteration 1 – Original Scoping:** This iteration was submitted under the original Scoping submission to Aberdeenshire Council in March 2022.
   - **Iteration 2 – Rescope:** This iteration was submitted under the second Scoping submission to Aberdeenshire Council in December 2022.
   - **Iteration 3 – Post-Exhibition:** This iteration was designed following public exhibitions in January and March 2023 and was informed by feedback from these public exhibitions.
   - **Iteration 4 – Refined:** This iteration formed the first refinement by the Applicant's engineering contractor in April 2023.
   - **Iteration 5 – Planning:** This iteration forms the the final design submitted into planning and was finalised in June 2023 following final survey work and an engineering walkover survey.

4.2 Key Components of the Project

8. The Proposed Development will comprise the following components:

   - **The Landfall:** including the Trenchless compound.
   - **The Cable Route Corridor:** including the cable trench, all trenchless crossings, the working area and compounds/laydown areas/mobilisation areas.
   - **The Substation Compound:** including the Proposed Substation, Sustainable Drainage Systems (SuDS) and construction compound.

9. *(Nb)The Offshore Works: including the Wind Turbine Generators, the Offshore Substation Platform, the Subsea Cables and Wave Buoys; and LiDAR are subject to a separate Offshore EIA Application.)*

10. The **Offshore EIA Report** was prepared and submitted to Marine Scotland for the **Green Volt Offshore Wind Farm** in January 2023 as part of an application for consent pursuant to section 36 of the Electricity Act 1989 (along with associated marine licenses).

11. Further details of the key components of the onshore infrastructure can be found in **Chapter 5 - Project Description**.

12. *(Nb Details of the key components of the offshore infrastructure have been presented in the separate **Offshore EIA Report**.)*

4.3 Key Criteria

13. A number of constraints and design criteria were considered when identifying possible Cable Route Corridors and possible Landfall and Proposed Substation locations. **Table 4.1** highlights the key environmental, technical and landowner constraints that were considered during the Site selection and design process.

Table 4.1 - Key constraints considered for Siting and Design

Topic	Key Constraints
Ecology and Ornithology	▪ Avoid key designations such as Marine Protected Areas (MPA); Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA) and RAMSAR Sites. ▪ Avoid areas of woodland and hedgerows as much as possible. ▪ Avoid areas of Ancient Woodland Inventory (AWI). ▪ Avoid sensitive habitats. ▪ Avoid the disturbance of EU Protected Species (EUPS).
Hydrology, Geology, Hydrogeology and Soils	▪ Minimise watercourse crossings. ▪ Avoid areas of Class 1 and Class 2 Peat. ▪ Avoid known Private Water Supplies (PWS) where possible. ▪ Minimise impacts on Groundwater Dependent Terrestrial Ecossystems (GWDTE) as far as possible. ▪ Avoid Geological Conservation Review Sites (GCRS). ▪ Areas of potential contaminated land.
Cultural Heritage and Archaeology	▪ Avoid nationally designated features such as Scheduled Monuments, Category A Listed Buildings and Gardens and Designed Landscapes (GDLs). ▪ Regionally significant features such as Category B and Category C Listed Buildings and Conservation Areas. ▪ Avoid, where possible, National Records of the Historic Environment (NRHE Sites) and Aberdeenshire Local Historic Environment Records (HERs).
Tourism and Recreation	▪ Minimise impacts on: o Core Path and Long-Distance Footpath crossings, most notably the Formartine and Buchan Way (FBW) o Golf Courses o Sports Fields o National Cycle Routes (NCR) o Any known tourism receptors
Infrastructure	▪ Avoid crossing existing areas of infrastructure such as overhead lines (OHLs), gas pipelines, and roads as much as possible and follow alongside these where possible to reduce disturbance. ▪ Maintain appropriate separation from OHLs. ▪ Avoid areas of other operational and proposed energy infrastructure including wind turbines, solar farms and gas power stations/terminals.

Residential	▪ Maintain appropriate separation between the Proposed Development and residential properties. ▪ Avoid encroaching on settlement boundaries.
Landscape and Visual	▪ Avoid Special Landscape Areas (SLAs), Gardens and Designed Landscapes, and any other landscape designations where possible. ▪ Designing and siting the Substation appropriately to minimise the Visual Impacts on local receptors.
Landowners	▪ Using first-hand knowledge of cable route corridor provided by landowners to feed into the potential constraints for example: o locations of private water supplies; o known areas of trees or wetland not shown on existing mapping; and o upcoming planning applications and other proposed development.
Other	▪ Quarries (both existing and disused) ▪ Limit impacts on agriculture as far as possible.

4.4 Background to the Project

14. The assessment and identification of the grid connection location was undertaken by National Grid Electricity System Operator (NGESO) along with the transmission owner, who in this location is Scottish & Southern Electricity Networks (SSEN) Transmission plc. This process resulted in the grid connection offer being made to the Applicant to connect at the National Grid New Deer Substation (NGNDSS). This offer was made in June 2021 by NGESO and was accepted on 16th August 2021. Once the grid connection point was confirmed to be at the NGNDSS: Landfall options were identified. As detailed in the **Offshore EIA Report**, several general areas were identified for Landfall (**Image 4.1**). These were the St Fergus South Landfall Option and the NorthConnect Parallel Landfall Option.

15. The St Fergus South Landfall Option located north of Peterhead with various possible locations for an onshore/offshore jointing pit, and onward cable to the NGNDSS. Locations to the north allow the Project to avoid the Buchan Ness to Collieston Special Protection Area (SPA) and Special Area of Conservation (SAC) but provide a more complex path onshore with a number of river crossings on route to the Substation Compound.

16. The NorthConnect Parallel Landfall Option located south of Peterhead with various possible locations for an onshore/offshore jointing pit, and onward cable to the NGNDSS. Locations to the south may require crossing the Buchan Ness to Colliestone SPA and SAC. The St Fergus South Landfall Option and the NorthConnect Parallel Option are shown on **Figure 5.11** of the **Offshore EIA Report**.

17. The Landfall Feasibility Report has been undertaken (**Appendix 4.1**) that considered potential Landfall points at both St Fergus South and NorthConnect Parallel from practical, constraints, and feasibility perspectives: including environmental, cultural and technical considerations. Both Landfall points were considered feasible. The final decision of Landfall location will be determined following a detailed evaluation by the team undertaking the **Onshore EIA Report**.

Image 4.1 - Export Option Areas

18. The confirmation that both Landfall options were feasible allowed for a number of options for Landfall locations both north and south of Peterhead and subsequent cable route corridor options between the potential Landfalls locations, and the grid connection to be explored during the design process of the Proposed Development. These are outlined in more detail below.

4.5 Initial Constraints Review

19. Having established the grid connection location and Landfall options, an initial review of the area around the Landfall options was undertaken in May 2021 to understand the key constraints and establish areas that had potential for the landing point, cable route, and the Proposed Substation location. The results of this can be seen in **Figure 4.1.** Both options were in play, and we knew where the grid connection was and therefore, the constraints were ran for the several areas in tandem.

20. Key criteria when undertaking the initial constraints review included:

- The ability to accommodate a final cable route corridor of approximately 60m wide plus any additional area required for construction compounds;
- Preference for the shortest length in route in order to minimise the overall footprint and the number of receptors that will be affected;
- Avoid populated areas where possible;
- Avoid key sensitive features highlighted in **Table 4.1** such as SPAs, SACs, SSSIs, historic designations, flood zones, drinking water protected areas, quarries, military activities, contaminated land, and other infrastructure.

21. The initial desktop review from available data highlighted that they key constraints of the area from the two Landfall search areas to the NGNDSS. Known constraints in the area are shown in **Figure 4.1** and include the constraints listed in **Table 4.2** - Key Constraints for Cable Route Corridors for each Landfall Search Area.

Table 4.2 - Key Constraints for Cable Route Corridors for each Landfall Search Area

St Fergus South	Peterhead South/Longhaven Cliffs
▪ Existing infrastructure in the form of: ○ Transmission scale OHLs and associated energy infrastructure; ○ St Fergus Gas Terminal; ○ Operational and Proposed renewable energy infrastructure; and ○ Major gas pipelines. ▪ Ecological and Hydrological designations and sensitive receptors such as: ○ AWI; ○ MPA ○ SSSI; and ○ Class 1 Peat. ▪ Historic Designations such as: ○ Nationally significant features including: Scheduled Monuments and Category A Listed Buildings; ○ Regionally significant features including Category B Listed Buildings, Category C Listed Buildings, and Conservation Areas; and ○ National Record of the Historic Environment Scotland (NRHE) Sites. ▪ Recreation features such as: ○ Core Paths, most notably the FBW; ○ NCR1; and ○ Golf Courses. ▪ Landscape Designations such as: ○ Special Landscape Areas; and ▪ Settlements, most notably: ○ Peterhead; ○ Longridge; ○ Mintlaw; ○ Maud; ○ New Deer; ○ Stuartfield; and ○ St Fergus.	▪ Existing infrastructure in the form of: ○ Transmission scale OHLs and associated energy infrastructure; ○ Peterhead Substation; ○ Peterhead Powerstation; ○ Operational and Proposed renewable energy infrastructure; and ○ Major gas pipelines. ▪ Ecological and Hydrological designations and sensitive receptors such as: ○ AWI; ○ MPA; ○ GCRS; ○ SSSI; ○ SPA; ○ SAC; ○ RAMSAR Sites; and ○ Class 1 Peat. ▪ Historic Designations such as: ○ Nationally significant features including: Scheduled Monuments, Category A Listed Buildings, and GDLs. ○ Regionally significant features including Category B Listed Buildings, Category C Listed Buildings, and Conservation Areas; and ○ National Record of the Historic Environment Scotland (NRHE) Sites. ▪ Recreation features such as: ○ Core Paths, most notably the FBW; and ○ NCR1. ▪ Landscape Designations such as: ○ Special Landscape Areas; and ○ GDLs. ▪ Settlements, most notably: ○ Peterhead; and ○ Boddam.

22. From the initial constraints review, it was highlighted that the most optimal areas for the Landfall areas would be to the north of Peterhead to the south of St Fergus, to the south of Peterhead to the north of Boddam and at the Longhaven Cliffs south of Boddam. Given their proximity to the coast and for the ability to avoid the surrounding constraints.

23. The Applicant provided the maximum extents required for Landfall and once the constraints review was undertaken, additional areas were added based on the minimum area required for Landfall around the surrounding constraints.

4.6 Iteration 1 – Original Scoping

24. Iteration 1 was submitted to Aberdeenshire Council for its Scoping Opinion in March 2022 (ref ENQ/2022/0373) (see **Appendix 1.1**). A Scoping Opinion was received for this iteration in May 2022 (see **Appendix 1.2**).

4.6.1 Landfall

25. At the point of submitting the Scoping Report to Aberdeenshire Council, 11 Landfall location options both north and south of Peterhead were proposed and can be seen in **Image 4.2.** The reason for the selection of all the Landfall options is described below. Generally, Landfall options were chosen that were in close proximity to the coast, would minimise the length of the Trenchless Compound that would be required to bring the cable onto land from offshore.

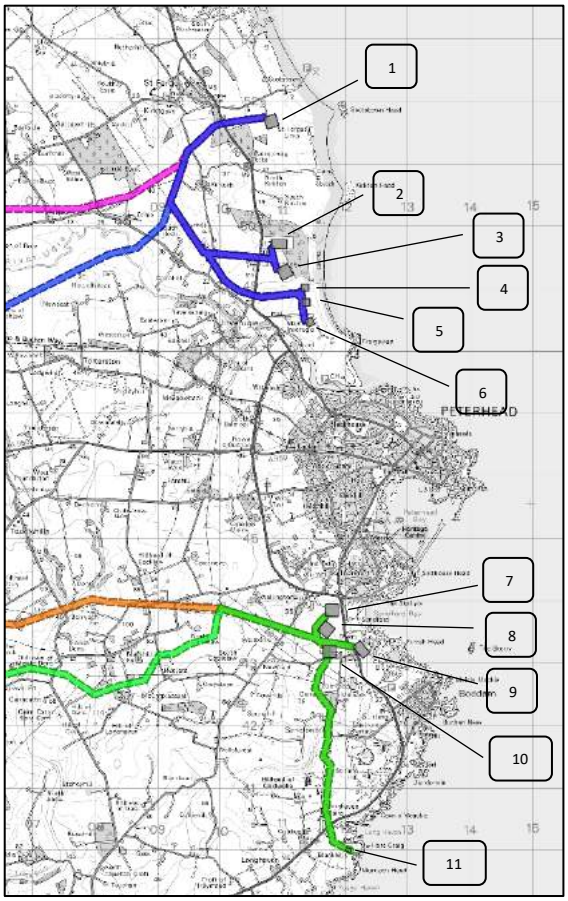

Image 4.2 – Location of the 11 Landfall Options as Part of Iteration 1

4.6.1.1 St Fergus South

26. Landfall options 1—6 **(Image 4.2)** were all located on areas of arable farmland to the east of the A90 and to the south of St Fergus, in close proximity to the coastline. The key constraints considered can be seen illustrated on **Figure 4.2a.** These included, areas of woodland, the consented Kirkton Solar Farm, a golf course, cultural heritage features and the settlement boundaries of St Fergus and Peterhead. The Landfall options all avoid these constraints as illustrated on **Figure 4.2a.**

4.6.1.2 Peterhead South

27. Landfall options 7—10 (**Image 4.2**) are all located within areas of grassland and scrub to the south of Peterhead in a largely industrial area and in proximity to the coastline. The key constraints considered can be seen illustrated on **Figure 4.2c** This included several OHLs associated with the Peterhead substation, core paths, heritage features (eg NHREs), the settlement of Boddam, and residential properties and Nature sites: SAC, SSSI and SLA. The Landfall options were all sited to avoid these constraints as illustrated on **Figure 4.2c.**

4.6.1.3 North Connect Parallel

28. Landfall option 11 is located in an area of grassland at the Longhaven Cliffs. The key constraints can be seen illustrated on **Figure 4.2c.** The constraints around this landing area are primarily ecological designations including the Bullers of Buchan Geological Conservation Review Site (GCRS), the Bucan Ness to Collieston SAC, the Bullers of Buchan Coast SSSI, and the Buchan Ness to Collieston Coast SPA. Landfall option 11, while in close proximity, avoids these designations as illustrated in **Figure 4.2c** Landfall option 11 was selected to be an option as it is the same Landfall as the consented NorthConnect project. At this stage of the design evolution, it was felt that there could be some efficiencies in using the same Landfall location as the NorthConnect Project and so it was included as an option. These efficiencies involved the hope of using some of the environmental assessment data associated with the NorthConnect project.

4.6.1.4 Landfall Constraints Summary

29. The key constraints in the immediate surroundings of each Landfall are outlined in **Table 4.3.** None of the options have any known constraints within the area suggested for the Landfall.

Table 4.3 - Iteration 1 Landfall Option Constraints

Landfall Option	Key Constraints Surrounding Landfall
Landfall Option 1	▪ Consented Kirkton Solar Farm ▪ Corepaths ▪ Woodland ▪ North East Aberdeenshire Coast Special Landscape Area ▪ Residential Properties ▪ NRHE (Canmore) Site
Landfall Option 2	▪ Woodland ▪ Residential Property ▪ NRHE (Canmore) Site ▪ North East Aberdeenshire Coast Special Landscape Area
Landfall Option 3	▪ Woodland ▪ Residential Property ▪ NRHE (Canmore) Site ▪ North East Aberdeenshire Coast Special Landscape Area
Landfall Option 4	▪ Golf Course ▪ North East Aberdeenshire Coast Special Landscape Area
Landfall Option 5	▪ Golf Course ▪ North East Aberdeenshire Coast Special Landscape Area
Landfall Option 6	▪ Golf Course ▪ North East Aberdeenshire Coast Special Landscape Area ▪ NRHE (Canmore) Sites ▪ Residential Properties
Landfall Option 7	▪ Peterhead Settlement Boundary ▪ Core Paths ▪ NRHE (Canmore) Sites ▪ Industrial Units
Landfall Option 8	▪ Peterhead Settlement Boundary ▪ Core Paths ▪ Industrial Units
Landfall Option 9	▪ Core Paths ▪ Peterhead Power Station ▪ Steep Topography ▪ NRHE (Canmore) Sites
Landfall Option 10	▪ OHLs ▪ Peterhead Substation ▪ NRHE (Canmore) Sites ▪ Industrial Units
Landfall Option 11	▪ SPA ▪ SSSI ▪ SAC ▪ GCRS ▪ North East Aberdeenshire Coast Special Landscape Area ▪ NRHE (Canmore) Sites ▪ Core Paths

4.6.2 Cable Routes

30. Having identified a number of Landfall location options, four cable route options at 100m in width were identified, two starting from the St Fergus South Landfall Options and two starting from Peterhead South/NorthConnect Parallel Landfall Options near Boddam as illustrated in **Image 4.3.**

4.6.2.1 Route Option 1

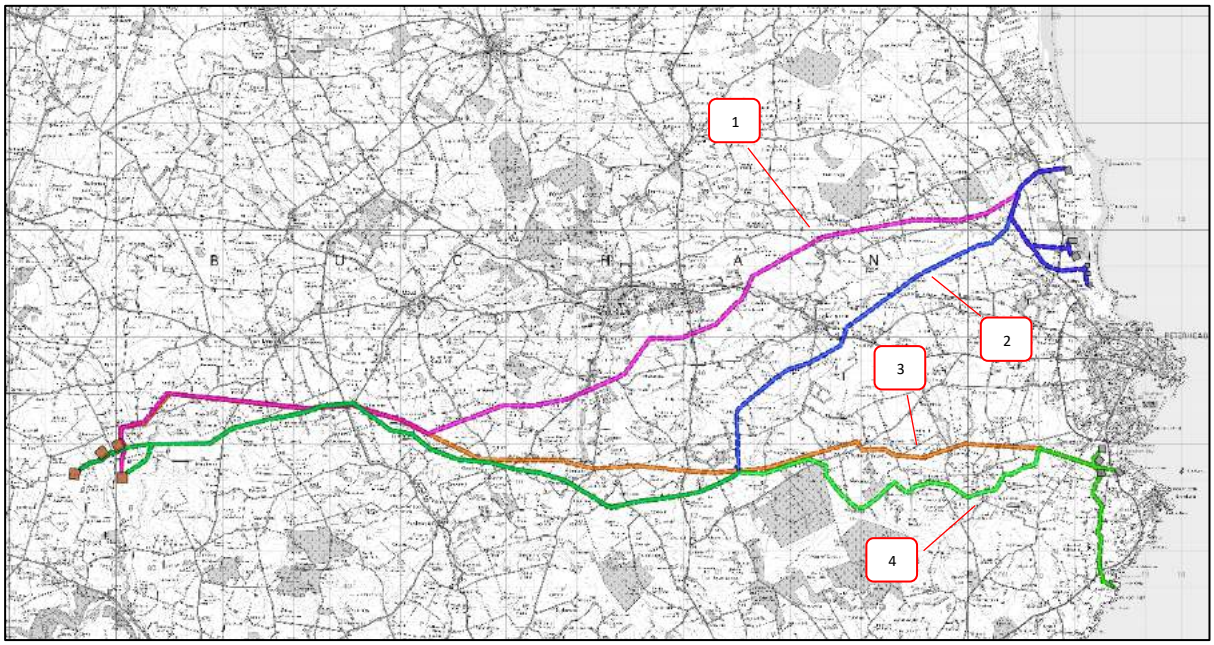

Image 4.3 – Location of the Four Cable Route Corridors as Part of Iteration 1

31. Route Option 1 in **Image 4.3** was the most northerly route option and this connected the Landfall options to the north of Peterhead to the potential substation location options. The route bypasses the settlements of St Fergus, Mintlaw and Stuartfield on their southern sides. Key constraints along this route are transmission lines, gas pipelines, the FBW/NCR1, AWI areas, NRHE Sites, and settlements. The route avoided the majority of sensitive designations, with some NRHE sites located on the edge of the cable route corridor, and crossings on the FBW, and existing infrastructure were endeavoured to be as perpendicular as possible. This route was in close proximity to settlements: including St Fergus and Stuartfield. Constraints avoided by Route Option 1 are shown in Figures 4.2a, 4.2d, 4.2e, 4.2g, 4.2h, 4.2j, 4.2l, 4.2m and 4.2n.

4.6.2.2 Route Option 2

32. Route Option 2 was the second most northerly option which connected the Landfall options to the north of Peterhead to the potential substation location options. The route bypasses the settlements of St Fergus and Longside on their southern sides. The key constraints on this route are transmission lines, gas pipelines, areas of AWI, the FBW/NCR1 and NRHE sites. Some of these NRHE sites were located within the Cable Route Corridor area that would require micro-siting. Constraints avoided by Route Option 2 are shown in Figures 4.2a, 4.2e, 4.2f, 4.2h, 4.2i, 4.2j, 4.2k, 4.2l, 4.2m and 4.2n.

4.6.2.3 Route Option 3

33. Route Option 3 connected the Landfall options south of Peterhead to the potential substation location options. The route runs from the south of Peterhead but does not bypass any other major settlement. The route primarily follows the existing 400kV north-east OHL to the NGNDSS as this OHL largely avoids most constraints in this area. However, there is an allowance for safety separation of 15m which was included in the constraints. Key constraints in close proximity to the route include: Class 1 Peat; AWI sites; NRHE Sites; transmission lines; gas pipelines; Scheduled Monuments; and the FBW/NCR1. Due to the proximity to the AWI sites and the Class 1 Peat, careful siting around these has to be undertaken, examples of these around Nether Kinmunday and Kinnadie can be seen in **Image 4.4 and Image 4.5.** Constraints avoided by Route Option 3 are shown in **Figures 4.2b, 4.2c, 4.2e, 4.2h, 4.2i, 4.2k, 4.2l, 4.2m.**

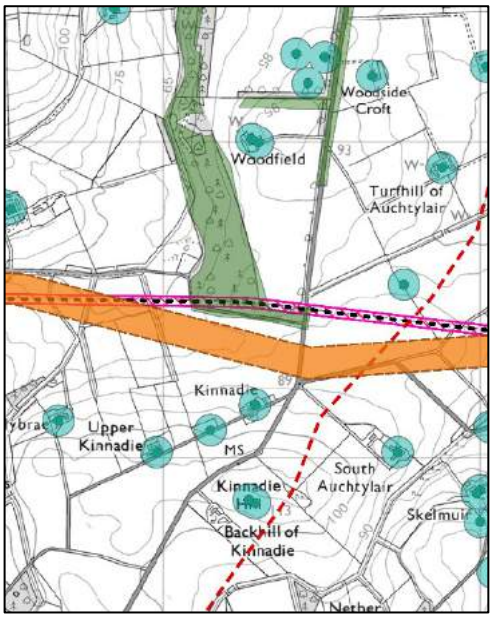

Image 4.4 – Route Option 3 (Orange_ Avoiding AWI (Green)

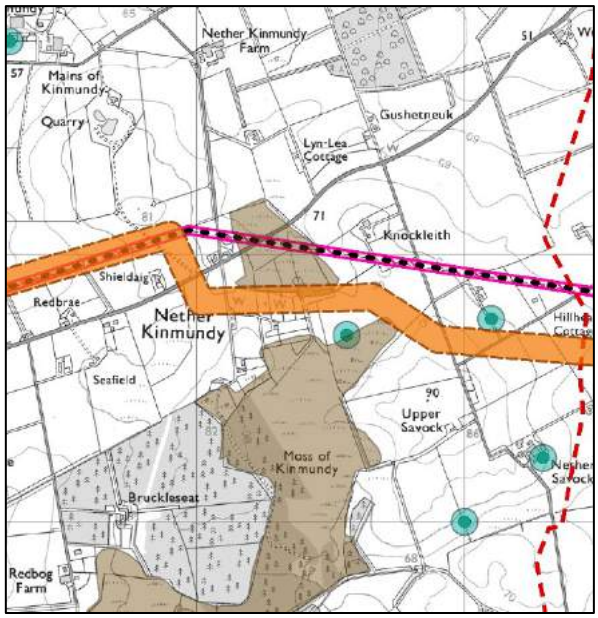

Image 4.5 – Route Option 4 (Orange) Avoiding Class 1 Peat (Brown)

4.6.2.4 Route Option 4

34. Route Option 4 is the most southerly option and connects the Landfalls south of Peterhead with the substation location options. The route runs from south of Peterhead but does not bypass any other major settlement. Key constraints in close proximity to the route include: Class 1 Peat; AWI sites; NRHE Sites; transmission lines; gas

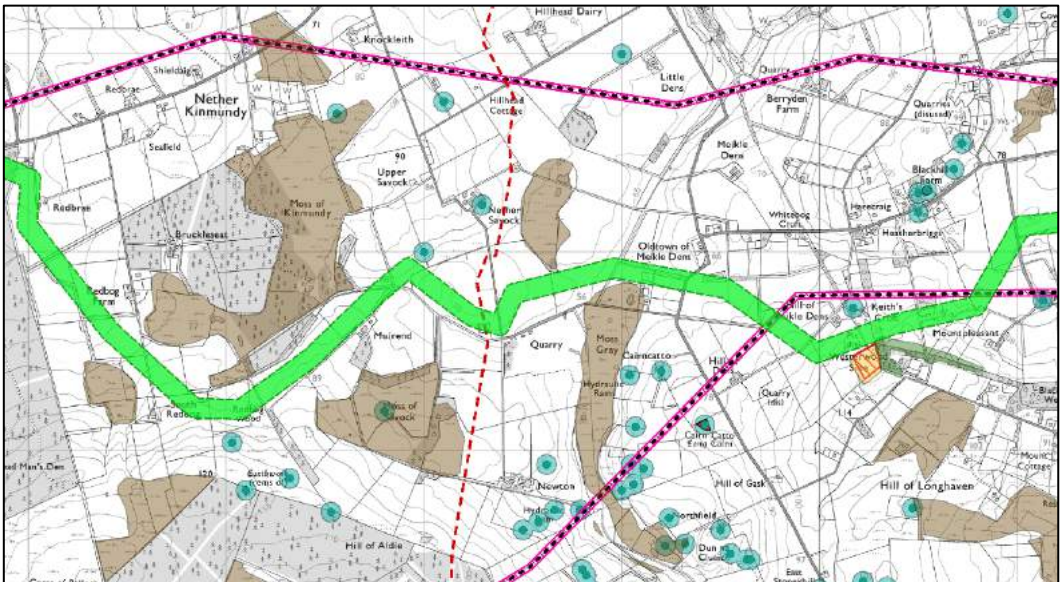

Image 4.6 – Route Option 4 (Bright Green) Avoiding Class 1 Peat (Brown), AWI (Dark Green), SSSI (Red Hatch) and GCRS (Yellow)

pipelines; Scheduled Monuments; Hill of Longhaven Quarry GCRS; Hill of Longhaven SSSI; and the FBW/NCR1. Careful siting around Class 1 Peat, the GCRS/SSSI and AWI sites can be seen in **Image 4.6** between the Hill of Longhaven and the Moss of Kinmundy. Constraints avoided by Route Option 3 are shown in **Figures 4.2c, 4.2f, 4.2i, 4.2k, 4.2l, 4.2m, 4.2n.**

35. The Iteration 1 cable route options which were included in the Original Scoping Report can be seen illustrated in **Figure 4.2.**

4.6.3 Substation

Image 4.7 – The Existing New Deer Substation

36. The grid connection for the Proposed Development has been allocated by National Grid at the NGNDSS **(Figure 4.2m)** as such, the land surrounding the NGNDSS was searched for an optimal Proposed Substation locations for the Proposed Development, proximity to the existing substation was key to siting the Proposed Substation in order to minimise the length of cable that would be required for connection, thus limiting the environmental impact incurred from connection.

37. Initially, a 200m buffer from residential properties was applied based on the separation of the existing New Deer substation to the closest residential property. The Class 1 Peat at Moss of Swanford, AWI near Cairnbanno House and NRHE Sites were highlighted as the key constraints in this area. The four proposed locations entirely avoid these constraints as illustrated in **Figures 4.2m and n.**

4.7 Iteration 2 – Rescope

38. Through the design process single cable route options from the two main Landfall areas to the Proposed Substation were identified. These cable route options were widened to approximately 500m in order to allow for flexibility in the design and to identify the area required for environmental baseline surveys. Given the extent of the changes to the cable route, a new Scoping Report was submitted to Aberdeenshire Council as outlined in **Chapter 1 - Introduction**. Iteration 2 was submitted to Aberdeenshire Council for Scoping Opinion in December 2022 (ref ENQ/2023/0008) (see **Appendix 1.3**). A Scoping Opinion was received in March 2023 (see **Appendix 1.4**).

4.7.1 Landfall

39. The Landfall Option areas were reduced to two options; The Northern Landing Point and the Southern Landing Point as illustrated in **Figure 4.3.**

40. **Table 4.4** below indicates which of the Landfalls from Iteration 1 have been discounted and why and which have been taken forward.

Table 4.4 - Landfalls Discounted and Taken Forward in Iteration 2

Landfall Option	Discounted	Taken Forward
Landfall Option 1	Discounted due to the amount of buried gas infrastructure in the vicinity of the option area associated with the St Fergus South Area. Additionally, following from a Design workshop with the Offshore EIA team in January 2022, it was highlighted that there are granite and doleritic dykes present in the headland that could cause difficulty for Trenchless Compound and overall deliverability.	
Landfall Option 2		**Options 2, 3, 4, 5 & 6** were combined and taken forward, herein referred to as the **Northern Landing Area**. Key Design Decisions are outlined in **Section 4.7.1.1** below.
Landfall Option 3		**Options 2, 3, 4, 5 & 6** were combined and taken forward, herein referred to as the **Northern Landing Area**. Key Design Decisions are outlined in **Section 4.7.1.1** below.
Landfall Option 4		**Options 2, 3, 4, 5 & 6** were combined and taken forward, herein referred to as the **Northern Landing Area**. Key Design Decisions are outlined in **Section 4.7.1.1** below.
Landfall Option 5		**Options 2, 3, 4, 5 & 6** were combined and taken forward, herein referred to as the **Northern Landing Area**. Key Design Decisions are outlined in **Section 4.7.1.1** below.
Landfall Option 6		**Options 2, 3, 4, 5 & 6** were combined and taken forward, herein referred to as the **Northern Landing Area**. Key Design Decisions are outlined in **Section 4.7.1.1** below.
Landfall Option 7	Discounted due to offshore congestion of other projects and the difficulty reaching this area caused by offshore projects linking onto land at this point making it too busy.	
Landfall Option 8	Discounted due to offshore congestion of other projects and the difficulty reaching this area caused by offshore projects linking onto land at this point making it too busy.	
Landfall Option 9	Discounted due to the significantly sloping topography as illustrated in	

	Image 4.8. A utilities line search indicated a number of buried pipelines running east to west beneath the site area. Additionally, due to offshore congestion, this would create difficulties in reaching this point.	
Landfall Option 10	Discounted as the Trenchless Compound length required would be longer than the other options and the length required needed to be minimised as it improves deliverability. Additionally, a utilities line search highlighted that there are a number of buried pipelines in the areas that would require drilling under. Additionally, due to offshore congestion, this would create difficulties in reaching this point.	
Landfall Option 11		**Option 11** was also taken forward and is herein referred to as the **Southern Landing Area**. Key Design Decisions are outlined in **Section 4.7.1.1** below.

Image 4.8 – Sloping Topography Present at Landfall Option 9

4.7.1.1 Options Taken Forward: Northern Landing Area (Options 2—6) and Southern Landing Area (Option 11)

41. **The Northern Landing Area** was formed by combining Landfall options 2 to 6. This was due to the proximity of the options to each other and the lack of constraints around each option and to keep options open, a larger area was taken forward to allow for deliverability.

42. This location was chosen due to the proximity to the coast and following the design workshop with the Offshore EIA team that took place in January 2022 it was highlighted that the geology in this location was optimal for Trenchless methodologies and that siting the Landfall area here would also save cable length, thus, improving the deliverability of the Proposed Development. The initial Design can be seen in **Image 4.9**.

43. This was later reduced in size as illustrated in **Figure 4.3a.** The section of the Northern Landfall to the south of the forestry was deemed the most optimal as it would reduce impact on trees. Additionally, this section is the closest to the coastline and therefore, reduced the Trenchless Compound that is required to bring the cable onto land. It was reduced in size to keep the Landfall nearest the coast but also to keep the area within the fields of one landowner: in order to contain the impacts to a sole landowner, keep it away from woodland and away from NRHE (Canmore) Sites.

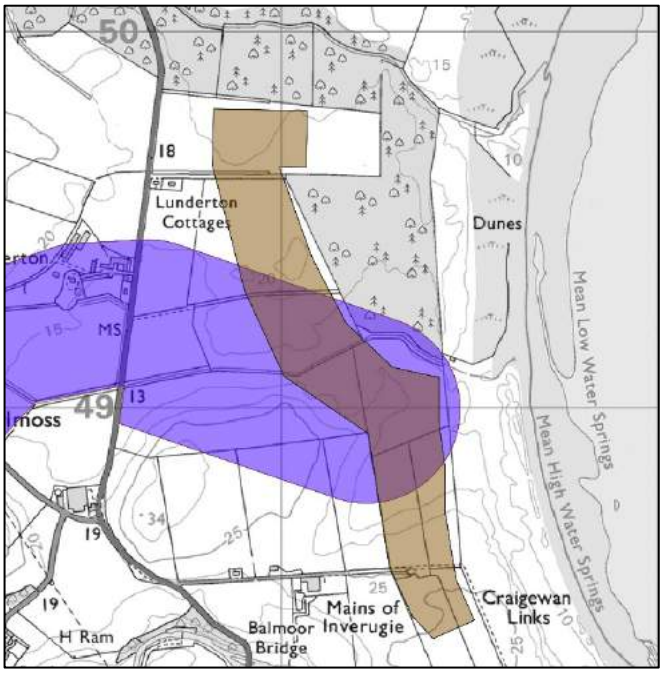

Image 4.9 – Initial Design of the Northern Landing Area (Brown) and Cable Route Corridor (Purple)

44. The **Southern Landing Area** was taken forward as the area has already been screened as part of the North Connect project, early discussion between Flotation and NorthConnect had commenced around the possibility to share the landing point. Additionally, due to the progress of the North Connect development and existing environmental data that was already available and could be utilised for the Southern Landing Area.

4.7.2 Cable Routes

45. Following the commencement of survey work, and consultation with stakeholders and landowners, the cable route options from Iteration 1 were refined into two options, herein referred to as the Northern Cable Route Option and the Southern Cable Route Option. These cable route options are illustrated in **Figure 4.3.** The cable routes were then further refined based on a number of environmental, technical, and landowner constraints. Through discussions between Green Cat Renewables and the Applicant, the Route Option 2 (from Iteration 1) was deemed to be the preferred route option from the north and through a number of design changes, this evolved into the Northern Cable Route Option. While both route options 3 and 4 were both utilised to form the Southern Cable Route Option. The key design changes for each of these routes are outlined below.

4.7.2.1 Design Review 1

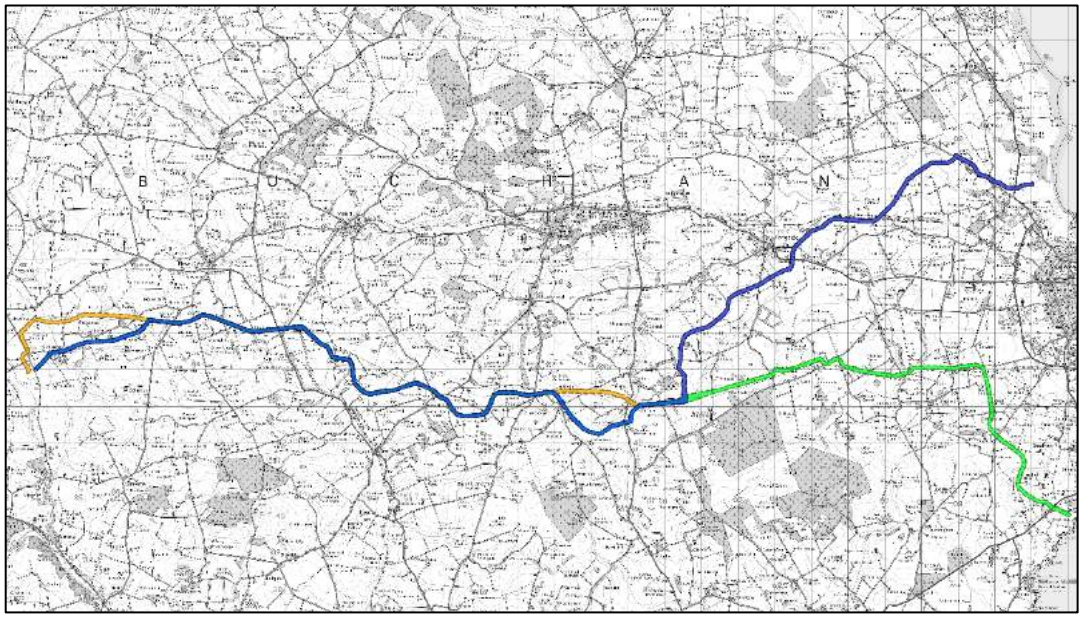

Image 4.10 – Design Review 1 Cable Route Options

4.7.2.1.1 Northern Cable Route Option

46. Route option 2 from Iteration 1 was opted as the preferred cable route option by the Applicant. This underwent various design reviews before reaching the final Iteration 2.

47. A design workshop was undertaken within the Green Cat Renewables Environmental Team in May 2022. This workshop reviewed the design of the Northern Cable Route Option from an environmental perspective and considered constraints such as:

- **Topography** – contours were utilised to ensure the flatest areas of land were used where possible and that the route was not cutting across any hill tops. This helps to improve the deliverability of the Project and also reduces the visibility of any landscape scarring.
- **Aberdeenshire Local HERs** – data was aquired from Aberdeenshire Council of the local HERs and these sites were avoided as far as possible. These are features that are locally designated for their historic value and therefore minimising impact on these is important to avoid loss of information and therefore, the ability to

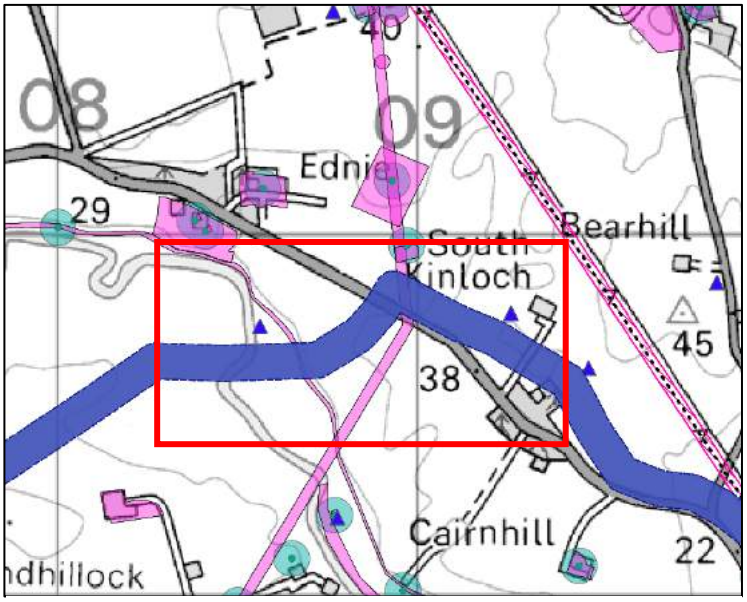

Image 4.11 – Northern Cable Route Option Crossing the Aberdeenshire Local HERs

understand different historic features. These have to be crossed in some areas along the route, eg the Ugie Canal and the St Fergus Pipeline Survey around the South Kinloch area as illusrated in **Image 4.11.** These records were deemed to be less sensitive to the Proposed Development. The Ugie Canal is incomplete and at the point of crossing there was no obvious visible evidence of the canal in the landscape. None of the features that were discovered suring the St Fergus Pipeline Survey were located at this point of crossing.

- **Scheduled Monuments** – these were avoided in their entirety along the Northern Cable Route Option, and none fall within the cable route corridor.
- **Roads** – the number of road crossings was minimised where possible, however given the distance between the Northern Landfall area and the NGNDSS (~35km) – it is impossible to avoid all roads.
- **Waterframework Directive (WFD) Named Watercourses** – an attempt was made to minimise the number of watercourse crossings where possible – however as with the road crossings it was never going to be possible to avoid all crossings.
- **OHLs** – minimise the number of OHL crossings where possible.
- **Pipelines** – minimise the number of pipeline crossings where possible.
- **Properties and Settlement boundaries** – avoid encroaching on residential properties and settlement boundaries – with the cable route corridor.
- **AWI/Other Forestry** – avoid all areas of AWI and minimise impact on other forestry.
- **Approximate PWS locations based on Ordnance Survey (OS) mapping** – approximate PWS locations were mapped base on well locations on OS 1:25,000 mapping while waiting on PWS data from Aberdeenshire Council.
- **Peat Class 1 and 2 Peat** – no Class 2 peat was located within the area and all areas of Class 1 peat were avoided, specifically around Slamptonhill and Clockhill areas as illustrated in **Image 4.12.**

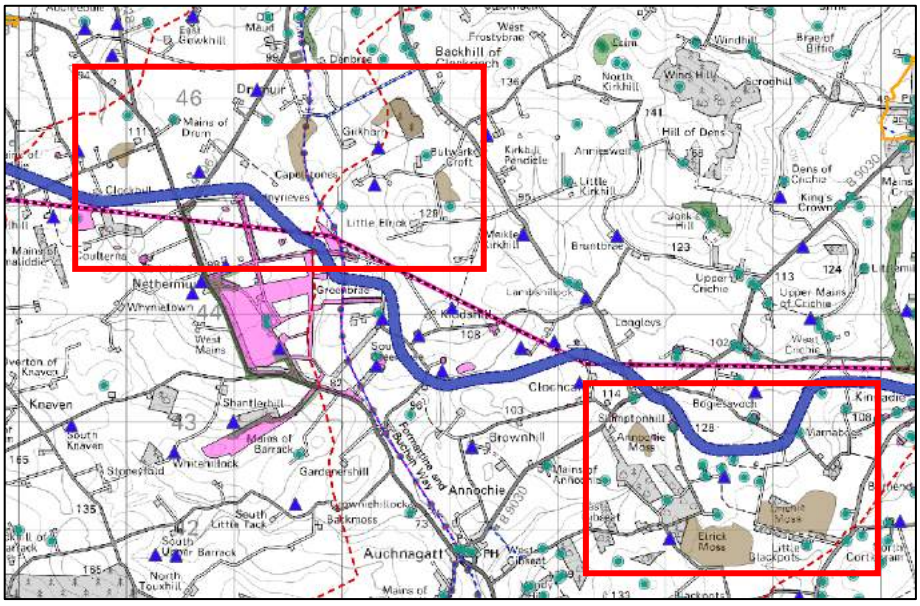

Image 4.12 – Northern Cable Route Option (Blue) Avoiding Class 1 Peat (Brown)

- **Ecological Designations** – continue to avoid all ecological designations such as SSSI, SAC, SPA and RAMSAR Sites.

48. Following from this workshop, some areas of the route, specifically sharp bends were straightened and widened to improve deliverability and allow for more space during Construction. An example of this can be seen in **Image 4.13** near Home Farm Kinmundy. Additionally, a second option was created where some of the bends are straightened to follow the existing OHL and improve deliverability.

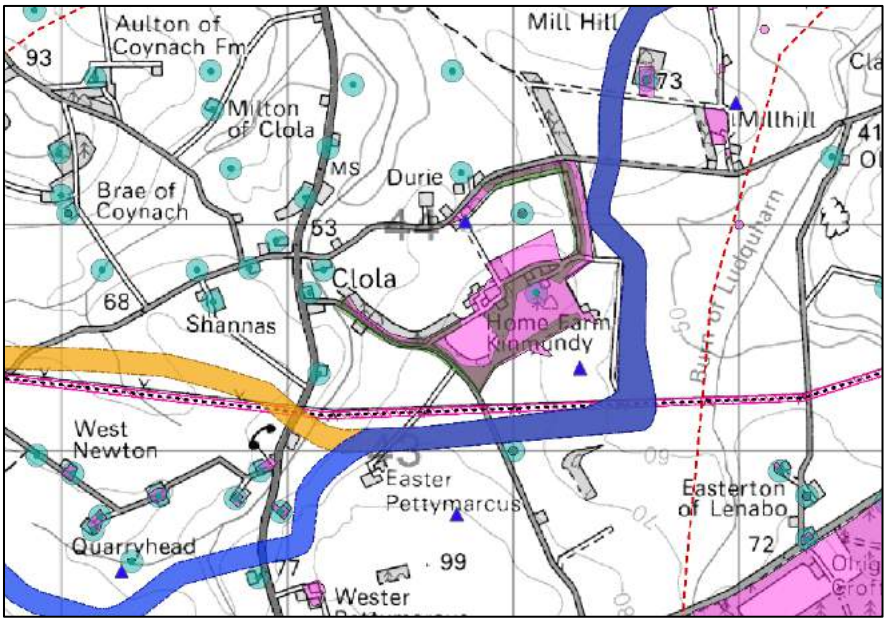

Image 4.13 – Corner widened around Home of Kinmundy Farm (blue) and Second option following OHL added (yellow).

49. This formulated two options for the Northern Cable Route Option that are illustrated in **Image 4.13**, above, and are referred to as the Yellow option and Blue option.

4.7.2.1.2 Southern Cable Route Option

50. Cable Route Options 3 and 4 were taken forward for redesign and this formed the Southern Cable Route Corridor. As the Landfall Options around Boddam have been removed, the route was redesigned to avoid the settlement and to avoid the OHL constraints associated with the Peterhead substation as seen in **Image 4.15** and **Figure 4.3b**. This route option largely follows the route of the existing OHL with some micro-siting to avoid areas of residential properties at Knockleith, Class 1 Peat around Nether Kinmundy, and woodland at South Braeside of Ludquharn as seen below in **Image 4.14** and in **Figure 4.3e**.

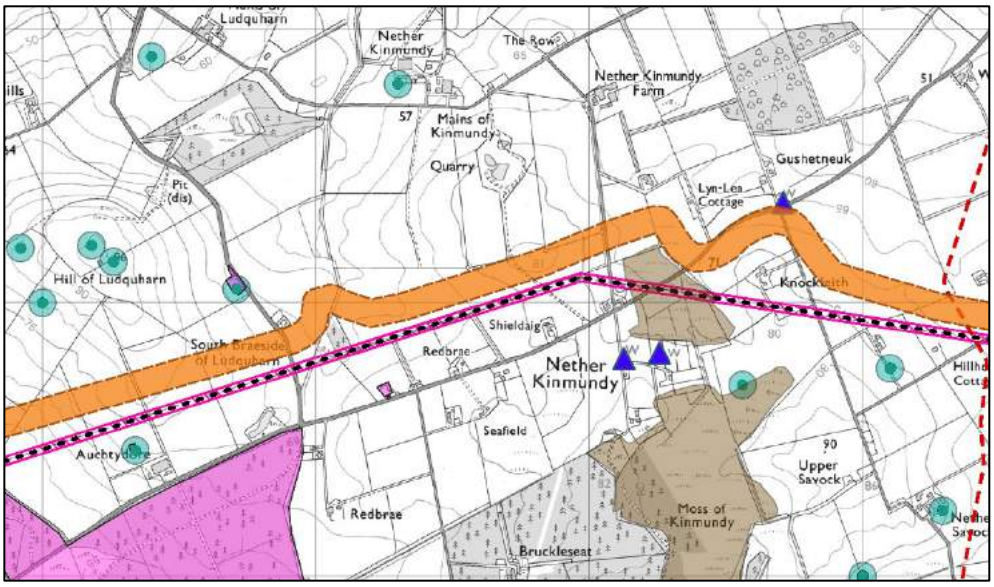

Image 4.14 – The Southern Cable Route Corridor (Orange) Avoiding Class 1 Peat (Brown) and Woodland Illustrated on the OS Map.

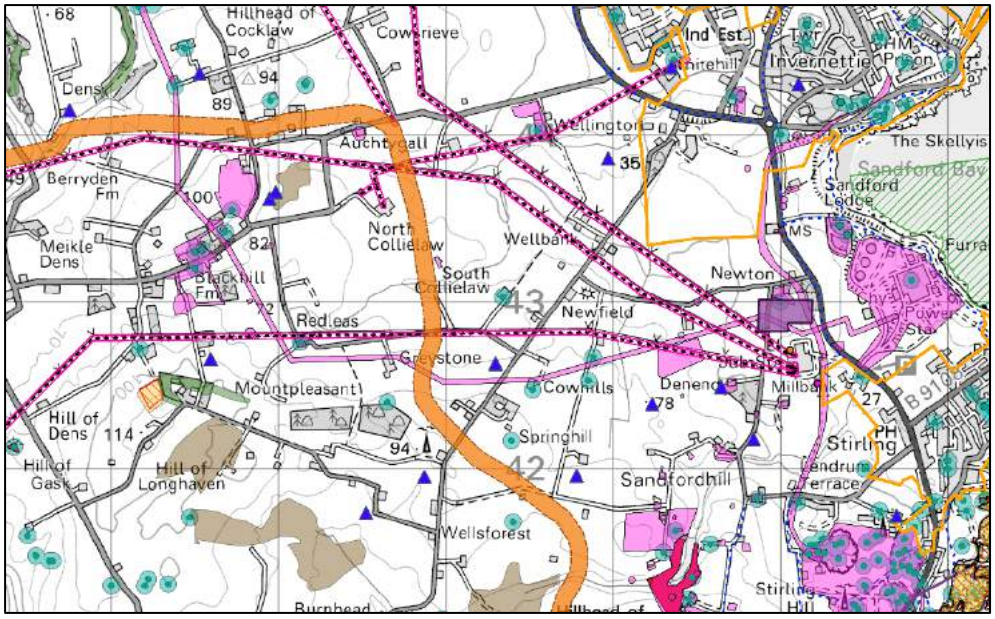

Image 4.15 – Southern Cable Route Option (orange) Avoiding the OHL Constraints around Peterhead Subatation (pink and black)

51. The Southern Cable Route Option joins up with the Northern Cable Route Option near Home Farm Kinmundy and follows along the same route from this point.

4.7.2.2 Design Review 2

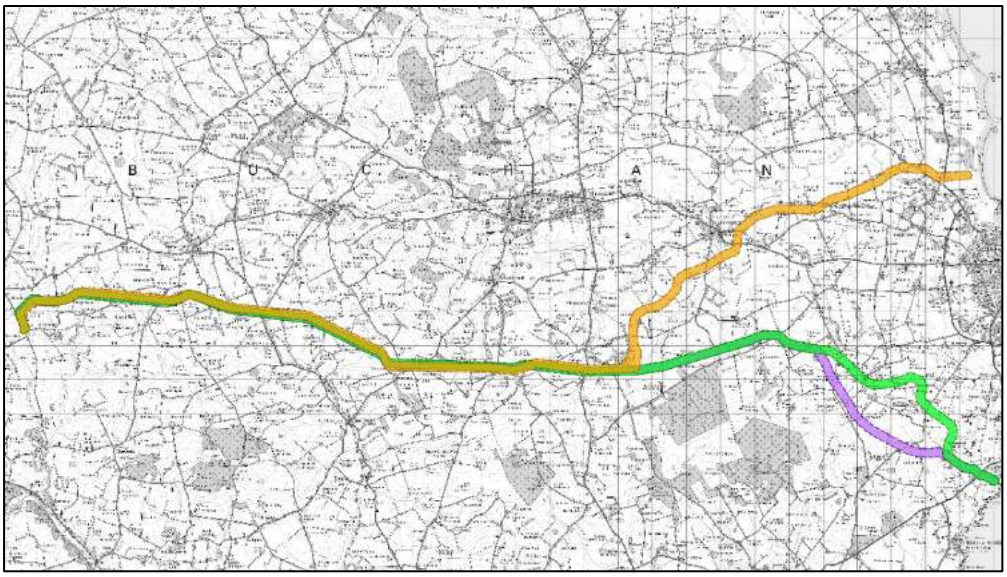

Image 4.16 – Design Review 2 Cable Route Options

4.7.2.2.1 Northern Cable Route Option

52. From Design Review 1, the Yellow option was deemed to be the more preferable route due to the straighter route which reduces the cable length that is required, improving the deliverability and this was taken forward for further refinement.

53. Following a site visit undertaken by the Applicant and Green Cat Renewables in July 2022, it was determined that the route should follow the OHL from the area around Home Farm Kinmundy onwards and this proved to be the least constrained pathway to the NGNDSS. The route was straightened where possible to follow the OHL and the route was also widened to 250m in order to provide a separation between the Proposed Development and the existing OHL.

54. Straightening the route allows for a reduced cable length and therefore a reduction in the overall footprint. This is due to the reduced amount of land that would be required for the Proposed Development and the subsequently reduced environmental impact to the receptors on this land.

55. The River Ugie River crossing at around South Kinloch at the eastern end of the route was moved to near Cairnhill. This was following a site visit by the Applicant and the land agent who identified that there was an ideal area to cross the River Ugie as there was an area of land nearby that was an old cattle yard that seemed appropriate for a Mobilisation Area for the river crossing.

56. A meeting was held on 9 August 2023 with the case officer from Aberdeenshire Council Planning department and the Environmental Planner to discuss the Proposed Development and provide an update but also to discuss the core path (Formartine and Buchan Way) that would be crossed in two different locations by the Northern Cable Route Corridor (**Image 4.17**). At the time of the meeting the Yellow option was running alongside the Formatine and Buchan Way that is a core path During the meeting the Environmental Planner advised that the area where the crossing was proposed was known to the Council as a very prominent area for EUPS badgers and badger setts that are protected. It was noted that this had caused an issue in the past and the Council advised that it would be best to move the crossing to the west of the Mains of Buthlaw, this change forms part of Iteration 2.

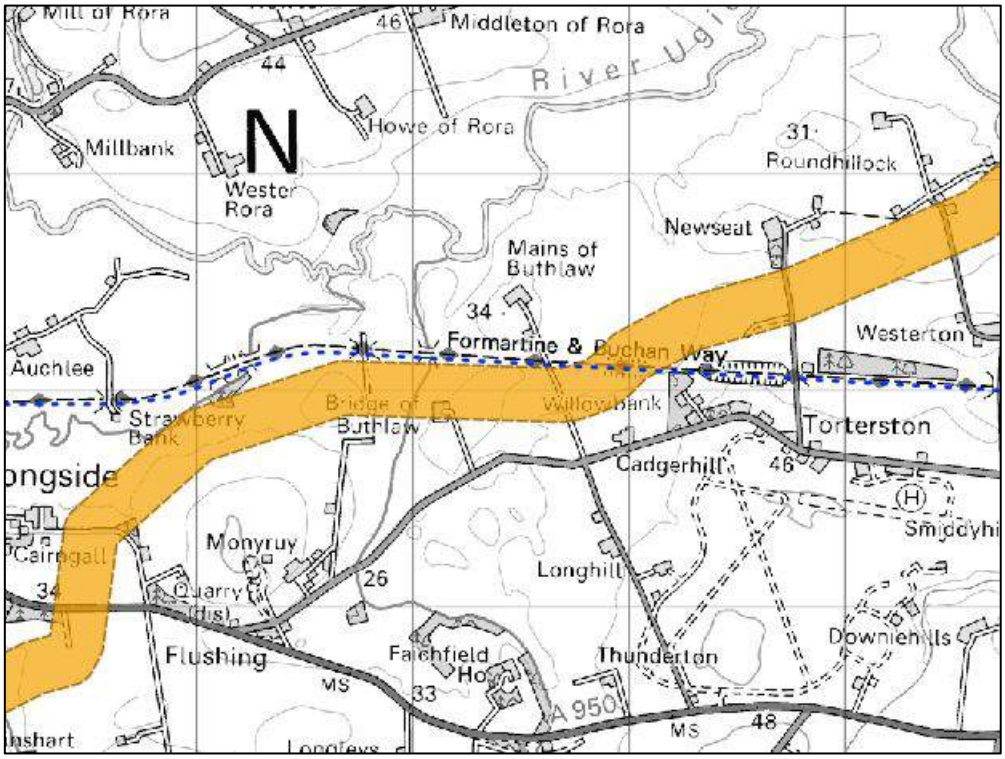

Image 4.17 - Northern Cable Route Option (yellow) following the FBW (blue)

4.7.2.2.2 Southern Cable Route Option

57. The Southern Cable Route Option was then taken for further redesign and two options were proposed, the Green Route and the Purple Route. The redesign was primarily undertaken to remove the 90° bend in the route around Westerton of Auchtgall to improve the deliverability of the route.

58. Both these routes had to avoid a concentration of Peat Class 1, a GCRS, SSSI and AWI areas around the Hill of Longhaven. Both route options were routed to avoid Scheduled Monuments, the Green Route at Sandford Hill, and the Purple Route at Cairn Catto. Additionally, the contours in this area indicated that the land was steeper, therefore effort was made to keep the route to the flattest areas possible. These constraints can be seen highlighted on **Image 4.18**.

59. Both of the options join together around Little Dens and then follow the same route, joining with the Northern Cable Route Option near Home Farm Kinmundy, and follows along the same route to the NGNDSS from this point.

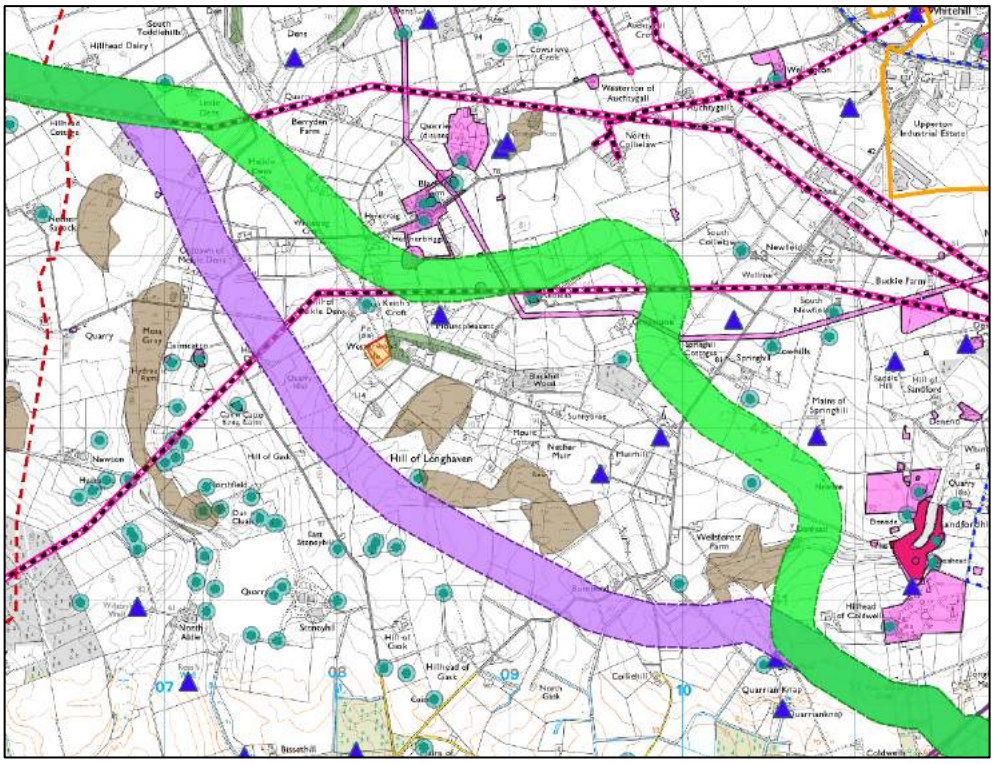

Image 4.18 – Southern Cable Route Options (Green and Purple) avoiding constraints such as Class 1 Peat (brown), AWI (dark green), GCRS (yellow) Scheduled Monuments (red), SSSI (red hatch) and steeper land indicated by the contours

4.7.2.3 Design Review 3

60. Both the routes went through a final design stage and were then submitted to Aberdeenshire Council for a Scoping Opinion. These are illustrated in **Image 4.19.** At this stage, the corridors were widened to 500m. While there were some constraints located within these 500m corridors, this allowed space for survey work to commence and additionally, allowed space for refined Design work and micro-siting further along the design process.

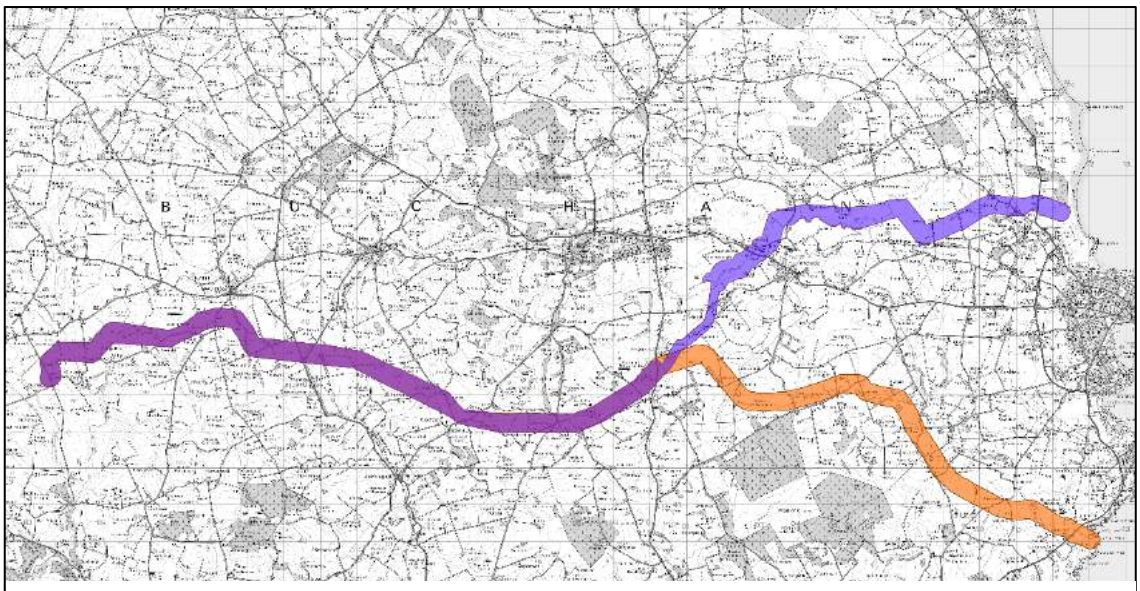

Image 4.19 – Design Review 3 Cable Route Options

4.7.3 Northern Cable Route Option

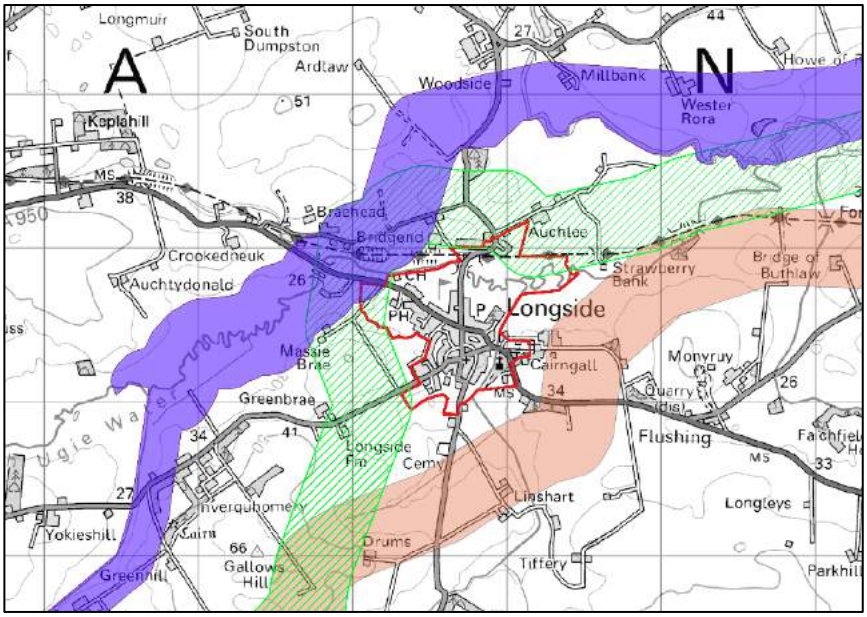

Image 4.20 – Rerouting stages around Longside. The orange route was carried forward from Design Review 2, the green hatch was move one and the purple is move two and this was taken forward in Iteration 3.

61. Additional alterations were made around the settlement of Longside. Following the advice from Aberdeenshire Council to cross the Formartine and Buchan Way further to the west: various options were reviewed. The route was moved north and around the west side of Longside, this was in order to reduce the encroachment on the settlement boundary and to be further located from surrounding residential properties. The design revisions on this move can be seen in **Image 4.20** and the most northerly revision is Iteration 2.

4.7.4 Southern Cable Route Option

62. The westerly option from Design Review 2 was taken forward for further design work and remained largely the same. The only change was to bring the cable route further north to join the Northern Cable Route Option at Millbreck, this was to avoid the AWI area and local HER around Home of Kinmundy Farm. The Southern Cable

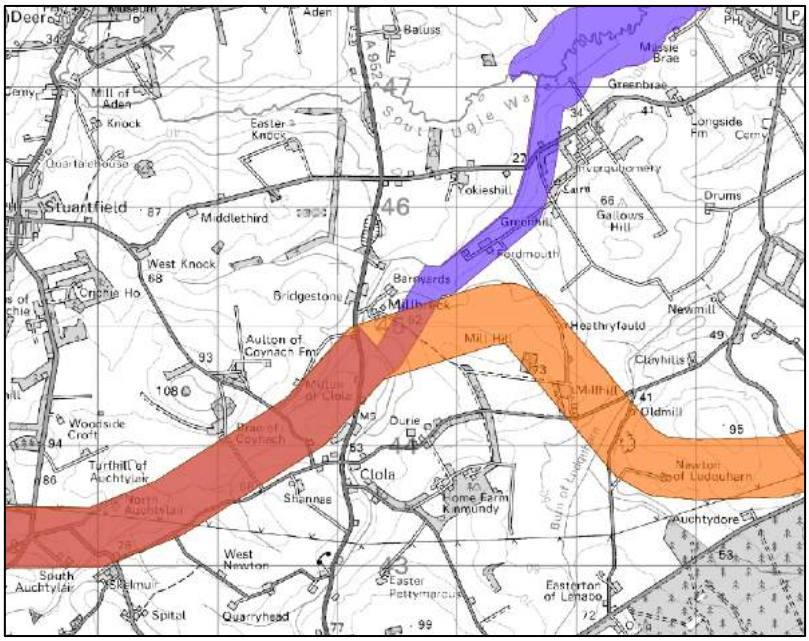

Image 4.21 – Southern Cable Route Option (Orange) joining with the Northern Cable Route Option (purple) to follow the same route (red)

Route Option joins up with the Northern Cable Route Option near Millbreck and follows along the same route from this point shown in **Image 4.21** Substation.

4.7.4.1 Additional Proposed Substation Location

63. Through further assessment and a review of the area, an additional proposed substation location was added next to the NGNDSS.

4.7.4.2 Discounted Options

64. The initial four option locations were discounted as options at this iteration. Following from the site visit GCR and the Applicant undertook in July 2022 it was determined that the land immediately to the south of the NGNDSS was ideal for the Substation Compound. The primary reason for removing these options was due to the proximity to the existing NGNDSS and the length of connection cable that would be required to connect these locations to the NGNDSS. Additionally, the separation between these options and the existing NGNDSS would have created a worse visual impact to the local residential receptors.

4.7.4.3 Options Taken Forward

65. It was determined that the area required for the Substation Compound was smaller than the option areas previously used. The new fifth location was selected due to the reduced visual impact on the local receptors by keeping the new and existing infrastructure closer together. Additionally, the proximity means that the connection to the NGNDSS would be shorter, reducing the cabling required and reducing the potential environmental impacts. This is due to the reduction in land required for connection cabling and therefore, the time required for construction would be minimised and the area of land impacted during construction would be minimised and therefore, this would minimise construction phase impacts.

4.8 Iteration 3 – Post-Exhibition

66. Iteration 2 was included in the updated Scoping Report that was submitted to Aberdeenshire Council in December 2022 but it was also presented to the public at exhibition events held in January and March 2023. The events were attended by several local residents and landowners. Details of the feedback received are included in the **Green Volt PAC Report** which is included as part of the planning submission. A summary of the feedback received is included in **Table 1** of the **Green Volt PAC Report**. Following the public exhibitions, further refinements were made to the cable route based on feedback received during the events, that resulted in Iteration 3. Consultation feedback received included:

- Additional information relating to private water supplies;
- Known areas of trees/forestry or wetland/ponds not shown on existing mapping from desktop surveys;
- Information on upcoming planning applications and other proposed development that were not known previously; and
- Avoiding land holdings with more individual properties and keeping to areas of arable fields.

4.8.1 Landfall

4.8.1.1 Discounted Options

67. The Southern Landing Area was removed as an option at this stage. This was due to the southern cable route corridor being removed as an option to be taken forward so the Southern Landing Area was no longer required. The reasons for this are outlined in **Section 4.8.2.1** below.

4.8.1.2 Options Taken Forward

68. The Northern Landfall Area was taken forward with the Northern Cable Route Option. There was no change to the Landfall from Iteration 2. The area allows for sufficient space for the Trenchless Compound and the associated infrastructure required to be located.

4.8.2 Cable Route

4.8.2.1 Discounted Options

69. At this stage, the Southern Cable Route Option was removed as an option. Following from further desk-based assessment and site work it was found that the Southern Cable Route Option was more constrained with residential properties, largely around the Nether Kinmundy area. Additionally, the presence of Class 1 Peat around the Moss of Kinmundy and Hill of Longhaven restrict the southern route. These constraints are shown on **Figures 4.3e and 4.3b**. It was hoped that environmental baseline data from the consented NorthConnect Project could be used for the Southern Cable Route Option but the data was out of date and the Southern Cable Route Option had evolved to be quite different from the NorthConnect route and so there were no longer any time efficiencies to taking the Southern Cable Route Option forward.

4.8.2.2 Options Taken Forward

70. The Northern Cable Route Option was taken forward as the preferred route (hereinafter referred to as Cable Route Corridor) and underwent some further design changes. These changes largely centred around knowledge provided by landowners and rerouting around Longside and neighbouring residential properties to avoid key constrains shown in **Figures 4.3a–4.3l**.

4.8.2.2.1 Landowners

- Landowners who identified existing Construction Projects and planning applications for future development were avoided.
- Some areas of the Cable Route Corridor were straightened to improve general deliverability of the cable route. This also reduced the length of the cable required and reduced any potential environmental impacts.
- Landowners highlighted areas of woodland on their properties and these were avoided by the route where possible.

4.8.2.2.2 Residential

71. The Cable Route Corridor was rerouted further north and west when passing Longside to provide further separation from the settlement boundary and residential properties (see **Image 4.22**). This reduces the potential impacts on local residents during Construction in terms of noise; air & dust pollution; and visual impacts. Additionally, this removed a number PWS from the cable route corridor, removing the need for mitigation on these. It also improved deliverability by avoiding a congested area for constraints.

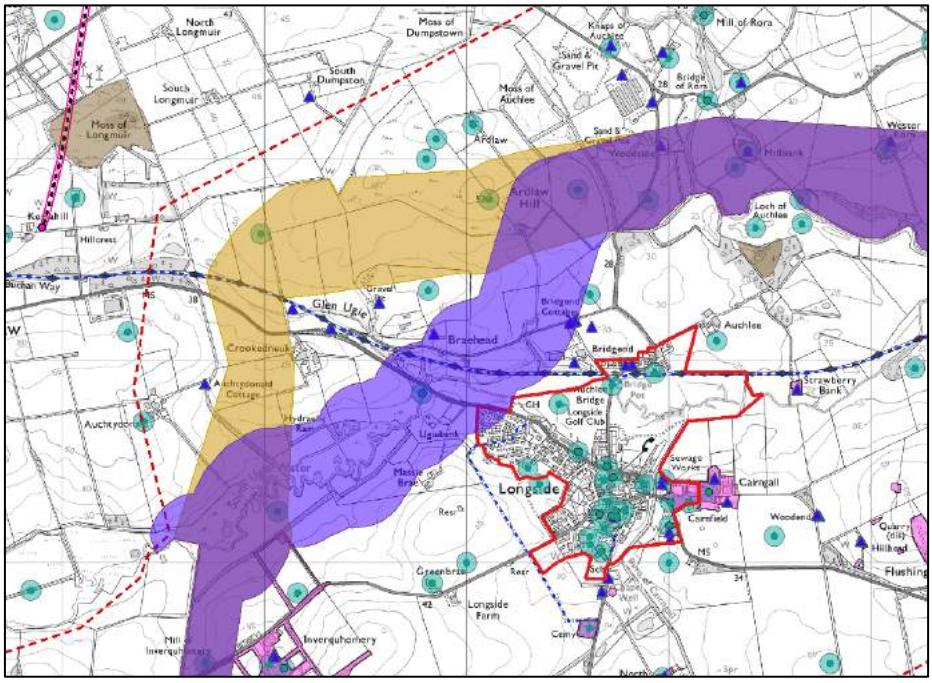

Image 4.22 – Cable Route Corridor being rerouted around Longside – purple indicates the Iteration 2 route and the yellow indicates the iteration 3 reroute.

72. The Cable Route Corridor in Iteration 3 remained at 500m at maximum width to allow space for the ongoing ecological and hydrological surveys. This iteration can be seen illustrated in **Figure 4.4.**

4.8.3 Substation

73. The Proposed Substation location remained the same as the previous iteration and indicative infrastructure was designed to fit within this area (see **Figure Image 4.23** below). This was located in the best area topographically while also maintaining separation from nearby residential properties.

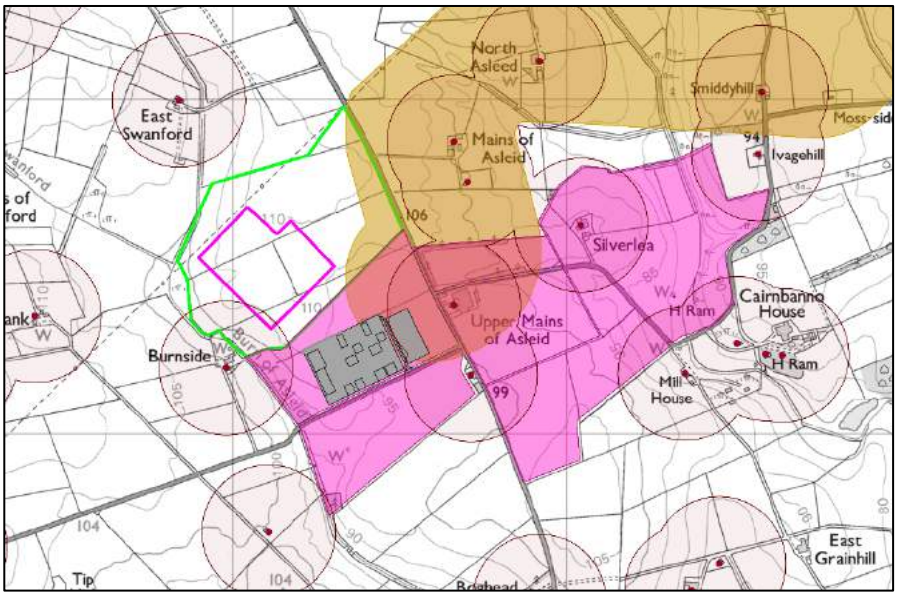

Image 4.23 – Substation infrastructure (grey) sited within the Substation location area (pink) and maintaining separation from residential properties (red)

4.9 Iteration 4 – Refined

74. Iteration 3 was then taken forward by the Applicant's engineering contractor to provide a more refined design of the Cable Route Corridor and trench within the 500m Cable Route Corridor with all known environmental constraints. The result of the technical design exercise against the environmental constraints was Iteration 4. Iteration 4 with known constraints are shown in **Figures 4.5a to 4.5f**.

4.9.1 Landfall

75. The Applicant's engineering contractor reviewed the Landfall area from an engineering deliverability perspective. The most optimal location within this area for the Landfall was determined to be at Lunderton, to the west of the woodland, due to the topography in the surrounding area, and the cut-and-fill and benching that may be required in other locations. This Landfall area can be seen in **Figure 4.5a.**

4.9.2 Cable Route

76. Once the Cable Route Corridor was confirmed, the proposed location of the cable trench and other design components within that Cable Route Corridor were identified by the Applicant's engineering contractor. This refinement was a balance of finding the best location for the trench from a technical and deliverability perspective, whilst avoiding all known environmental constraints as far as possible. This is shown in **Figures 4.5a** to **4.5i**. Trenchless crossings were identified at this stage of the design. This embedded mitigation reduces potential environmental impacts by cabling under roads and watercourses, but also sensitive areas such as forestry and sensitive habitats such as badger setts. The cable route was reduced to a 50m – 80m Cable Route Corridor by the Applicant's engineer. This represents the maximum width required during construction. The route chosen was carefully designed around some key constraints environmental constraints whilst considering technical requirements for construction and operation of the Proposed Development. This reduction on width reduces the land required for the Proposed Development and as such the number of receptors that could be impacted by the cable route.

4.9.2.1 Sensitive Ecological/Hydrological Receptors

77. The results of the protected species survey were utilised to ensure that the route avoided receptors such as badger setts and otter holts. Using trenchless crossings to take the cable route under treelines and hedgerows and areas of AWI and avoid their removal where possible.

78. Using trenchless crossings to cross watercourses and avoid the need for open-cutting through watercourses as this can impact on the water quality and ecological communities within these watercourses. This is discussed further in **Chapter 6 – Ecology and Ornithology** and **Chapter 7 – Geology, Hydrology, Hydrogeology and Soils**. See Figures 4.5a to 4.5i for constraints avoided as a direct consequence.

4.9.2.2 Landowners

79. Using trenchless crossings to avoid driveways and access roads to reduce impact on resident's ability to access their properties. See Figures 4.5a to 4.5i for the constraints avoided.

4.9.2.3 Archaeological Features

80. An archaeological desk-based survey of LiDAR data, historic map data, and local HER/NRHE data was undertaken to identify any key sensitive features that would require avoidance or further exploration. The route was designed to avoid these as far as possible. Through discussions with AOC Archaeology and the Aberdeenshire Council Archaeologist, a desk-based assessment was deemed appropriate in terms of Design. A targeted walkover survey of the route has been undertaken on Iteration 4 and will inform the assessment. Further information is outlined in **Chapter 11 – Cultural Heritage and Archaeology**. See **Figures 4.5a—4.5i** for constraints avoided.

4.9.2.4 Private Water Supplies

81. Initially, Private Water Supplies (PWS) data was provided by Aberdeenshire Council. Discussions were undertaken with the landowners to further establish the location of PWS utilising questionaries and local knowledge where possible. The PWS were avoided by the route as far as possible and where they fall within the working corridor, for example at Slampton as illustrated in **Image 4.24**, below, mitigation will be proposed and this is discussed further in **Chapter 7 – Geology, Hydrology, Hydrogeology and Soils**. See **Figures 4.5a—4.5i** for constraints avoided.

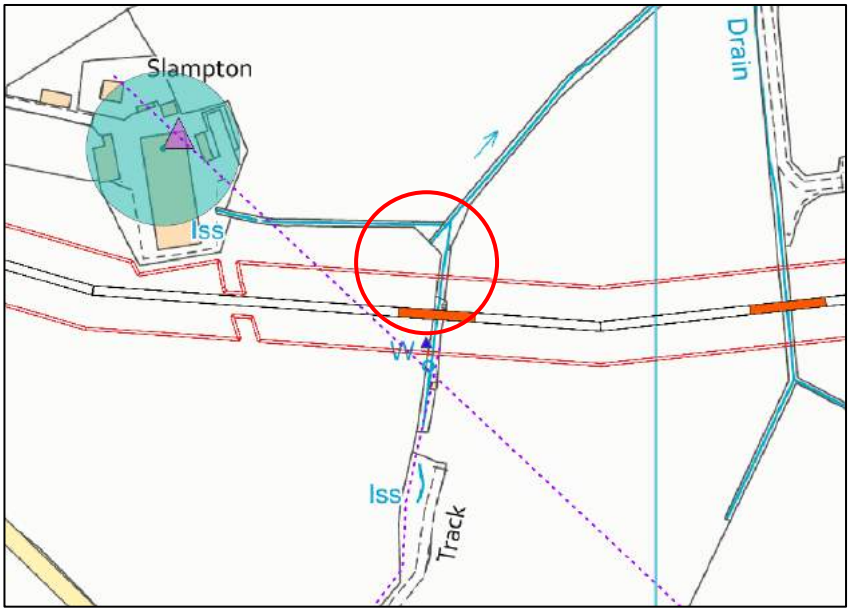

Image 4.24 – Example of a PWS (blue triangle) that will require mitigation.

4.9.2.5 Infrastructure

82. An appropriate separation distance of 15m was maintained from OHLs for construction safety.

83. Using a trenchless crossing to avoid the need to trench over roads and gas pipelines. See **Figures 4.5a—4.5i** for constraints avoided.

4.9.3 Substation

84. The Proposed Substation remained in the same location as the previous iteration. This location was deemed to be the location with the best balance between deliverability in terms of terrain and in terms of distance from nearby residential properties.

4.10 Iteration 5 – Planning

85. Further minor refinements were made to Iteration 4 following from further environmental survey information and an engineering walkover that took place in June 2023. This resulted in the final design which is the Proposed Development that will be submitted to Planning, Iteration 5. **Figures 4.6a-e** show Iteration 5 with environmental constraints.

4.10.1 Landfall

86. Following discussions between the environmental team, the Applicant's engineers and land agents, the Landfall was moved south of the woodland. This allowed the Landfall to be brought closer to the coastline, reducing the length of the Trenchless Crossing required and therefore, improving the deliverability. Additionally, it moved the Landfall away from the woodland, minimising potential impact to the trees.

4.10.2 Cable Route

87. Following from final survey work, a walkover by the engineers and initial assessment work, further refinements to the route were made that fall under the following categories:

4.10.2.1 Sensitive Ecological Receptors:

88. Further refinements to avoid close proximity to sensitive ecological receptors such as badger setts, otter holts and other protected species or their habitat following on from the ecological surveys were made.

89. A 30m buffer was applied to all badger setts, any work that is undertaken within this buffer would be subject to a licence, therefore, it was endeavoured to avoid these sensitive-buffer locations as far as possible. This is discussed further in **Chapter 6 - Ecology and Ornithology**.

4.10.2.2 Landowners

90. Smaller landholdings were cut out of the route as far as possible to reduce the number of landowners impacted. An example of this at Upper Kinnadie can be seen in **Image 4.25**.

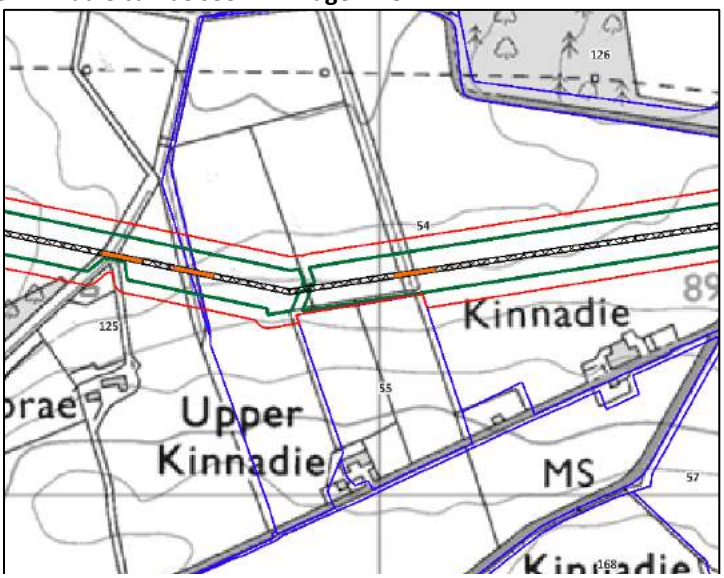

Image 4.25 – Example of where the redline boundary is cut around smaller land holdings, in this instance, landholding 55

4.10.2.2.1 Trenchless Crossings

91. Some trenchless crossings were extended around residential properties and areas of existing infrastructure in order to minimise potential impacts during construction such as disturbance from noise of construction plant. This was to reduce the impact on the residential receptor and to keep construction equipment as far from the properties as possible to minimise the noise; air and dust pollution; and visual impacts.

92. The connection point on the NGNDSS will be to the north of the existing NGNDSS, therefore, a route from the Proposed Substation to the SSE NGNDSS was added to the route. Given the proximity of the NGNDSS to the Proposed Substation there were limited options for the cable route between the two substations. The design process involved looking at the environmental constraints and ensuring these were avoided while also maintaining technical deliverability within the proposed study areas. The shortest distances between the connection points was identified as preferable to minimise construction phase impacts. Although the shortest route was taken forward environmental constraints were avoided.

93. Along the Cable Route Corridor, space was allocated for construction compounds, lay down, and mobilisation areas at regular intervals along the route. Larger areas were allocated at the Landfall and substation ends of the cable route corridor. These are indicated on **Figure 4.6a-e.**

4.10.3 Substation

94. The Proposed Substation location and design has remained the same as previously described and can be seen in **Figure 4.2e.** This location provides the best balance environmentally and in terms of deliverability. Drainage design for the Proposed Substation was undertaken and a SuDs pond has been proposed to the south of the Proposed Substation. See **Drawing C4642 (1) 110 – Drainage Concept** for more information.

4.10.4 Application Site Boundary

95. Once the design of the cable trench and Cable Route Corridor, the Landfall, and the Substation was finalised, additional space was added either side of the working corridor where landowner and environmental constraints allowed, to create the Application Site Boundary. This additional space was provided in order to take into account any constraints which may arise following from detailed design and site investigations.

96. This was done in discussion with the engineers to allow for deliverability of the Project and was based on detailed site investigations. This has produced an Application Site Boundary of approximately 80m but with wider areas in some locations to allow for flexibility in design once detailed ground investigations have been undertaken. This has been taken forward in this planning application and on which the environmental assessments have been based.

97. The final Application Site Boundary is illustrated in **Figure 5.1.**

4.11 Conclusion

98. This chapter set out the Project Alternatives studied and considered by the Applicant and indicates the main reasons for the option chosen whilst also taking into account the potential effects of the Proposed Development on the environment.

99. The final design of the Proposed Development (*Iteration 5*) has been informed by a robust EIA and design iteration process, taking into account potential environmental effects, physical constraints, and health & safety considerations. The information used to inform the design iteration process has includes scoping responses, feedback from public exhibitions, extensive baseline data, and the EIA/design process. This has ensured that potential adverse effects as a result of the Proposed Development have been avoided or minimised as far as reasonably practicable. Iteration 5 and the details of all of the components of the final design to be taken forward in a planning appication are described in **Chapter 5 – Project Description** and details are shown in **Figures 5.1 – 5.3.**

4.12 References

Scottish Government (2017) The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations, 2017. Available at: https://www.legislation.gov.uk/ssi/2017/102/contents Accessed 30/05/2023.

GREEN VOLT

5

Chapter 5

Project Description

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-REP-0009-05	
Version Number:	00	
Date:	01/08/23	
Prepared by:	Andrew Maclean	*Andrew Maclean*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	Issued for Client Review	29/06/2023
A2	Second draft for review	18/07/2023
A3	Second for Review	01/08/2023
00	Final	03/08/2023

Contents

5 Project Description

5.1 Introduction

1. This chapter of the Onshore EIA Report provides a description of the Proposed Development as well as details of how it will be constructed, operated, maintained, and decommissioned. The details within this chapter inform and underpin the assessments undertaken for each technical chapter of the **Onshore EIA Report (Chapters 6—16)**.

2. For the purpose of this EIA Report, it is important to define the different aspects of the Project which are referenced throughout. Definitions:

   - The Project – Refers to the holistic overview of the windfarm project, comprising all elements both onshore and offshore.
   - The Proposed Development – Refers solely to the onshore elements of the Project, which this EIA Report is focused on.
   - The Offshore Project – Refers solely to the offshore element of the Project, which is being consented separately.

3. As outlined in **Chapter 1 - Introduction** the joint venture between Flotation Energy and Vårgrønn is responsible for the development of the Project. In collaboration, Flotation Energy and Vårgrønn have formed a dedicated company called Green Volt Offshore Windfarm Ltd, which will be referred to as 'the Applicant' moving forward. The purpose of this joint venture and the establishment of Green Volt Offshore Windfarm Ltd is to drive the development of the Project and oversee its construction, with the goal of achieving operational status by 2027.

4. Green Volt Offshore Windfarm is proposed as a significant milestone towards achieving the objectives outlined in the UK North Sea Transition Deal 2021 (the NST Deal). This NST Deal, signed in March 2021, represents a sector agreement between the UK government and the oil and gas industry. It acknowledges the ongoing importance of oil and gas in our energy supply during the transition to a Net Zero future. Recognising the need to reduce CO_2 emissions generated by offshore oil and gas production as early as possible, the NST Deal sets a target of a reduction in CO_2 emissions of at least 50% by 2030.

5. With the aim of becoming operational by 2027, Green Volt Offshore Windfarm aligns with these objectives. The Project presents an opportunity to reduce the carbon footprint of the oil and gas industry in the Outer Murray Firth by approximately 500,000 tonnes of CO_2 annually. Overall, the Project will reduce UK CO2 levels by 500,000 tonnes through exporting excess energy produced by Green Volt Offshore Windfarm to the national grid. By harnessing the power of wind energy, the Project will contribute to the reduction of greenhouse gas emissions (GHGs) and play a crucial role in achieving a more sustainable energy landscape.

6. The Project will provide oil and gas platforms in the Outer Moray Firth with renewable electricity, harnessed from the proposed Green Volt Offshore Windfarm. The Project will also provide renewable energy to the Scottish mainland via a subsea export cable that will connect onshore to the National Grid.

7. The Proposed Development consists of a linear corridor starting approximately 1.25km north of Peterhead and running generally east-west to the Grid connection point located approximately 5.5km from New Deer and 0.45km south-east of the existing National Grid New Deer Substation (NGNDSS). **Chapter 4 – Assessment of Alternatives** discusses the rational for the location of the Proposed Development and discusses the various options assessed during the conceptual design process.

8. The technical details of the Proposed Development are presented within three broad interrelated categories:

   - **Landfall**: the point at which the offshore cables are physically brought ashore and the interface between the offshore and onshore infrastructure.

- **Cable Route Corridor**: the Cable Route Corridor that contains the underground circuits, comprising 2 cables in trefoil arrangements in up to 2 separate trenches that transmit the energy generated by the offshore wind turbines from the Landfall to the grid connection point.
- **Substation Compound**: consisting of substation (grid transformers and HVAC switchgear and associated electrical equipment), construction compound, drainage, and the proposed route of the connection to the SSE/National Grid Substation.

9. This chapter should be read in conjunction with the figures, drawings and appendices listed below. These figures and drawings show the various components which comprise the Proposed Development:

- Figure 5.1 – Overview of route
- Figure 5.1a – Overview Section A
- Figure 5.1b – Overview Section B
- Figure 5.1c – Overview Section C
- Figure 5.1d – Overview Section D
- Figure 5.1e - Overview Section E
- Figure 5.2 – Proposed Landfall Area
- Figure 5.3 – Proposed Substation Area
- Drawing 12731-156-WIE-ZZ-XX-DR-C-91001-P01 – Typical Cross Section
- Drawing 200-007-DRG-020-Rev A01 – Trenchless Road Crossing Typical Section
- Drawing 200-007-DRG-021-Rev A01 Trenchless River Crossing Typical Section
- Drawing 200-007-DRG-022 Rev A01 Transition Joint Bay Typical Arrangement
- Drawing C4642 (1) 110 Drainage Concept
- C4642 (1) 120 Control Building
- C4642 (1) 121 DRC Building
- C4642 (1) 122 Filter Building
- C4642 (1) 123 GIS Switchgear Building
- C4642 (1) 124 SGT
- C4642 (1) 125 Shunt Reactor
- Appendix 5.1 – Construction Execution Plan
- Appendix 5.2 – Outline CEMP
- Appendix 5.3 – EMF Assessment

5.2 Site Description

10. The Proposed Development is approximately 35km in length running east to west from the Landfall approximately 1.25km north of Peterhead – to the Substation Compound approximately 0.45km south-east of the NGNDSS. The land use within the Application Site Boundary is dominated by agriculture, predominantly crossing through arable land and agriculturally improved grassland. There are also small patches of woodland, watercourses, and several roads of various classifications. Watercourses, areas of woodland and other constraints are shown on **Figures 4.6a-e.** There are no sizeable towns or settlements within the Application Site Boundary, however there are a number of dispersed properties and farms within the wider area.

11. The topography within the Application Site Boundary predominantly consists of a gently undulating/rolling landscape that range from approximately 20m – 150m above ordnance datum (AOD). The land slopes to the east of the Proposed Development to form the coastal cliffs and dunes near St Fergus and the sandy beach at Sanford Bay.

12. The Proposed Development is situated within three Aberdeenshire Landscape Character Types (LCT). The Landfall is situated within LCT 12: Beaches, Dunes, and Links. This LCT is defined by long and gentle curved sandy beaches backed by wind-sculpted seaward dunes. There are few trees and limited vegetation with a sense of naturalness and remoteness present. Peterhead is the largest settlement in this LCT. Otherwise, the landscape is devoid of settlement.

13. As the Proposed Development moves in a western direction it moves through LCT 17: Coastal Agricultural Plains. This LCT is comprised of low-lying and often very open sweeps of exposed farmland where the influence of the

sea is particularly strong. It is characterised by gently undulating landforms, relatively large scale, extensive mosslands, and the influence of development including transmission masts, electricity transmission lines, the A90 and A953, and the gas terminal at St Fergus. Watercourses occupy broad shallow valleys and basins with occasional more steeply-cut scrub covered banks. The River Ugie which meanders across a large floodplain west of Peterhead is one of the most prominent examples. The landscape encompasses many smaller settlements such as Longside and New Leeds.

14. Moving in a southwestern direction the Proposed Development crosses through the southern tip of LCT 21: Farmland and Wooden Policies. This area is concentrated around the South Ugie Water valley of Aberdeenshire and is distinguished by rolling landscapes and diverse woodland cover. There is a mixture of farmland on lower hill slopes and more open larger scale farmland on gentler slopes. The landscape is richly scenic. The settlements of Old Deer, Maud and Mintlaw populate the area.

15. The Substation Compound is located within LCT 20: Undulating Agricultural Heartland. The LCT is an extensive area of gently undulating farmland laying at the core of northeastern Aberdeenshire. Generally, the area consists of sparse woodland cover, with broadleaf trees concentrated in shelterbelts along ridges, and around farms. Larger coniferous forests and the occasional beech shelterbelts occur in some areas. This is a well-settled landscape with a number of small settlements such as New Deer.

16. The Proposed Development interacts with the River Ugie 4 times. The River Ugie is a spate river that enters the sea at Peterhead. The main fishery within the River Ugie is salmon. The impact on the river and associated marine habitat is explored in more detail in **Chapter 6 – Ecology and Ornithology**.

17. There are occasional areas of woodland within the Application Site Boundary. Much of these are commercial forests with a uniform appearance. The Forest of Deer is a prominent example.

5.3 Design Envelope Approach

18. **Table.5.1** sets out the infrastructure required for the Proposed Development. The reason for using a Design Envelope Approach is because this enables the completion of detailed design work after obtaining consent, without compromising the integrity of the assessment as all development will be within the approved parameters. Moreover, this approach provides the Planning Authority and Regulators with the assurance to make an informed decision by considering the assessment of the worst-case scenario.

19. The Design Envelope sets out maximum parameters of the Proposed Development (or minimum where applicable). This results in an assessment which ensures that any potential significant effects represent the worst-case scenario. When the detailed design is finalised at a later stage, it will fit within the parameters set out here.

20. The Design Envelope has been determined through a design process that is described in further detail in **Chapter 4 – Assessment of Alternatives**.

21. Each technical chapter of this Onshore EIA Report assesses the worst-case scenario for each particular receptor. The worst-case scenario for each receptor may vary and each technical chapter will clarify the assumptions that have been used as a worst-case to appropriately assess the environmental impact for that discipline.

5.4 Project Onshore Infrastructure

22. **Table 5.1** outlines the parameters of the onshore elements of the Proposed Development. The works associated with the Offshore Project are considered in a separate Offshore EIA Report which has been submitted separately (**Offshore EIA Report**).

23. The parameters provided in **Table.5.1** are indicative of a worst-case scenario based on the conceptual design available at the time of writing this EIA Report. Final dimensions will be provided after the detailed stage, post consent however in any event will not exceed the parameters set out in this chapter. **Figures 5.1a-e** show the proposed locations for the components of the Proposed Development described in **Table.5.1**.

Table.5.1 Proposed Development Parameters

Infrastructure Type	Parameter	Parameter Maximum
Landfall		
Trenchless Compound	Area	Up to 20m × 8m
Onshore Transition Jointing Pit	Area	Up to 20m × 8m
Mobilisation Area 5 (Main Site Yard 2)	Area	Up to 40,983m^2
Cable Route Corridor		
Cable Trench	Route Length	Up to 35km
	Number of trenches / conduits	Up to 2 trenches
	Width of trenches / conduits	Maximum of 8m
Export cable	Number of cables	Up to 6 export cables plus 1 fibre options cable per bundle)
	Number of cable bundles	2 (3 export cables plus 1 fibre optic cable per bundle)
	Cable size	Up to 2500mm
	Cable outer diameter	Up to 140mm
Haul Road	Length	Up to 35km
	Depth	Up to 400mm
	Width	Up to 6m
Cable Route Corridor	Length	Approximately 35km
	Width	Up to 80m
Mobilisation Area 1 (Main Site Yard 1)	Length	Up to 365m
	Width	Up to 220m
	Area	Up to 68,826m^2
Mobilisation Area 2	Length	Up to 365m
	Width	Up to 250m
	Area	Up to 5,421m^2
Mobilisation Area 3	Length	Up to 253m
	Width	Up to 135m
	Area	Up to 22,643m^2
Mobilisation Area 4	Length	Up to 56m
	Width	Up to 83m
	Area	Up to 3,788m^2

Infrastructure Type	Parameter	Parameter Maximum
Substation Compound		
Temporary Construction Compound	Length	Up to 260m (**Figure 5.3**)
	Width	Up to 350m
	Area	Up to 91m^2
Proposed Substation	Overall Length	Up to 250m (**Figure 5.3** and **Figure 10.6**, **Figure 10.7** and **Figure 10.8**)
	Width	Up to 180m
	Area	Up to 45,000m^2
	Maximum Height	Up to 18m
	Type of Switchgear	Gas Insulated (subject to change)
Super Grid Transformer (SGT)	Length	Up to 30m
	Width	Up to 12m
	Height	Up to 4m
Reactors	Length	Up to 10m
	Width	Up to 5m
	Height	Up to 4.5m
Control Building	Length	Up to 30m
	Width	Up to 12m
	Height	Up to 8m
Dynamic Compensation Building	Length	Up to 23m
	Width	Up to 22m
	Height	Up to 18m
Filter Building 220kV and 400kV	Length	Up to 60m
	Width	Up to 34m
	Height	Up to 18m
Drainage/SuDS	Volume	SuDS pond to be utilised at Substation location (see **Figure 5.3**). Up to 3,750m^3 of storage
Connection to NGNDSS	Length	Up to 1km

5.5 Project Onshore Infrastructure

5.5.1 Landfall

24. Key components of the Landfall point are:

- Temporary Trenchless Compound.
- Onshore Transition Jointing Pit; and
- Main Site Yard 2 (Mobilisation Area 5).

5.5.1.1 Trenchless Compound

25. The Landfall point is situated 1.25km to the north of Peterhead and 400 metres south of the village of Lunderton. Trenchless methodologies such as horizontal directional drilling (HDD) will be utilised to avoid the need for an open trench for the export cables coming from offshore to onshore. A Landfall Trenchless Compound will be constructed at the Landfall point.

26. There is an environmental benefit to using the HDD methodology. In comparison to open-trench methods, HDD reduces surface disruption, trenchless techniques help preserve natural habitats, wetlands, and water bodies. It also mitigates the risk of soil erosion, sedimentation, and potential contamination associated with open-trenching methods.

5.5.1.2 Onshore Transition Jointing Pit

27. The High Voltage Alternating Current (HVAC) Cables come onshore at the Landfall point. The offshore HVAC cables will be jointed with onshore HVAC cables at the Transition Jointing Pit. The offshore and onshore cable circuits will be connected in the Transition Jointing Pit at the Landfall point. Phase Compensation Reactor(s) will be permanently installed within the jointing pit to improve system reliability and provide voltage control. The size of the Onshore Transition Jointing Pit will be up to 20m × 8m.

28. To allow the cables to transition from the offshore environment to an onshore environment the action of a marine cable-pull will be performed. This involves applying forces to the cables, such as a pulling tension and sidewall pressure. Cable pulling tools such as cable pulling machines, winches and blowers will be used.

29. The only point on the Cable Route Corridor where access will be required for the marine cable pull-in, termination and testing operations would be at the Onshore Transition Joint Bay location. As no Jointing Pits or Link Boxes are present along the marine cable, all installation and reinstatement at the Onshore Transition Jointing Bay located 1.25km north of Peterhead will be completed following the completion of cable pull-in and prior to the commencement of any testing of the marine cable system.

5.5.2 Cable Route Corridor

30. Key components of the Onshore Working Cable Route Corridor are:

- Cable Trench
- Onshore Export Cables
- Fiber Optic Cable
- Haul Road
- Subsoil Bund
- Topsoil Bund
- Jointing Pits and Link Boxes
- Mobilisation Areas

31. **Drawing 12731-156-WIE-ZZ-XX-DR-C-91001-P01 Typical Cross Section** shows an indicative cross-section of the Onshore Cable Route Corridor.

32. The onshore export cables will take power to and from the Proposed Substation south-west of New Deer and the Green Volt Offshore Windfarm. A working corridor width of approximately 37m and up to 80m in some locations will be required to allow access for excavating cable and drainage trenches, storage of topsoil and excavated soil, delivery of materials, transportation of personnel, and the presence of excavation and cable installation machinery and equipment.

5.5.2.1 Cable Trench

33. The onshore export cables will be housed in ducts and buried in a cable trench along the whole Cable Route Corridor at a depth of approximately 1.2–2m (2m when going under trees and high value crops) below ground level. The number of cables being laid is two. The cables will be laid in 2 trenches if individual trenches are used. If a twin duct is used, this will result in a single trench being created. Each trench will have a width of 4m. Alternatively, if two cables are co-located in the same trench the width will be 8m.

5.5.2.2 HVAC Cables

34. The Proposed Development will utilise the same cable technology for the onshore export cables as is being used for the cables from the offshore substation platform (OSP) to Landfall. Two three-core armoured HVAC cables are proposed, but to reduce transmission losses and minimise the number of export cables required to Landfall, the voltage carried will be up to 220 kV. The offshore export cables will carry electricity approximately 80km to the Landfall location. The onshore export cables will be approximately 34km from the Landfall to the Proposed Substation and there will be another length of cable up to 1km in length from the Proposed Substation to the NGNDSS. A maximum cable length of 120km per export cable is expected for the Project.

35. Two HVAC cables will be required for the Project. The specific details of the cable components will be determined based on the chosen specialist manufacturer. Typically, the conductor responsible for carrying the current will be made of copper or aluminium.

5.5.2.3 Fibre Optic Cable

36. The fibre optic cable will run from the offshore oil and gas platforms to the NGNDSS. It will come onshore via the marine-cable pull and will be laid in the same trenches as the onshore export cable. Fibre optic cables play a pivotal role in facilitating efficient communication and data transfer. These advanced cables utilise the power of light to transmit data at incredibly high speeds, ensuring seamless connectivity across the operational infrastructure of the Project. The fibre optic communications will be used for the control and electrical protection of the transmission system.

5.5.2.4 Substation Export Cables

37. The location of the Proposed Substation is also a suitable location for the grid connection point, based on economic and technical grounds, as the limited distance to the NGNDSS means the project can justify using an AC transmission system. The Cable Route Corridor from the Proposed Substation to the NGNDSS is approximately 1km.

38. The nominal voltage of the cable will align with the Grid connection point, which is expected to be up to 400kV. The HVAC cable parameters are shown in **Table 5.2**

Table 5.2 – Indicative HVAC Cable Parameters

Cable	Quantity	Parameter Maximum
HVAC Export Cables	3 export plus 1 fibre option	Up to 2500mm^2
Outer diameter (OD)	2	Up to 140mm
Length	-	Up to 1km

5.5.2.5 Haul Road

39. During construction, the working onshore Cable Route Corridor will include a haul road to facilitate access to the Cable Trench and Joint Pits. Haul roads will be used to transport materials, equipment, and vehicles during the Construction Phase of the Proposed Development. Haul roads will be temporary in nature and will be approximately up to **6m** in width at a maximum of 400mm in depth. Haul roads are expected to be constructed from the Landfall along the Cable Route Corridor to the Proposed Substation.

5.5.2.6 Jointing Pits and Link Boxes

40. Along the Cable Route Corridor, there will be periodic requirements for Jointing Pits and Link Boxes.

    Jointing Pits (measuring approx. 10m×2m) will be necessary to house the joints between individual lengths of cable. One Jointing Pit will be required per circuit, and they are likely to be needed every 600–1000m for each circuit. The Jointing Pits will consist of a concrete plinth and may include concrete walls. Additionally, each Jointing Pit associated with a single circuit will require a separate smaller concrete enclosure: viz. a Link Box. The Link Box is essential for providing connections between cable sheaths that are crucial for the efficient operation of the haul-cable and for fault testing. These Link Boxes house the cross-bonded cable sheath connections between cable cores that help reduce circulating currents in the cable sheaths and consequently lower the running temperatures within the cables.

41. Each Link Box associated with a joint bay of each cable circuit will consist of a manhole set in a concrete plinth at ground level. The manhole covers will either be heavy-duty to withstand agricultural vehicle load-bearing capabilities or lightweight for personnel access without additional lifting machinery. The dimensions of the link box covers will be 1200×900mm.

42. For the purposes of the assessment, it is assumed that Link Boxes may be demarcated using fencing, marker posts, or a ground beam, or they may be installed without demarcation, subject to discussions with the landowner. The locations of the Link Boxes will be recorded using GPS and provided to the landowners for their records. Each Link Box will be connected to the corresponding Jointing Pit via an underground testing cable, which will be buried following the same principles as for the export cables. One Link Box will be required for each circuit approximately every 600–1000m and will be located within the 60m Cable Route Corridor, but no more than 15m from its corresponding Jointing Pit.

5.5.2.7 Mobilisation Areas

43. Five mobilisation areas have been identified along the Cable Route Corridor. These mobilisation areas would serve a variety of functions depending upon the construction programme. Early in the construction programme, they may be utilised to offload plant and materials to allow access to the onshore working Cable Route Corridor. The mobilisation areas may be used to temporarily store construction materials, such as fence posts or drainage stone. Dependent upon schedule, delivery restrictions, and weather conditions, it may be necessary to temporarily stockpile pipe and material at the mobilisation areas for use later on in the working corridor. Mobilisation areas are shown in **Figures 5.1a-e**.

44. Mobilisation Areas 1 and 5 have been identified as the two areas most suitable to house the required material, plant, and equipment storage. If required, both sites combined could accommodate up to 100% of the entire storage and mobilisation requirements for the construction of the onshore Cable Route Corridor.

45. Mobilisation Areas 1 and 5 will also be Main Site Yards and office complexes. Mobilisation Area 5 is located 1.5km north-west of Peterhead, approximately 400m south of the village of Lunderton. It is located in a relatively level field currently used for arable cultivation.

46. Mobilisation Area 1 is conveniently accessed via the road that leads to the NGNDSS situated between Maryhill and Burnend of Gight. Traffic movement restrictions may be imposed for HGV or abnormal loads, as the road network in the New Deer area may carry increased traffic loads at peak travel times. **(An assessment of the potential impacts on Traffic and Transportation is found in Chapter 13 – Traffic and Transportation.)**

47. Access to Mobilisation Area 5 will be formed in the field boundary adjacent to the west side of the A90. Due to the location of the access, it will be prudent to develop the existing gated field access, in order to provide adequate visibility splays. Traffic movement restrictions may be imposed for HGV or abnormal loads, as the road network in the Peterhead area may carry increased traffic loads at peak travel times. (An assessment of the potential impacts on Traffic and Transportation is found in **Chapter 13 – Traffic and Transportation**.)

5.5.2.8 Proposed Substation Area

48. The Proposed Substation Area will be located on an area of agricultural land approximately 5.5km south-east of New Deer and approximately 0.45km south of the NGNDSS on the west side of the road between Maryhill and Burnend of Gight. The Proposed Substation Area layout is depicted in **Figure 5.3** and it will comprise:

- Proposed Substation
    - Control Building
    - Super Grid Transformer
    - Reactors
    - GIS Switchgear Buildings
    - Dynamic Compensation Building
    - Filter Building (220kV and 400kV)
- Temporary Construction Compound
- SuDS Pond

49. The maximum building heights are 18m for the Dynamic Compensation Building and the Filter Building as detailed in **Table.5.1**.The exact specification of the buildings will be determined during the detailed design phase. For the purposes of this EIA it has been assumed that equipment will be housed within buildings. Generic elevations for the buildings are provided in the following drawings:

- C4642 (1) 120 Control Building
- C4642 (1) 121 DRC Building
- C4642 (1) 122 Filter Building
- C4642 (1) 123 GIS Switchgear Building
- C4642 (1) 124 SGT
- C4642 (1) 125 Shunt Reactor

50. The conceptual drainage design associated with the Proposed Substation is provided in **Drawing - C4642 (1) 110 Drainage Concept**.

5.6 Construction

51. The following sections describe the construction of the Proposed Development at a high level. A more detailed description of the Proposed Development is outlined in **Appendix 5.1 – Construction Execution Plan**.

5.6.1 Construction Programme

52. Key Construction activities and an indicative Construction Programme are outlined in **Table 5.3**

Table 5.3 Green Volt Onshore Infrastructure Outline Construction Programme

200-007-PRG003 Rev01 Green Volt Onshore Cable Construction Programme																																
		Qtr. 2, 2025			Qtr. 3, 2025			Qtr. 4, 2025			Qtr. 1, 2026			Qtr. 2, 2026			Qtr. 3, 2026			Qtr. 4, 2026			Qtr. 1 2027			Qtr. 2 2027			Qtr. 3 2027		
Task Name	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Ja**	**Fe**	**M**	**A**	**M**	**J**	**J**	**A**	**S**
Contract Award																																
Substation Construction																																
Onshore Substation Civils Construction Works																																
Electrical Installation																																
Final Commissioning																																
Cable installation – Onshore																																
Mobilisation																																
Survey																																
Compounds Construction																																
ROW Preparation																																
Fencing																																
Top Soil Strip																																
Land Drainage (Pre-Con)																																
Haul Road																																
Crossings																																
Trench Excavation																																
Civils (Cable ducts, TJBs & JBs)																																
Backfill – Import & Export																																
Backfill																																
Cable Install																																
Land Drainage (Post-con)																																
Connections (Jointing)																																

200-007-PRG003 Rev01 Green Volt Onshore Cable Construction Programme																																
		Qtr. 2, 2025			Qtr. 3, 2025			Qtr. 4, 2025			Qtr. 1, 2026			Qtr. 2, 2026			Qtr. 3, 2026			Qtr. 4, 2026			Qtr. 1 2027			Qtr. 2 2027			Qtr. 3 2027		
Task Name	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Ja**	**Fe**	**M**	**A**	**M**	**J**	**J**	**A**	**S**
Testing																																
Land Drainage (Post-con)																																
Haul Road (Removal)																																
Top Soil Re-instate																																
De-mobilisation																																
TRENCHLESS – Landfall (900m)																																
Mobilisation																																
Duct weld and test																																
HDD Drive # 1																																
Pull Back																																
Second HDD set-up																																
HDD Drive # 2																																
Pull Back																																
De-mobilisation																																
TRENCHLESS – RVX 14/1 (535m)																																
Mobilisation																																
Duct weld and test to West																																
HDD Drive 1																																
Pull Back																																
Second HDD set-up																																
HDD Drive 2																																
Pull Back																																
De-mobilisation																																
TRENCHLESS – DRLX 7/1 (425m)																																
Mobilisation																																

200-007-PRG003 Rev01 Green Volt Onshore Cable Construction Programme																																
		Qtr. 2, 2025			Qtr. 3, 2025			Qtr. 4, 2025			Qtr. 1, 2026			Qtr. 2, 2026			Qtr. 3, 2026			Qtr. 4, 2026			Qtr. 1 2027			Qtr. 2 2027			Qtr. 3 2027		
Task Name	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Ja**	**Fe**	**M**	**A**	**M**	**J**	**J**	**A**	**S**
Duct weld and test																															
HDD Drive 1																															
Pull Back																															
Second HDD set-up																															
HDD Drive 2																															
Pull Back																															
De-mobilisation																															

5.6.2 Access to Site

53. The Mobilisation Area 1 is located approximately 0.45km south-east of the NGNDSS . With construction direction west to east, the main access approach from the south will be the A90 to Aberdeen, A947 (Old Meldrum Road), B9170, through Methlick on the B9005/B9170, then B9005 to C Class Road for Burnend of Gight/Maryhill.

54. Mobilisation Area 5 is located close to the Landfall to the west of Craigewan links golf course, Peterhead, with construction direction east to west, the main access approach from the south will be the A90 to Aberdeen.

55. West/east or east/west access dependent upon construction direction and Main Site Yard location, will utilise the following routes:

- The A950/A981/B9170 run through the villages of Longside, Mintlaw, and New Deer and will be the main access spine for access to the Cable Route Corridor working areas. It is recommended that access through these villages is assessed by direct observation (via site visit).
- The A948 and B9030 (New Deer/Auchnagatt/Stuartfield/Old Deer) provides access to the southern and central area of the Cable Route Corridor.
- The A952 and several C Class roads (Suitable for Farm equipment/HGV) provides access to the central and eastern end of the Cable Route Corridor.
- South – A90 to Aberdeen, A947 (Old Meldrum Road), B9170, through Methlick on the B9005/B9170, then B9005 to C Class Road for Burnend of Gight/Maryhill.

5.6.3 Enabling Works

56. Key components of Proposed Development enabling works are:

- Establishment of Proposed Substation Area/ Cable Route Corridor footprint
- Preparation of Landfall Trenchless Compound and Main Site Yards
- Preparation of mobilisation areas
- Confirmation of watercourse crossing methodology
- Install fencing where appropriate
- Install drainage systems

57. Once the enabling works have been completed, consideration will be given to commencing strategic planting around the perimeter of the Site, where this is practicable, to ensure any screening has maximum growing time: prior to completion of construction.

58. The Landfall Trenchless Compound also needs to be prepared, that includes the construction of a hardstanding area. During this process, the topsoil and subsoil excavated from the Landfall Trenchless Compound will be used to create bunds or embankments to the north and south of the Landfall Trenchless Compound. These bunds serve multiple purposes, providing some screening to minimise noise and offering shelter from winds at the worksite. It is important to keep the east and westerly sides of the Compound open to accommodate the cables that will be laid inland to the west and the trenchless works that will extend seawards to the east.

59. Once all existing services and infrastructure is highlighted (cables, pipelines, sewars etc) the Main Site Yards and Landfall Trenchless Compound are cleared and secure, the yards will be surveyed, and a plan of the layout will be produced. Then the components for each yard will be delivered and installed. Once the Main Site Yards are established, the next phase will involve crews with sufficient travelling to the remaining mobilisation areas (highlighted in **Section 5.6.6**) along the Cable Route Corridor and begin to prepare these. The preparation of each mobilisation area will involve breakthrough of hedges, erecting site fence, topsoil strip, installing stone apron, protection services, installing bogmat protection and laying stone apron/track on geotextile membrane.

60. Crossing methods associated with watercourses will be assessed during Detailed Design. Aberdeenshire Council and Scottish Environmental Protection Agency (SEPA) will be consulted in order to agree a suitable methodology for each crossing. Water crossings are highlighted **200-007-DRG-021 Rev A01 - Trenchless River Crossing Typical Section.**

61. Non trenchless methods used for watercourse crossings are as follows:

- **Ditch** – Suitable diameter Flume Pipe/ Spoil fill / Sandbag face / Bogmat running surface

- **Minor watercourse** – Suitable diameter Flume Pipe / Spoil fill / Sandbag face / Bogmat running surface, or; Beam Bridge / Stone ramp / Bogmat running surface
- **Major watercourse** – Beam Bridge / Stone ramp / Bogmat running surface

62. To prevent livestock and members of the public accessing construction areas, fencing will be installed around work areas. Fence posts will be distributed along the marked lines and driven into the ground, generally with an excavator bucket. Fencing for stock accesses will be installed at this time and topsoil strip will be carried out across them. Gates at road crossings, livestock, and other accesses, together with any required signs, will also be installed. The fencing crew foreman shall ensure that all service protection fencing and matting is in place when inspecting the Site. Fencing will be suitably earthed with rods beneath overhead electric lines.

63. To ensure proper drainage for the site yards, mobilisation areas, and off-easement accesses, a specialist sub-contractor will be tasked with installing the Drainage system. The design of the Drainage system will be developed by a Drainage Engineer post-consent, to meet the specific requirements of the Proposed Development. By implementing an efficient Drainage system, the Proposed Development will effectively manage water flow and prevent potential issues that may arise from poor drainage conditions.

5.6.4 Landfall

5.6.4.1 Onshore Transition Jointing Pit

64. The construction of the Onshore Transition Jointing Pit involves drilling a hole from the inland side of the Landfall to a point below Mean Low Water Springs (MLWS), allowing marine equipment to operate. The diameter of the hole will be sized to accommodate a conduit through which the cable(s) will be pulled. The maximum distance for cable-pulling depends on the cable's design strength. Standard cables have a limit of 500ms for pull distance (but in exceptional cases, specially reinforced cables can extend this distance to 1km).

65. After the cable pull-in operations and the completion of the jointing activities, the Onshore Transition Jointing Pit will be filled with backfill material and the surrounding ground will be restored to its original state.

5.6.5 Cable Route Corridor

66. The key elements of the Onshore Cable Route Corridor are:

- dividing the Cable Route Corridor into sections based upon road crossings;
- completion of Enabling Works (e.g. mobilisation areas, fencing and bell mouths);
- duct installation works at multiple locations to increase efficiency;
- initiate cable-pulling and jointing activities;
- cable testing; and
- remedial works.

67. The Cable Route Corridor will be divided into sections, that will likely be defined by road crossings. Since the Construction Works along the Cable Route Corridor progress linearly, it is possible to undertake construction on multiple sections simultaneously, which can be more efficient than advancing from a single work location along the entire Cable Route Corridor.

68. For each section of the route, initial mobilisation will involve installing temporary fencing, establishing the bell mouth near the public road, and setting-up a temporary construction compound at the mobilisation locations. Once completed, the Cable Route Corridor within the section will undergo topsoil-stripping to create a haul road. If necessary, temporary agricultural land drainage measures, including the installation of temporary drainage, will be implemented for each section before any trench excavation works are initiated.

69. Conducting construction activities at multiple work locations along the Cable Route Corridor during the construction phase allows for optimal sequencing of trenchless and open-cut installation techniques, resulting in a shorter overall construction programme. For example, a trenchless installation team can access a cable section to perform trenchless crossings and install cable ducts before the open-cut installation team arrives at that section. This ensures that the open-cut team can proceed with their installation works more efficiently, without waiting for the completion of trenchless crossings in that section.

70. For open-cut trenching, the excavation and duct installation rate ranges from 100–200m per day/per circuit. This includes the installation of cable ducts, cement-bound sand, warning boards, and subsoil reinstatement. Final drainage reinstatement within the subsoil — follows the trenching and duct installation team's work completion. Trenching work focuses on completing sections of 500–1000m between joint pit locations, rather than completing a long continuous trench and returning to the start for the next section. The total installation time, including drainage reinstatement, for a section between joint pits is approximately 6 weeks for 600m cable sections (or 10 weeks for 1000m cable sections) – assuming two excavator teams working concurrently along the route section. (If complex ground conditions or greater burial depth/complex drainage reinstatement are encountered, the installation rate may be slower.) It is estimated that this will be approximately 17 months for the entire Cable Route Corridor.

71. Once the duct installation works are completed, cable-pulling and jointing activities can begin. Cable-pulling involves delivering a large cable drum by HGV and pulling the cables through the pre-installed ducts using a cable winch and pulling engine. Once multiple cable sections are pulled into the ducts, the cable jointing process can commence. This process is repeated along the entire Cable Route Corridor to establish a complete cable system. Cable jointing requires setting up a temporary jointing area to ensure the jointing works are carried out under "clean room" conditions. Typically, cable pulling and jointing works take around 1–2 weeks at each set of Joint Pit locations along the Cable Route Corridor's.

72. The topsoil strip across the Construction Corridor and haul road within any Cable Route Corridor section remain in place until the construction and testing for that entire portion of the Cable Route Corridor are completed. Retaining the haul road during this period is necessary to maintain access along the route for test preparation, installation of any required monitoring equipment, and carrying out any remedial works identified during the testing process. Once the end-to-end testing of each particular route section is completed, any necessary remedial works are performed, and the cable system is proven, the temporary construction corridors (TCCs), haul roads, and topsoil can then be reinstated for that section.

5.6.5.1 Haul Roads

73. Following topsoil stripping, pre-construction drainage activities, and any required cut-and-fill operations, the extents of the haul road will be marked out by the survey crew. The survey work will be carried out by a team of surveyors and assistant under the leadership of a senior surveyor. After the survey crew have marked out the haul road, the haul road crew will then carefully lay a geotextile membrane over the extents of the haul road footprint, in preparation for the delivery of the sub-base stone that will be delivered direct to site in 10T tipper trucks direct from the supplier. Stone for the haul roads will be delivered direct to site for placement directly to the haul road where possible, to minimise double-handling of material. Where necessary, haul road stone may be delivered to mobilisation areas and stored temporarily, where it is not possible to deliver direct to the final point of use. The haul road will be a maximum of 6m wide; with a depth of 400mm that includes a subbase and Ministry of Transport (MOT) type 1 stone running course. Wider passing places will be installed to allow passing of plant and vehicles deemed necessary. Protection to existing underground infrastructure and services (cables, pipelines, sewars etc) will be provided by means of bogmat protection and fencing to limit crossing of services and infrastructure to the temporary haul road. There will also be piles of MOT type 1 stone running along the haul road, to allow for easy access and constant maintenance of the haul road.

5.6.5.2 Crossings

74. Where crossings of sensitive roads, ditches, tracks, treelines, infrastructure, and watercourses are required, trenchless methodologies will be used. The depth and length of the sections of trenchless drilling techniques such as HDD, microtunneling and pipe jacking would be agreed upon with all local and statutory authorities, private companies, and agencies to obtain all consents, permits, licences and authorisation necessary to carry out the crossings prior to construction. An indicative crossing is provided in **Drawing 200-007-DRG Trenchless Road Crossing Typical Section**.

75. At this time, the following number of crossings are proposed. A total of 6 of these crossings are deemed to be sensitive/major. These crossings are shown in **Figures 5.1a-e**:

- Road crossings = 20

- River Crossings = 4
- Ditch Crossings = 44
- Track Crossings = 22
- Treeline Crossings = 2
- Service Crossing = 6 (Major Cables & Pipelines)
- Lockout/Cul-de-sac working = ¾/0.75

Major crossings:

- DRLX7/1 (425m Trenchless)
- RVX14/1 (535m Trenchless)
- DRLX15/1 (250m Trenchless)
- RVX16/1 (300m Trenchless)
- RVX16/2 (200m Trenchless)
- RVX18/1 (350m Trenchless)

5.6.5.3 Cable Installation

76. It was determined that the onshore export cables will be installed within the Cable Route Corridor. This decision considers various factors such as existing road network access, the location of major crossings, the reduction of traffic on public roads in the rural farming area, and materials logistics. The construction work would start at the Landfall. Once completed, the Cable Route Corridor would be fenced out from the Landfall to the Proposed Substation, and subsequent activities like topsoil stripping, crossings, trench excavation, and cable installation would start along the Cable Route Corridor.

77. The cable installation works are expected to take place within a 35 - 80m wide working corridor that accommodates the working area, excavated soils, and cable trenches. The methodology for cable installation will be chosen based on the existing land-use. At this stage, it is anticipated that open-cut trenching will be used for most of the cable length, with trenchless methodologies employed as an alternative to cross significant constraints such as watercourses and roads.

5.6.5.4 Trenchless Drilling Methodologies

78. Various trenchless methods have the potential to be used with the Proposed Development. Trenchless methods include HDD, microtunneling and pipe ramming.

5.6.5.4.1 Horizontal Directional Drilling (HDD)

79. HDD is expected to be employed for certain sections of the onshore cable route, including the Landfall, water crossings, road crossing, and the Proposed Substation. Prior to the cables being pulled ashore or installed along the onshore export cable route, HDD ducts will be constructed. Proposed locations of trenchless crossings are shown in **Figures 5.1a** – **e**.

80. The HDD process involves drilling an arc between two designated points referred to as – the launch site and receiving site – to pass beneath the obstacle being avoided, e.g., a water-crossing.

81. The initial step of HDD involves drilling a small pilot hole using a cutting/steering head to establish the path of the arc from the launch site towards the receiving site. Once the pilot bore is completed, the cutting/steering head is exchanged for a back-reamer of appropriate size at the receiving site. The back-reamer is then pulled through the pilot hole from the drill rig towards the launch site to enlarge the hole's diameter. It is expected the boreholes will be 600–900mm in diameter. It may be necessary to perform the back-reaming in multiple stages, gradually increasing the borehole diameter each time. Once the required diameter is achieved, the back-reamer is passed through the bore once or twice more to ensure the hole is clear of any significant obstructions.

82. HDD as a trenchless technology carries an array of benefits compared to the traditional open-cut method. Some of the advantages of HDD compared to traditional open-cut methods are listed **Section 5.6.9.1**

5.6.5.4.2 Microtunneling

83. Microtunneling is a trenchless construction method that involves a fully remote-controlled process. It provides ongoing support throughout the excavation process by utilising a guided pipe jacking technique. The primary

application of Microtunneling is for the installation of sewer lines. Spoils generated during the process can be removed either through pumping or by using mechanical augers. The method comprises six distinct and interconnected systems, which are as follows:

- A micro tunnel boring machine
- A jacking system
- A spoil removal system
- The guidance system (laser guidance)
- Remote control system
- A pipe lubrication system

84. The microtunneling is very accurate in nature. A wide variety of microtunneling machines are available for boring. The factors that are needed to identify the best machine is based on the soil conditions of the site, the groundwater level and obstructions that are unanticipated.

5.6.5.4.3 Pipe Ramming

85. Pipe ramming is a trenchless construction method commonly utilised for installing utilities, particularly for railroad or road crossings. This method involves driving a steel casing into the ground using an air compressor. The steel casing used in pipe ramming can be either open-ended or closed-ended, depending on the diameter requirements.

86. During the pipe ramming process, the steel casing is hammered into the ground, displacing the soil around it. Air pressure is used to assist in pushing the soil out of the casing, particularly when larger diameters are involved. The force generated by the air compressor drives the casing forward, creating a path for the utility installation.

87. Pipe ramming is favoured for its ability to overcome challenging ground conditions, such as hard soil or rock. It provides a robust and efficient method for crossing roads, railways, or other obstacles, reducing the need for open trench excavation.

88. By utilising pipe ramming, utilities can be installed with minimal disruption to existing infrastructure and reduced impact on the surrounding environment. This trenchless method offers a reliable and cost-effective solution for various crossing installations.

5.6.6 Main Site Yards and Mobilisation Areas

89. The initial operations relating to the Proposed Development will commence with the acquisition and setup of the Main Site Yards along with mobilisation areas shown in **Figure 5.1e** and **Figure 5.3**. The Main Site Yard 1 and Mobilisation Area 1 is conveniently accessed via the road that leads to the NGNDSS situated between Maryhill and Burnend of Gight. The accessibility was the primary reason for the Mobilisation Area 1 location being selected. A dedicated crew equipped with the necessary resources will undertake the preparation of the Site, that involves creating bunds for existing topsoil containment and ensuring the security of the area by erecting suitable fencing. Existing services within the yard will be carefully located and identified, and measures will be taken to protect them, such as using high-visibility nylon, or bunting for overhead cables.

90. Main Site Yard 2 and Mobilisation Area 5 and associated office complex is located approximately 1.5km to the north-west of Peterhead, approximately 400m south of the village of Lunderton. The location of the Mobilisation Area 5 is shown in **Figure 5.1a** and **Figure 5.2**. Mobilisation Area 5 is a relatively level singular field, utilised for arable cultivation and is a green field site. It has a dwelling to the north-east corner and has overhead (OH) electric cables to the west boundary, and an existing field drain/ditch to the south & east boundaries. Due to the location of the access, it may be prudent to upgrade the existing gated field access, in order to provide adequate visibility splays. This is a decision that will be made at a later date during the creation of a Construction Traffic Management Plan (CTMP). Traffic movement restrictions may be imposed for HGV or abnormal roads, as the road network in the Peterhead area may carry increased traffic loads at peak travel times. A detailed assessment of access routes is outside the current scope of this document. As the A90 is the main trunk route in the area, it is safe to conclude that suitable access to the site is available.

91. The Main Site Yards will be the focal points of the construction phase of the cable project, with all staff mobilising to the Site Yards on workdays, where they will park their personal transport (cars/bikes, etc) before being

transported to the worksite in works vehicles, e.g., Transit vans, 4×4 or minibuses. This prevents the areas around the work site in urban and rural areas from suffering congestion and minimises parking problems both on and adjacent to the worksite.

92. All construction sites will have to be carefully planned, set out and approved, to ensure the health and safety and welfare of workers/site visitors. Including access and egress, security matters, etc. It is important to note that the Main Site Yards will in all likelihood include temporary stores to house dry stores for perishable materials, a Quarantine Compound for bunded materials, etc. The Main Site Yards will also have a car-parking area to accommodate the workforce and visitors, along with stores, offices, and canteen facilities.

93. The mobilisation areas serve various functions based on the construction programme. In the early stages of construction, they are used for unloading plant and materials to facilitate access to the designated right of way. Once access is established and right-of-way operations are underway, the mobilisation areas may temporarily store construction materials, e.g. fence posts and drainage stone, required by the right-of-way and drainage crews. As the delivery and stringing of pipes commence, these areas can also serve as offload points for pipes and fittings. Depending on the Schedule, delivery restrictions, and weather conditions, it may be necessary to temporarily stockpile pipe and materials at the mobilisation areas for future use along the right of way.

94. The size of the mobilisation areas will be finalised at detailed design stage post consent based on the storage requirements of the specific section of the cable route. In any event, the size of the mobilisation areas will not exceed the maximum parameters set out in **Table.5.1** above. They will be adequately sized to accommodate temporary material storage between mobilisation areas. Topsoil within the area will be stripped and stored in topsoil bunds, typically positioned around the perimeter. This not only helps screen the site from the public but also enhances security. Access to the road network will be facilitated through a gated bell mouth. To protect the road interface, where the access meets the road, bog mats will be placed to safeguard the road edge and existing services. A stone road and apron, placed on a geotextile membrane, will be constructed to provide a reliable all-weather surface.

95. Access points are required in areas where the road network does not directly adjoin the Cable Route Corridor. In such cases, access points will be created to enable the delivery of plant, equipment, and materials to the Site. Typically, these accesses involve extending the Cable Route Corridor to the nearest public road or trackway. These accesses undergo topsoil stripping and may include a stone-running layer installed on a geotextile membrane to maintain a stable running surface and ensure all-weather usability.

5.6.7 Proposed Substation

96. The Proposed Substation will allow power supplied by the Offshore Project to be transformed and delivered to the NGNDSS.

97. The electrical system element with the longest maximum construction period is the construction of the Proposed Substation as it has the most complex construction activities. This element of the Proposed Development is also progressed within a discrete construction site (rather than being a linear project, that drives a sequential order of key Construction Phases).

98. The Proposed Development will need an Alternating Current (AC) Substation, which will occupy an area of approximately 250ms ×180ms (45,000m^2) at the Connection Point southwest of NGNDSS. (See **Figure 5.3** Substation location and layout.)

99. The key activities relating to the construction of the Proposed Substation are:

- Site Establishment;
- Enabling Works;
- Civil Engineering Works;
- Mechanical and Electrical Works; and
- Energisation.

5.6.7.1 Site Establishment

100. The first stage of construction for the Proposed Substation will be to establish the construction access and associated Temporary Construction Compound to allow the mobilisation of the main construction site.

5.6.7.2 Enabling Works

101. The main enabling works will establish the Proposed Substation and basic infrastructure, such as drainage and internal access roads. Once the enabling works have been completed, consideration will be given to commencing strategic planting around the perimeter of the site, where this is practicable, to ensure any screening has maximum growing time prior to completion of construction. A Sustainable Drainage System (SuDS) pond will be established within the Proposed Substation Area as shown in **Figure 5.3**.

102. Enabling works attributed to the Proposed Substation are as follows:

- Right of way (ROW)
- Temporary fencing
- Drainage

5.6.7.2.1 Right of Way (ROW)

103. The preparation of the right of way (ROW) for the Proposed Substation generally involves the following tasks:

- Erecting advance warning signs at road crossings in accordance with the highway specification and detailed design provided by the Applicant.
- Breaking through the field boundary at the Main Site Yard 1 and office complex, ensuring the protection of services, and laying bog mats or a stone apron for access from the road into the field.
- Erecting site fencing as per the detailed design specified by the Applicant.
- Installing goal posts and bunting across the spread at locations with overhead cables, ensuring safe clearance for passing plant and equipment.
- Breaking through subsequent field boundaries as required.
- Pruning trees and implementing tree protection measures as instructed or agreed upon in the Pre-Entry Forms.
- Excavating trial areas to locate services and erecting location/warning notices under a permit to dig.
- Excavating trial areas to assess ground conditions, recorded by the site engineers under a permit to dig.
- Carrying out any preparatory work identified by the Applicant or the Applicant's Lands Liaison Officer to comply with notices or orders related to the preservation of hedges, trees, buildings, or features within the right of way. In certain cases, a bio-security zone may be established to provide additional protection.

104. Depending on the ground topography, and conditions, it may be necessary to re-engineer fence lines around the Site. This may also apply to crossings of overhead lines or situations where the spread runs parallel to overhead lines or existing underground services. Working width drawings will provide dimensions and specifications for the required land take at the Site. Security patrols will also be present on-site.

105. Please note that the specific details and requirements may vary depending on the client's specifications and project circumstances.

5.6.7.2.2 Temporary Fencing

106. Prior to erecting temporary fencing, the perimeter of the ROW will be defined, marked, and inspected for services using Cable Avoidance Tool (CAT) and Ground Penetrating Radar equipment, by the surveying teams. Fence posts will be positioned along the marked lines and driven into the ground, typically using an excavator bucket. During this process, fencing for stock accesses will also be installed, and topsoil stripping will be carried out accordingly. Gates will be installed at road crossings, stock accesses, and other designated points, along with any necessary signage. The fencing crew foreman will ensure that all service protection fencing and matting are in place when passing through the area. If required, the fencing will be properly grounded with rods beneath overhead electric lines. The appropriate fencing materials and configurations will be utilised based on the designated zone or specific requirements outlined in the project plans.

5.6.7.2.3 Drainage

107. The installation of drainage systems for the Proposed Substation will be carried out by a specialised subcontractor in accordance with the design developed by a drainage engineer. This work will be conducted as soon as practically possible to prevent deterioration of the working areas. In general, existing drainage will be inspected, cleaned, and repaired if necessary. If additional drainage is required to ensure proper drainage in the

working areas, it will be installed using either a 360° backhoe or a drainage trencher, depending on the size of the area that needs to be drained.

108. The pre-construction drainage will be installed by a specialist subcontractor following the erection of fences, as per the design provided by the drainage engineer. Typically, the pre-construction drainage is installed on the "high" side of the ROW using a drainage trenching machine. This ensures the creation of a cutoff or header drain that diverts water from the existing drainage system, which may be damaged during trenching operations prior to pipe installation. This approach prevents the cable trench from being flooded with water during excavation and protects the drainage system from damage when tracked over by plant and machinery across the ROW.

109. Drainage reconnections will take place during the construction phase. The reconnection of land drains cut by the cable trench, that are not being replaced by an easement or header drain will be carried out as part of the backfill operation. After the installation of the cable the backfill will be compacted in layers up to the underside of the severed drains which are to be permanently reinstated by cross connection. The replacement drain will extend into the virgin/undisturbed ground on each side of the trench width for a minimum of 1m measured at right angles to the trench. The undisturbed ground will be excavated by hand and a good connection formed to the existing drain. The cable trench backfill will then be compacted up to the subsoil surface level. All drainage reconnections across the trench will be carried out in accordance with the requirements of the land drainage specification.

110. Post Construction Drainage will involve Replacement Drainage Installation as instructed by the Drainage Design Engineering accordance with agreements with landowners and tenants or their agents.

111. A drainage concept design has been undertaken for the Proposed Substation. This is provided in the following drawings:

- C4642 (1) Drainage Concept 110

5.6.7.3 Light Pollution

112. It is anticipated that the vast majority of works for this development will be undertaken during daylight hours. However, there may be circumstances for matters of safety which will require the illumination of areas of work by artificial means. For example, the Proposed Substation construction is a weather-dependant operation and therefore may need to be undertaken out with daylight hours. Should artificial lighting be required, lamps will be positioned such that they will minimise direct illumination of any neighbouring properties.

5.6.7.4 Civil Engineering Works

113. Civil engineering works will establish all the locations of equipment foundations and content construction of buildings within the Proposed Substation Compound.

5.6.7.5 Mechanical and Electrical (M&E) Works

114. The mechanical and electrical works phase comprises the delivery and installation of all electrical equipment, including any Abnormal Indivisible Load (AIL) and deliveries such as transformers.

115. The operation and maintenance requirements for the export cables and grid connection cables will involve infrequent on-site inspections of the cables and corrective maintenance activities. The cables will be continuously monitored remotely. Following the completion of construction, access to the cable route will be from access points along the existing highway.

116. The Proposed Substation will be unmanned: the onshore infrastructure will be continuously monitored remotely, and there will be operation and maintenance staff visiting both the Proposed Substation and NDNGSS to undertake preventative and corrective works on a regular basis (no less than every six months).

117. It is not expected that the transition joint bays at the Landfall will need to be accessed during the operation of the transmission assets. However, Link Boxes will be provided with inspection covers to allow for access. Access will be required for an annual check and where corrective activities are required. Jointing bays will only require access in the event of a cable failure requiring placement.

118. Vehicle movements associated with operation and planned maintenance of the onshore infrastructure will operate only during the daytime and evening periods (07:00 – 23:00). Vehicle movements may however be subject to unscheduled events outside these hours.

5.6.7.6 Energising

119. Once cables are installed the energising sequence will begin. The energisation sequence of the Green Volt Electrical System (GVEC) necessarily follows a sequence driven by proximity to the National Grid transmission system. The Proposed Substation will be energised first, following the completion of the works at the NGNDSS and the connection between the two, with the cable route section between the Proposed Substation and GVEC being energised next. Once this is complete, the GVEC can then be energised. The energisation of the final section of onshore cable between the GVEC and Landfall can only be energised once the marine cable has been installed and terminated at both ends.

5.6.8 Proposed Substation Area

5.6.8.1 Proposed Substation

120. Duct installation below the Maryhill and Burnend of Gight road will be done through trenchless methods. It is likely that HDD installation would be the initial preferred methodology. Although there are other trenchless methods such as microtunneling and pipe jacking that may be used. The current crossing length of the Maryhill and Burnend of Gight, using trenchless methodology, would be in the region of 50m.

121. As the Proposed Substation will connect to the NGNDSS a substation connection loop (SSCL) will be necessary to supply power between both substations. The (SSCL) will run to the west of the existing NGNDSS, before turning north, crossing the OH Electric Cables at the north-west corner of the NGNDSS. It is assumed that proximity to the OH Electric Cables will result in trenchless construction methodologies, e.g., HDD.

122. The SSCL then turns right as it enters the NGNDSS. Due to topography and geology, it may be necessary to use minor cut-and-fill construction methodology in this area.

5.6.9 Construction Environmental Management Plan

123. A draft Construction Environmental Management Plan (Outline CEMP) is provided in **Appendix 5.1**. The Outline CEMP details the mitigation measures which would be applied during the Construction Phase of the Proposed Development.

124. The Outline CEMP will be further developed and refined during the Construction Phase by the Principal Contractor and considered a “live document” for ongoing adaptation throughout the Construction Phase of the Project, in line with Green Volt requirements and input from Aberdeenshire Council, SEPA and other relevant consultees.

125. The Outline CEMP will establish individual responsibilities along with reporting and communication lines. Particular attention will be given to communication to ensure that, for example, appropriate reviews of Operational Procedures are carried out during their preparation to ensure that environmental issues are adequately addressed.

126. It should be noted that impacts on receptors arising from construction works will also be assessed throughout each technical chapter along with appropriate mitigation measures.

5.6.9.1 Mitigation

127. Trenchless technology such as HDD, microtunneling and pipe jacking carry an array of benefits compared to the traditional open-cut method. *There is a reduced environmental impact associated with the trenchless methodology.* Some of the advantages of trenchless compared to traditional open-cut methods are listed below:

- **Minimal Surface Disruption:** HDD techniques allow for the installation of pipelines, cables, and conduits beneath obstacles such as roads, rivers, and sensitive environmental areas without the need for open trenches or disruptive excavation. This method minimises surface disruption, reduces environmental impact, and preserves the aesthetics of the surrounding area.

- **Versatility and Flexibility:** Trenchless techniques can be employed for a wide range of projects, including utility installations, oil and gas pipelines, fibre optic cables, and electrical conduits. It offers flexibility in terms of installation depths, angles, and distances, allowing for customised solutions based on project requirements.
- **Reduced Environmental Impact:** By minimising surface disruption, trenchless techniques help preserve natural habitats, wetlands, and water bodies. It also mitigates the risk of soil erosion, sedimentation, and potential contamination associated with open-trenching methods.
- **Faster Installation:** Trenchless drilling often enables faster project completion compared to conventional methods. It eliminates the need for time-consuming excavation and restoration processes, resulting in shorter project durations and reduced disruptions to the local community.
- **Enhanced Safety:** Trenchless drilling enhances safety by reducing risks associated with open trenches, such as accidents, cave-ins, and exposure to traffic hazards. It provides a safer working environment for operators and minimises public safety concerns during installation.
- **Extended Reach:** Trenchless techniques can achieve significant distances and depths, allowing for installations across long distances or challenging terrains where traditional methods may not be feasible or cost-effective.

5.7 Transport to Site

128. Details of the key transport and access issues associated with the Proposed Development can be found in the following documents:

- **Chapter 13 – Traffic and Transport**
- **Appendix 13.1 – Transport Assessment**
- **Appendix 13.2 – Route Survey Report**

129. Components and construction materials for the Proposed Substation will arrive at Peterhead Port and be delivered to Main Site Yard 1. The transport route which will be used is detailed below. Further detail is provided in **Appendix 13.2 – Route Survey Report**.

- Exit the port onto Bath Street and turn left;
- Continue west on Charlotte Street and Kirk Street;
- Take the first exit at the roundabout and proceed southbound on the A982 South Street;
- Continue southbound, joining the A90 and proceeding to Ellon;
- Depart the A90 and join the A948 westbound at Ellon;
- Continue on the A848 northbound, passing through Auchnagatt and New Deer;
- Turn onto the B9170 Auchreddie Road West;
- Turn left onto the unclassified road leading to Greens;
- Turn left onto the unclassified road between Maryhill and North Millbrex; and
- Turn right into a new Site access junction.

5.8 Operation and Maintenance

5.8.1 Scheduled Maintenance

130. During the Operational Phase of the Proposed Development, there will be scheduled monitoring of the onshore infrastructure. The maintenance of underground electric cables involves various activities aimed at ensuring the reliability and longevity of the cable system.

131. **Visual Inspections:** Regular visual inspections of the cable infrastructure are conducted to identify any visible signs of damage, such as cracks, corrosion, or physical disturbances. This can be done by visually examining exposed cable sections, joint boxes, and termination points.

132. **Cable Testing:** Cable testing is performed periodically to assess the electrical integrity of the cables. This includes tests such as insulation resistance testing, voltage withstand testing, and partial discharge testing to identify any insulation degradation, faults, or weaknesses in the cable system.

133. **Thermographic Inspections:** Thermal-imaging techniques are used to detect hot spots or abnormal temperature variations along the cable route. This helps identify potential issues like excessive load, loose connections, or insulation problems that could lead to cable failure.

5.8.2 Unscheduled Maintenance

134. During the Operational Phase of the Proposed Development there will be unscheduled monitoring and maintenance of the onshore infrastructure.

5.8.3 Cable Testing

135. Cable testing is performed periodically to assess the electrical integrity of the cables. This includes tests such as insulation resistance testing, voltage withstand testing, and partial discharge testing to identify any insulation degradation, faults, or weaknesses in the cable system.

5.8.4 Electromagnetic Field

136. The Green Volt electrical connection will be developed as High Voltage Alternating Current (HVAC) cable circuits operating at 50Hz. The offshore circuits following the two connection routes will consist of a single 3-core cable each offshore. Upon reaching the shore, 3 single-phase cables will be used per circuit.

137. Electromagnetic Fields (EMFs) are naturally occurring in the physical world and are produced whenever electricity is generated, transmitted, or used. With the increasing use of electrical devices, there are increasing changes to naturally occurring magnetic fields. The public is therefore exposed to increased levels of EMFs from sources such as household wiring and appliances, belowground cables, and both high-voltage and low-voltage power lines.

138. The EMFs generated by the onshore underground cables will be effectively shielded by the cable sheath and their burial in the ground. As a result, no electric field will be detectable above ground level. The Proposed Substation building walls or perimeter fence will also provide additional screening, ensuring that the electric field strength from these structures is not significant.

139. The maximum EMFs generated by the underground export cabling has been calculated using worst-case assumptions and in accordance with the Code of Practice approach. Based on these calculations, the maximum magnetic field strength is determined to be 8.6 µT. This value represents only 2.4% of the 360 µT guideline public exposure limit set out by the World Health Organisation (WHO) and adopted by the UK Government, which is set to protect health and ensure safety regarding magnetic field exposure.

140. The cable designs for the Proposed Development will be fully compliant with Government policy. All EMFs produced would be below the threshold exposure limits and therefore no significant EMF effects will arise from the Proposed Development.

141. The exposure to electromagnetic fields (EMFs) in the vicinity of the Proposed Substation is primarily influenced by the proximity of underground cables entering and exiting the building. Due to the distance between the Proposed Substation and the nearest publicly accessible point, the greatest EMF exposure typically arises from these transmission lines.

142. It is important to note that the design and operation of the Proposed Substation will adhere to all relevant health and safety legislation and occupational exposure guidelines for EMFs. By complying with these regulations and guidelines, the aim is to ensure the safety and well-being of individuals working in and around the Proposed Substation.

143. In summary, the electromagnetic fields (EMFs) emitted by the Proposed Development will be significantly below the adopted guideline public exposure limits established to safeguard health. Anticipated levels of EMF exposure from the Proposed Development do not suggest any measurable adverse health effects resulting from public exposure.

5.9 Decommissioning Plan

5.9.1 Decommissioning Schedule

144. The Decommissioning Plan will be developed prior to the decommissioning process once details are known.

145. It is anticipated that the decommissioning phase could last up to two years however, these dates and timeframes are indicative only and may not be finalised until closer to the time of decommissioning. When the operational phase is complete, any potential unforeseen issues that arise which may influence the decommissioning phase, will additionally be considered. This knowledge, together with the outcome of consultation with relevant authorities, will help develop a final schedule of decommissioning works.

5.9.2 Project Management and Verification

146. The Decommissioning Programme will be finalised once consultation is complete, and the plan will be submitted to the Local Authority before construction commences. However, the final review of the document and proposed schedule of decommissioning works will be completed towards the end of the operational lifetime of the Proposed Development. This review will produce a Decommissioning of Works Document, including current knowledge of decommissioning methods, measures and timing which will be made available to the public for comment.

147. A Decommissioning Close Out Report will be issued for approval to the appropriate regulatory authorities after the decommissioning phase is finished.

148. As a minimum, this report should include:

- Confirmation that the approved decommissioning programme has been agreed to during the decommissioning works; otherwise, an explanation of any major variances from the programme this includes information of actual costs of the works and an explanation of any major variances from the forecast costs;
- Information on the outcome of the decommissioning phase;
- Confirmation that relevant authorities have been notified on infrastructure remains where required, to overcome risks posed by such remains.

149. Upon completion, not more than four months after the decommissioning works, the report will be provided to the relevant authorities.

5.9.3 Restoration of the Site

150. The actions of the Plan will involve the removal of cables that are economically feasible, environmentally acceptable, and practical to remove. Considering the valuable metals present in the cables, it is highly likely that in economic terms, it makes sense to extract and recycle them. Environmental surveys might be necessary to ensure compliance with environmental standards, as the habitats may have undergone changes over a span of 35 years, potentially leading to the colonisation of Protected Habitats or Species in the area.

151. Regarding the onshore components, a designated working corridor will be established, and a trench will be excavated above the cable. The cable will be extracted, and the trench will be refilled and restored to its original use. The impacts will be similar to those associated with the Construction Phase, but they will depend on the ecological condition and usage of the area during the Decommissioning Phase.

152. Removing the section of cable installed at road crossings trenchless crossings may pose technical challenges. Therefore, it is likely to be capped and left in place (unless there are compelling reasons to remove it).

    Similarly, for the Landfall cables, it is probable that they will be cut-off and capped at both ends and left in their current location. If there is a decision to remove them – the holes would need to be filled to prevent a hydrological connection between the field and the seabed.

153. Following the completion of decommissioning works, the Proposed Development Site will be restored, as far as reasonably practical, to its original pre-construction state.

5.9.4 Post-Decommissioning Site Monitoring, Maintenance, and Management

154. It is proposed that post-decommissioning monitoring surveys of the Site will be carried out by an independent contractor at appropriate intervals after the decommissioning works completion. The scope of which will be agreed in advance with the relevant authorities.

155. Should these surveys identify any residual elements of the Proposed Development appropriate measures will be taken to remove them to avoid posing risk to those using the area. The removal technique and associated machinery will likely be the same as that used for the initial decommissioning works but will ultimately depend on the type and size of the identified elements.

156. Should there be any uncertainty regarding the identification of anomalies during the surveys other than those associated with the Proposed Development which could be of archaeological interest, these will be referred to the appropriate public authority at the time of decommissioning.

GREEN VOLT

6

Chapter 6

Ecology and Ornithology

Onshore EIA Report: Volume 1

Document Code: FLO-GRE-REP-0009-06		
Version Number:	00	
Date:	*Issue Date 03/08/23*	
Prepared by:	Irene Tierney	*Irene Tierney*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First draft for review	25/07/23
A2	Second draft for review	01/08/23
00	Final	*03/08/23*

Contents

6 Ecology & Ornithology

6.1 Introduction

1. This chapter forms an Ecological Impact Assessment (EcIA) and provides the ecological and ornithological components of the Environmental Impact Assessment (EIA) required under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (Scottish Government, 2017). The EcIA considers the potential effects of the Proposed Development, as described in **Chapter 5 - Project Description,** on the habitats, species (avian and non-avian) and ecosystems present at the Site. It details likely significant effects and identifies appropriate mitigation and good practice methods to protect nature conservation interests.
2. The assessment considers the construction, operation, maintenance, and decommissioning phases of the Proposed Development.
3. For the purpose of this EcIA, the Site is detailed in **Figures 5.2a-5.2e** and includes the Application Site Boundary for the trenchless Landfall site containing the trenchless compound and ancillary infrastructure, the Cable Route Corridor (which is the area within which the cable trench, haul road and all ancillary infrastructure will be situated) and the Substation Compound.
4. Analysis and assessment of the baseline ecological and ornithological data have enabled the identification of appropriate mitigation measures to prevent, reduce, or offset potential adverse ecological and ornithological effects, where possible. The specific objectives of the chapter are to:
   - Describe the ecological baseline of the Site and in the wider Ecological Survey Area (ESA);
   - Describe the ornithological baseline of the Site and in the wider area;
   - Describe the assessment methodology and significance criteria used in completing the impact assessment;
   - Describe the potential effects, including direct, indirect and cumulative effects;
   - Describe the mitigation measures proposed to address any likely significant effects; and
   - Assess the residual effects remaining following the implementation of mitigation.
5. The assessment has been undertaken by IMTeco Ltd and in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Code of Professional Conduct.
6. The effects on hydrology are addressed in **Chapter 7 - Geology, Hydrology, Hydrogeology and Soils,** which also considers the hydrological impacts on Groundwater Dependent Terrestrial Ecosystems (GWDTEs) identified in the ecology assessment.
7. This chapter is supported by the following Technical Appendices:
   - **Appendix 6.1** - Habitat Survey and National Vegetation Classification;
   - **Appendix 6.2** - Protected Species Survey;
   - **Appendix 6.3** - Breeding Bird Survey; and
   - **Appendix 6.4** - Confidential Annex.
8. The **Figures** are referenced within the text, where relevant, and are located within **Appendix 6.1–6.4**.
9. For the purposes of this assessment, the following definitions are made:
   - The Proposed Development: all associated infrastructure required for Green Volt Onshore Infrastructure including; the Landfall, the Cable Route Corridor, and the Substation Compound;
   - The Zone of Influence (ZoI): this is 'the area over which ecological features may be subject to significant effects as a result of the proposed project or associated activities' (CIEEM, 2018);
   - The Site: is the area within which all new infrastructure shall be contained within the Application Site Boundary;
   - The ESA: is the area in which ecological and ornithological surveys were undertaken (as displayed in the corresponding maps in **Appendix 6.1-6.4**).

10. Potential ecological and ornithological effects are often related to effects on hydrology and geology. This chapter should, therefore, be read in conjunction with **Chapter 5 – Project Description** and **Chapter 7 - Geology, Hydrology, Hydrogeology and Soils.**

6.2 Legislation, Policy and Guidance

11. The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017[1] establish in broad terms what is to be considered when determining the effects of development proposals on local receptors. The following key industry guidance, policy, legislation and information sources have been considered in carrying out this assessment, as set out in the following sections.

12. Guidance for assessing the potential impact of the Proposed Development on the ecological and ornithological features of the development site have been based on the following statutory, general, and national guidance listed in **Table 6.1**. The assessment list is further expanded within the References section. Any appropriate local policy and guidance will also be considered.

13. Guidance solely in respect to survey methodologies followed is detailed in Technical Appendices 6.1 to 6.4.

Table 6.1 – Policy, Legislation & Guidance

	Legislation or Guidance Document
Legislation	Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011, which transpose the EIA Direction into the Scottish planning system; Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (The Habitats Directive); Council Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (Water Framework Directive); The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the Habitats Regulations), which transposes the Habitats Directive into UK law; Environmental Impact Assessment Directive 85/337/EEC (the EIA Directive); The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017; The Water Environment and Water Services (Scotland) Act 2003 (WEWS); The Water Environment (Controlled Activities) (Scotland) Regulations 2011, Amendment Regulations 2021; The Wildlife and Countryside Act 1981 (as amended); Nature Conservation (Scotland) Act 2004 (as amended); The Wildlife and Natural Environment (Scotland) Act 2011; and The Protection of Badgers Act 1992.
Policy	Aberdeenshire Local Development Plan 2023; Aberdeenshire Nature Conservation and Biodiversity; Fourth National Planning Framework (NPF4); UK Post-2010 Biodiversity Framework (2012); Scottish Government (2017). Planning Advice Note 1/2013-Environmental Impact Assessment, Revision 1.0; PAN 51: Planning, Environmental Protection and Regulation (revised 2006); PAN 60: Planning for Natural Heritage (Scottish Government, 2000); Nature Conservation: Implementation in Scotland of the Habitats and Birds Directives: Scottish Executive Circular 6/1995 as amended (June 2000); Scottish Government Control of Woodland Removal (2009);
Guidance	Averis et al., (2014). An Illustrated Guide to British Upland Vegetation. Joint Nature Conservation Committee. Peterborough; Joint Nature Conservation Committee (2010). Handbook for Phase 1 Habitat survey: a technique for environmental audit;

1.

[1] The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 https://www.gov.scot/publications/planning-circular-1-2017-environmental-impact-assessment-regulations-2017/pages/1/

	Legislation or Guidance Document
	Scottish Environment Protection Agency (SEPA) (2017). Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (Version 3); NatureScot: 'Management of European sites'; Scottish Natural Heritage (2018). Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland; BS 42020:2013 Biodiversity: Code of Practice for Planning and Development: BSI Standards Publication; Scottish Natural Heritage (2016). Assessing connectivity with Special Protection Areas; Stanbury et al., 2021 'Fifth Birds of Conservation Concern'; Rodwell, J. S., (1991, 1992, 1998, 2000) British Plant Communities. Vol 1-5; Scottish Government (2013) The Scottish Biodiversity List (SBL);

6.3 Assessment Methodology

14. The EIA methodology adopted within this assessment is based on standard best practice and has been agreed with Aberdeenshire Council and consultees through the EIA Scoping process.

6.3.1 Baseline

15. The assessment of the potential impact of the Proposed Development on ecology and ornithology was undertaken by the general method described in the following sub-sections.

16. The ecological and ornithological assessments undertaken as part of the EIA have been based upon the Site and survey areas. The Site is the area contained within the Application Site Boundary. The survey areas vary between assessments and are defined within the individual EcIA Technical Reports (Appendix 6.1 to 6.4).

6.3.2 Scope of Assessment

17. The scope of the Ecological Impact Assessment (EcIA) includes the following elements:

- Identification of designated sites of ecological and nature conservation interest located up to 5km from the Site;
- Identification of designated sites of ornithological interest located up to 10km from the Site;
- Identification of historical records of rare, notable or protected species or habitat located up to 2km from the Site;
- Consideration of the likely significant effects on ecological and ornithological features arising due to the Proposed Development;
- Description of measures required to mitigate adverse effects on ecological and ornithological features within or adjacent to the Site, with the aim to avoid, reduce or compensate for the effect;
- Identify opportunities for ecological and ornithological enhancement;
- Identification of the cumulative effects that the Proposed Development may have in combination with other developments in the local area which are at the application stage, consented or under construction or operational; and
- Identification of residual effects on ecological features, including those considered to be significant, taking into account the above mitigation.

18. Important ornithological issues that are considered in the overall assessment are:

- If the Proposed Development would have a detrimental impact on species protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- Species classed as Birds of Conservation Concern 5 (BoCC5) Red Listed;
- If the Proposed Development would have a detrimental impact on bird species included in Annex I the Council Directive 2009/147/EC on the Conservation of Wild Birds; and

- If the Proposed Development would have a detrimental impact on bird species on sites designated for ornithological interests within the ZoI as specified by NatureScot.

19. Given the context of the Proposed Development and agreed scope, it was considered that the following bird species/groups would be target species for assessment:

- Annex 1 and Schedule 1 species, and
- Red listed Birds of Conservation Concern (BoCC5).

20. The principal ecological and ornithological issues considered in this EcIA include:

- Potential effects on sites designated for nature conservation;
- The harm and disturbance, both direct and indirect, to habitats and species arising from the construction, operation, maintenance, and decommissioning of the Proposed Development; and
- The potential legal implications of the above impacts.

6.3.3 Baseline Survey Areas

21. The area within which the desk-based research and field surveys were undertaken varies depending on the ecological feature and its search/survey requirements. Details of the extent of each Ecological Study Area (ESA) and ornithological survey area are described in the relevant 'Baseline Conditions' section of this chapter and associated **Appendices 6.1-6.4** and illustrated on their respective figures.

6.3.4 Desk Study Assessment Methodology

22. A desk study was undertaken to collate relevant public domain survey data, scientific publications, grey literature, and to obtain historical records of protected and relevant species of conservation interest and species and habitats protected by Scottish and European legislation from within the Site and surrounding environment.

23. The Desk Study Area (DSA) comprised of the following areas around the Site:

- A buffer of 10km from the Site was searched for Internationally designated statutory sites with an ornithological interest (e.g. Special Protected Areas (SPA)) and Nationally designated statutory sites (e.g. Sites of Special Scientific Interest (SSSI));
- A buffer of 5km from the Site was searched for Internationally designated statutory sites for ecological interest and nature conservation (e.g. Special Area of Conservation (SAC) or Ramsar sites) and Nationally designated statutory sites (e.g. SSSI's);
- A buffer of 2km from the Site was searched for non-statutory sites;
- A buffer of 2km from the Site was searched for records of notable or protected species; and
- A buffer of 2km from the Site was searched for records of invasive and non-native species.

24. The purpose of the desk-based review was to provide background information on the habitats and species potentially present, to help inform and guide the baseline ecological and ornithological field surveys and to provide context to their results. Combined with the results of the field surveys, this information has been utilised to provide a comprehensive ecological and ornithological baseline on which to base the EcIA.

6.3.5 Statutory & Non-Statutory Designated Sites

25. A search was conducted for the presence of any designated sites with ecological qualifying features within 5km of the Proposed Development, and with ornithological qualifying features within 10km, using NatureScot's SiteLink website and the Joint Nature Conservation Committee (JNCC) website. This was undertaken to identify and provide information on statutory designated sites of nature conservation, located within 5km and 10km of the Site. These included Special Protected Areas (SPA), Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs). Non-statutory designated sites included Local Nature Reserves (LNR), Local Wildlife Sites (LWS), Local Biodiversity Sites (LBS), Local Nature Conservation Sites (LNCS), Ancient Woodland Inventory (AWI) and Native Woodland Survey Scotland (NWSS).

6.3.6 Protected Species & Habitats

26. Records of UK protected mammal species, invertebrates, birds, habitats and plant species within 2km of the proposed Application Site Boundary were considered via biological records from North East Scotland Biological Records Centre (NESBReC).

6.3.7 Field Survey Methodology

27. Detailed field survey methodologies and results are included within **Appendices 6.1-6.4**. The following sections summarise the baseline methods and results, as identified during these surveys.

6.3.8 Habitat & Botanical Surveys

28. Habitat surveys for the Proposed Development included the Phase 1 habitat survey approach (Joint Nature Conservation Committee 2010) and followed the National Vegetation Survey (NVC) scheme (Rodwell et al., 1991-2000) using standard methods (Rodwell, 2006).

29. Surveys were undertaken within the ESA as detailed in Figures 1 to 8 in **Appendix 6.1**. The habitat ESA extended to 250m as per GWDTE guidance beyond the Application Site Boundary, as a consequence of the requirement to ensure sufficient buffer areas were surveyed to account for the presence of potential GWDTEs, in line with SEPA guidance.

6.3.8.1 Phase 1 Habitat Survey

30. Habitat field surveys were undertaken from August 2022 to May 2023. The surveys included searches for scarce or rare plants.

31. The habitat surveys included the Phase 1 habitat survey approach (Joint Nature Conservation Committee 2010). This involves the following elements.

- Habitat mapping using a set of standard colour codes to indicate habitat types on a Phase 1 habitat map.
- Description of features of possible ecological or nature conservation interest in notes relating to numbered locations on the Phase 1 habitat map, called 'target notes'.

32. Phase 1 habitat survey methods are described in Joint Nature Conservation Committee (JNCC 2010) and target notes are included.

33. Plant nomenclature in this report follows Stace (2010) for native and naturalised species of vascular plant. Plant names in the text are given with the common name first, followed by the scientific name in brackets.

34. The Phase 1 characterisation has been utilised to allow a broader visual representation of the habitats within the study area.

35. In addition, the survey aimed to identify wetland habitats in accordance with the habitat's descriptions given in 'A Functional Wetland Typology for Scotland' guidance. Where wetland habitats were identified, further detailed surveys were undertaken for the identification of vegetation communities with potential groundwater dependency in accordance with SEPA guidance. The full methods are presented in **Appendix 6.1**.

36. In addition to habitat characterisation, any signs of protected mammal species and potential bat roosts, as well as an assessment of habitat suitability for other protected species (including herptiles) were recorded. Target notes were used to record additional details of vegetation and habitats of conservation interest where present.

37. Mapping was subsequently undertaken by use of Geographic Information Systems (GIS) software.

6.3.8.2 National Vegetation Classification Surveys

38. An NVC survey was undertaken on all wetlands and habitats of conservation value recorded during the Phase 1 survey. The NVC survey involved mapping distinct areas of homogenous vegetation and recording detailed descriptions of the vegetation communities, with reference to published community descriptions (Averis et al., 2014; Elkington, T. et al, 2001). The full methods are presented in **Appendix 6.1**.

6.3.9 Ornithological Surveys

39. A series of breeding bird surveys (see **Appendix 6.3**) were undertaken for the Proposed Development between April to June 2023.

6.3.10 Breeding Bird Surveys

40. The survey work was undertaken according to a scaled down version of the Common Bird Census (CBC) methodology (Gilbert et al., 1998; Marchant, 1983) with a 250m buffer (**Appendix 6.3: Figure 1**) either side of the Application Site Boundary. This methodology is specifically put forward by NatureScot to survey lowland bird species. There were monthly visits throughout each month starting in mid-April through to late June in 2023. Surveys were undertaken during periods of good weather (i.e. good visibility, no persistent rain or fog, avoiding excessive heat or cold or wind speeds exceeding Beaufort Force 4) from one hour before dawn to approximately six hours after dawn.

6.3.11 Scarce Breeding Birds within a 2km Radius of Site

41. Following guidance from Hardey, 2013, surveys were undertaken monthly between April and late June 2023 within a 2km buffer looking for signs of scarce breeding species with a combination of fixed-point watches and walkovers. There were monthly visits throughout each month starting in mid-April through to late June in 2023. Surveys were undertaken during periods of good weather (i.e. good visibility, no persistent rain or fog, avoiding excessive heat or cold or wind speeds exceeding Beaufort Force 4) from one hour before dawn to approximately six hours after dawn. Species that were specifically surveyed for, but not limited to, included Schedule 1 species, common crane, short-eared owl, redshank, curlew, lapwing.

6.3.12 Protected Species Survey

42. Protected Species Surveys (see **Appendix 6.2 and 6.4 for details**) were undertaken and encompassed all land within the Site in line with NatureScot guidance.

43. During the protected mammal surveys the following species were specifically targeted, with species-specific buffers included for the surveys where possible, according to survey guidelines and best practise and termed Ecology Survey Area (ESA):

- Badger (*Meles meles*): Suitable habitats within the Site and extending up to 100m from the Application Site Boundary (NatureScot, 2001);
- Otter (*Lutra lutra*): Suitable habitats to be surveyed within the Site, extending up to 200m from the Application Site Boundary, of suitable habitats potentially impacted by the Proposed Development (Chanin, 2003a, b; NatureScot, 2020);
- Water Vole (*Arvicola amphibious*): The survey area included all suitable habitat within the Site, and within a 200m buffer to be surveyed where possible (access permitting), and extending up to 50m up and downstream of any watercourses or ditch systems potentially impacted by the Proposed Development (Dean, M., et al. 2016).;
- Red Squirrel (*Sciurus vulgaris*): Suitable habitats to be surveyed within the Site, involving visual surveys and transects, with distances as per Gurnell, J. and P.W.W. Lurz (2012, page 9);
- Brown Hare (*Lepus europaeus*): Suitable habitats within the Site and extending up to 200m from the Application Site Boundary, following methodology set out in Cresswell et al. (2012);
- Pine Marten (*Martes martes*): The survey includes a systematic search for signs of pine marten presence and potential den sites within the Proposed Development following methodology set out in Cresswell et al. (2012);
- Reptiles & Amphibians: No records of reptiles were recorded by NESBReC and farmland habitat is sub-optimal for reptiles and amphibians over the majority of the Proposed Development. No specific surveys were undertaken; and
- Further species included watching brief surveys of deer and hedgehog.

44. Any evidence of the presence of protected mammals was recorded onto 1:10,000 scale survey maps in the field. The location of all signs was recorded using a handheld Global Positioning System unit and photographs were taken to visually catalogue each record.

6.3.12.1 Badger Surveys

45. The surveys consisted of a walkover of the Site and a 100m buffer (access permitting) from the Application Site Boundary to visually inspect and assess the Site for its potential to support badgers. All potential access routes and, where possible, within dense plantations were surveyed. Badger surveys were undertaken according to recommended guidelines (full details are provided in **Appendix 6.2 and 6.4**).

6.3.12.2 Otter Surveys

46. The surveys consisted of walkovers of the Site and a 200m buffer (access permitting) from the Application Site Boundary, to visually inspect and assess the Site for its potential to support otters. Otter surveys were undertaken according to recommended guidelines. All watercourses and waterbodies located within the Site, and where accessible (access permitting), within the ESA buffer of the Site were surveyed (full details are provided in **Appendix 6.2**).

6.3.12.3 Water Vole Surveys

47. The surveys consisted of walkovers of the Site and a 200m buffer to visually inspect and assess the Site for its potential to support water vole. Water vole surveys were undertaken according to recommended guidelines. The survey area included all suitable habitat within the ESA buffer which was surveyed where possible (access permitting). This extended up to 50m up and downstream of any watercourse or ditch system potentially impacted by the Proposed Development (full details are provided in **Appendix 6.2**).

6.3.12.4 Red Squirrel Surveys

48. An initial walkover assessment was undertaken to identify suitable habitat and the presence of red squirrel on site. The methodology included identifying field signs (full details are provided in **Appendix 6.2**).

6.3.12.5 Brown Hare

49. A survey, following the methodology set out in Cresswell et al. (2012), of all areas within the site, including vegetated boundaries and fence lines was undertaken to make direct observations of hare activity and to search for the field evidence of hare including:

- Forms (resting places);
- Foraging evidence (often distinctive from rabbit and vole); and
- Brown hare droppings (generally larger and longer than that of rabbit).

6.3.12.6 Pine Marten

50. The survey included a systematic search for signs of pine marten presence and potential den sites within 250m of the Proposed Development (where accessible) and determining habitat suitability for pine marten, following the methodology set out in Cresswell et al. (2012). Evidence of this species includes scat, footprints, and dens. Pine martens are elusive and largely nocturnal, which makes them difficult to see, but their scats are often quite distinctive and the most commonly encountered field sign. Scats are most easily found along forest tracks. Scat is highly variable depending on diet but classic pine marten scat is highly twisted and contains bone fragments and hair. Pine marten scat also has a sweet parma violet fragrance.

51. Pine martens prefer overhead cover in woods and their dens can be found in large holes or cavities in trees. Breeding nests can be found in rocks, in hollow trees or in a bird or squirrel nest. Pine martens are active all year round but are best surveyed between May and September, and ideally in June-August when scats are most abundant. Pine martens are more active at this time (June-August) and weather conditions or leaf litter are less likely to degrade or obscure scats.

6.3.12.7 Bat Surveys

52. Potential Roost Assessments (PRA) were undertaken with reference to NatureScot and Bat Conservation Trust guidelines. No buildings on Site are to be demolished.

6.3.12.8 Other Observations

53. Records of all and other species (such as, reptiles, amphibians, hedgehog, and deer), if observed during all survey times and site walkovers were noted (full details are provided in **Appendix 6.2**).

6.3.13 Ornithology

54. Breeding Bird Surveys (BBS) undertaken between April to June 2023 to obtain baseline ecological information, to inform the Ecological Impacts Assessment (EcIA) of the Proposed Development. Surveys for breeding birds were undertaken at the appropriates seasons or months (full details are provided in **Appendix 6.3**) as recommended in guidance by NatureScot.

55. Important issues that are considered in the ornithological assessment are:

- If the Proposed Development would have a detrimental impact on species protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended);
- If the Proposed Development would have a detrimental impact on species classed as BoCC5 Red Listed;
- If the Proposed Development would have a detrimental impact on bird species included in Annex I the Council Directive 2009/147/EC on the Conservation of Wild Birds; and
- If the Proposed Development would have a detrimental impact on bird species on sites designated for ornithological interests within the ZoI as specified by Nature Scot.

6.3.13.1 Aim of Ornithological Surveys

56. The aim of the BBS was to obtain baseline information regarding the occurrence and distribution of protected species within the survey area to provide an accurate and robust baseline on which to base the EcIA.

6.3.13.2 Habitat Suitability for Breeding Birds

57. The Site where the Cable Route Corridor is proposed is predominantly a homogenous farmland habitat of grazing and arable fields, which has a limited attraction to breeding bird species, Data from NESBReC from 2002-2020 recorded the following species that are predominantly ground nesters; skylark, lapwing, curlew, grey partridge, short eared owl and corn bunting.

6.3.13.3 Breeding Bird Survey Results

58. Twenty-two species of birds designated as BoCC Red or Amber listed were recorded as breeding or possibly breeding within the survey area. Of these twenty-two species only four species were recorded breeding in open or arable fields (full details are provided in **Appendix 6.3**)

6.4 Methodology for the Assessment of Effects

59. The approach undertaken for the impact assessment follows the CIEEM guidance for EcIA, which sets out the process for assessment broadly through the following stages:

- Determining importance of baseline ecological features, including identification of Important Ecological Features (IEFs) (avian and non-avian);
- Identification, assessment and characterisation of ecological effects;
- Incorporation of measures to mitigate identified effects;
- Assessment of significance of residual effects following mitigation;
- Identification of appropriate compensation to offset significant residual effects; and
- Identification of opportunities for ecological enhancement.

6.4.1 Determining Important Ecological Features (IEFs)

60. One of the key challenges in EcIA is to decide which ecological features are important and should be subject to detailed assessment. Such ecological features will be those that are considered to be most important and potentially affected by the project. In EcIA, 'importance' of an ecological feature is synonymous with 'sensitivity' and is defined within a geographical context. Some examples of the criteria used to determine importance are defined in **Table 6.2**.

61. Designations are normally indicative of an importance level; for example, a SAC designated under the Habitats Directive is explicitly of European (International) importance. Where a site is offered more than one designation, it is the one of higher level (within the geographic frame of reference) considered of overriding importance. Ecological features of interest should be valued accordingly, with ecological features unrelated to the site designation assessed and evaluated according to their intrinsic importance.

62. Upon the identification of the potential direct and indirect effects from the Proposed Development, it was necessary to undertake a systematic assessment of importance to determine the Important Ecological Features (IEFs). IEFs are ecological features that could be 'significantly' affected by the Proposed Development, both negatively and positively.

63. In this EcIA, only ecological features with regional importance and above (as defined in **Table 6.2** below) were considered sufficiently important to be determined as IEFs, and in accordance with CIEEM guidance, only these IEFs required assessment for potential significant effects.

Table 6.2 – Geographical context of Important Ecological Features and their evaluation.

Level of Importance of Receptor (Value)	Qualifying Criteria
International (e.g. Europe)	The ESA is considered of international ecological value when it supports either: ▪ An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar site, Biosphere Reserve or an area which NatureScot has determined meets the published selection criteria for such designations, irrespective of whether or not it has yet been notified. ▪ A viable area of a habitat type originally listed in Annex 1 of the Habitats Directive (translated into specific legal obligations by The Conservation (Natural Habitats, &c.) Regulations 1994, known as the Habitats Regulations in Scotland), or smaller areas of such habitat which are essential to maintain the viability of that ecological resource on an international scale. ▪ >1% of the European resource of an internationally important species, i.e. those originally listed in Annex 1, 2 or 4 of the Habitats Directive (implemented by the Habitats Regulations in Scotland).
UK/National (i.e. Scotland)	An ESA is considered of national ecological value when it supports either: ▪ A nationally designated site (SSSI, NNR) or a discrete area which NatureScot has determined meets the published selection criteria for national designation irrespective of whether or not it has yet been notified. ▪ A viable area of a priority habitat identified in the UK BAP, or smaller areas of such habitat which are essential to maintain the viability of that ecological resource at a national scale. ▪ >1% of the National Resource of a regularly occurring population of a nationally important species, i.e. a priority species listed in the UK BAP and/or Schedules 1, 5 (S9 (1, 4a, 4b)) or 8 of the Wildlife and Countryside Act 1981.
Regional	An ESA is considered of regional ecological value when it supports either: ▪ Regional sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, e.g. Local Nature Reserves (LNR) and Local Nature Conservation Sites (LNCS). ▪ Viable areas of legally protected habitat/habitat identified in Council BAP or smaller areas of such habitats that are essential to maintaining the viability of the resource at a county scale. ▪ Areas of internationally or nationally important habitats which are degraded but are considered readily restored. ▪ Any regularly occurring population of an internationally/nationally important species or a species in a relevant UK/Council BAP which is important for the maintenance of the regional meta-population. ▪ Regionally important population/assemblage of an EPS, Schedule 1 and/or 5 species. ▪ Semi-natural ancient woodland smaller than 0.25ha. ▪ Networks of species-rich hedgerows.
Local	An ESA is considered of local ecological value when it supports either:

Level of Importance of Receptor (Value)	Qualifying Criteria
(e.g. local community council areas, Local Nature Reserves)	▪ Commonplace and widespread semi-natural habitats, e.g. scrub, poor semi-improved grassland, coniferous plantation woodland, intensive arable farmland etc. which, despite their ubiquity, contribute to the ecological function of the local area (habitat networks etc.); ▪ Very small, but viable, populations of internationally/nationally important species or a species in a relevant UK/Council BAP which is important for the maintenance of the local meta-population. ▪ Locally important population/assemblage of an EPS, Schedule 1 and/or 5 species ▪ Networks of linear features, including species-poor hedgerows.
Less than Local Importance (Site Wide)	A Site Wide area is considered of site ecological value when it supports: ▪ Habitats of limited ecological value, e.g. amenity grassland, but which contribute to the overall function of the Application Site's ecological function.

64. Habitats and species of nature conservation importance are identified through policies and legislation. For example, habitats and species of international importance were originally listed on Annex I of the Habitats Directive (translated into specific legal obligations by The Conservation (Natural Habitats, &c.) Regulations 1994, known as the Habitats Regulations, in Scotland). Where these are considered of principal importance for biodiversity in Scotland, these features are also listed in the Nature Conservation (Scotland) Act 2004. Other features of importance are listed on the SBL or as Local Biodiversity Action Plan (LBAP) priorities. These elements provided a crucial starting point for the identification of IEFs requiring consideration in EcIA.

65. Application of professional judgement was applied to determine the level of importance and to identify IEFs against which effects on integrity can be assessed.

66. When determining the importance in the context of EcIA, contextual information regarding the value of the site to the species as well as the distribution and abundance of a given species was considered. For example, an uncommon species is recorded, but it is known to be widespread and common locally, and its range is regionally and nationally stable (regional importance as per **Table 6.2**), but if habitats on site are of low value to the species, the local population may be determined to be of local importance, or potentially less than local.

67. Alternatively if a population of an uncommon species is improving regionally and nationally (local importance as per **Table 6.2**), but habitats on Site that are of a high value and relatively rare regionally, the species is likely to constitute a notable proportion of a regional population, and therefore the local population may be considered to be of at least regional importance.

68. Additionally, in accordance with CIEEM guidance, where a legally protected species is present within the ZoI and there is potential for a breach of legislation, such species is considered to be an IEF. When valuing ecological receptors, professional judgement must be made based on an objective assessment of the best information available: in circumstances of reasonable doubt, a precautionary approach has been adopted.

6.4.2 Characterising Potential Effects on Receptors

69. In line with the CIEEM EcIA guidance, where possible, consideration is given to the following characteristics when identifying potential effects of the Proposed Development on IEFs:

- Nature of effect: whether it is positive (beneficial) to IEFs, e.g. by increasing species diversity or extending habitat, or negative (detrimental), e.g. by loss of, or displacement from, suitable habitat;
- Extent: the spatial or geographical area over which the effect may occur;
- Duration: the duration of an effect as defined in relation to ornithological characteristics (such as a species' life cycle) as well as human timeframes. It should also be noted that the duration of an activity may differ from the duration of the resulting effect; e.g. if short-term construction activities cause disturbance to breeding birds, there may be long-term implications from failure to reproduce that season;

- Frequency: the number of times an activity occurs may influence the resulting effect; and
- Timing: this may result in an impact on an ecological feature if it coincides with critical life stages or seasons.

6.4.3 Determining Magnitude of Effect

70. The magnitude of potential effects will be identified through consideration of the above effect characteristics, to determine the degree of change to baseline conditions predicted as a result of the Proposed Development. The criteria used in the EcIA for assessing the magnitude of an effect are summarised in **Table 6.3**.

Table 6.3 – Framework for determining magnitude of effect.

Magnitude of Effect	Definition
High	A fundamental change to the baseline condition of the asset, leading to total loss or major alteration of character.
Medium	A material, partial loss or alteration of character.
Low	A slight, detectable, alteration of the baseline condition of the asset.
Negligible/None	A barely distinguishable change from baseline conditions.

6.4.4 Determining Significance of Effect

71. Significance is a concept related to the weight that should be attached to effects when decisions are made. A significant effect is simply an effect that is sufficiently important to require that the decision-maker is adequately informed of the environmental consequences of permitting a development.

Significance of the potential effects on each identified IEF is determined through professional judgement, by considering both the nature conservation importance of each feature and the degree to which it may be affected (the effect magnitude) by the Proposed Development. To determine significance a matrix approach has been used and is illustrated in **Table 6.4**.

Table 6.4 – Significance of effects matrix.

	Sensitivity				
Magnitude of Impact	International	National	Regional	Local	Less than Local
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Minor
Low	Moderate	Minor	Minor	Minor	Negligible
Negligible	Minor	Negligible	Negligible	Negligible	Negligible

Key	
Significant Effect	
Non-Significant Effect	

6.4.5 Cumulative Effects

72. Cumulative effects can result from individually insignificant, but collectively significant actions, taking place over a period of time or concentrated in a location. Within EcIA, cumulative effects are particularly important as many ecological features are exposed to background levels of threat or pressure and may be close to reaching critical thresholds where further impact could cause irreversible decline. It is recognised that different actions can cause cumulative effects as follows:

- Additive/incremental effects: multiple activities/projects may give rise to a significant effect due to their proximity in time and space. These may be additive or synergistic effects; and
- Ancillary: ancillary developments may include different aspects of the project which may be authorised under different consent processes, these will be included as part of the cumulative assessment.

6.4.6 Requirements for Mitigation

73. Best practice guidance e.g. CIEEM 2018; 2019 identifies a hierarchy of mitigation for potential impacts that seeks to:

- Avoid adverse ecological impacts, especially those that could be significant to important receptors;
- Minimise adverse impacts that could not be avoided; and
- Compensate for any remaining significant residual impacts.

74. The embedded mitigation is considered in the design layout for the Proposed Development. Where likely significant adverse effects are predicted regardless of design layout, further mitigation is separately identified, as per CIEEM guidance.

6.4.7 Residual Impacts

75. Following the assessment of potential effects, including incorporation of embedded mitigation, all attempts will be made to avoid and mitigate significant effects. Where significant effects are predicted, further specific, applied mitigation is detailed. Following the application of this mitigation, an assessment of residual effects will be undertaken to determine the final significance of effects. Where residual effects remain significant or require application of compensatory measures, these will be considered against the relevant policy and legal objectives to determine the outcome of the application.

6.4.8 Embedded Mitigation & Good Practice

76. Application of the 'mitigation hierarchy' has been achieved throughout the Proposed Development process, with the identification and incorporation of methods for the avoidance of impacts and application of embedded mitigation. Measures to avoid or reduce potential ecological effects have been incorporated into the design of the Proposed Development ('embedded mitigation'). This includes 'mitigation by design' whereby aspects of the Proposed Development have been re-designed to avoid or reduce ecological effects. This type of mitigation is particularly beneficial for ecological resources as there is greater certainty that it will be delivered (CIEEM, 2018; 2019).

77. Mitigation by good practice is the active implementation of widely used good practice measures during the Proposed Development process. Although not 'embedded mitigation', mitigation by good practice forms an integral part of the development process.

78. As 'mitigation' is only applied to prevent, reduce or offset any specific significant adverse effects on IEFs, mitigation by good practice is introduced to ensure the safeguarding of the wider natural environment, including features that may have not been included in the EIA process, either as they were absent, and/or not considered of sufficiently important at the time.

79. Embedded mitigation, including the implementation of good practice, is taken into consideration when undertaking the assessment of significant effects. If significant effects are predicted further 'mitigation' is required to be detailed.

6.4.9 Mitigation by Design

80. Ecological features have been considered at all stages of the Proposed Development design, from initial feasibility to final layout. This has helped to avoid or greatly reduce impacts on IEFs and other ecological features. Critical design consideration has been the avoidance of habitats with high conservation value, and potential groundwater dependency, which has been largely achieved by re-designing parts of the Proposed Development infrastructure (e.g. re-aligning the Cable Route Corridor, implementing the use of a Trenchless Compound) away from any sensitive habitats or features.

81. The sensitive designs (e.g. of watercourse crossing and wetland areas) presented in **Chapter 5 - Project Description** of the EIA Report have been developed to safeguard the water environment, will also help effectively mitigate construction-related direct and indirect impacts to fish and other aquatic features.

6.4.10 Mitigation by Good Practice

6.4.10.1 Construction

82. In addition to the incorporation of effective mitigation through the Proposed Development design, the following sections outline mitigation of the Proposed Development impacts through practice, particularly with the aim of safeguarding protected species during the Proposed Development construction and operation. It is anticipated that these elements will be included in a Species Protection Plan (SPP), as part of the wider environmental management of the Proposed Development construction and operation, in accordance with NatureScot guidance.

6.4.10.2 Ecological Clerk of the Works

83. A suitably qualified and experienced Ecological Clerk of Works (ECoW) will be appointed to provide ecological and environmental advice during construction, including the monitoring of compliance with the recommendations of this EcIA Report and subsequent planning conditions. The ECoW will monitor and advise on the implementation of pollution prevention and good working practices throughout construction, to protect both terrestrial and aquatic ecosystems from accidental pollution.

6.4.10.3 Construction Phase Mitigation

84. Pre-construction surveys for protected species will be undertaken to provide up-to-date information about the distribution and abundance of the protected species. The results of the surveys will inform the need for and scope of Species Protection Plans and associated mitigation and licencing requirements, all of which will be developed in line with NatureScot guidance.

6.4.10.4 Construction Phase Mitigation for GWDTE's

85. Good practice design and construction and measures as outlined in the Construction Environmental Management Plan will minimise potential indirect effects of the Proposed Development on any GWDTEs during construction phase. This Plan will be provided prior to constructional work commencing. Further information on the embedded hydrological mitigation measures are detailed in **Chapter 10 - Hydrology and Hydrogeology**.

6.4.10.5 Construction Phase Mitigation for Aquatic Habitats

86. Mitigation presented within Chapter 10 - Hydrology and Hydrogeology of this EIA Report to safeguard the water environment, will effectively mitigate construction-related impacts to any aquatic species, such as the direct and indirect effect of pollution and sedimentation from instream works and surface water run-off. Water quality monitoring is recommended to ensure the safeguarding of the water environment and important aquatic features (see **Chapter 10 - Hydrology and Hydrogeology**).

6.4.11 Mitigation by Practice: Operation

Once the cable is operational, there will be minimal disturbance and/or impact on the ecological receptors identified. Operational activities may include maintenance and repair of the cables; however, it is not expected that this will be a regular occurrence. Therefore, any maintenance will require site-specific mitigation similar to that of the construction phase to protect the immediate environment, such as pollution prevention measures.

6.4.12 Mitigation by Practice: Decommissioning

87. Decommissioning activities are anticipated to be of a similar character to those of the Proposed Development construction and so the construction phase embedded mitigation outlined above is considered appropriate to the decommissioning phase.

6.4.13 Compensation

88. Where there are significant residual adverse ecological effects despite the mitigation proposed, these should, under EcIA guidelines (CIEEM, 2018; 2019), be offset by appropriate compensatory measures.

6.4.14 Biodiversity Enhancement and Habitat Management Plan (HMP)

89. The Applicant has committed to the provision of a Habitat Management Plan to reduce adverse environmental effects and to provide significant enhancements for important ecological features and biodiversity at the Proposed Development and as a requirement in line with Policy 3 of National Planning Framework 4. Biodiversity enhancements must be identified in proportion to the opportunities on site, scale of the development and informed by the ecological survey.

6.4.14.1 Enhancement of Riverine Habitats

90. Objective 1: Management of Bank Side Vegetation, via riparian planting in appropriate areas within the Site to deliver benefits to fish and macro-invertebrates, including the casting of shade, maintenance of cool water temperatures, provision of cover and sources of food from infalling litter and insects, and to deliver opportunities for other wildlife, including foraging and commuting bats, terrestrial mammals (including otter), birds and reptiles.

91. Objective 2: Riparian Planting, to include both continuous and discontinuous shrub and tree-dominated planting of broad-leaved species of local provenance, to provide cover for commuting otters, and potentially rest site opportunities in denser areas of planting. Benefits for other biodiversity including fish and amphibians will benefit otters and bats by potentially increasing food resources.

6.4.14.2 Enhancement of Terrestrial Habitats

92. Objective 1: Hedge and tree planting, to include both species-rich hedges and trees (broad-leaved species) planting along field margins of species of local provenance. This will provide commuting corridors for badgers and other species, such as bats, and increase insects and nesting potential for birds.

93. Objective 2: Planting of wildflower edges/corridors along agricultural fields. This will provide bees and other pollinating insects with food, shelter and places to breed. This will provide essential supporting habitat for corn bunting. An increase in pollinating insects within a farmland environment assists in the pollination of arable crops.

94. The appropriateness of any specific measures proposed to achieve the aims and objectives, methods to be used and suitable locations within the Site for implementation, will be determined in consultation with the landowners, NatureScot, Aberdeenshire Council (AC) and Green Volt Offshore Windfarm Ltd, post-consent. Prescriptive measures will be included in the HMP to be agreed with NatureScot, AC and additional relevant stakeholders, and to be secured by appropriate planning condition. The success of management prescriptions and habitat creation in achieving the aims and objectives of the HMP will be monitored, with the results reported to an advisory group, in accordance with timings and protocols to be agreed with NatureScot and AC. The HMP, once finalised, will be a live document, with the habitat management measures implemented being adaptive throughout the lifetime of the proposed development in response to the findings of ongoing monitoring.

6.5 Baseline Description

6.5.1 Desk Study Results

6.5.1.1 Statutory & Non-Statutory Designated Sites

95. There are statutory designated sites located within 5km of the ESA boundary that have ecological qualifying features, and within 10km for ornithological interests (**Table 6.5**).

Table 6.5 – Statutory Designated Sites within 5km for ecological interest and 10km for ornithological interests of the Site.

Site of Interest	Distance from site (approx.)	Description/Qualifying Features of Interest only	Condition (at last assessed date)
Sites of Special Scientific Interest & Special Areas of Conservation			
Rora Moss SSSI	2.08km	Raised bog	Unfavourable No change, 21 Jun 2012

Site of Interest	Distance from site (approx.)	Description/Qualifying Features of Interest only	Condition (at last assessed date)
Kirkhill SSSI	3.93km	Quaternary of Scotland	Favourable Maintained, 7 Jul 2010
Moss of Cruden SSSI	4.36km	Quaternary of Scotland	Favourable Maintained, 8 Jun 2007
Gight Woods SSSI	4.26km	Upland mixed ash woodland Upland oak woodland	Favourable Declining, 1 May 2013 Favourable Maintained, 19 Mar 1999
Windy Hills SSSI	4.37km	Quaternary of Scotland	Favourable Maintained, 15 May 2007
Bullers of Buchan Coast SSSI	7.4km	Birds: Seabird colony, breeding Kittiwake (*Rissa tridactyla*), breeding Guillemot (*Uria aalge*), breeding Shag (*Phalacrocorax aristotelis*), breeding	 Favourable Maintained, 24 Jun 2016 Unfavourable No change, 24 Jun 2016 Favourable Recovered, 24 Jun 2016 Favourable Maintained, 24 Jun 2016
Buchan Ness to Collieston SAC	7.4km	Vegetated sea cliffs	Favourable Declining, 21 Jun 2016
Special Protection Areas			
Buchan Ness to Collieston Coast SPA	5.3km	Birds: Seabird assemblage, breeding Fulmar (*Fulmarus glacialis*), breeding Herring gull (*Larus argentatus*), breeding Guillemot (*Uria aalge*), breeding Kittiwake (*Rissa tridactyla*), breeding Shag (*Phalacrocorax aristotelis*), breeding.	 Favourable Recovered, 16 Jun 2017 Unfavourable Declining, 16 Jun 2017 Unfavourable No change, 16 Jun 2017 Favourable Maintained, 16 Jun 2017 Unfavourable No change, 16 Jun 2017 Unfavourable No change, 16 Jun 2017
Loch of Strathbeg SSSI, SPA	8.3km	Birds: Goldeneye (*Bucephala clangula*), non-breeding Pink-footed goose (*Anser brachyrhynchus*), non-breeding Greylag goose (*Anser anser*), non-breeding Sandwich tern (*Sterna sandvicensis*), breeding Svalbard barnacle goose (*Branta leucopsis*), non-breeding Teal (*Anas crecca*), non-breeding Whooper swan (*Cygnus cygnus*), non-breeding. Loch of Strathbeg Goose Management Scheme S49	 Condition Not Assessed Favourable Maintained, 1 Apr 2009 Unfavourable No change, 1 Apr 2009 Unfavourable No change, 31 Jul 2013 Unfavourable Declining, 1 Mar 2014 Favourable Maintained, 1 Apr 2009 Favourable Maintained, 1 Mar 2014

96. There are woodlands designated in the Ancient Woodland Inventory and Native Woodland Survey of Scotland (NWSS) sites within 2km of the site boundary (**Table 6.6**). Only those within the 250m buffer from the Application Site Boundary are listed in **Table 6.6**. There are conifer plantations listed within the National Forestry Inventory within the 250m survey buffer for the site and within the 2km buffer. There are three local conservation sites within the 2km of the site.

Table 6.6 - Non-Statutory Designated Sites within 2km of the Site.

Site of Interest	Distance from site (approx.)	Description/Qualifying Features of Interest only
Native Woodland Survey Scotland (main ones listed only)		
Lowland mixed deciduous woodland (multiple)	42m	Mixed mature Young pole, immature Established regeneration Pole immature
Wet woodland (multiple)	200m 32m 0m	Young pole, immature Mixed Pole immature, mainly broadleaved Young pole, immature (Mixed mainly conifer)
Unidentifiable type (multiple)	163m 218m 113m	Mixed mature, with some regeneration Established regeneration Young pole, immature
Nearly-native woodland	30m 60m	Young pole, immature Young pole, immature
Upland birchwood	64m	Established regeneration
Ancient Woodland Inventory		
Broadleaved woodland	230m	Ancient (of semi-natural origin): 2a
Mainly Conifer	54m 0m (within working area)	LEPO:2b Mainly Conifer LEPO:2b
Local Nature Conservation Sites		
Rattray Head to Peterhead LNCS	Within 250m ESA	Variety of coastal habitats including sand dunes. Good diversity of plant species including several species that are rare in NE Scotland. Adjacent fields important for roosting and feeding geese, waders and wildfowl.
Rora Moss LNCS	1.3km	Lowland raised bog with acid grassland, ponds and rush pasture. Good variety of peatland species. The southern part of the site is commercial forestry with bog habitat in the unplanted areas.
Skelmuir Hill, Stirling Hill, Dudwick LNCS	1.6km	Preglacial Buchan Gravels Formation, which is rich in flints, blankets the ridge of Stirling Hill, Hill of Dudwick and Skelmiur Hill. Den of Boddam glacial meltwater channel.

6.5.2 Protected Species

97. The biological records obtained via NESBReC of legally protected species are summarised in **Table 6.7**.

Table 6.7 – Protected species of interest to a 500m survey buffer.

Species	Abundance	Date Range
Badger	10	2000-2015

Species	Abundance	Date Range
Brown Hare	11	1981-2015
Eurasian Red Squirrel	1	1991-1995
Common Pipistrelle	4	2004-2022
Pipistrelle species	1	2009
Soprano Pipistrelle	1	2006
Daubentons Bat	4	1992-2003
Pine Marten	2	1980 & 2020
European Otter	14	1991-2022
West European Hedgehog	4	1992-2012

6.5.3 Baseline Field Survey Results

6.5.3.1 Habitats and Botanical Survey Overview

98. A summary of the Phase 1 broad habitat types are presented in **Table 6.8**.

99. Figure 7 Maps 1-16 within **Appendix 6.1** displays the NVC survey results; standard Phase 1 shading has also been used to broadly characterise stands of vegetation based on the dominant NVC community within a particular area (Figure 6 Maps 1-16). The majority of the habitat is agricultural consisting of arable and modified grassland fields for grazing. There are mosaics of marshy grassland, swamps and mires in wetter areas mainly associated with minor and major watercourses. There are small areas of highly modified remnant bog habitats and woodland of varying classifications and types within the ESA. The full details of the National Vegetation Classification & Habitats Survey are within **Appendix 6.1**.

Table 6.8 – Phase 1 Habitat Types recorded within the ESA.

Phase 1 Code	Description
Woodlands and Scrub	
A1.1.1	Woodland Broadleaved: semi-natural (some AWI/NSSI)
A1.1.2	Woodland Broadleaved: plantation
A1.2.2	Woodland Coniferous: plantation
A1.3.1	Woodland Mixed: semi-natural (some AWI/NSSI)
A1.3.2	Woodland Mixed: plantation
A2.1	Scrub: Dense/continuous
A2.2	Scrub: Dense/scattered
A3.1	Parkland/Scattered trees: broadleaved
A3.2	Parkland/Scattered trees: conifers
A3.3	Parkland/Scattered trees: mixed
Grassland and Marsh	
B2.2	Neutral grassland: semi-improved
B4	Improved grassland
B5	Marsh/marshy grassland
B6	Poor semi-improved grassland
Tall Herb and Fern	
C3.1	Tall herb and Fen: tall ruderal
Mire	
E1.7	Mire: Wet Modified Bog
Swamp, Marginal and Inundation	
F1	Swamp
F2.2	Swamp: Marginal and Inundation
Open Water	

Phase 1 Code	Description
G1	Standing water
G2	Running water & ditch systems
Coastland	
H1.1	Coastland Intertidal: sand
H6.5	Sand dune: grassland
Rock Exposure & Waste: Artificial	
I2.1	Quarry
Miscellaneous	
J1.1	Cultivated/disturbed land: arable
J1.2	Cultivated/disturbed land: amenity
J2.1.1	Intact hedge: species rich
J2.1.2	Intact hedge: species poor
J2.2.2	Defunct hedge: species poor
J2.3.1	Hedge and trees: native species rich
J2.3.2	Hedge and trees: species poor
J2.4	Fence
J2.5	Stone wall
J3	Built area/hardstanding
J3.6	Buildings
J4	Bare ground

6.5.3.2 Calculated Habitat Area

100. The area and percentage of habitats within the ESA were calculated and are provided in **Table 6.9**. The habitat area calculations are rounded up (to the second decimal point), and with overlapping of habitats, mosaics and the three-dimensional nature of habitats, the areas given are approximations. Habitat area calculations are based on the total area of land within the ESA as 2205.18ha and grouped according to main broad habitat. The main largest habitat within the ESA is arable crop fields at 53.34%, with modified grassland fields at 30.67%. All woodland types and scrub total 4.2% of the area. Areas grouped together included other habitats, such as linear features of hedges, tree lines, ditches, watercourses, tracks, roads, and hardstanding's, residential and farm buildings and totalled 3.8% of the calculated area.

Table 6.9 – Summary of calculated areas of broad habitat types within the ESA.

Phase 1 habitat	Area (ha)	% of Habitat in ESA
A1.1.1	16.46	0.75
A1.1.2	11.34	0.51
A1.2.2	30.14	1.37
A1.3.1	2.84	0.13
A1.3.2	10.88	0.49
A2.1	5.88	0.27
A2.2	7.72	0.35
A3.1	6.25	0.28
A3.2	0.28	0.01
A3.3	0.81	0.04
B2.2	93.29	4.23
B4	676.32	30.67
B5	33.02	1.5
C3.1	11.77	0.53
E1.7	1.03	0.05
F1	0.88	0.04
F2.2	0.3	0.01
G1	3.12	0.14

Phase 1 habitat	Area (ha)	% of Habitat in ESA
G2	0	0
H1.1	1.24	0.06
H6.5	8.5	0.39
I2.1	5.58	0.25
J1.1	1176.33	53.34
J1.2	17.32	0.79
Other habitats*	83.87	3.8
Total	2205.18	100

**hedges, tree lines, ditches, watercourses, residential & farm buildings, hardstanding, tracks and roads etc.*

6.5.3.3 NVC Survey Results

101. A total of twenty-six NVC vegetation types, with non-NVC types such as arable and plantation (Conifer, Broadleaved and Mixed woodland), buildings, tracks and roads, were located in this survey, these National Vegetation Communities are presented in **Table 6.10**. The full details of the National Vegetation Classification & Habitats Survey are within **Appendix 6.1**.

102. Much of the vegetation communities on site have been impacted by farm practices and include grassland modification, drainage and grazing. These can also form transitional zones to other plant communities, especially where land has been unmanaged, or is adjacent to main watercourses.

Table 6.10 – National Vegetation Classification types recorded within the ESA.

NVC Code	Community/Sub-community name
Woodlands and Scrub	
W4	*Betula pubescens-Molinia caerulea* woodland
W7	*Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland
W9	*Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis* woodland
W11	*Quercus petraea – Betula pubescens – Oxalis acetosella* woodland
W23	*Ulex europaeus-Rubus fruticosus* scrub
Mires	
M18	*Erica tetralix-Sphagnum papillosum* raised and blanket mire
M20a	*Eriophorum vaginatum blanket and raised* mire*:*
M23	*Juncus effusus/acutiflorus – Galium palustre* rush-pasture *Juncus effusus* sub-community
M25	*Molinia caerulea-Potentilla erecta* mire
M27	*Filipendula ulmaria-Angelica sylvestris* tall-herb fen
Mesotrophic Grassland	
MG5	*Cynosurus cristatus-Centaurea nigra* grassland
MG6	*Lolium perenne-Cynosurus cristatus* grassland
MG7	*Lolium perenne* leys and related grassland
MG10a	*Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community
Open Vegetation	
OV21	*Poa annua – Plantago major* community
OV22	*Poa annua-Taraxacum officinale* community
OV25	*Urtica dioica-Cirsium arvense* community
OV27	*Chamerion angustifolium community*
Swamps and Fens	
S5	*Glyceria maxima* swamp
S9	*Carex rostrata* swamp
S28	*Phalaris arundinacea tall-herb* fen
Sand Dune	
SD5b	*Leymus arenarius mobile dune community, Elymus farctus* sub-community
SD6a	*Ammophila arenaria mobile dune community, Elymus farctus* sub-community
SD6e	*Ammophila arenaria mobile dune community, Festuca rubra* sub-community

NVC Code	Community/Sub-community name
SD8a	*Festuca rubra-Galium verum fixed dune grassland, typical* sub-community
SD9a	*Ammophila arenaria-Arrhenatherum elatius dune grassland, typical* sub-community
Non NVC types	
C	Non NVC type - Crop/Arable
MP	Non NVC type - Mixed Plantation
BP	Non NVC type - Broadleaved Plantation
CP	Non NVC type - Coniferous Plantation
Other	Non-NVC type (watercourses, ditches, stone walls, fences & tracks, buildings and quarries)

6.5.3.4 GWDTE Assessment Results

103. **Table 6.11** summarises the habitats found in the survey and following the Scottish Environmental Protection Agency Guidance (SEPA, 2017a; 2017b), are classed as Groundwater Dependent Terrestrial Ecosystems (GWDTE). A Figure illustrating the potential GWDTE recorded is presented in **Appendix 6.1: Figure 8 Maps 1-4.** An evaluation of site-specific groundwater dependency is detailed in **Appendix 6.1.**

Table 6.11 – NVC communities and their GWDTE score (1= Strong dependency upon groundwater, 2= likely to be some dependency, 3= slight or no dependency: site fed by other water sources)

NVC Community	GWDTE score (1, 2, or 3)
W4 *Betula pubescens-Molinia caerulea* woodland	1
W7 *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland	1
M23 Juncus effusus/acutiflorus – Galium palustre rush-pasture Juncus effusus sub-community	2*∞
M27 *Filipendula ulmaria-Angelica sylvestris* tall-herb fen	2
MG10a *Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community	2*∞
MG5 *Cynosurus cristatus-Centaurea nigra* grassland	3
M25 *Molinia caerulea-Potentilla erecta* mire	3
M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire	3
M20a *Eriophorum vaginatum blanket and raised* mire	3
S5 *Glyceria maxima* swamp	3
S9 *Carex rostrata* swamp	3
S28 *Phalaris arundinacea tall-herb* fen	3
* GWDTE Score Scotland or may vary for different hydroecological settings ∞ Country Occurrence: Scotland only – Not in England & Wales *Explanation of GWDTE scores:* *1 – Strong dependency upon groundwater discharge (Red-Highly).* *2 – Likely to be some dependency on groundwater discharge (Yellow-Moderate).* *3 – Groundwater discharge usually irrelevant: site fed by other water sources.*	

6.5.3.5 Summary of Habitat Sensitivities

104. The NVC habitat types, their associated habitat sensitivities and their corresponding categories for the SBL List and Annex 1 designations are summarised in **Table 6.12**.

Table 6.12 – NVC types recorded at the Proposed site, with corresponding GWDTE designation, SBL and/or Annex 1 designations.

NVC	GWDTE	SBL	EU Habitats Directive Annex I habitat type
W4	1	Wet woodland	N/A
W7	1	Wet woodland	N/A
MG10a	2		N/A
M23	2	Upland flushes, fens, swamps (applies to M23a only)	N/A

NVC	GWDTE	SBL	EU Habitats Directive Annex I habitat type
M27	2		N/A
M25	3	Lowland raised bog	Blanket bog (H7130)
M20a	3	Lowland raised bog	Blanket bog (H7130)
M18	3	Lowland raised bog	Blanket bog (H7130)
S5	3	Upland flushes, fens and swamps/ Lowland fens	N/A
S9	3	Upland flushes, fens and swamps/ Lowland fens	N/A
W11	0	Lowland mixed deciduous woodland	Old sessile oak woods with *Ilex* and *Blechnum* (H91A0)
SD5b	0	Coastal sand dunes	Embryonic shifting dunes (H2110)
SD6a,e	0	Coastal sand dunes	Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') (H2120)
SD8	0	Coastal sand dunes	Fixed dunes with herbaceous vegetation ('grey dunes') (H2130)
SD9	0	Coastal sand dunes	Fixed dunes with herbaceous vegetation ('grey dunes') (H2130)

105. There are two Class 1 GWDTE (W4 & W7) which are highly dependent on groundwater sources. These woodlands have been classed as wet woodland on the NWSS inventory. One woodland is located (NJ 99190 43847) in wetter/damp soil adjacent to a pond. The other woodland is located at NJ 92874 44391 and is mostly a plantation woodland with an area of wetter ground where native regenerated birch and willow are present. This woodland is in proximity to the Cable Route Corridor.

106. There are three communities categorised as Class 2 GWDTE (MG10a, M23 & M27). M23 is mainly Class 2 but can be a Class 1 under certain hydrogeological circumstances, however, the M23 located within the ESA is associated mainly with seepage, drainage channels and surface water flow. The MG10a community is in multiple locations and mainly within modified grassland fields where drainage is impacted.

107. There are five communities categorised as Class 3 GWDTE (M18, M20a, M25, S5 & S9). M25 is a community that can be a Class 2 under certain hydrogeological circumstances, however, the M25 is associated with bog mire communities which share the same hydrology sources.

108. Some parts of the areas identified as moderate groundwater-dependent (Class 2) habitats are on or near areas of Class 5 soil. In this classification the soil information takes precedence over vegetation data. The peat class, its location and the vegetation types have been summarised in **Appendix 6.1: Table 4**. It can be assumed that the underlying substrate in these areas is peat under the present vegetation, and water flow through peat occurs at a slow rate.

109. Where there are moderate GWDTE located on non-peat soil classification there appears to be ponding in shallows and dips where water accumulates, leading to surface waterlogging. This can occur where the surface topography is typically almost flat with minor surface irregularities, which would tend to encourage ponding in the natural hollows.

110. The NVC communities that correlate with Annex I types H7130, H91A0, H2110, H2120 and H2130 are listed in **Table 6.12**. The findings are summarised as follows in regard to correlation to Annex 1 designations;

- The Annex I type H7130 Blanket bog does not correlate directly with the NVC communities within the study area, such as M18, M20 and M25. These NVC communities within the study area are considered to have been heavily modified because of existing forestry works, grazing from deer and the creation of drainage ditches.
- The Annex I type H91A0 does not correlate directly with the NVC communities within the study area, such as W11, both of which lacked in species variety within the understory and ground flora and did not have the

full floristics for the H91A0 and tended to have some of the characteristics of W11c, but not fully. Much of the woodland was small in size and this may have had an impact on its management.

- The Annex 1 type H2110 does correlate with that of the SD5 located within the ESA within the landfall vicinity.
- The Annex 1 type H2120 does correlate with that of the SD6 located within the ESA within the landfall vicinity.
- The Annex 1 type H2130 does correlate with that of the SD8 and SD9 located within the ESA within the landfall vicinity.

6.5.4 Protected Species Survey Results

111. Potential suitable habitat is present on the Site for bats, badger, otter, water vole, pine marten, hedgehog, brown hare, red squirrel and roe deer.

6.5.4.1 Badger

112. Multiple badger setts were recorded within the ESA (see **Appendix 6.4: Confidential Annex**). These varied in size from maternity setts of over 20 entrances to single outliers. The Site is suitable for foraging and commuting for badgers and there are numerous opportunities for foraging in the surrounding habitats. The field margins, hedgerows and woodland offers good connectivity pathways within the surrounding area, as badgers are known to travel widely. Multiple field signs of badger were located along the route and included burrows, pathways, scat, footprints, scrapings and fur on fence wire.

6.5.4.2 Otter

113. Otter field signs were noted and two possible otter holts were recorded within the ESA (see **Appendix 6.2**). Otters are known to occur on the River Ugie with evidence of a potential otter resting place, spraints and paw prints. The habitat is suitable for otter on the watercourses including North & South Ugie Water and River Ugie. Holts would be expected to occur under tree roots and thick vegetation along the bankside. Trenchless techniques are proposed for the crossings of all watercourses.

6.5.4.3 Water Vole

114. Evidence of water vole was recorded within the ESA and located on the majority of the major river crossings, and minor watercourses and ditches. Water vole burrows, pathways, feeding remains and latrines were located in vegetation up to 10 metres away from watercourses in suitable habitat such as dense *Juncus effusus* (see **Appendix 6.2**). Watercourses had high habitat suitability to support water vole, especially where the water flow was slow. Sections of the ditches and watercourse banksides were frequently densely vegetated with rush vegetation and various grasses. This habitat was considered to provide suitable coverage from potential predators, whilst providing suitable food sources.

6.5.4.4 Red Squirrel

115. No field signs of red squirrel or their dreys were recorded within the survey area, however there is suitable habitat on Site.

6.5.4.5 Pine Marten

116. No evidence of pine marten was recorded within the ESA. In discontinuous habitats, linear features such as established hedgerows, stone walls, roads and small stands of woodland may be important features as links between foraging areas for pine marten. The Proposed Development is in a landscape which is dominated by farmland, major and minor watercourses and scattered woodland. Important linear features consist of treelines and multiple hedgerows.

6.5.4.6 Brown Hare

117. Evidence of brown hare were recorded during the survey, with multiple hares sighted across the Site during the survey period. The habitat of farm fields and woodland is suitable for brown hare.

6.5.4.7 Bats

118. No buildings are to be demolished and it is expected that felling of mature trees will be avoided. Preliminary Roost Assessments (PRA) of trees that have bat roost potential were highlighted, however design meetings clarified that these trees were not being felled.

6.5.4.8 Ornithology

119. Twenty-two species of birds designated as BoCC Red or Amber listed were recorded as breeding or possibly breeding within the survey area (see **Appendix 6.3: Table 3**). Of these twenty-two species only four species were recorded breeding in open or arable fields. The open grazing and arable fields had scattered pairs of skylarks throughout the survey area and small numbers of meadow pipit with corn buntings recorded and oystercatcher. All the other species recorded were along treelines, hedgerows, woodland edges, rough dense vegetation and near water.

120. No hen harrier, short-eared owl, lapwings or curlew were recorded breeding within the survey area. Curlews were heard offsite to the north near Ednie. Sparrowhawk, kestrel and buzzard were deemed to be breeding throughout the survey area where plantations and mature trees were present. Snipe were recorded calling in suitable rough habitat near the River Ugie. Sedge warblers were relatively common in these areas along with smaller numbers of reed bunting and occasional grasshopper warbler. Breeding bird species near plantation edges and mature treelines included sparrowhawk, stock dove, bullfinch, buzzard, wren, coal tit, robin, willow warbler, goldcrest, chaffinch and blackbird.

6.5.4.9 Other Species

121. No evidence of reptiles (including sightings) were recorded during surveys.

122. Common frog and toad were infrequently recorded throughout the wetter habitats of the ESA during surveys. Habitats were suitable for amphibians in the wetter areas of vegetation, such as waterlogged grassland, marshy grassland and swamp vegetated habitats.

123. Deer prints were evident on wet mammal paths and indicated that the habitat is used by deer. Small numbers of roe deer were noted infrequently. There are no impassable fences in the wider area so the deer can roam widely and freely.

124. Every five years the British Deer Society undertakes a survey plotting the current distribution of all six species of wild deer in Great Britain and Northern Ireland and uses it to monitor and record changes from the previous survey to establish if the range has changed.

125. The results of the 2016 Deer Distribution Survey indicate the following in the area where the site is located:

- Roe deer were recorded in 2007 and/or 2011 and reconfirmed in 2016.
- No other deer species have been recorded in the area of the site.

126. The Deer distribution survey and map are awaiting update and collation of the 2022 survey data.

6.6 Determination of Important Ecological Features

127. **Table 6.13** evaluates the importance of ecological features associated with the Proposed Development, and determines which ecological features, based on both their intrinsic value and their potential to be affected by the project, are considered to be IEFs.

128. Each ecological feature has been assigned a level of importance in accordance with the geographical scale outlined in **Table 6.2**. Features of Local or Less than Local importance, and those to which impacts can be categorically ruled out, are scoped out of further assessment. However, if impacts to such features – even if not significant in terms of EcIA – may result in legal offences then suitable safeguards will be presented in **Section 6.7.**

Table 6.13 – Determination of ecological importance.

Ecological Feature	Evaluation Rationale	Conservation Importance	IEF/Action
Statutory Designated Sites			
Rora Moss SSSI	This designation is located to 2.08km north of the Site. The qualifying feature is active raised bog and was assessed to be in unfavourable with no change, assessed in 21 June 2012. There will be no land take from this designation. There is indirect hydrological connectivity with this designation via a tributary of the North Ugie Water. However due to the distance of the designation, absence of direct connectivity it is not anticipated that the designation and its qualifying feature will be directly or indirectly affected by the Proposed Development.	National	No/ Scoped out of assessment
Kirkhill SSSI	This designation is located 3.93km to the north of the Site. The qualifying feature is geological. Due to the distance of the designation, absence of direct connectivity and no biological designation it is not anticipated that the designation will be directly or indirectly affected by the Proposed Development.	National	No/ Scoped out of assessment
Moss of Cruden SSSI	This designation is located 4.36km to the north of the Site. The qualifying feature is geological. Due to the distance of the designation, absence of direct connectivity and no biological designation it is not anticipated that the designation will be directly or indirectly affected by the Proposed Development.	National	No/ Scoped out of assessment
Gight Woods SSSI	This designation is located to 4.26km south-west of the Site. The qualifying features are: Upland mixed ash woodland: assessed to be in favourable condition, but declining, assessed in 1 May 2013. Upland oak woodland: assessed to be in favourable and maintained condition, assessed in 19 Mar 1999. There will be no land take from this designation. There is no direct connectivity with this designation and due to the distance it is not anticipated that the designation and its qualifying features will be directly or indirectly affected by the Proposed Development.	National	No/ Scoped out of assessment
Windy Hills SSSI	This designation is located 4.37km to the south-west of the Site. The qualifying feature is geological. Due to the distance of the designation, absence of direct connectivity and no biological designation it is not anticipated that the designation will be directly or indirectly affected by the Proposed Development.	National	No/ Scoped out of assessment

Ecological Feature	Evaluation Rationale	Conservation Importance	IEF/Action
Bullers of Buchan Coast SSSI, SAC	This designation is located on the east coast, 7.4km to the south-east of the Site, and south of Peterhead. The qualifying feature is geological and biological and supports colonies of breeding birds which are of international importance. There will be no land take from this designation. The landfall connection is located near coastal sand dune habitat and agricultural fields, north of Peterhead. Due to the designated features of breeding bird colonies specifically associated with vegetated sea cliffs for breeding purposes it has been scoped out of the assessment as impact will be negligible.	International	No/ Scoped out of assessment
Buchan Ness to Collieston Coast SPA	This designation is located on the east coast, 5.3km to the south-east of the Site, and south of Peterhead. The qualifying feature is biological and supports breeding seabirds (in excess of 20k) which are of international importance. There will be no land take from this designation. The landfall connection is located near coastal sand dune habitat and agricultural fields, north of Peterhead. Due to the designated feature of seabirds specifically associated with stretches of cliffs, formed of granite, quartzite, with occasional sand beach there will be no direct connectivity with the qualifying features and the Site. Therefore, it has been scoped out of the assessment as impact will be negligible.	International	No/ Scoped out of assessment
Loch of Strathbeg SSSI, SPA	This designation is located on the east coast, 8.3km to the north-east of the Site. The qualifying feature is biological and supports non-breeding waterfowl which are of international importance via habitats of shallow freshwater loch with surrounding wetland, dune and grassland communities. There will be no land take from this designation. The landfall connection is located near coastal sand dune habitat and agricultural fields, north of Peterhead. Due to the distance of the designation, absence of direct connectivity it is not anticipated that the designation will be directly or indirectly affected by the Proposed Development. Therefore, it has been scoped out of the assessment as impact will be negligible.	International	No/ Scoped out of assessment
Non-Statutory Designated Sites			

Ecological Feature	Evaluation Rationale	Conservation Importance	IEF/Action
Ancient Woodland Inventory Scotland	There are multiple AWI woodlands within 2kms of the Application Site Boundary and most are considered to be outwith the ZoI of the Proposed Development. There are two AWI listed woodlands that are within the working corridor. ▪ Crichie Wood (AWI: LEPO 2b) is listed on the Ancient Woodland Inventory and is within the ESA. This woodland consists of mainly conifer plantation with broadleaved trees along the southern edge and regeneration occurring within the main area of woodland. This woodland is approximately 67m north of the working corridor. ▪ The Cable Route Corridor is proposed through a narrow belt of broadleaved trees listed as AWI: LEPO 2b (New Deer) at approx. NJ 90537 44968. These AWI LEPO: 2b woodlands are semi-natural woodlands that have been continuously wooded (since 1860) to the present day. Due to the distance of Crichie Wood (outwith the working corridor, but within the ESA) and absence of direct connectivity it is not anticipated that the designation will be directly or indirectly affected by the Proposed Development. Where the cable route and working corridor is proposed through an AWI, the woodland is adjacent to the junction of A948 and B9106 roads. During the design process the method proposed is to be trenchless for the cable to be taken under the woodland and road junction. Tree root protection zones will be implemented to ensure that this AWI will not be impacted. Mitigation will also follow the guidance for buffer zone recommendations for ancient woodland (UK Gov, 2022). However, due to their proximity and sensitivity they have been scoped in for further assessment.	Regional	Yes/ Scoped into the assessment
Native Woodland Survey Scotland	There are multiple NWSS listed woodlands within 2kms of the Application Site Boundary and most are considered to be outwith the ZoI of the Proposed Development. There are two NWSS listed woodlands that are in close proximity to the working corridor. However, one listed NWSS woodland, which is a wet woodland (NJ 99190 43847) is approximately 45 meters south from the working corridor. There will be no land take from this woodland, however due to its proximity mitigation is proposed such as the inclusion of Tree Root Protection Zones. The working corridor is 8m south of a wet woodland in the NWSS list (NJ 92897 44302). The Application Site Boundary follows the woodlands southern edge. There will be no land take from this woodland, however due to its proximity mitigation is proposed such as the inclusion of Tree Root Protection Zones. A native woodland (classed on the NWSS list and NVC W9) is located at NJ 89809 45050). The working corridor is 137m distance from this woodland.	Regional	Yes/ Scoped into the assessment

Ecological Feature	Evaluation Rationale	Conservation Importance	IEF/Action
	However, due to their proximity and sensitivity (as NVC W4, W7 & W11) they have been scoped in for further assessment.		
Local Nature Conservation Sites			
Rattray Head to Peterhead LNCS	This LNCS is within the ESA at the eastern coastal section of the linear route. The working corridor and Application Line Boundary follow the LNCS site boundary. The site is noted for its variety of coastal habitats including; ▪ Sand dunes ▪ Good diversity of plant species including several species that are rare in NE Scotland. ▪ Adjacent fields important for roosting and feeding geese, waders and wildfowl. Although there will be no land take from the LNCS, there is direct contact with the working corridor and that the adjacent fields may support roosting and feeding geese, waders and wildfowl. Mitigation will be applied and include: Good practice for pollution prevention and silt mitigation during the construction phase. This LNCS has been scoped into the assessment due to proximity.	Local	Yes/ Scoped into the assessment
Rora Moss LNCS	This LNCS is located 1.3km to the north of the Site. The site is lowland raised bog with acid grassland, ponds and rush pasture. Good variety of peatland species. The southern part of the site is commercial forestry with bog habitat in the unplanted areas. There will be no land take from this designation. There is indirect hydrological connectivity with this designation via a tributary of the North Ugie Water. However due to the distance of the designation, absence of direct connectivity it is not anticipated that the designation and its qualifying feature will be directly or indirectly affected by the Proposed Development.	Local	No/ Scoped out of assessment
Skelmuir Hill, Stirling Hill, Dudwick LNCS	This LNCS is 1.6km to the south of the Site. It is known for its geological features. Due to the distance and no connectivity to the designation and its qualifying feature, it has been scoped out of the assessment.	Local	No/ Scoped out of assessment
Notable Habitats & Related Designation/Sensitivity			
Woodlands and Scrub			
W4, W7, W9 & W11	The W4 and W7 woodland are close fits to the wet woodland classification and lack the full number of floristics. This may be due to the small size of the woodlands and drainage management. They form mosaics with W11 classification in woodlands located at NJ 99190 43847 and NJ 92897 44302	Regional	Yes/ Scoped into the assessment

Ecological Feature	Evaluation Rationale	Conservation Importance	IEF/Action
	and are associated with wet woodlands on the NWSS list. W9 is located at NJ 89809 45050 associated with a native woodland on the NWSS list. W4 and W7 are classed as highly dependent on groundwater. These have been scoped into further assessment via the AWI and NWSS assessment due to proximity and sensitivity of the habitats.		
W23	There is Gorse scrub which is common throughout the site. Habitat is considered to be Less than Local Importance.	Less than Local	No/ Scoped out of assessment
Mires			
M18, M20a, & M25	Potential GWDTE of low dependency and are modified habitats in areas of Class 1 Peat. Class 1 Peat is a nationally important resource, and is likely to be of "high conservation value". It is recognised that this definition is not directly applicable to evaluating purely the Nature Conservation Value of peatland. Noted as being low in species diversity, which is an indication of negative pressures resulting from historical land management practices. The bog habitats are highly modified due to historical impacts from drainage, farming, grazing practices, and plantations resulting in a modified species poor bog. There will be not land take from this habitat following on from the design process stages where these areas were avoided.	Regional	No/ Scoped out of assessment
M23	Potential GWDTE of moderate to high dependency. Located in multiple areas and habitats associated with sub-surface water associated mainly with seepage, drainage channels, minor water channel embankments and surface water flow, and where grazing is evident. In most instances located in topographic situations where a suitable aquifer or point of discharge would not typically be present and is likely due to sub-surface flow/percolation through the soil. Habitat is considered to be Less than Local Importance.	Less than Local	No/Scoped out of assessment
M27	This is a rich herb mire associated with mesotrophic soils and forms mosaics with swamp communities. The M27 is not a rare community, however, it is ecologically important for its ability to support species. This community is typically found where it is protected from grazing. It can be found in both topogenous and soligenous mires and is especially typical of silted margins of slow-moving streams and soakways, the edges of flushes and damp hollows, and also of artificial habitats such as along dykes and roadside ditches and around ponds. This is located mainly in association with swamp habitats near the South Ugie Water.	Local	No/ Scoped out of assessment

Ecological Feature	Evaluation Rationale	Conservation Importance	IEF/Action
	During the design process these wetland mires and swamp habitats were avoided with the use of trenchless methodology to transport the cable under the mires, and therefore there will be no land take from this habitat. Habitat is considered to be of Local Importance.		
Mesotrophic Grassland			
MG6 & MG7	These area grassland communities associated with agricultural improvement, mainly for grazing purposes. They can also be utilised for amenity grassland, such as golf course type grass. Habitat is not included within the SBL. Common and widespread habitat nationally and regionally. Not classified as a GWDTE. Habitat is considered to be Less than Local Importance.	Less than Local	No/Scoped out of assessment
MG5 & MG10a	These are neutral NVC communities located in waterlogged rush dense grazing fields, along ditch margins, and at minor watercourse embankments. Both are widespread within the ESA. MG10 has limited species diversity and ecological value and is not a conservation priority. MG10a is potential GWDTE of moderate dependency, and MG5 is slight/low and likely fed by other water sources. Habitats are considered to be Less than Local Importance.	Less than Local	No/Scoped out of assessment
Open Vegetation			
OV21, OV22, OV25, OV27	Habitats of open vegetation located in rough unmanaged areas on farms, along field and track edges, waste ground, derelict buildings, ditches and watercourses, within woodland and open space. Some communities were too small to map, but were located throughout the ESA. Habitats are considered to be Less than Local Importance.	Less than Local	No/Scoped out of assessment
Swamps and Fens			
S5, S9 & S28	These communities were located adjacent to ponds and waterlogged areas along minor and major watercourses, both in linear areas as well as wider areas within the swamp vegetation forming mosaic habitats at the South Ugie Water. These communities form zonation's of aquatic swamp and mire and are located in areas that are too wet to be grazed. S5 & S9 are included in the SBL and UKBAP and are of Regional importance. During the design process these wetland mires and swamp habitats were avoided with the use of trenchless methodology to transport the cable under the swamp area to avoid direct impact. Mitigation to avoid indirect impact such as ensuring that the trenchless crossing does not become a flow path for water is required.	Regional	No/ Scoped out of assessment

Ecological Feature	Evaluation Rationale	Conservation Importance	IEF/Action
	Pollution prevention plans will be put in place. Due to the design process these have been scoped out of further assessment.		
Sand Dune			
SD5b, SD6a, SD6e, SD8a & SD9a	The sand dune communities are located along the eastern coastal section within the ESA. These are all listed under Annex 1 habitat types, SBL and UKHab priority types. There will be no land take from these vegetative communities that are associated with the onshore element of the Cable Corridor Route that joins at the trenchless crossing compound and the Onshore Transition Jointing Pit. The cable will pass under these communities via trenchless methodology and no impacts are anticipated. A modified grassland area is allocated as a golf course between the dune system and the location of the Onshore Transition Jointing Pit, which is located in a modified grazing field. Due to this design these NVC communities have been scoped out of further assessment.	Regional	No/ Scoped out of assessment
Watercourses & ditch systems	Habitat is included within the SBL, and Annex 1. Trenchless methodology will be used for delivering the cable under watercourses in order to reduce any impact. Common and widespread habitat internationally to locally. Pollution prevention plans will be put in place and include silt mitigation.	Local	No/ Scoped out of assessment
Coniferous woodland (plantation)	Habitat is not included within the Local Biodiversity Action Plan, SBL or the Habitats Regulations. It is widespread, extensive, temporary, and often non-natural habitat across Scotland. Typically, of low ecological value compared to other woodland types. Area of habitat recorded was species-poor dominated by commercial, non-native species. Habitat is considered to be Less than Local Importance.	Less than Local	No/ Scoped out of assessment
Species			
Badger	Badger is legally protected by the Protection of Badgers Act 1992 (as amended). The species is at risk of persecution, but it not recognised as a high conservation priority. Badger are a widespread species throughout the UK with a stable and inclining estimated population, the species has shown a similar increase in size. The species is listed on the IUCN Red list as of 'Least Concern' in mainland UK. Evidence of badger were recorded within the ESA, such as large setts to single outliers, latrines, worn pathways, hair on fences and diggings. Habitats on site have suitability to support badgers for commuting and foraging.	Regional	Yes/ Scoped into the assessment

Ecological Feature	Evaluation Rationale	Conservation Importance	IEF/Action
	All field margins and plantation edges offer good connectivity pathways within the surrounding area. Badger is considered of Local Importance. These have been scoped into further assessment due to the widespread nature of the badger setts and field signs within the ESA to assess the overall impact. Design meetings have configured the route to avoid the main badger setts by a minimum of 30 meters, however, this did not apply to one of the badger setts. A licence application to NatureScot for disturbance to badgers will be required. This will be included within the badger species protection plan.		
Otter	Otter is protected under the Conservation (Natural Habitats, &c.) Regulations 1994 as a European Protected Species. Otter is a priority species in the UKBAP, NLBAP and the SBL and listed as 'near threatened' globally by the International Union for Conservation of Nature (IUCN). However, in Scotland it is listed by the IUCN as 'vulnerable'. Both the UK and Scottish otter population is in a favourable and inclining condition. The Scottish otter population is estimated to be around 8,000 Otters. Evidence of otter and potential holts were recorded within the ESA. Otter is considered of Local Importance. A licence application to NatureScot for works within 30m of potential holts. This will be included within the otter species protection plan.	Local	No/Scoped out of assessment
Water Vole	Water Vole is legally protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is a priority species in the UKBAP, NLBAP and the SBL. Although the current UK population (132,000) is believed to have declined by 50% since 1998, and the species are in decline in both England and Wales, the Scottish population, which is largely genetically and phenotypically distinct, is in fact increasing in size, with a stable range. The species is listed on the IUCN Red list and 'near threated in Scotland, but 'endangered' elsewhere in the UK. Evidence of water vole were recorded within the ESA, and located along ditch systems, and watercourses. Field evidence included burrows, feeding signs, and latrines. As a result, the species is considered of Local Importance. The cable will pass under all watercourses via trenchless methodology and no impacts are anticipated on the water vole and their habitat. There will be no land take of the water vole habitat and mitigation will include pollution prevention plans. Due to this design this species has been scoped out of further assessment.	Local	No/Scoped out of assessment

Ecological Feature	Evaluation Rationale	Conservation Importance	IEF/Action
Red Squirrel	Red Squirrels and their dreys are protected by the Wildlife and Countryside Act 1981(as amended) and by the Nature Conservation Act 2004, and is a Species of Conservation Concern (SOCC). Red Squirrel is also a priority species in the SBLBAP, UKBAP and SBL. No evidence of red squirrel or their dreys were recorded within accessible areas of the Site. The species is considered of National importance, however is scoped out of the assessment as it is not seen on site.	National	No/Scoped out of assessment
Brown Hare	Brown Hare is an SBL species and are protected under the Wildlife and Countryside Act 1981 (as amended) during the closed season. This is a highly mobile species which enables them to move away from construction activities. With the application of standard best practices measures and a Species Protection Plan, then the potential for construction effects have been managed. Brown hare is therefore scoped out of further assessment.	Less than Local	No/Scoped out of assessment
Pine Marten	Pine marten is legally protected under the Wildlife and Countryside Act 1981 (as amended). Pine marten is also a priority species in the NLBAP and SBL. Although the status on the species in England and Wales is poor, in Scotland the species status is favourable and can now be found in all regions of Scotland with the exception of the central belt and the south-east coast. The species is listed on the IUCN Red list and 'Least Concern' in Scotland, but 'Critically Endangered' elsewhere in the mainland UK. Scotland's population is estimated at 3,700 adult pine martens, which represent approximately 99% of the known UK population. No evidence of pine marten was recorded within the site. In light of the above, the species is considered of Less than Local Importance and is scoped out of the assessment as it is not considered present on site	Less than Local	No/Scoped out of assessment
Roe Deer	Small numbers of roe deer are recorded on site and there is suitable habitat throughout the ESA, and within the wider area. In light of the above, the species is considered of Local Importance and is scoped out of the assessment as only present intermittently on site.	Local	No/Scoped out of assessment
Amphibians & Reptiles	Common amphibian species are protected under the Wildlife and Countryside Act 1981 (as amended) against intentional or reckless killing and injury. The habitat present on Site provides good reptile habitat (grassland and stone walls) for species such as common lizard, but none were noted during the surveys. The species are considered of Local Importance and are scoped out of the assessment.	Local	No/Scoped out of assessment

Ecological Feature	Evaluation Rationale	Conservation Importance	IEF/Action
Bats	All bats in Scotland are protected under the Conservation (Natural Habitats, and c.) Regulations 1994 as European Protected Species. Bats are also priority species in the UKBAP, NLBAP and the SBL. The site contains hedges, mature tree lines along field and roads, field boundaries, woodland and mixed plantations. The main habitat on Site is agricultural fields (arable and modified grassland), which are typically regarded as low value habitat for foraging and roosting bats. A small number of trees on site have potential for bat roosts within the Proposed Development. The majority of the conifer plantations trees have negligible bat roost potential. No roost potential trees are to be felled; therefore, no bat roosts will be impacted by the development. The species is considered of Regional importance, however bats are scoped out of the assessment as no potential roosts sites will be impacted.	Regional	No/Scoped out of assessment
Ornithology	Breeding birds recorded in the predominantly agricultural fields in the survey area were very limited. Species recorded included skylark, meadow pipit and corn bunting. The skylark has a UK population of 1,785,000 breeding territories and the meadow pipit is 2.5 million breeding territories and both these species are relatively common throughout Aberdeenshire. The corn bunting is a much rarer species with 11 thousand breeding territories present in the UK with as few as 800 pairs in Scotland (BTO 2018, RSPB). Timing sensitivities of avian receptors for breeding passerines is the most sensitive between April to July, extending into September for corn bunting. Potential effects on breeding passerines during the installation phase could include Habitat displacement due to cable installation; Accidental nest site destruction during onshore cabling; Disturbance due to noise, light and human presence. The bird territories most likely to be affected by any habitat displacement would be skylark and to a lesser extent meadow pipit and these are considered to be of local importance. The maximum number of territories would be extremely low in relation to the species overall populations in the UK. There were three territories of corn bunting recorded. These are considered to be of regional importance. Proposed mitigation (see **Appendix 6.3**) will limit any detrimental impact to this species with displacement over one to two seasons, the magnitude of the effect is defined as low. This leads to a minor non-significant effect.	Regional	Yes/Scoped into the assessment

6.6.1 Scoped out of the Assessment of Potential Effect

129. Following the systematic evaluation of importance outlined in **Table 6.13 – Determination of ecological importance.** some of the ecological features have been scoped out of inclusion of Assessment of Potential Effects and are not considered to be IEFs.

130. Although the IEFs that have been scoped out of further assessment within this Chapter, measures to mitigate or avoid potential effects on these IEFs have been included within embedded mitigation and detailed mitigation to help ensure legislative compliance of works as well as adherence to accept industry best practise.

6.6.2 Scoped IN to the Assessment of Potential Effect

131. Following the systematic evaluation of importance outlined in **Table 6.13**, the following ecological features listed in **Table 6.14** are considered of Regional Importance, or above. Thus, they are considered to be IEFs and have therefore been scoped into the Assessment of Potential Effects.

Table 6.14 - Ecological Features Scoped into the Assessment of Potential Effects

Scoped IN:
Ancient Woodland Inventory Scotland Native Woodland Survey Scotland ▪ Woodlands: W4, W7, W9 & W11
Rattray Head to Peterhead LNCS
Badger
Ornithology

6.7 Ecological Impact Assessment

132. There are three main ways by which habitat features may be affected during the construction phase:

- Direct loss – to accommodate the Proposed Development infrastructure, where losses are considered permanent;
- Disturbance – the effects of disturbance are variable in their extent, depending on the nature of the disturbance and sensitivity of the habitat feature. Some disturbance types (for example, creation of temporary hardstanding areas at the contractor's compound) result in medium - to long-term disturbance which requires extended recovery periods. In other cases (for example, installation of cables and traversing of machinery) disturbance is short-term, and certain habitat types are able to recover quickly; and
- Indirect effects – these primarily relate to changes in hydrology of wetlands in the context of deeper excavations, the potential for runoff, erosion and sedimentation, along with pollution which may result in the event of contaminant spillage.

6.7.1 Overall Habitat Loss Summary

133. The construction of the Proposed Development will cause the loss of and disturbance to habitats during construction and the effects may be both permanent and temporary. Permanent losses are straightforward to calculate based on the Proposed Development layout, but estimates of temporary losses, such as those caused by construction activities (e.g. vehicle movements and stockpiling) in the areas surrounding built infrastructure, are more difficult. However, temporary losses can be assumed to be relatively limited in extent, based on experience of the construction of similar developments, and so are assumed, on a *precautionary principle*, to equate to approximately 20% of the areas permanently lost.

134. No International or National designated sites (SPA, SAC, SSSI) are within the construction footprint or buffer zones.

6.7.2 Woodland

6.7.2.1 Ancient Woodland Inventory Scotland

135. There are multiple AWI woodlands within 2km of the Application Site Boundary and most are considered to be out with the ZoI of the Proposed Development. There are two AWI listed woodlands that are within the working corridor. Crichie Wood is 67m north of the working corridor boundary and will not be impacted therefore is not considered here. However, the cable centreline and working corridor do traverse through the other AWI and the method proposed is via trenchless methodology and is included as embedded mitigation within the design process. This also enables the cable to be routed under a road junction. Tree Root Protection Zones (BS 5837: 2012 – Trees in Relation to Design, Demolition and Construction) are to be implemented as part of the mitigation in this section to protect the sensitive habitat of the AWI and wider buffer zones will be implemented according to the UK Government recommendations (UK Gov, 2022).

6.7.2.2 Native Woodland Survey Scotland

136. There are multiple NWSS listed woodlands within 2km of the Application Site Boundary and most are considered to be outwith the ZoI of the Proposed Development. There are two NWSS listed woodlands that are in close proximity to the working corridor. These are listed as wet and native woodlands and correspond with the NVC categories of W4, W7, W9 and W11. Therefore, these will be assessed together.

137. Of the two NWSS woodlands noted only one is in proximity to the working corridor. Therefore, mitigation will be implemented such as Tree Root Protection Zones (BS 5837: 2012) and pollution control measures.

6.7.2.3 Residual Effects on Woodland

138. Project assumptions of embedded mitigation measures in relation to good practice construction measures, and pollution prevention controls in order to safeguard the ecological receptors from any potential significant effect as a result of the Proposed Development. Additionally, micrositing, informed by the ECoW, will help to further reduce impacts.

139. In light of the above and that all mitigation must be adhered to, the detrimental effects of the Proposed Development related to construction in proximity to the woodland features and their NVC communities is of negligible magnitude. Therefore, it is considered to be not significant in terms of the EIA Regulations.

6.7.3 Rattray Head to Peterhead LNCS

140. The Rattray Head to Peterhead LNCS is noted for its variety of coastal habitats including; sand dunes, good diversity of plant species including several species that are rare in NE Scotland, adjacent fields important for roosting and feeding geese, waders and wildfowl.

141. The ecological baseline has been considered throughout the design process of the Proposed Development, including design meetings and communications with specialists providing input to subsequent design iterations. This was with the aim to either eliminate or reduce the potential for any significant effects on receptors and following the 'mitigation hierarchy', as described in CIEEM guidance (CIEEM, 2018). The mitigation hierarchy follows a sequence of avoidance, mitigation, compensation and enhancement measures to be identified as part of the EcIA. Ecological factors taken into account for the design process for the Rattray Head to Peterhead LNCS included the following;

- Avoidance of habitats of local conservation value, as far as practicable. The location of the Onshore Transition Jointing Pit and associated infrastructure have been placed away from the edge of the LNCS and the sensitive sand dune communities, with the no habitat loss to the LNCS.

142. The cable will pass under the LNCS via trenchless methodology and no impacts are anticipated.

143. A modified grassland area is allocated as a golf course between the dune system and the location of the Onshore Transition Jointing Pit, which is located in a modified grazing field.

6.7.3.1 Residual Effects on Rattray Head to Peterhead LNCS

144. Project assumptions of embedded mitigation measures in relation to good practice construction measures, and pollution prevention controls in order to safeguard the ecological receptors from any potential significant effect

as a result of the Proposed Development. Additionally, micrositing, informed by the ECoW, will help to further reduce impacts.

145. With the inclusion of all mitigation the detrimental effects of the Proposed Development related to construction in proximity to the LNCS and its features are of negligible magnitude. Therefore, it is considered to be not significant in terms of the EIA Regulations.

6.7.4 Badger

146. Baseline surveys for badgers recorded multiple setts consisting of a large 20+ hole sett to single outliers, including paths and well-worn tracks, diggings and latrines. The badger is protected under the Protection of Badgers Act 1992. Under this Act it is illegal to intentionally or recklessly damage a badger sett or obstruct access to a sett and to disturb a badger while occupying a sett, or for any person to kill, injure or take a badger. It is also an offence to cruelly ill-treat a badger, to dig for or to snare a badger. In effect, badgers are fully protected in Scotland, and any planned activity that may affect them requires prior consultation with NatureScot. Badgers are considered to be of Local importance within the survey area and to have low sensitivity to human disturbance.

6.7.4.1 Badger: Construction Phase - Potential Effects

147. The construction of the Proposed Development has the potential to adversely affect badgers directly or indirectly in a number of ways:

- Physical damage or loss of setts or foraging habitat from construction;
- Damage/destruction of routes potentially used by badgers while crossing the development footprint (severance);
- Disturbance caused by noise of construction of Proposed Development; and
- Direct injury or mortality.

148. The ecological baseline has been considered throughout the design process of the Proposed Development, including design meetings and communications with specialists providing input to subsequent design iterations. This was with the aim to either eliminate or reduce the potential for any significant effects on receptors and following the 'mitigation hierarchy', as described in CIEEM guidance (CIEEM, 2018). The mitigation hierarchy follows a sequence of avoidance, mitigation, compensation and enhancement measures to be identified as part of the EcIA. Ecological and hydrogeological factors taken into account throughout the design process include the following;

- Consideration of areas with the potential to support protected species in relations to the location of the Cable Route Corridor and associated infrastructure, as far as practicable.
- The design was altered to avoid setts, outliers and areas of high activity.

149. Mitigation to avoid and minimise impacts to badgers include:

- Exposed pipe systems will be capped when contractors are off site, and exposed trenches or holes will be covered or exit ramps provided to prevent badgers becoming trapped.
- Mammal friendly designs (with appropriate mammal ledges to provide routes for mammals to pass through) will be used for large culverts and bridges to provide safe access and crossing points.
- Badger friendly fencing will be used to avoid blocking potential routes (they will have regular small gaps for badgers to move through).
- Any security lighting will be directed away from the setts.
- Chemicals will be stored in a safe place.
- Low vehicle speed limits (15 mph).
- A 30m work exclusion zones are to be placed around the setts.
- A 100m work exclusion zones from any pile driving or blasting work will be created around the badger setts as needed. Where exclusion zones of the required size aren't possible, works will require a licence from NatureScot before they can proceed.
- A pre-construction survey will be undertaken and a review of all new, active and inactive setts to determine indirect or direct encroachment onto species-specific features, such as setts.

6.7.4.1.1 Licence Requirements

150. Design meetings have configured the route to avoid known badger setts by a minimum of 30 meters, however, this did not apply to one of the badger setts. A licence application to NatureScot for disturbance to badgers will be required. This will be included within the badger species protection plan.

6.7.4.1.2 Severance

151. Severance describes the loss of continuity between habitats which ultimately results in the isolation or fragmentation of discrete populations of species and may result in changes to ecological processes such as population dynamics. The Proposed Development does not sever access to any important badger habitats, and it is considered highly unlikely that the Proposed Development would prevent a badger crossing between different areas.

152. To avoid blocking potential routes, and as part of embedded mitigation, any fencing during construction, operation will be permeable and mammal friendly. They will be mammal friendly in-so-far as they will have regular small gaps for badgers to move through. The spacing will be agreed with NatureScot.

153. The magnitude of potential impact from severance is assessed as negligible. With the embedded mitigation, the impact of severance is considered to be: unlikely, never/one-off, reversible and short-term and no likely significant effects are predicted.

6.7.4.1.3 Mortality Caused by Vehicle Traffic

154. Vehicular traffic on the Proposed Development Site would increase (from pre-construction baseline) during construction and so would mean that individual badgers would have a slightly increased possibility of being injured or killed by vehicles operating. However, during construction the existing inbuilt design measures (embedded mitigation) means that an ECoW will ensure that pipes etc. are stored correctly (reducing likelihood of badgers from using them and being present in potentially 'high risk' areas) and low vehicle speed limits (15 mph) would greatly reduce the likelihood of injury or death from happening during construction.

155. Consequently, the magnitude of impact of direct mortality from construction of the Proposed Development is assessed as negligible. With the embedded mitigation, impact of direct mortality from construction of the Proposed Development is considered to be unlikely, intermittent, irreversible and short-term and no likely significant effects are predicted.

156. In order to prevent (non-significant) adverse impacts on badger (which is legally protected) a Badger Species Protection Plan will be developed and implemented for all stages of the Proposed Development construction.

157. With the inclusion of all mitigation the detrimental effects of the Proposed Development will be little or no disturbance occurring to badgers and will be temporary and of a negligible magnitude, therefore is considered to be not significant in terms of the EIA Regulations.

6.7.4.2 Badger: Operation and Maintenance Phase - Potential Effects

158. The Proposed Development operation and maintenance phase is anticipated to involve activities which will directly or indirectly impact badger at one location. Mitigation, a licence application and a species protection plan will be required. With the inclusion of all mitigation the detrimental effects of the Proposed Development will be minor disturbance occurring to badgers and will be temporary and of a negligible magnitude, therefore is considered to be not significant in terms of the EIA Regulations.

6.7.4.3 Badger: Decommissioning Phase - Potential Effects

159. Impacts to badgers and their habitats from decommissioning works are anticipated to be of a similar nature to the construction phase impacts, but of lower magnitude. Decommissioning impacts to badgers and their habitats are considered temporary, reversible, of negligible magnitude and considered to be not significant in terms of the EIA Regulations.

6.7.5 Ornithology

6.7.5.1 Ornithology: Construction Phase - Potential Effects

160. The construction of the Proposed Development has the potential to adversely affect breeding birds directly or indirectly in a number of ways:

- Habitat displacement due to construction phase;
- Accidental nest site destruction during construction phase; and
- Disturbance due to noise, light and human presence.

161. The ecological baseline has been considered throughout the design process of the Proposed Development, including design meetings and communications with specialists providing input to subsequent design iterations. This was with the aim to either eliminate or reduce the potential for any significant effects on receptors and following the 'mitigation hierarchy', as described in CIEEM guidance (CIEEM, 2018). Ecological and hydrogeological factors taken into account throughout the design process include the following:

- Consideration of areas with the potential to support breeding bird species in relation to the location of the Cable Route Corridor and associated infrastructure, as far as practicable.
- The design was altered to avoid habitats, such as, woodland.

162. Examples of mitigation to avoid and minimise impacts to breeding birds include:

- That a qualified ecologist or ECoW is to be present during any vegetation removal or ground clearance.
- Pre-construction breeding bird surveys will be undertaken in the working corridor if ground clearance is to take place between mid-March to end of July.
- Pre-construction breeding surveys for corn bunting will continue until late September in appropriate areas with suitable habitat.
- Pre-construction surveys will be completed as close to the start of works as possible, and always within the most recent survey period.
- That if trees need to be felled that species-specific surveys are undertaken for species that could nest in trees.

6.7.5.2 Ornithology: Operation and Maintenance Phase - Potential Effects

163. With the inclusion of all mitigation the detrimental effects of the Proposed Development related to construction and maintenance phase is not anticipated to involve any activities which will directly or indirectly effect breeding birds, therefore is considered to be not significant in terms of the EIA Regulations.

6.7.5.3 Ornithology: Decommissioning Phase - Potential Effects

164. Impacts to breeding birds and their habitats from decommissioning works are anticipated to be of a similar nature to the construction phase impacts, but of lower magnitude. Decommissioning impacts to breeding birds and their habitats are considered temporary, reversible, of negligible magnitude and considered to be not significant in terms of the EIA Regulations.

6.7.6 Cumulative Effect Assessment

165. The EIA Regulations require the cumulative effects of the Proposed Development with other relevant projects or plans to be assessed. In considering cumulative effects, it is necessary to identify any effects that may not be significant in isolation but that may be significant in combination with other developments.

166. This assessment considers that cumulative effects can result from effects that were individually assessed as non-significant, but in combination with effects or actions taking place over time, or across a wider spatial range, such as where the ZoI of other developments or actions may overlap with the Proposed Development, then non-significant effects may cumulatively be considered significant.

167. Cumulative effects are particularly important in EcIA as ecological features may be already exposed to background levels of threat or pressure and may be close to critical thresholds where further impact could cause irreversible decline.

6.7.7 Statement of Significance

168. Adverse effects not significant in EIA terms are considered to occur for AWI & NWSS woodland, Rattray Head to Peterhead LNCS, badger and breeding birds. Following the implementation of good practice, embedded mitigation and detailed mitigation, such as a habitat management plan, species protection plans and standard working methods, inclusion of a CEMP and pollution prevention measures, no significant residual effects are predicted.

169. Therefore, embedded mitigation and detailed mitigation have been proposed to ensure the low magnitude of effects during the construction phase and reduce the likelihood of legal offences and comply with good practice.

170. Habitat management plans are advised to protect good quality habitat and enhance biodiversity, such as riparian habitats, hedges, trees, and woodland and protect hydrological connectivity to sensitive mire and swamp habitats and watercourses. Species Protection Plans have been advised in **Appendix 6.2** and **6.4** for water vole, otter and badger.

171. This assessment does not predict any likely ***significant ecological residual effects*** associated with the Proposed Development.

6.8 References

Aberdeenshire Nature Conservation and Biodiversity; Accessed at https://www.aberdeenshire.gov.uk/environment/natural-heritage/biodiversity/#:~:text=Policy%20P1%20of%20the%20Aberdeenshire,the%20scale%20of%20the%20development;

Bang and Dahlstrøm. (2001). Animal Tracks and Signs. Oxford University Press, Oxford;

Birks, J. (2012) Pine marten. In: Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trewhella, W.J., Wells, D. and Wray, S. (2012). UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton

Chanin (2003a) Monitoring the Otter (Lutra lutra). Conserving Natura 2000 Rivers: Monitoring Series No. 10. English Nature, Peterborough;

Chanin (2003b). Ecology of the European Otter. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough;

CIEEM (2018, updated 2019). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine;

Collins, J.(ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn);

Conservation of Habitats and Species Regulations 2017, as amended in Scotland by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 (collectively 'the Habitats Regulations').

Cresswell et al., (2012). UK BAP Mammals Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. Published by The Mammal Society;

Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London;

European Commission (2011). EU Biodiversity Strategy;

Gurnell et al., (2009). Practical Techniques for Surveying and Monitoring Squirrels. Forestry Commission Scotland, Edinburgh;

Harris S., Cresswell P and Jefferies D., (1989). Surveying Badgers. The Mammal Society, London;

Harris and Yalden. (2008). Mammals of the British Isles: Handbook, 4th Edition. The Mammal Society, Southampton;

Hundt (2012). Bat Surveys: Good Practice Guidelines (2nd Edition), BCT, London;

Joint Nature Conservation Committee (2013). Guidelines for selection of biological Sites of Special Scientific Interest (SSSI);

Joint Nature Conservation Committee (2004) Common Standards Monitoring Guidance for Reptiles and Amphibians, Version February 2004. JNCC, Peterborough;

NatureScot SiteLink: Accessed at https://sitelink.nature.scot

Rodwell (2006). National Vegetation Classification: Users' handbook;

Rodwell, J. S., (1991, 1992, 1998, 2000) British Plant Communities. Vol 1-5;

Scottish Government (2013) The Scottish Biodiversity List;

Scottish Government (2013). Scottish Biodiversity List ;

Scottish Executive (2001) (updated 2006). European Protected Species, Development Sites and the Planning System: Interim guidance for local authorities on licensing arrangements;

Scottish Executive Rural Affairs Department (SERAD) (2000). Habitats and Birds Directives, Nature Conservation: Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds (''The Habitats and Birds Directives''). Revised Guidance Updating Scottish Office Circular No 6/1995;

Scottish Government (2008) Scottish Government Planning Advice Note 60: Planning for Natural Heritage 2008;

Scottish Government (2022) The Scottish Biodiversity Strategy to 2045;

Scottish Government (2022) Onshore Wind Policy Statement;

Scottish Government (2023) National Planning Framework (NPF) 4;

Scottish Environment Protection Agency (SEPA) (2017) Guidance Note 31 - Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (Version 3); accessed at https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf;

SNH (2016). Assessing connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage (SNH), Guidance. Version 3 – June 2016;

SNH (2016a) Carbon and Peatland map.

SNIFFER (2009) WFD95: A Functional Wetland Typology for Scotland – Field Survey Manual. Version 1;

Stanbury et al., 2021. Fifth Birds of Conservation Concern.

Strachan et al., (2011). The Water Vole Conservation Handbook;

The Herpetological Conservation Trust (2007). National Amphibian and Reptile Recording Scheme, Habitat Recording Guide;

The Wildlife and Countryside Act 1981 (as amended);

The Wildlife and Natural Environment (Scotland) Act 2011;

The Nature Conservation (Scotland) Act 2004.

Wheeler, P., Wray, S. and Yalden, D. (2012) Brown Hare and Mountain Hare. In: Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trewhella, W.J., Wells, D. and Wray, S. (2012). UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton

GREEN VOLT

7

Chapter 7

Geology, Hydrology, Hydrogeology and Soils

Onshore EIA Report: Volume 1

Document Code: FLO-GRE-REP-0009-07		
Version Number:	00	
Date:	*Issue Date 03/08/23*	
Prepared by:	Kirsten Dickson	*K.Dickson*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First draft for review	17/07/23
A2	Second draft for review	31/07/23
00	Final	03/08/23

Contents

7 Hydrology

7.1 Introduction

1. Understanding surface and groundwater environments is critically important to designing a successful project. Surface water includes watercourses, water bodies, and precipitation runoff. It provides an important resource for: potable and other uses, amenity, aesthetic value, conservation, ecological environments, and for recharge to groundwater systems. Groundwater is also an important resource. It provides more than a third of the potable water supply in the UK and includes all water stored in permeable underground strata (or aquifers). In addition, it provides essential baseflow to rivers and wetland areas, often supporting important ecological systems.

2. The risk of pollution or disruption of watercourses, groundwater bodies, and private water sources, within or near the site of the Proposed Development, needs to be assessed and appropriately mitigated where necessary. Potential impacts could include:

   - Erosion and sedimentation
   - Impacts to surface runoff characteristics
   - Impacts on surface water quality
   - Impacts on river flows and flooding
   - Impacts on Groundwater Dependent Terrestrial Ecosystems (GWDTE)
   - Impacts on soils
   - Impacts on peat hydrological regime
   - Chemical pollution of groundwater
   - Disruption or fouling of private water supplies
   - Impacts on public water supplies and abstractions
   - Modifications to hydrogeological regime
   - Peat Slide Risk

3. This chapter presents the impact assessment of the construction and operation of the Proposed Development on the hydrology, geology, and hydrogeology environments. This chapter also considers the potential cumulative effects that may arise from the Proposed Development in combination with other future developments, including consented and in-planning projects within 10km of the Proposed Substation and 2km around the Working Cable Route Corridor.

4. The Chapter is supported by the following figures produced alongside the hydrological assessment and within the Ecological Impact Assessment (EcIA) by GLM Ecology Ltd and IMT Ecology Ltd:

   - Chapter 6 – Ecology: Appendix 6.1 – Habitats Survey & National Vegetation Classification,
   - Figure 7.1 a-e - Hydrological Context Map, and
   - Figures 7.2 a-e - Soil Maps.

7.2 Legislation, Guidance and Policy

5. Statutory, general, national, and local guidance consulted during this assessment is listed in **Table 7.1** .

Table 7.1 - Legislation, Guidance and Policy

	Documents
Retained European Legislation	Freshwater Fish Directive 2006/44/EC Water Framework Directive (WFD) 2000/60/EC Dangerous Substances Directive 76/464/EEC
Scottish Government Policy, Advice and Legislation	PAN 79: Water and Drainage, 2006 Planning Advice Note (PAN) 61: Planning and SUDS, 2001

	Documents
	Scottish Government (2017) Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity Generation Developments Scottish Government (2023) Fourth National Planning Framework (NPF4) Scottish Planning Policy (SPP) 2014 The Flood Risk Management (Scotland) Act 2009 The Housing Scotland (Act) 1987 (Sect 86) The Pollution Prevention and Control (Scotland) Regulations, 2000 The Public and Private Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2017 The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations, 2017 Water Environment and Water Services (Scotland) Act 2003
SEPA Guidance	PPG 1 General Guide to the Prevention of Pollution GPP 2 Above Ground Oil Storage Tanks PPG 3 Use and design of oil separators in surface water drainage systems GPP 4 Treatment and disposal of wastewater where there is no connection to the public foul sewer GPP 5 Works and maintenance in or near water PPG 6 Working at Construction and Demolition Sites GPP 8 Safe Storage and Disposal of Used Oils GPP 21 Pollution Incident Response Planning Managing River Habitats for Fisheries, 2002 Special Requirements for Civil Engineering Contracts for the Prevention of Pollution, Version 2, SEPA, 2006 Culverting of Watercourses, WAT-PS-06-02, 2015 Natural Flood Management Handbook, 2015 Indicative River & Coastal Flood Map (Scotland) Planning advice on wastewater drainage, 2011 Temporary Construction Methods, WAT-SG-29, 2009 SEPA Flood Risk and Planning Briefing Note, 2009 Groundwater Protection Policy for Scotland, v3, 2009 SEPA Position Statement 'The role of SEPA in Natural Flood Management', 2012 Technical flood risk guidance for stakeholders, SS-NFR-P-002, 2015 SEPA Regulatory Position Statement – Developments on peat, 2010 Engineering in the water environment: good practice guide; River crossings, 2010 Environmental Standards for River Morphology, WAT-SG-21, 2012 The Water Environment (Controlled Activities) (Scotland) Regulations 2011; A practical guide, Version 8.3 February 2019 Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems, 2017 SEPA Water quality classification interactive database (2020 data)
Other Guidance	CIRIA C515 Groundwater Control - Design and Practice CIRIA C532 Control of Water Pollution from Construction Sites CIRIA C648 Control of Water Pollution from Linear Construction Projects CIRIA C689 Culvert Design and Operation Guide CIRIA C741 Environmental Good Practice on Site CIRIA C753 SUDS Manual A handbook on environmental impact assessment; Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment Process in Scotland. NatureScot, 2018 River Crossings and Migratory Fish: Design Guidance, A Consultation Paper, The Scottish Executive Historic Environment Scotland and Marine Scotland Science

	Documents
	Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only Forestry & Water Scotland (2018) Protecting Private Water Supplies During Forestry Activities

7.3 Consultation

6. **Table 7.2** sets out the consultation undertaken during the scoping process and as part of the assessment. The actions taken based on the points raised are also provided within the table, indicating where these points have been covered within the assessment.

Table 7.2 – Consultation Responses

Consultee	Consultee Comment / Scoping Response	Action
Aberdeenshire Council	Aberdeenshire Council refers to SEPA's response and notes that their response is detailed and answers the posed questions.	It is considered that these topics are thoroughly covered within this Chapter, along with **Appendix 7.1.**
	Aberdeenshire Council provided the Private Water Supply (PWS) data within 3km of the scoping route.	This information is summarised within **Section 7.5.5** of this chapter, and is considered further within **Appendix 7.1**, including details of appropriate mitigation measures proposed.
Scottish Environment Protection Agency (SEPA)	SEPA note that they agree with the proposed methodology and the use of a 250m Study Area from the proposed infrastructure.	This Study Area has been utilised for the hydrological assessment and is illustrated within **Figures 7.1a-e.**
	SEPA note that there are several Private Water Supplies (PWS) records on their data set within the vicinity of the Proposed Development and request that these receptors are considered within the assessment. SEPA note that avoidance should be the first principle.	This is held to be covered by the PWS data requested from Aberdeenshire Council, in addition this data was refined through a PWS questionnaire to landowners, as detailed within **Section 7.5.5.** Where it was not possible to site the cable route >250m from a PWS source, and therefore the PWS would be located within the potential Zone of Dewatering as guided by SEPA's Guidance note 31, appropriate mitigation measures have been proposed. This is discussed within **Section 7.7** and **Appendix 7.1**.
	SEPA requested that a site-specific Peat Management Plan (PMP) is submitted alongside the Planning Application.	Since submission of the scoping report, the cable route has been refined and no longer passes through any carbon-rich soil. It is considered that the proposed Cable Route Corridor will not require the excavation of peatland and therefore, it is considered that a PMP will no longer be required.
	SEPA welcomed a targeted National Vegetation Classification (NVC) survey and note that avoidance of Ground Water Dependent Terrestrial Ecosystems (GWDTE) should be the first principle, although floating tracks or a Trenchless	The findings of the targeted NVC survey are detailed within **Appendix 6.1**. GWDTE communities have been considered within **Section 7.5.9** and avoided where possible; it is considered that the mitigation measures outlined within **Section 7.7** will

Consultee	Consultee Comment / Scoping Response	Action
	Compound could be considered as mitigation.	safeguard these sensitive habitats from any potential impacts.
	SEPA welcomed the use of a Trenchless Compound to minimise disturbance to sensitive habitats and watercourses.	Where appropriate, a trenchless methodology has been identified as the preferred construction method across sensitive habitats and watercourses, Trenchless Compounds being one example of a trenchless methodology. This will be confirmed at a later design stage and will be informed by further site investigations.
Flood Risk and Coast Protection	Noted that a Flood Risk Assessment may be required, depending on the final layout, and requested that a Drainage Impact Assessment (DIA) is submitted with the Planning Application.	Flood Risk has been considered within **Sections 7.5.4** and **7.6.2.4** and it is assessed that the mitigated Proposed Development will not result in increased flood risk. Therefore, no Flood Risk Assessment is required. A proposed Drainage Concept (see **Drawings C4642 (1) 110 Drainage Concept**) has been provided in support of the Planning Application. These calculate the estimated increase in surface water runoff from the proposed substation and detail a drainage plan to manage this increase, safeguard the surrounding water environment, and minimise the potential flood risk. Therefore, it is considered that these documents will address any drainage concerns and a DIA is not required.

7. Green Cat Renewables (GCR) also reached out to the Ugie District Salmon Fishery Board, the Ythan District Salmon Fishery Board, and the River Ythan Trust on behalf of Flotation Energy to request their advice on recommended mitigation measures and on alternative construction methods (for instance trenchless methodology) that would minimise the potential impacts on watercourses. However, a response to these requests has not been received to date.

7.4 Assessment Methodology

8. The assessment of the potential impact of the Proposed Development on hydrology and hydrogeology was carried out by the general method described in the following sub-sections.

7.4.1 Study Area

9. Given the scale of the Proposed Development, a conservative Study Area of 250m around the proposed Cable Route Corridor has been used for the assessment, based on the potential Zone of Dewatering for excavations >1m in depth as set out within SEPA's Guidance Note 31 – Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. A larger 1km Study Area was positioned around the Proposed Substation location as this work will require deeper excavations and the laying of concrete hardstanding areas.

10. The criteria for defining the Study Area have been established based on professional judgement, experience regarding expected working areas, relevant SEPA guidance, and other relevant guidance on hydrological assessment.

7.4.2 Desk Study Assessment Methodology

11. The purpose of the baseline study is to identify:

- Land use across the site
- Topography and surface water hydrology, including watercourses, springs, and drains
- The extent of river catchments and all flooding risk
- Geological and hydrogeological conditions of the site
- Any current dewatering or abstraction
- Private drinking water abstractions and private water supplies
- The extent of habitats across the Site, particularly any GWDTE

12. Baseline conditions within the Site are initially established through a desktop survey and later through a site visit. The following sources have been consulted:

- Ordnance survey 1:10,000 and 1:50,000 map data
- Ordnance survey Digital Terrain Model (DTM)
- BGS - Geology of Britain Viewer https://www.bgs.ac.uk/map-viewers/geology-of-britain-viewer/
- BGS – Hydrogeological Map of Scotland 1:625,000
- BGS – Groundwater Vulnerability Map of Scotland 1:625,000
- Scotland's soils, Carbon and Peatland 2016 Map https://map.environment.gov.scot/Soil_maps/?layer=10
- Scotland's Environment Map https://map.environment.gov.scot/sewebmap/?layers=riverClass
- Consultation with statutory and non-statutory organisations, including SEPA, NatureScot, Scottish Water, and the Council's Environmental Health Department.
- SEPA Flood Maps https://map.sepa.org.uk/floodmap/map.htm
- SEPA River Basin Management Plan (RBMP) interactive Map https://www.sepa.org.uk/data-visualisation/water-environment-hub/
- NatureScot Sitelink https://sitelink.nature.scot/map
- Ugie District Salmon Fishery Board http://ugie.dsfb.org.uk/
- Ythan District Salmon Fishery Board http://www.ythan.co.uk/
- River Ythan Trust http://www.riverythantrust.org.uk/

13. The findings of the desktop survey were confirmed and supported by targeted field surveys on the 8th - 10th February 2023 and 28th February – 2nd March 2023, these covered the main hydrological features within the Site. Where possible, this walkover included verification of the location of proposed watercourse crossings, visual inspection of all surface waterbodies managed under the Water Framework Directive (WFD), and visual inspection of ground conditions.

14. A targeted National Vegetation Classification (NVC) and Habitats Survey was undertaken by the appointed ecologist, IMTeco Ltd, in August 2022 to May 2023. The aim of this survey was to identify and map the vegetation communities within the Working Cable Route Corridor to identify the areas of greatest ecological interest, including potential Groundwater Dependent Terrestrial Ecosystems (GWDTE).

7.4.3 Assessment of Receptor Sensitivity

15. With the baseline established, sensitive receptors can be determined. The criteria set out in the Table below outlines the various factors considered in the assessment of the sensitivity of potential receptors.

Table 7.3 – Sensitivity Table

Sensitivity	Definition
High	Receptor of high quality, rarity of a regional or national scale, and limited potential for substitution or replacement. This includes: ▪ Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA) or Special Area of Conservation (SAC) ▪ SEPA Water Quality defined as High ▪ Abstraction for public water supply

Sensitivity	Definition
	▪ Private water supplies – 0 to 100m from construction activities ▪ Designated salmonid fishery and/or salmonid spawning grounds present ▪ Watercourse widely used for recreation, directly related to watercourse quality (e.g., swimming, salmon fishery) <500m downstream of development ▪ Active flood plain area (important in relation to flood defence) ▪ Groundwater - public drinking water supply ▪ Groundwater aquifer productivity classed 1A or 2A in the BGS 1:625000 Hydrogeology Map ▪ Geology that is rare or of national importance as defined by SSSI or Regional Important Geological Site (RIGS) ▪ Groundwater dependent terrestrial ecosystems (GWDTE) defined as Class 1, and/or defined as 'High Conservation Value' by Ecologist ▪ Peat defined as Class 1 and Class 2 ▪ Peat Slide Risk likelihood of 'probable' or 'almost certain'
Medium	Receptor of medium quality, rarity of a local, regional, or national scale, and limited potential for substitution/replacement. This includes: ▪ SEPA Water Quality defined as Good ▪ Surface water abstractions for private water supply for more than 15 people ▪ Private Water Supplies – Surface water abstractions within 100–600m of construction activities, groundwater spring abstractions within 100–400m of construction activities, and groundwater borehole abstractions within 0– 200m of construction activities ▪ Designated salmonid fishery and/or cyprinid fishery ▪ Watercourse widely used for recreation, directly related to watercourse quality (e.g., swimming, salmon fishery) >500m downstream of development ▪ Groundwater aquifer productivity classed as 1B or 2B in the BGS 1:625000 Hydrogeology Map ▪ Groundwater dependent terrestrial ecosystems (GWDTE) defined as Class 2, and/or defined as 'Medium Conservation Value' by Ecologist ▪ Peat Slide Risk of 'Likely'
Low	Receptor of low quality, rarity of a local, regional, or national scale, and limited potential for substitution/replacement. This includes: ▪ SEPA Water Quality defined as Moderate or Poor ▪ Occasional or local recreation (e.g., local angling clubs) ▪ Conveyance of flow and material, main river <10m wide or ordinary watercourse >5m wide ▪ Existing flood defences ▪ Private Water Supplies – Surface water abstractions >600m from construction activities, groundwater spring abstractions within 400–800m of construction activities, and groundwater borehole abstractions within 200–600m of construction activities ▪ May be subject to improvement plans by SEPA ▪ Designated cyprinid fishery, salmonid species may be present and catchment locally important for fisheries ▪ Watercourse not widely used for recreation, or recreation use not directly related to watercourse quality ▪ Groundwater aquifer productivity classed as 1C or 2C in the BGS 1:625000 Hydrogeology Map ▪ Groundwater dependent terrestrial ecosystems (GWDTE) defined as Class 3, and/or defined as 'Local Conservation Importance' by Ecologist ▪ Peat Slide Risk of 'Unlikely'

Sensitivity	Definition
Negligible	Receptor of low quality, rarity of a local scale, and limited potential for substitution/replacement. Environmental equilibrium is stable and is resilient to changes that are greater than natural fluctuations, without detriment to its present character. This includes: ▪ SEPA water quality defined as Bad ▪ Fish sporadically present or restricted, no designated features ▪ Receptors not used for recreation, e.g., no clubs or access route associated with watercourse ▪ Watercourse <5m wide – flow conveyance capacity of watercourse low - very limited floodplain as defined by topography, historical information and SEPA flood map ▪ Private Water Supplies – groundwater spring abstraction >800 m from construction activities, and groundwater borehole abstractions >600 m from construction activities ▪ No public drinking water supplies ▪ Groundwater aquifer productivity classed as 3 in the BGS 1:625000 Hydrogeology Map ▪ Receptor heavily engineered or artificially modified and may dry up during summer months ▪ Geology not designated under a SSSI or RIGS or protected by specific guidance ▪ Peat defined as Classes 3, 4 and 5 ▪ Peat Slide Risk of 'Negligible'

7.4.4 Assessment of Magnitude of Impact

16. The analysis of the significance of each impact is based on its magnitude. The magnitude of impact includes the timing, scale, size, and duration of the potential impact. For the purposes of this assessment the magnitude criteria are defined in **Table 7.4**.

Table 7.4 – Magnitude of Impact Table

Magnitude	Criteria	Description and Example
High	Results in loss of attribute	▪ Fundamental (long term or permanent) changes to geology, hydrology, water quality and hydrogeology ▪ Loss of designated Salmonid Fishery ▪ Loss of national level designated species/habitats ▪ Changes in WFD water quality status of river reach ▪ Loss flood storage/increased flood risk ▪ Pollution of potable source of abstraction compared to pre-development conditions
Medium	Results in impact on integrity of attribute or loss of part of attribute	▪ Material but non-fundamental and short- to medium-term changes to the geology, hydrology, water quality and hydrogeology ▪ Loss in productivity of a fishery ▪ Contribution of a significant proportion of the discharges in the receiving water, but insignificant enough to change its water quality status
Low	Results in minor impact on attribute	▪ Detectable but non-material and transitory changes to the geology, hydrology, water quality and hydrogeology
Negligible	Results in an impact on attribute but of insufficient magnitude to affect the use/integrity	▪ No perceptible changes to the geology, hydrology, water quality and hydrogeology ▪ Discharges to watercourse but no loss in quality, fishery productivity or biodiversity

Magnitude	Criteria	Description and Example
		▪ No significant impact on the economic value of the receptor ▪ No increase in flood risk

7.4.5 Assessment of Significance of Impact

17. The sensitivity of the receptor together with the magnitude of impact defines the significance of the impact as outlined in **Table 7.5** .

Table 7.5 – Significance of Impact Matrix

Sensitivity		Magnitude			
		High	Medium	Low	Negligible
	High	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Low	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

7.4.6 Limitations

18. The fieldwork followed standard field methods with visual inspections of watercourses and ground conditions. Due to the length of the cable route, access restrictions, and the design evolution, not all the watercourses could be visited during the walkover. However, all the surface watercourses within the Study Area that are managed under the Water Framework Directive (WFD) were inspected.

19. PWS information was provided by Aberdeenshire Council on the 5th August 2022, which was then supplemented and refined through a PWS questionnaire that was distributed by the land agent to the relevant landowners. However, it is recognised that this information may be incomplete or incorrect and precautionary mitigation measures will be put in place. These mitigation measures are detailed within **Appendix 7.1 – Private Water Supply Risk Assessment**.

20. Whilst some information gaps have been identified, it is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of any potential significant impact on geology, hydrology, and hydrogeology receptors.

7.5 Baseline

7.5.1 Site Context

21. The Cable Route Corridor is approximately 35km from Landfall to the Proposed Substation at New Deer, Aberdeenshire. This will facilitate the connection of the Offshore Project to the National Grid, which will yield a total generating capacity of 490-560 megawatts (MW).

22. The current land use within the Study Area is predominantly agricultural farmland, however, the grassland and arable land is intersected by smaller areas of coniferous forestry, heathland, and scattered farmhouses, and the eastern fringe of the Study Area is comprised of coastal dunes. The Cable Route Corridor will also traverse several roads, watercourses, and overhead lines.

23. The topography of the Study Area predominantly consists of gently undulating hills that range from approximately 9–144m Above Ordnance Datum (AOD), with the highest point at the Standing Stones at North Mains of Auchmaliddie. The land falls to the east of the Study Area to form the coastal cliffs and dunes near St Fergus.

24. The Proposed Development is discussed in further detail within **Chapter 5 – Project Description**.

7.5.2 Surface Water Hydrology Overview

25. The Study Area is located within the watershed of three surface water catchments. The majority of the Study Area is located within the River Ugie catchment of the Scotland River Basin, although the western fringes of the Study Area traverse into the River Ythan catchment, and the most eastern section crosses into the Buchan Coastal catchment.

26. There are numerous watercourses within the Study Area, these range in size from field drainage ditches to the River Ugie with a catchment area of 333km^2. The watercourses that have the potential to be impacted by the Proposed Development are shown on **Figure 7.1a-7.1e**. The majority of these watercourses drain into the River Ugie, which is formed from the confluence of the North and South Ugie Waters and flows in a predominantly eastern trajectory before dispelling into the North Sea, directly north of Peterhead, Aberdeenshire. The River Ugie catchment is a popular destination for recreational fishing, and the river and its tributaries are known to support salmon, sea trout and brown trout populations[i].

27. There are also a number of unnamed burns and agricultural drainage ditches within the Study Area. Although these waterbodies are not assessed individually within this chapter, being held as 'Negligible' in accordance with the Receptor Sensitivity criteria set out in **Table 7.3**, it is considered that these waterbodies will be encompassed and safeguarded by the assessment of the wider water environment. Additionally, the mitigation measures set out within **Section 7.7** will safeguard their water quality and quantity.

28. It is also worth noting that many of the smaller watercourses and agricultural drains have some degree of channelisation and appear artificially straightened with raised embankments. This is considered to be due to the predominantly agricultural land use, and examples are illustrated below in **Photo 7.1** and **Photo 7.2**.

Photo 7.1 – Example of a channelised watercourse visited during the field surveys, located at BNG 384217, 845134

Photo 7.2 - Example of a channelised watercourse visited during the field surveys, located at BNG 400462, 844520

7.5.3 Water Quality

29. The Water Framework Directive (WFD) (EU, 2000) was implemented in December 2003 and is enforced within Scotland through the Water Environment and Water Services (Scotland) Act 2003 (Scottish Executive, 2003).

30. SEPA have classified the surface water quality of all significant waterbodies in Scotland under the Water Framework Directive (WFD) (2020)[ii]. SEPA have classified all rivers with a catchment area of >10km^2, or smaller waterbodies where there has been reason to monitor the water quality. The WFD-named watercourses identified within the Study Area have been recorded in **Table 7.6**, along with the most recent classification and the number of watercourse crossings.

Table 7.6 -Main waterbodies within the proposed Study Area

Watercourse Name	SEPA ID	Catchment	No. of Crossing Points	Overall Status (2020)	Limiting Parameters
Cairnbulg Point to the Ugie Estuary	200142	Buchan Coastal	0	High	No Limiting Parameters
River Ugie-North/South confl to tidal limit	23215	River Ugie	2	Poor	Pre-HMWB, Ecology & Water Quality
Faichfield Burn	23217	River Ugie	0	Moderate Ecological Potential	Pre-HMWB, Ecology & Water Quality
North Ugie Water – lower catchment	23221	River Ugie	1	Moderate Ecological Potential	Pre-HMWB & Ecology
South Ugie Water – Stuartfield to Longside	23224	River Ugie	1	Moderate	Pre-HMWB & Ecology
Quhomery Burn	23226	River Ugie	1	Moderate Ecological Potential	Pre-HMWB, Ecology & Water Quality

Watercourse Name	SEPA ID	Catchment	No. of Crossing Points	Overall Status (2020)	Limiting Parameters
Annochie Burn	N/A	River Ythan	1	Not classified by SEPA	Not classified by SEPA
Little Water/ Black Burn	23237	River Ugie	1	Moderate Ecological Potential	Pre- HMWB, Ecology & Water Quality
Burn of Swanford	N/A	River Ythan	0	Not classified by SEPA	Not classified by SEPA

31. For waterbodies that have not been classified, such as tributaries for the classified waterbodies, it is industry standard to assume the classification based on downstream or adjacent waterbodies, unless otherwise justified.

32. It is worth noting that the 'River Ugie - North/South confl to tidal limit' waterbody was designated as a surface Drinking Water Protected Area (DWPA) under the Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013[iii].

33. The information set out in **Table 7.6** indicates that the coastal water has a better overall condition than the inland surface waterbodies. The surrounding land is predominantly agricultural in use, which is considered to have an influence on the inland surface water quality. The Study Area is also fully located within the Moray, Aberdeenshire, Banff, and Buchan Nitrate Vulnerable Zone (NVZ), which highlighted that the concentration of nitrates in the water either is currently or is expected to exceed the nitrate levels set out within the Nitrates Directive 91/676/EEC and is monitored by SEPA to reduce nitrate loss from agricultural practices.

7.5.4 Flood Risk

34. SEPA's Flood Hazard and Risk Map (the map) illustrates the indicative flood extents of high likelihood (1 in 10-year probability), medium likelihood (1 in 100-year probability), or low likelihood (1 in 200-year probability) of coastal, surface and river floods[iv].

35. The map has identified that the watercourses listed in **Table 7.6** all have a high risk of 'river flooding'. The flooding remains predominantly within the channel of the watercourses, with the exception of the 'North Ugie Water – lower catchment' and the 'River Ugie – North/South confl to tidal limit'. The flooding for these watercourses is illustrated extending into the nearby farmland outwith the river channel.

36. In addition, there are several small areas of high likelihood of 'surface water flooding' located along the Study Area, however it is evident from the map that these are primarily indicative of surface water ponding associated with topographic low points, and localised to small agricultural burns and drainage ponds.

37. A high likelihood of 'coastal flooding' within the Study Area is notable in the eastern section, however it is mostly contained along the shoreline of Sandford Bay.

38. The eastern section of the Study Area is also located within a Potentially Vulnerable Area, which is an area designated for flood management under the Flood Risk Management Act (Scotland) 2009. This indicates that there is potential for flooding to impact on vulnerable areas of people, properties, communities, and specific environmental sites.

7.5.5 Private Water Supplies

39. Private Water Supplies (PWS) are considered to be a domestic, public, or commercial water supply that is not provided by a water company. PWS can be grouped into two types of supplies:

- Type A – Supply >50 people, or more than 10m^3 of water a day, form part of a commercial/public activity, or are used in a commercial/public activity (regulated under The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017), and
- Type B - Supply <50 people in total and serving domestic premises only (regulated under The Private Water Supplies (Scotland) Regulations 2006)).

40. PWS information is generally recorded and updated by Local Authorities. PWS data was requested from Aberdeenshire Council out to 3km from the proposed cable route in August 2022, as to encompass the proposed study area and the surrounding area.

41. The Council's dataset identified 59 records of PWS within 250m of the proposed Cable Route Corridor. In order to confirm that the Council's records were up to date and that none of the relevant properties hold an unregistered supply, a PWS questionnaire was sent out to the relevant landowners and distributed at the public consultation events. The questionnaire requested the current status, location, and type of the water source and of any associated pipework. The questionnaire also provided a map of the proposed cable route so that the user could illustrate the location of the PWS. This data was then collected by the land agent and was used to inform and update the Council's PWS records. The source locations of PWS were updated, where appropriate, and any properties found to now be served by mains supply were removed from the data set.

42. The updated PWS data indicated that there are 46 PWS records located within 250m of the proposed Cable Route Corridor. 45 of these supplies were noted to be a Type B PWS, and one of these supplies was noted to be a Type A PWS associated with an operational quarry. These PWS are illustrated within **Figure 7.1a-7.1e** and are detailed further within **Appendix 7.1 – Private Water Supply Risk Assessment**.

7.5.6 Geology

7.5.6.1 Bedrock Geology

43. The bedrock geology for the Study Area was obtained from the British Geological Survey (BGS) 1:50,000 map[v]. The BGS map identified the following bedrock to be beneath the Study Area, as encountered in an east to west direction:

- Peterhead Pluton – Granite;
- Forest Of Deer Pluton- Melagranite, biotite;
- Crinan Subgroup and Tayvallich Subgroup of Argyll Group– Semipelite, pelite and psammite;
- North-East Grampian Granitic Suite (Ordovician) of the Caledonian Supersuite- Granodiorite;
- North-East Grampian Basic Suite of the Caledonian Supersuite – Gabbroic Rock;
- Strichen Formation of the Argyll Group- Quartzite;
- Maud Pluton of the North-East Grampian Basic Suite– Gabbroic Rock;
- Macduff Formation of the Southern Highland Group – Micaceous psammite, semipelite and pelite; and
- North Britain Late Carboniferous Tholeithic Suite – Quartz-microgabbro.

44. A faultline dissects the centre of the Study Area as it crosses to the south of Mintlaw in a north-east to south-west alignment.

7.5.6.2 Superficial Geology

45. The superficial geology for the Study Area was obtained from the British Geological Survey (BGS) 1:50,000 map[v]. The BGS map identified the following superficial geology within the Study Area, as encountered in an east to west direction:

- Marine Beach Deposits – Gravel, sand and silt, which is associated with the coastline;
- Blown Sand – Sand, which is found along the sand dunes at the coastline;
- Hatton Till Formation – Diamicton, clay, sand, and gravel;
- Alluvium – Clay, silt, sand and gravel. These deposits are generally found adjacent to surface water bodies;
- Glaciofluvial Sheet Deposits – Gravel, sand, and silt;
- Banchory Till Formation – Diamicton, which is the predominant deposit across the Study Area; and
- Peat – found in small, isolated pockets.

7.5.7 Hydrogeology

46. All groundwater bodies in Scotland have been classified by SEPA under the Water Framework Directive (WFD)[ii]. The Study Area is underlain by three groundwater bodies, as listed below from east to west:

- The Fraserburgh groundwater (ID: 150634) is 207.4 km^2 in area and was recorded as having an overall status of 'Good' in 2020, with no limiting parameters;

- The Mintlaw groundwater (ID: 150655) is 323.1km^2 in area and was awarded an overall status of 'Good' in 2020 with no limited parameters noted; and
- The western portion of the Study Area traverses the Ellon groundwater unit (ID: 150676). In 2020, this groundwater body was recorded as having an overall status, chemical status, and water quality status of 'Poor'.

47. The BGS Hydrogeology 1:625000 map classifies the potential for aquifer to supply groundwater (i.e. aquifer productivity) and describes the potential for groundwater flow mechanisms[v]. The Study Area is situated upon four bedrock aquifers, which are summarised in **Table 7.7** below.

Table 7.7 – Bedrock aquifers and associated productivity

Rock Unit	Aquifer Productivity	Description
Unnamed Igneous Intrusion (Late Silurian to Early Devonian)	2C – Low Productivity Aquifer	Small amounts of groundwater in near surface weathered zone and secondary fractures, with rare springs.
Argyll Group	2C – Low Productivity Aquifer	Small amounts of ground water in near surface weathered zone and fractures.
Unnamed Igneous (Intrusion, Ordovician to Silurian)	2C – Low Productivity Aquifer	Small amounts of ground water in near surface weathered zone and secondary fractures, with rare springs.
Southern Highland Group	2C – Low Productivity Aquifer	Small amounts of groundwater in near surface weathered zone and secondary fractures.

7.5.8 Soils and Peatland

48. The Macaulay Land Use Research Institute (MLURI) created both the 1:250 000 National Soil Map of Scotland and the 1:25 000 Soil Map of Scotland[vi], which maps the soil types across Scotland.

49. The Soil Map of Scotland identifies the generalised soil types within the Study Area to be Alluvial soil, Brown soils, Immature soils, Mineral gleys, Mineral Podzols, Peat, and Peat gleys. These soil types are illustrated in **Figure 7.1a-7.2e**, and their characteristics are further detailed in **Table 7.8** below.

Table 7.8 – Soil Characteristics[vii]

Generalised Soil Type	Soil Drainage	Soil Description
Alluvial soil	Variable drainage, from free to poor.	Weakly developed soils established by river, estuarine or marine deposits.
Brown soils	Imperfectly drained.	Moderately acid soils with brown mineral topsoils and yellow/brown subsoils.
Immature soils	Variable drainage.	Characterised by indistinct or weakly developed horizons that are generally restricted to surface organic horizons or surface mineral horizons, if developed.
Mineral gleys	Poorly drained.	Permanently or intermittent waterlogged soils, due to either inhibited surface water drainage or the presence of groundwater.

Generalised Soil Type	Soil Drainage	Soil Description
Mineral Podzols	Freely drained.	These soils are generally associated with acid parent material, with heathland or coniferous woodland as the associated vegetation.
Peat	Poorly drained.	Organic soils that are formed: wither under waterlogged conditions to where dead plant material builds-up faster than it can be broken down by soil organisms.
Peat gleys	Poorly drained	Wet soils formed from permanent or intermittent waterlogging. Soils are typically greyish or blue with orange mottling and have a peat-rich surface horizon.

50. The *NatureScot Carbon and Peatland Map* (2016)[viii] illustrates the distribution of soil carbon categories and peatland habitats across Scotland, in addition to known areas of deep peat and priority peatland habitat[1]. This Map indicates that the Study Area is predominantly underlain with mineral soil, which is defined as mineral soils with no peatland vegetation.

51. There are also smaller areas of Class 5 (mineral or peat soils with no peatland vegetation) and Class 4 (predominantly mineral soil with some peat soil that are unlikely to include peatland habitat or carbon-rich soils) soils situated within the Study Area.

52. Areas of Class 1 and Class 2 peatland are nationally important carbon-rich soils, deep peat, and priority peatland habitats that are likely to be of high conservation value. There are three pockets of Class 1 peat that traverse the Study Area, which are all located along the western section of the Proposed Development, as shown on **Figure 7.1d-7.1e .** At its closest point, there is a pocket of Class 1 peat c.80m to the north of the proposed Cable Route Corridor.

7.5.9 Sensitive Habitats

53. There are no known SSSI Designated Sites located within the Study Area[ix]. The nearest designated site is the Rora Moss Site of Special Scientific Interest (SSSI) that is located c1.9km to the north of the Study Area at its closest point. This ecological designation is noted for its raised bog habitat. The designation was last assessed to be in an unfavourable condition in 2012, with pressures noted to be the drainage and scarification of the habitat[2].

54. A site walkover and National Vegetation Classification (NVC) study was conducted by IMTeco Ltd (See **Appendix 6.1 – Habitat Survey & National vegetation Classification**). In addition to the arable land, some areas of the Proposed Development are comprised of broadleaf and coniferous woodland, grassland, modified bog, and sand dunes. There are also areas of running water, standing water, and ditch systems that drain the agricultural land. With regards to hydrology, several areas of GWDTE were identified in mosaics across the site. Present communities include:

- W4 *Betula pubescens-Molinia caerulea* woodland
- W7 *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland
- M23 *Juncus effusus/acutiflorus – Galium palustre* rush-pasture Juncus effusus sub-community
- M27 *Filipendula ulmaria-Angelica sylvestris* tall-herb fen
- MG10a *Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community
- MG5 *Cynosurus cristatus-Centaurea* nigra grassland
- M25 *Molinia caerulea-Potentilla erecta* mire
- M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire
- M20a *Eriophorum vaginatum* blanket and raised mire
- S5 *Glyceria maxima* swamp
- S9 *Carex rostrata* swamp

1.

1. [1] https://map.environment.gov.scot/Soil_maps/?layer=10
2. [2] https://sitelink.nature.scot/site/1371

- S28 *Phalaris arundinacea* tall-herb fen

55. The above communities have been assigned varying degrees of groundwater dependency, based on the Scotland Dependency Score (UKTAG Guidance 5ab Annex 1). The W4 & W7 communities within the study area are regarded as Class 1 GWDTE, which have a strong dependency on groundwater. The MG10a, M23 & M27 communities within the study area are categorised as Class 2 GWDTEs, where there is likely to be some dependency on groundwater discharge, due to the hydrogeological conditions associated with the communities during the surveys. All other communities on site were categorised as Class 3 GWDTE.

56. Further details regarding GWDTEs and other vegetation communities present on the site is available in **Appendix 6.1 – Habitat Survey & National Vegetation Classification**.

7.6 Potential Effects

7.6.1 Sensitive Receptors

57. The Study Area is predominantly situated within the watershed of the River Ugie catchment of the Scotland River Basin, although the western and eastern fringes of the Study Area also traverse into the River Ythan catchment and the Buchan Coastal catchment, respectively.

58. The overall condition of the watercourses along the Study Area are generally classified to be in either a moderate or poor condition. However the River Ugie and the River Ythan catchments as a whole are known to support salmonid populations and are popular destinations for recreational fishing. Furthermore, the Study Area encompasses the 'River Ugie- North/South confl to tidal limit' Drinking Water Protected Area (DWPA), which could be impacted by reduced water quality and quantity from development activities. Several waterbodies were also highlighted to be at high risk from river and surface water flooding, which has the potential to be elevated by unmitigated construction work. As such, the waterbodies identified in **Table 7.6**, and their associated tributaries will be considered as a receptor with a 'High' sensitivity.

59. Unmitigated construction works has the potential to temporarily impact the water quantity and quality of any PWS within 250m of the Proposed Development. Some PWS are located <100m from the proposed Cable Route Corridor and therefore, as depicted in **Table 7.3**, PWS will be included as a receptor with 'High' sensitivity. The individual risk to each PWS is detailed further in **Appendix 7.1**.

60. Most of the Study Area is located upon the Mintlaw Groundwater unit, although the western boundary traverses the Ellon groundwater unit, and the eastern boundary crosses the Fraserburgh groundwater unit. Both the Mintlaw and the Fraserbugh units were awarded an overall status of 'Good' in 2020 by SEPA, although the Ellon groundwater body was classed as 'Poor' in the same year. The various bedrocks underlying the sites can be mostly described as low productivity aquifers (2C), meaning that there is limited potential for construction activities to impact on the water quality of this groundwater unit and for any unmitigated contaminated groundwater to move outwith the vicinity of the Proposed Development. As such, these groundwater units will be considered as a receptor with 'Medium' sensitivity.

61. There are three pockets of Class 1 peat that are partially located within the Study Area. Class 1 Peat is considered to be of national importance and conservation value. The closest area of Class 1 peat is located c.80m to the north of the proposed Cable Route Corridor at its nearest point. Although the peatland is situated outwith the proposed Cable Route Corridor, due to its proximity, there is potential for the peat to be disturbed during construction activities. Therefore, Class 1 Peat will be included as a receptor with 'High' sensitivity.

62. The NVC study identified several pockets of plant communities on site that are thought to be groundwater dependent (GWDTE), with these vegetation communities graded as Class 1, Class 2, and Class 3. There is likely to be some dependency on groundwater discharge (as detailed within **Appendix 6.1 – Habitat Survey & National Vegetation Classification**). These habitats are of conservation value and may be impacted by excavation works on the site. As such, the Class 1 GWDTEs are considered as receptors with 'High' Sensitivity. Given the spread of Class 2 and Class 3 GWDTEs on site, the Class 2 and Class 3 GWDTE are taken to also be covered by the Class 1 review, providing a conservative element to the assessment.

63. The identification of sensitive receptors, considering baseline conditions, is summarised below in **Table 7.9**.

Table 7.9 – Sensitive Receptors

Receptor	Sensitivity	Comment
Watercourse & Fishery	High	The Study Area is located within the watershed of the River Ugie, the River Ythan, and the Buchan Coastal catchments. The River Ugie and the River Ythan and their tributaries are known to support salmonids and are widely used for recreation. In addition, several of the watercourses are noted to be at high risk from surface water and river flooding. The River Ugie catchment also encompasses the 'River Ugie-North/South confl to tidal limit' DWPA.
Private Water Supply (PWS)	High	Discussions with Aberdeenshire Council and a PWS questionnaire has identified 46 potential PWS to be located within the Study Area.
Groundwater Unit	Medium	The Proposed Development is located upon the Mintlaw, Fraserburgh, and Ellon groundwater units, and the bedrocks underneath the Study Area are considered to be low productivity aquifers (2C).
Class 1 Peat	High	Three pockets of Class 1 Peat traverse into the Study Area, with one situated c.80m to the north of the proposed Cable Route Corridor at its closest point.
GWDTE	High	The W4 & W7 within the study area are categorised as Class 1 GWDTE.

7.6.2 Construction

7.6.2.1 Increase in Runoff

64. Replacing natural land cover with impermeable surfaces will reduce the rate of infiltration of rainwater into the underlying strata and increase runoff from the site. An increase in runoff in the area can also compound various other predicted impacts, such as sedimentation, erosion, chemical pollution, and flood risk.

65. No increase in runoff resultant of the cable duct installation is anticipated. Although the duct will be constructed from impermeable materials, permeable cement bound sand will be lain below and above the duct, and any excavated subsoil and topsoil will be reinstated in their respective horizons once the cable ducts are laid. Therefore, the permeability of the ground will remain the same. A haul road will be installed to run alongside the cable ducts, it will be approximately 5m wide and will be formed of MOT Type 1 Sub Base, ensuring that the ground remains permeable.

66. The cable route will also require the installation of cable joint pits, which will comprise concrete plinths at every 0.6-1km intervals along the cable route, as further detailed within the **Construction Execution Plan (CEP).** These joint pits will be installed at ground level, approximately 10m by 2m in size, covered over by a manhole cover, and will replace the baseline ground conditions with an impermeable material that will increase surface runoff at these locations.

67. Hardstanding areas and concrete foundations will be required for the construction of the Proposed Substation and the associated access track and construction compound. These will increase the impermeable footprint of the site and result in localised changes to surface water hydrology, which is currently an arable field.

68. Mobilisation Areas will also be constructed along the Cable Route Corridor, as detailed within the **CEP**. These areas will be utilised for storage during the construction stage and will be temporarily stripped of topsoil. A stone road and apron will be laid on a geotextile membrane to provide access to the Mobilisation Areas during all weather conditions. Therefore, the ground will remain permeable and free draining along the access to the Mobilisation Areas and will not result in an increase in runoff.

69. However, Mobilisation Area 1 and Mobilisation Area 2 will also hold the main yard sites and office complexes and will be situated 0.45km to the south-east of the existing National Grid New Deer Substation (NGNDSS) and 1.5km to the north-west of Peterhead, respectively. This will require the temporary construction of office

buildings and material storage that will be comprised of portacabin and ISO containers. These elements will increase the impermeable footprint of the Site and result in localised changes to the surface water hydrology.

70. Before any cable trench excavation is carried out, temporary agricultural land drainage measures, including installation of temporary header drains, will be installed for each route section. Drainage will also be installed for the site yard, mobilisation areas, and off easement accesses by a specialist sub-contractor that will be designed to accommodate any runoff from the working areas, as calculated by an assigned drainage engineer. This is to ensure that any increase in runoff is captured and managed appropriately.

71. **Table 7.10** below sets out the potential impacts from an increase in runoff from the proposed Cable Route Corridor on the sensitive receptors, prior to the implementation of mitigation.

Table 7.10 - Impact of Increase in Runoff from the cable route (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	There is potential for increased surface runoff however, this is limited to the immediate area surrounding the cable joint bays, proposed office complex infrastructure, and material storage areas, as the ground along the remaining cable route will remain permeable. The installed drainage system should also be able to accommodate any additional runoff from the proposed infrastructure.	High	Low	Minor to Moderate
Private Water Supply (PWS)	Several PWS have been identified within 250m of the Cable Route Corridor. There is potential for cable joint pits to be sited in line with these water supplies, and, as such, there is potential for an increase in runoff to enable sediment and contaminants to reach the relevant PWS. However, it is anticipated that any increase in runoff will be accommodated by the installed drainage system.	High	Low	Minor to Moderate
Groundwater Unit	The ground along the installed cable route will remain permeable, except for the cable joint bays, the proposed office complex infrastructure, and material storage areas. The extent of impermeable surfaces proposed is limited in relation to the size of the groundwater body.	Medium	Low	Minor
Class 1 Peat	The ground along the installed cable route will remain permeable, except for the cable joint bays and the proposed office complex infrastructure. The location of the joint bays will be confirmed once further site investigations have been carried out post-Consent. One of the three areas of Class 1 Peat within the Study Area is situated downhill of the proposed Cable Route Corridor and therefore has the potential to be degraded by an increase in runoff should a joint bay be installed uphill of	High	Low	Minor to Moderate

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
	this carbon-rich soil. However, it is anticipated that any increase in runoff will be accommodated by the installed drainage system. The two remaining areas of Class 1 Peat within the Study Area are located uphill from the Cable Route Corridor and are therefore not considered to be at risk from increased runoff.			
GWDTE	There is potential for an increase in surface water runoff to enable sediment and contaminants to reach GWDTE communities. However, this potential is limited by the installed drainage system.	High	Low	Minor to Moderate

72. **Table 7.11** below sets out the potential impacts from an increase in runoff from the Proposed Substation on the sensitive receptors, prior to the implementation of mitigation.

Table 7.11 - Impact of Increase in Runoff from the Substation (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	There is potential for increased surface runoff to elevate the risk of flooding in the downstream catchment, and to enable sediment and contaminants to reach watercourses. The topography on site indicates that surface water runoff will be directed towards the Burn of Swanford as it flows to the west of the proposed substation.	High	Medium	Moderate to Major
Private Water Supply (PWS)	There is potential for increased runoff from the hardstanding areas to carry sediment or pollutants towards nearby PWS. The topography on site dictates that any runoff from the substation will move in a south-west trajectory. There is a PWS situated c.150m to the south of the Proposed Substation however, it is considered that any potential runoff from the Proposed Substation moving towards this water supply would be intercepted by the existing drainage system associated with the minor road that runs parallel to the south of the proposed substation.	High	Negligible	Negligible
Groundwater Unit	The extent of impermeable surfaces proposed is limited in relation to the size of the groundwater body.	Medium	Low	Minor
Class 1 Peat	An increase in runoff has the potential to degrade peat and result in detrimental carbon release. There is a pocket of Class 1 Peat c.0.8km to the	High	Negligible	Negligible

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
	north-west of the Proposed Substation at its closest point; however, this carbon-rich soil is situated at 5m greater elevation - than the Proposed Development and is separated from the Proposed Substation by an area of woodland and field drains, which is considered to prevent runoff reaching the sensitive habitat.			
GWDTE	No GWDTE communities have been recorded within the vicinity of the Proposed Substation and therefore, they will not be impacted by any increase in runoff.	High	Negligible	Negligible

7.6.2.2 Sedimentation and Erosion

73. Construction activities on or near the edges of watercourses can impact the structural integrity of the banks of watercourses, either through direct damage to bankside material or indirect loosening of soil structure. This can affect localised watercourse morphology and water quality through erosion or even collapse of the banks, resulting in a downstream negative impact on aquatic ecological receptors.

74. Construction works such as excavations for infrastructure can involve the relocation of peats and mineral soils, and the importation of new substrates such as aggregate for Civil Enabling Works. This introduces the possibility for sediments to be washed out of materials before they are sufficiently compacted.

75. Poorly implemented drainage systems can create new runoff pathways that have the potential to erode rills into loosely aggregated substrates such as alluvial deposits.

76. Although the cable trenches proposed will require only shallow excavations, the action of cable-laying also has the potential to damage soils and introduce new drainage pathways which could generate silt laden runoff.

77. If erosion was to occur around the proposed infrastructure, an increased sediment load could lead to the constriction of the channels draining into the local river systems. This would negatively impact water quality and degrade habitat for any existing aquatic receptors.

78. It is worth noting that the amount of suspended solids pollution will be greater during heavy rainfall events, although the dilution potential of the watercourses is also at its greatest during these periods.

79. **Table 7.12** below sets out the potential impacts from sedimentation and erosion from the proposed cable route on the sensitive receptors, prior to the implementation of mitigation.

Table 7.12 - Impact of sedimentation and erosion from the cable route (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	Due to the proximity of the proposed Cable Route Corridor to various watercourses, and the requirement for several watercourse crossings, there is potential for sediment-laden runoff or contaminants to reach watercourses. However, it is anticipated that any increase in runoff will be accommodated by the installed drainage system, limiting the potential	High	Low	Minor to Moderate

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
	for sediment-laden runoff or erosion to occur.			
Private Water Supply (PWS)	Several PWS have been identified within 250m of the proposed Cable Route Corridor and, as such, there is potential for sediment-laden runoff to reach some of the water supplies and impact the water quality. However, the installed drainage system will limit the potential for sediment-laden runoff reaching any nearby PWS.	High	Low	Minor to Moderate
Groundwater Unit	Sedimentation from construction activities could result in silt-laden runoff entering the groundwater, if unmitigated, although this is tempered by the relatively large size of the groundwater body.	Medium	Low	Minor
Class 1 Peat	The topography on site dictates that the area of Class 1 Peat located to the north of Clockhill is downhill from the proposed Cable Route Corridor, whereas the other two pockets of Class 1 Peatland are situated uphill from the construction work. However, the potential for this peatland habitat to be impacted by any sedimentation or erosion from the proposed Cable Route Corridor will be limited by the installed drainage system.	High	Low	Minor to Moderate
GWDTE	Due to the proximity, these communities have the potential to be impacted if sediment-laden runoff is distributed over sensitive communities, although this is limited but the installed drainage system.	High	Low	Minor to Moderate

80. **Table 7.13** below sets out the potential impacts from sedimentation and erosion from the Proposed Substation on the sensitive receptors, prior to the implementation of mitigation.

Table 7.13 - Impact of sedimentation and erosion from the Substation (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	Due to its proximity, there is potential for increased sediment to be washed into the Burn of Swanford as it flows to the west of the proposed substation.	High	Medium	Moderate to Major
Private Water Supply (PWS)	The topography dictates that any sediment-laden runoff from the Substation will run in a south-west trajectory, towards the PWS that is situated c.150m to the south of the proposed Substation. However, it is	High	Negligible	Negligible

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
	anticipated that any sediment-laden runoff will be intercepted by the existing drainage system associated with the minor road that runs parallel to the south of the proposed Substation. The existing drainage associated with the road will intercept any runoff from the proposed Substation that is moving towards this water supply.			
Groundwater Unit	Sedimentation from the construction of the Substation could result in silt-laden runoff entering the groundwater, if unmitigated. However, this is tempered by the relatively large size of the groundwater body.	Medium	Low	Minor
Class 1 Peat	Due to the topography surrounding the Proposed Development site for the substation, sediment-laden runoff will not reach any of the nearby pockets of Class 1 Peat.	High	Negligible	Negligible
GWDTE	No GWDTE communities have been recorded within the vicinity of the Proposed Substation and therefore, they will not be impacted by any sediment-laden runoff.	High	Negligible	Negligible

7.6.2.3 Chemical Pollution

81. There are various sources of potential contamination by way of chemical pollution during construction. Runoff from construction areas and excavations may become contaminated by construction material or spilt pollutants, which ultimately enter watercourses or groundwater. Concrete or cement brought onto site for the construction of the foundations may be spilt. Construction-related oil, grease, fuel, or foul water may also be accidentally leaked. Even a small amount of these pollutants can have a serious negative impact on water quality and aquatic ecosystems. Similar fuels and oils may be required to be brought onto site for maintenance purposes throughout the operational life of the development.

82. **Table 7.12** below sets out the potential impacts from chemical pollution from the proposed cable route on the sensitive receptors, prior to the implementation of mitigation.

Table 7.14 - Impact of chemical pollution from the cable route (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	Due to the proximity of the proposed Cable Route Corridor to various watercourses, there is potential for runoff containing construction-related pollutants to contaminate local watercourses. However, it is anticipated that the installed drainage system will accommodate any contaminated runoff, which will limit this potential.	High	Low	Minor to Moderate

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Private Water Supply (PWS)	Several PWS have been identified within 250m of the proposed Cable Route Corridor. The installed drainage system will be designed to accommodate any contaminated runoff. Groundwater catchments can transcend surface watersheds, and contaminated groundwater may move towards any nearby PWS and impact on the water quality. However, this is restricted by the limited permeability of the underlying strata.	High	Low	Minor to Moderate
Groundwater Unit	There is potential for chemical pollution to enter the groundwater unit, given the nature of the development; however, the impact is tempered by the relatively large size of the groundwater body, and the zone of impact would be limited by the limited permeability of the underlying strata.	Medium	Low	Minor
Class 1 Peat	Chemical pollution may lead to the loss of peatland vegetation cover, which would leave the underlying peat vulnerable to erosion. However, only small quantities of potential chemical pollutants will be brought on site. The extent of vegetation loss as a result of chemical pollution is likely to be highly localised to the point of the spill, and the installed drainage system will be designed to accommodate any runoff from the site that may be carrying pollutants.	High	Low	Minor to Moderate
GWDTE	Due to the proximity, unmitigated chemical pollution has potential to degrade GWDTE in the vicinity of the construction works however, this is limited by the installed drainage system.	High	Low	Minor to Moderate

83. **Table 7.15** below sets out the potential impacts from chemical pollution from the Proposed Substation on the sensitive receptors, prior to the implementation of mitigation.

Table 7.15 - Impact of chemical pollution from the Substation (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	Due to its proximity, there is potential for runoff containing construction-related pollutants to be washed into the Burn of Swanford as it flows to the west of the proposed Substation.	High	Medium	Moderate to Major

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Private Water Supply (PWS)	Considering the topography on site, it is not anticipated that any contaminated runoff will move towards the nearby PWS. As groundwater catchments can transcend surface watersheds, it is considered that potentially contaminated groundwater could move towards the nearest PWS. However, there is merit in highlighting the limited permeability of the Site's underlying strata, as these mean any unmitigated contaminants carried in either surface or groundwater will significantly dilute and disperse into the surrounding environment before reaching any of the supplies.	High	Low	Minor to Moderate
Groundwater Unit	There is potential for chemical pollution to enter the groundwater unit, given the nature of the development; however, the impact is tempered by the relatively large size of the groundwater body, and the zone of impact would be limited by the limited permeability of the underlying strata.	Medium	Low	Minor
Class 1 Peat	Due to the topography surrounding the location of the Proposed Substation, contaminated runoff will not reach any of the nearby pockets of Class 1 Peat.	High	Negligible	Negligible
GWDTE	No GWDTE communities have been recorded within the vicinity of the Proposed Substation and therefore, they will not be impacted by any contaminated runoff.	High	Negligible	Negligible

7.6.2.4 Disruption to Flow Paths & Flood Risk

84. Construction of proposed infrastructure may interrupt natural flow paths and result in localised changes to surface water hydrology. This can result in the 'drying out' of hydrologically sensitive areas, or alternatively, result in an increase in flood risk that can see sensitive areas flooded and contaminated with mineral matter.

85. Water crossing points can result in this sort of disruption to flow paths As detailed in SEPA's SG25, 'Engineering in the water environment: good practice guide – River Crossings (2010)', a poorly designed and constructed crossing can lead to a variety of detrimental impacts including:

- Loss or damage of plants, animals and their habitats;
- Create a barrier to the movement of fish and other wildlife;
- Prevent sediment and woody debris being moved downstream;
- Prevent natural river movement;
- Increase flood risk; and
- Erosion of the stream bed.

86. The proposed Cable Route Corridor will require several crossings points across watercourses of various sizes, ranging from the River Ugie to small field drains. All crossing points will be designed to ensure protection of the existing fluvial morphology and aquatic flora and fauna.

87. It is proposed that a trenchless methodology will be utilised for relevant crossing points, as detailed within the CEP. This trenchless technique will ensure minimal disturbance to watercourses as it does not require in-water construction activities. It is also effective in maintaining natural river morphology and does not provide a barrier for fish movement.

88. Smaller watercourses will be "flumed" at the proposed crossing points, which consists of installing a steel pipe into the relevant watercourse and plugging around the flume at both ends to form a watertight seal. This will allow the watercourse to continue to flow whilst the cable trench is excavated below and will maintain a dry trench. The trench will then be excavated and the ducts will be installed using excavators. Once complete, the banks will be immediately backfilled and temporary works will be removed. This methodology will allow the watercourse to continue to flow during construction and should be effective in protecting the existing fluvial morphology and aquatic flora and fauna.

89. However, it is worth noting that further site investigation will confirm the final number of trenchless crossings. The trenchless methodology will also be finalised once further geotechnical data has been gathered, to ensure that the proposed methodology will safeguard the surrounding hydrological and hydrogeological environment.

90. Cable ducts can create new pathways for groundwater flow, which can lead to lowering of the groundwater level. However, this will be localised to the cable route. Additionally, as the backfill materials will be the excavated subsoil and topsoil the potential for significantly disrupted flow paths will be minimised relative to using foreign material.

91. The Proposed Substation will require the construction of concrete hardstanding areas. Construction of this infrastructure may interrupt the natural flow paths and result in localised changes to surface water hydrology.

92. **Table 7.16** below sets out the potential impacts from disruption to flow paths and flood risk from the proposed Cable Route Corridor on the sensitive receptors, prior to the implementation of mitigation.

Table 7.16 - Impact of disruption to flow paths and flood risk from the cable route (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	Taking the proposed methodology for watercourse crossings into account, there is limited opportunity for the proposed Cable Route Corridor to interrupt surface water flow paths and increase flood risk.	High	Low	Minor to Moderate
Private Water Supply (PWS)	The construction of the infrastructure may disrupt flow paths to nearby PWS.	High	Low	Minor to Moderate
Groundwater Unit	There is limited opportunity for the proposed infrastructure to interrupt groundwater flow paths, which is further tempered by the relatively large size of the groundwater body. There is potential for the installed cable ducts to create a new groundwater flow path although this impact will be localised to the installed cable infrastructure.	Medium	Low	Minor
Class 1 Peat	Due to their proximity, the construction of cable route may interrupt groundwater flow to the Class 1 Peat. However, as groundwater tables often follow the surface topography, the	High	Low	Minor to Moderate

	influence of the proposed infrastructure on the flowpath to surrounding peatland is anticipated to be limited due to the topography.			
GWDTE	Due to their proximity, the construction of Cable Route Corridor may interrupt groundwater flow to the GWDTE communities.	High	Low	Minor to Moderate

93. **Table 7.17** below sets out the potential impacts from disruption to flow paths and flood risk from the Proposed Substation on the sensitive receptors, prior to the implementation of mitigation.

Table 7.17 - Impact of disruption to flow paths and flood risk from the Substation (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	Due to its proximity, there is potential for the construction of the Proposed Substation to result in localised changes to the groundwater seepage into the Burn of Swanford as it flows to the west of the proposed Substation.	High	Low	Minor to Moderate
Private Water Supply (PWS)	It is expected that there would be limited opportunity for any PWS to be impacted, considering the limited permeability of the underlying strata.	High	Low	Minor to Moderate
Groundwater Unit	There is limited opportunity for the proposed infrastructure to interrupt groundwater flow paths, which is further tempered by the relatively large size of the groundwater body.	Medium	Low	Minor
Class 1 Peat	Due to their proximity, the construction of the Substation Compound area may interrupt groundwater flow to the pocket of Class 1 Peat to the north-west. How ever, as groundwater tables often follow the surface topography, the influence of the proposed infrastructure on the flow path to surrounding peatland is anticipated to be limited due to the topography.	High	Low	Minor to Moderate
GWDTE	No GWDTE communities have been recorded within the vicinity of the Proposed Substation and therefore, there will be no interruption of flow paths to the sensitive communities.	High	Negligible	Negligible

7.6.2.5 Dewatering & Abstraction

94. Given what is known about the ground conditions in the area and the expected extent of the excavation works, groundwater will likely enter excavations. As such, dewatering will likely be required to temporarily lower the water table for larger excavations. SEPA guidance specifies that the potential zone of dewatering impact can be up to 250m from excavations that exceed 1m in depth, and 100m from excavations less than 1m in depth. Dewatering may also be required whilst some of the watercourse crossing points are being installed to ensure a safe working environment. The outline pipes will be set up to prevent scouring and disturbance, and the foremen will be notified of the agreed areas suitable for the water to be pumped to.

95. Where possible, all pumped water will be discharged on land located away from watercourses and any newly installed drains so that natural filtration can occur. A filtrating bund will be constructed at the chosen location to prevent the build-up of silt over a large area, and the collected silt will then be returned to the subsoil surface prior to topsoil reinstatement.

96. If an appropriate location of land is not available for discharging water, then excess water will pass through a filtration system, such as temporary settlement lagoons, with straw bales and silt netting filtration/silt bags, and will then be discharged into a watercourse.

97. Once construction activities are complete and the excavations are reinstated the groundwater table and surface water levels are expected to recover in a matter of days. The proposed methodology for any dewatering activities is detailed further within the Construction Execution Plan (CEP).

98. **Table 7.18** below sets out the potential impacts from dewatering and abstraction from the proposed cable route on the sensitive receptors, prior to the implementation of mitigation.

Table 7.18 - Impact of dewatering and abstraction from the cable route (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	Due to the proximity, the watercourses within the Study Area have the potential to be impacted by any temporary dewatering activities, as it may temporarily lower the water table within the vicinity of the watercourses.	High	Low	Minor to Moderate
Private Water Supply (PWS)	Dewatering has the potential to temporarily impact on the quantity of any PWS located within the potential zone of dewatering, as it may temporarily lower the water table within the vicinity of the PWS.	High	Low	Minor to Moderate
Groundwater Unit	There is limited potential for dewatering activities to significantly impact the groundwater table, particularly given the size of the groundwater body, and any dewatering activities being temporary.	Medium	Low	Minor
Class 1 Peat	Dewatering has the potential to temporarily dry the peat mass in the vicinity of the works as it may temporarily lower the water table within the vicinity of the peatland habitat.	High	Low	Minor to Moderate
GWDTE	Dewatering may temporarily affect groundwater in the vicinity of these communities.	High	Low	Minor to Moderate

99. **Table 7.19** below sets out the potential impacts from dewatering and abstraction from the Proposed Substation on the sensitive receptors, prior to the implementation of mitigation.

Table 7.19 - Impact of dewatering and abstraction from the Substation (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	Due to its proximity, the Burn of Swanford has the potential to be impacted by any temporary dewatering	High	Low	Minor to Moderate

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
	activities as it flows to the west of the Proposed Substation.			
Private Water Supply (PWS)	Dewatering has the potential to temporarily impact on the quantity of any PWS located within the potential zone of dewatering. As such, the construction of the Substation may temporarily impact on the water quantity of the PWS located to the south of the Proposed Substation.	High	Medium	Moderate to Major
Groundwater Unit	There is limited potential for dewatering activities to significantly impact the groundwater table, particularly given the size of the groundwater body, and any dewatering activities being temporary.	Medium	Low	Minor
Class 1 Peat	There are no areas of Class 1 Peat located <250m from the development footprint for the Substation and therefore, will not be impacted by any required dewatering activities.	High	Negligible	Negligible
GWDTE	No GWDTE communities have been recorded within the vicinity of the Proposed Substation and therefore, there will be no impact from any dewatering activities.	High	Negligible	Negligible

7.6.3 Operation

100. Most of the potential effects identified during the construction phase would not be expected to arise during the operational phase, due to the nature of the works. The Cable Route Corridor, Proposed Substation, and associated infrastructure will remain in-situ during operation, and the mobilisation areas, including the site yards and office complex, will be removed and reinstated with the excavated subsoil and subsoil at the end of the construction phase.

101. The risk of release of sediments or chemical pollutants entering the water environment from operational activities of the Proposed Development is significantly lower than the construction phase due to the smaller levels of ground disturbance and reduced quantity of oil, greases, and other materials on to the Site. Furthermore, no dewatering activities will be required during the operational phase.

102. Embedded mitigation and good design will reduce the potential for adverse operational impacts.

103. There is the potential for hardstanding areas and access tracks associated with the Proposed Substation to result in an increase of surface runoff during the operational phase, in turn leading to the potential for increased risk of surface erosion and downstream flood risk. The manhole covers will also remain in place along the Cable Route Corridor during its operation and increase the potential for runoff, the remainder of the cable joint pits will be covered by excavated topsoil and the footprint of the manhole covers is relatively small and the surrounding ground will remain permeable. Therefore, it is assumed that any potential impacts from an increase in runoff from the proposed cable route on the sensitive receptors will be negligible during operation.

104. The potential operational effects from the operation of the Working Cable Route Corridor and Proposed Substation are set out below.

7.6.3.1 Increase in Runoff

105. There is potential for the Proposed Substation to increase the volume of surface water runoff, due to the increase in impermeable surfaces that will restrict the infiltration of rainfall into the soil. This increase in runoff could result in the elevation of baseline flood risks downstream, if unmitigated, and the increases in flows could also have a detrimental effect on the populations of fish and freshwater invertebrates.

106. **Table 7.20** below sets out the potential impacts from an increase in runoff from the Proposed Substation on the sensitive receptors during operation, prior to the implementation of mitigation.

Table 7.20 - Impact of Increase in Runoff from the Substation (without mitigation)

Receptor	Comment	Sensitivity	Magnitude of Impact	Significance of Impact
Watercourse & Fishery	There is potential for increased surface runoff to elevate the risk of flooding in the downstream catchment. The topography on site indicates that surface water runoff will be directed towards the Burn of Swanford as it flows to the west of the Proposed Substation.	High	Medium	Moderate to Major
Private Water Supply (PWS)	The topography on site dictates that any runoff from the substation will move in a south-west trajectory. There is a PWS situated c.150m to the south of the Proposed Substation however, it is considered that any potential runoff from the Proposed Substation moving towards this water supply would be intercepted by the existing drainage system associated with the minor road that runs parallel to the south of the Proposed Substation.	High	Negligible	Negligible
Groundwater Unit	The extent of impermeable surfaces proposed is limited in relation to the size of the groundwater body.	Medium	Low	Minor
Class 1 Peat	An increase in runoff has the potential to erode create rills in the Peatland habitat, degrading the peat and resulting in a detrimental carbon release. There is a pocket of Class 1 Peat c.0.8km to the north-west of the Proposed Substation at its closest point however, this carbon-rich soil is situated at 5m greater elevation than the Proposed Development, and is separated from the Proposed Substation by an area of woodland and field drains, which is considered to prevent runoff reaching the sensitive habitat.	High	Negligible	Negligible
GWDTE	No GWDTE communities have been recorded within the vicinity of the Proposed Substation and therefore, they will not be impacted by any increase in runoff.	High	Negligible	Negligible

7.7 Mitigation

7.7.1 Construction Mitigation

7.7.1.1 Excavations

107. Prior to excavations, an end-use will be identified for the excavated material and an appropriate storage solution determined accordingly. Stored materials will be kept away from surface water bodies to minimise the possibility for sediments entering the aquatic environment.

108. Where excavation works are proposed in pasture fields, the original turves will be carefully lifted and stored so that they can be reinstated once the works are complete. These turves will be stored upright in a single layer and regularly watered to prevent drying out and damage to the vegetation. The proposed storage locations and methodology for the turves will be agreed in advance with the appointed Ecological Clerk of Works (ECoW).

109. Soils will be stripped to avoid cross-contamination between distinct horizons. Stripped materials will be side-cast or stockpiled for use in the same area as they are excavated from or stored in appropriately designed and clearly defined separate stockpiles for re-use elsewhere.

7.7.1.2 Water Quality and Flood Risk Management

110. Drains will be installed prior to the construction of any cable joint bays, mobilisation areas, and site yards. This will include the instalment of infiltration trenches running adjacent to the proposed Cable Route Corridor and associated infrastructure, which will collect any runoff and allow any potential sediments and pollutants to be filtered from the water as it percolates into the surrounding topsoil.

111. Temporary drains will also be installed along the length of the proposed Cable Route Corridor during construction to intercept any surface water runoff, limit the amount of water filling the excavation trenches, and prevent any drainage channels forming. These drains will control the volume and quality of surface water discharge to the surrounding water environment and may include the use of settling tanks or ponds to remove sediment, as required.

112. The location of cable joint bays has not yet been confirmed and will be determined at a later design stage that will be informed by further site investigations however, these joint bays will be sited at areas with the lowest flood risk along the cable, where possible.

113. Where appropriate, temporary silt fences will be installed downslope of construction works to filter runoff that is potentially carrying silt from excavations or stockpiles. This will be effective in protecting surface water quality in adjacent watercourses and eliminate the possibility for silt laden runoff to enter them.

7.7.1.3 Private Water Supplies

114. Standard procedures will be enforced by the Principal Contractor to protect the water quality and quantity of any nearby PWS. The Principal Contractor will ensure that the drainage measures installed during the construction phase are properly maintained and monitored to ensure the drainage management remains fully effective in safeguarding the surrounding water supplies. Additionally, no fuel or potentially contaminative materials will be stored uphill of any nearby PWS sources.

115. Works carried out in proximity to any identified PWS shall be carried out in accordance with the mitigation set out in the Private Water Supply Risk Assessment (PWSRA) within **Appendix 7.1.** This includes monitoring the water quality and quantity of any PWS within proximity of construction works. If the quality and/or quantity is found to be impacted by the Proposed Development, a temporary alternative source of water will be supplied until construction works are complete.

7.7.1.4 Reinstatement

116. Early reinstatement of excavated materials is required to minimise visual impact, to reduce time required for temporary storage/stockpiling of soils, and to encourage vegetation and habitat restoration as early as possible.

117. As far as is reasonably practical and achievable, excavated material horizons will be replaced in sequence and depths similar to those recorded prior to excavation, or similar to the surrounding undisturbed ground at the point of reinstatement.

118. Any detailed reinstatement and restoration proposals will consider and mitigate all residual risks to environmental receptors.

7.7.1.5 Dewatering

119. Dewatering shall be avoided where possible to minimise impacts on sensitive habitat. However, formation of the Proposed Substation foundations may involve dewatering to temporarily lower the water table and enable work in the excavated areas.

120. Details of the pre-construction ground investigation will include an assessment of the ground permeability and water potential; the results will be used to inform any dewatering required on site.

121. Where dewatering is required, it shall comply with the Abstraction Regime of CAR General Binding Rule (GBR) 2 and GBR 15.

122. Details of how dewatering will be managed shall be provided within a final Construction Method Statement (CMS) prior to construction of the proposed project. Mitigating measures will include: using an irrigation sprinkler head to maintain moisture in the upper soil horizons of nearby GWDTE and peatland habitat; and, keeping the excavation duration as short as possible. This will maintain a continuous water supply to sensitive habitats and minimise the overall impact of dewatering.

7.7.1.6 General Site Pollution Control

123. The proposed mitigation for the construction of the access roads will continue to function through the life of the project. Routine maintenance for the roads will be carried out in summer months when the tracks are dry. Operational best practice procedures will continue to be adopted, with the risk of water pollution from such activities considered to be negligible.

124. With regard to vehicles, fleet vehicles entering the site will be regularly checked and maintained to prevent leakage of contaminants. Concrete will be premixed offsite and delivery wagons will only be washed out in areas where suitable control measures are in place. The concrete used will be of a high grade that is not prone to leaching alkalis. The number of onsite vehicles will be highest during construction. The ongoing risk of pollution on the site after construction is considered to be very low.

125. Best practice procedures in the handling, use and storage of fuel, oils, and chemicals will be adhered to at all times.

126. Prior to construction, the outline Construction Environmental Management Plan (CEMP) will be updated, and a Pollution Prevention Plan (PPP) will be put in place, adhering to the standards set out by SEPA and Aberdeenshire Council. These documents will outline mitigation measures to reduce or nullify potential impacts on the ground and surface water environment.

127. The Outline CEMP and PPP will address the following issues:

- Reinstatement and Restoration
- Decommissioning
- Contractor Duties
- Tool Box Talks
- Pollution Prevention and Mitigation
- Control of Substances Hazardous to Health
- Pollution Monitoring & Controls
- Site Waste Management Plan

7.7.2 Operation Mitigation

7.7.2.1 Substation Drainage Strategy

128. The surface water from the Proposed Substation and associated infrastructure will be managed by the implementation of a surface water drainage system. This will consist of various SuDS methods to safeguard the surrounding water environment.

129. Surface water flowing from the proposed access tracks will be captured by adjacent swales, which will also have check dams to allow the sediment to settle. The swale located on the downslope section of the tracks will also have a filter trench to collect the runoff and divert it to an underdrain. Filter trenches or swales with perforated pipes will be installed adjacent to the Substation roofs and hardstanding areas to capture any runoff, which will then be diverted into the under drains.

130. The installed underdrains and collector pipes will then direct the water to the SuDS Pond/Wetland for final treatment and storage before the water is then discharged into the adjacent Burn of Swanford at a rate that will mimic the existing greenfield runoff rate.

131. The proposed drainage strategy for the Substation site is illustrated on **Drawing C4642 (1) 110**.

7.8 Residual Effects

Table 7.21 – Summary of Residual Effects from the Cable Route

Sensitive Receptor	Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
		Sensitivity	Magnitude	Significance		
Construction						
Watercourse & Fishery	Increased Runoff	High	Low	Minor to Moderate	Temporary drains to be installed adjacent to the cable route infrastructure to capture runoff.	Negligible
	Sedimentation & Erosion	High	Low	Minor to Moderate	Excavated materials will be stored away from surface water bodies. Temporary drains to be installed adjacent to the cable route infrastructure to capture runoff. Temporary silt fences to be implemented to prevent sediment transport into water courses.	Negligible
	Chemical Pollution	High	Low	Minor to Moderate	Temporary drains to be installed adjacent to the cable route infrastructure to capture runoff. Adherence to best practice procedures in the handling, use and storage of fuel, oils and chemicals. Concrete will be delivered in ready mix wagons. Wagons only to 'wash-out' in areas	Negligible

Sensitive Receptor	Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
		Sensitivity	Magnitude	Significance		
					where suitable control measures are in place. Pollution monitoring and control.	
	Disruption to Flow Paths & Flood Risk	High	Low	Minor to Moderate	The proposed temporary drains and watercourse crossing methodology will maintain the hydrological flow and connectivity of nearby watercourses. Regular checks will be conducted to remove any possible debris that might impede water flow.	Negligible
	Dewatering & Abstraction	High	Low	Minor to Moderate	Dewatering will be carried out efficiently to minimise exposure to dewatering. Existing water flow will be controlled by temporary pumping around the construction area to minimise disturbance and sediment pollution to the watercourse.	Negligible
Private Water Supplies (PWS)	Increased Runoff	High	Low	Minor to Moderate	Temporary drains to be installed adjacent to the cable route infrastructure to capture runoff.	Negligible
	Sedimentation & Erosion	High	Low	Minor to Moderate	Excavated materials will be stored away from surface water bodies.	Negligible

Sensitive Receptor	Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
		Sensitivity	Magnitude	Significance		
					Temporary drains to be installed adjacent to the cable route infrastructure to capture runoff. Temporary silt fences to be implemented to prevent sediment transport into watercourses. Nearby PWS will be monitored to ensure the quality and quantity of the water supply is not adversely impacted, where applicable.	
	Chemical Pollution	High	Low	Minor to Moderate	Temporary drains to be installed adjacent to the cable route infrastructure to capture runoff. Adherence to best practice procedures in the handling, use, and storage of fuel, oils and chemicals. Concrete will be delivered in ready mix wagons. Wagons only to 'wash-out' in areas where suitable control measures are in place. Pollution monitoring and control. Nearby PWS will be monitored to ensure the quality and quantity of the water supply is not adversely impacted, where applicable.	Negligible

Sensitive Receptor	Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
		Sensitivity	Magnitude	Significance		
	Disruption to Flow Paths & Flood Risk	High	Low	Minor to Moderate	The proposed temporary drains and watercourse crossing methodology will maintain the hydrological connectivity to any water supplies. Regular checks will be conducted to remove any possible debris that might impede water flow.	Negligible
	Dewatering & Abstraction	High	Low	Minor to Moderate	Dewatering will be carried out efficiently to minimise exposure to dewatering. Nearby PWS will be monitored to ensure the quality and quantity of the water supply is not adversely impacted, where applicable.	Negligible
Class 1 Peat	Increased Runoff	High	Medium	Minor	Temporary drains to be installed adjacent to the cable route infrastructure to capture runoff.	Negligible
	Sedimentation & Erosion	High	Low	Minor to Moderate	Excavated materials will be stored away from surface waterbodies. Temporary drains to be installed adjacent to the cable route infrastructure to capture runoff. Temporary silt fences to be implemented to prevent sediment transport into watercourses.	Negligible

Sensitive Receptor	Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
		Sensitivity	Magnitude	Significance		
	Chemical Pollution	High	Low	Minor to Moderate	Implementation of Sustainable Drainage Systems to capture runoff. Adherence to best practice procedures in the handling, use and storage of fuel, oils and chemicals. Concrete will be delivered in ready mix wagons. Wagons only to 'wash-out' in areas where suitable control measures are in place. Pollution monitoring and control.	Negligible
	Disruption to Flow Paths & Flood Risk	High	Low	Minor to Moderate	The proposed temporary drains and watercourse crossing methodology will maintain the hydrological connectivity to the Peatland. Regular checks will be conducted to remove any possible debris that might impede water flow.	Negligible
	Dewatering & Abstraction	High	Low	Minor to Moderate	Dewatering will be carried out efficiently to minimise exposure to dewatering. Sprinklers will be used to irrigate any sensitive habitats during dewatering activities.	Negligible

Table 7.22 - Summary of Residual Effects from the Substation

Sensitive Receptor	Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
		Sensitivity	Magnitude	Significance		
Construction						
Watercourse & Fishery	Increased Runoff	High	Medium	Moderate to Major	Implementation of Sustainable Drainage Systems to capture and treat any runoff.	Negligible
	Sedimentation & Erosion	High	Medium	Moderate to Major	Excavated materials will be stored away from surface water bodies. Implementation of Sustainable Drainage Systems to capture and treat any runoff. Temporary silt fences to be implemented to prevent sediment transport into watercourses.	Negligible
	Chemical Pollution	High	Medium	Moderate to Major	Implementation of Sustainable Drainage Systems to capture runoff. Adherence to best practice procedures in the handling, use, and storage of fuel, oils and chemicals. Concrete will be delivered in ready mix wagons. Wagons only to 'wash-out' in areas where suitable control measures are in place. Pollution monitoring and control.	Negligible

Sensitive Receptor	Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
		Sensitivity	Magnitude	Significance		
	Disruption to Flow Paths & Flood Risk	High	Low	Minor to Moderate	Implementation of Sustainable Drainage Systems to capture runoff which will maintain the hydrological connectivity of the nearby watercourses. Regular checks will be conducted to remove any possible debris that might impede water flow.	Negligible
	Dewatering & Abstraction	High	Low	Minor to Moderate	Dewatering will be carried out efficiently to minimise exposure to dewatering. During construction, sprinklers will be used to irrigate sensitive areas surrounding the Zone of Dewatering.	Negligible
Private Water Supplies (PWS)	Chemical Pollution	High	Low	Minor to Moderate	Implementation of Sustainable Drainage Systems to capture runoff. Adherence to best practice procedures in the handling, use, and storage of fuel, oils and chemicals. Concrete will be delivered in ready mix wagons. Wagons only to 'wash-out' in areas where suitable control measures are in place. Pollution monitoring and control.	Negligible

Sensitive Receptor	Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
		Sensitivity	Magnitude	Significance		
					Nearby PWS will be monitored to ensure the quality and quantity of the water supply is not adversely impacted, where applicable.	
	Disruption to Flow Paths & Flood Risk	High	Low	Minor to Moderate	Implementation of Sustainable Drainage Systems to capture runoff which will maintain the hydrological connectivity of the nearby water supplies. Regular checks will be conducted to remove any possible debris that might impede water flow.	Negligible
	Dewatering & Abstraction	High	Medium	Moderate to Major	Dewatering will be carried out efficiently to minimise exposure to dewatering. Nearby PWS will be monitored to ensure the quality and quantity of the water supply is not adversely impacted, where applicable.	Negligible
Class 1 Peat	Disruption to Flow Paths & Flood Risk	High	Low	Minor to Moderate	Implementation of Sustainable Drainage Systems to capture runoff which will maintain the hydrological connectivity to the nearby Peatland. Regular checks will be conducted to remove any possible debris that might impede water flow.	Negligible
Operation						

Sensitive Receptor	Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
		Sensitivity	Magnitude	Significance		
Watercourse & Fisheries	Increased Runoff	High	Medium	Moderate to Major	Implementation of Sustainable Drainage Systems to capture and treat any runoff.	Negligible

7.9 Cumulative Assessment

132. Cumulative impacts are considered to be additional effects as a result of this Proposed Development in combination with other developments currently at the planning, consented, and construction stage that have the potential to result in cumulative impacts on the hydrological, hydrogeological, and geological environment. There is potential for other cumulative schemes within 10km of the Proposed Substation and 2km of the proposed Cable Route Corridor to impact on the water environment. Potential cumulative effects on soil and geology are considered to be limited to the Site however, surface water and groundwater pathways have the potential to create or exacerbate a wider zone of cumulative effect.

133. The cumulative schemes that have been considered as part of this assessment are identified on **Figure 3.1.**

134. It is worth noting that the North-East 400kv Overhead Line reinforcement Works (ECU00000677) is consented and is currently in the final construction phase. It is therefore assumed that the construction works for this overhead line will be complete before the construction works begin for the Proposed Development. It is therefore considered that this proposal will not have a cumulative construction impact with the Proposed Development.

135. Due to their proximity, there is also potential for localised cumulative impacts to arise in conjunction with the:

- Kirkton Solar PV Farm and Energy Storage Facility (ECU00003226),
- Residential mixed-use development (APP/2022/0369),
- Formation of a footpath (APP/2019/0421), and
- New dual Terminal Towers to connect into NGNDSS (ECU00000649).

136. However, the cumulative impacts are not anticipated to meet the criteria for a significant impact as the Proposed Development and the cumulative schemes will each: have embedded mitigation; have proposed mitigation; and, follow good practice. It is also assumed that there will be a dilution effect on any potentially contaminated or sediment-laden surface water or groundwater movements between the various developments, relative to the individual assessments done. This is based on the general rule that the greater the distance of a receptor from the source of pollution, the greater the potential for dilution of an effect by other water sources, which will limit the magnitude of any effect. Additionally, the limited permeability of the underlying strata will limit the potential for movement through the aquifer, which will limit the zone of potential impact.

137. For the same reasons, cumulative impacts during the operation of the Proposed Development are not considered to meet the criteria for a significant impact.

138. As such, no significant cumulative or operational impacts are anticipated on the surrounding hydrological, hydrogeological, and geological receptors from the Proposed Development in conjunction with the cumulative schemes.

7.10 Conclusion

139. A desk-based study and site walkover were conducted to establish the baseline hydrological environment of the Study Area, whereby potential impacts from the development were identified.

140. It was determined that there were five categories of sensitive receptor within the Study Area:

- Surface Water Features;
- Groundwater Units;
- Nearby PWS;
- Three pockets of Class 1 Peat; and
- Class 1 GWDTE.

141. It is anticipated that careful design of the site layout, and the implementation of the mitigation methods proposed, will ensure that any potential risks identified are avoided and the associated risk is reduced to acceptable levels.

7.11 References

[i] The River Ugie Angling Association. Available online at: http://www.riverugie.co.uk/

[ii] Scottish Environment Protection Agency. (2020). Water Classification Hub. Available at: https://www.sepa.org.uk/data-visualisation/water-classification-hub/

[iii] Scottish Government. (2014) Drinking Water Protected Areas. Available at: https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/

[iv] Scottish Environment Protection Agency. (2022). Flood Risk Management Map. https://map.sepa.org.uk/floodmap/map.htm

[v] British Geological Survey. (2023) GeoIndex (Onshore) Available at: https://www.bgs.ac.uk/map-viewers/geoindex-onshore/

[vi] Soil Survey of Scotland Staff (1981). Soil maps of Scotland at a scale of 1:250 000. Available at: https://map.environment.gov.scot/Soil_maps/?layer=2

[vii] The James Hutton Institute (2023) Soil Classification. Available at: https://www.hutton.ac.uk/learning/soilshutton/soil-classification

[viii] NatureScot (2016) Carbon and Peatland 2016 Map. Available at: https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/

[ix] NatureScot (2023) SiteLink. Available at: https://sitelink.nature.scot/map

GREEN VOLT

8

Chapter 8

Contaminated Land

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-REP-0009-08	
Version Number:	A3	
Date:	*Issue Date 01/08/2023*	
Prepared by:	Les Rodger	*Electronic Signature*
Checked by:	Corey Simpson	*Electronic Signature*
Approved by Client:	Tracey Clarkson-Donnelly	*Electronic Signature*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First Review	04/07/2023
A2	Second Review	21/07/2023
A3	Third Review	01/08/2023
00	Final	*02/08/2023*

Contents

8 Contaminated Land

8.1 Introduction

1. A full understanding of the potential impact of Contaminated Land is necessary to the design of any project, in order to assess the risk that any potential source of contamination is connected by a pathway to any potential receptor. The Source-Pathway-Receptor assessment and Conceptual Site Model are critical parts of any Contaminated Land Assessment. Any project can introduce new receptors to the linkage or could create new pathways between existing sources and receptors. Ultimately, either scenario could increase the geoenvironmental risks. It is necessary to consider both short-term human health risks (during Construction), long-term human health risks (post-Construction), risks to flora and fauna, especially within Environmentally-sensitive areas, risks to the construction itself and risks to the water environment.
2. Chapter 8 assesses the likely potential sources of contamination along the Cable Route Corridor (CRC) and creates a Conceptual Site Model (CSM), assessing source-pathway-receptor linkages, prepared in accordance with best practice and then assesses the risk of any sources identified that could present an increased risk to any receptor identified via any pathway.
3. Of the above listed receptors, the Water Environment is addressed in **Chapter 7 – Geology, Hydrology, Hydrogeology and Soils** and reference to that chapter should be made where appropriate. However, aspects of particular relevance to the Contaminated Land aspect are highlighted in this chapter.

8.2 Legislation, Guidance and Policy

4. Statutory, general, national and local guidance consulted during this Contaminated Land Assessment (CLA) are listed below in **Table 8.1.**

Table 8.1 - Legislation, Guidance and Policy

Legislation, Guidance and Policy	Documents
Scottish Government Policy, Advice and Legislation	Planning Advice Note (PAN) 33: Development of Contaminated Land, 2017 The Pollution Prevention and Control (Scotland) Regulations 2000 Water Environment and Water Services (Scotland) Act 2003 Environmental Protection Act (1990) The Contaminated Land (Scotland) Regulations 2005 The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)
SEPA Guidance	PPG 1 General Guide to the Prevention of Pollution GPP 2 Above Ground Oil Storage Tanks PPG 6 Working at Construction and Demolition Sites Special Requirements for Civil Engineering Contracts for the Prevention of Pollution, Version 2, SEPA, 2006 Temporary Construction Methods, WAT-SG-29, 2009 Groundwater Protection Policy for Scotland, v3, 2009 SEPA Regulatory Position Statement – Developments on Peat, 2010 Engineering in the water environment: good practice guide; River crossings, 2010
British Standards, Eurocodes and International Standards	BS EN 1997-2 Eurocode 7 – Geotechnical Design BS EN ISO 14688-1 Geotechnical Investigation and Testing – Identification and Classification of Soil, 2018 BS 10175+A2 Code of Practice for the Investigation of Potentially Contaminated Sites, 2017

	BS 5930 Code of Practice for Ground Investigations, 2015 BS 8485+A1 Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings, 2019 BS EN ISO 21365 Soil Quality – Conceptual Site Models for Potentially Contaminated Sites, 2020
Other Guidance	CIRIA C515 Groundwater Control – Design and Practice CIRIA C532 Control of Water Pollution from Construction Sites CIRIA C648 Control of Water Pollution from Linear Construction Projects CIRIA C741 Environmental Good Practice on Site CIRIA C665 Assessing Risks Posed by Hazardous Ground Gases to Buildings, 2007 CIRIA SP168 Asbestos in Soil and Made Ground: a Guide to Understanding and Managing Risks, 2014 CIRIA C552 Contaminated Land Risk Assessment, 2001 LQM/CIEH S$ULs for Human Health Risk Assessment, 2015

8.3 Consultation

5. **Table 8.2** sets out the Consultation undertaken during the scoping process and as part of the EIA assessment. The actions taken based on the points raised are also provided within **Table 8.2**, indicating where these points have been covered within the Assessment.

Table 8.2 Consultation Responses

Consultee	Consultee Comment/Scoping Response	Action
Aberdeenshire Council	Aberdeenshire Council provided data on suspected sources of contamination within 250m of the Scoping route.	This information is referenced and summarised within chapter 8.7.
	Aberdeenshire Council required a Phase One Geoenvironmental Assessment including a Conceptual Site Model, in accordance with guidance.	The required study is included within chapters 8.5 to 8.7.
Scottish Environment Protection Agency (SEPA)	SEPA note that the Scoping route no longer lies close to a former RAF Airfield. Accordingly, a Phase One Geoenvironmental Assessment with respect to radioactivity is not required.	SEPA is the controlling regulator for radioactivity. However, Aberdeenshire Council is the regulator for most other types of contamination. Therefore a SEPA assessment was not required.

8.4 Assessment Methodology

6. A desk study has been developed with the aid of site reconnaissance to make an assessment of the existing conditions at the Site prior to any Site Works. In particular, a desk study is required in order to develop a CSM for the Site and the subsequent assessment of geoenvironmental risks using the Source-Pathway-Receptor model. This enables the design of an appropriate intrusive ground investigation, if this is shown to be required.

7. The desk study has considered the following:

- The current uses of the Site and its surroundings, including a site reconnaissance and examination of current Ordnance Survey (OS) maps.
- The former uses of the site and its surroundings, including an examination of old OS maps.
- Information on the geology underlying the site, including records held by the British Geological Survey (BGS).
- The environmental setting of the site, determined by the geology, hydrogeology and hydrology.
- Collation of environmental data.
- Consultation with the relevant environmental regulators for the Site.

- Consideration of the likely geochemical conditions, development of a CSM and a Risk Assessment (RA), highlighting the potential sources of contamination, pathways and receptors.

8. Based on this, the intrusive investigation considered necessary and which will be undertaken with respect to Contaminated Land is outlined.

9. Current guidance and best practice requires that a CSM be derived from desk study information. This CSM formulates the potential sources present at a site, the likely receptors and potential pathways connecting the two. The CSM is required prior to design of any appropriate investigation to determine if the potential linkages are in fact realised.

- **Potential Sources:** Contamination may have arisen from present uses of the Site, as highlighted by the site reconnaissance or from past uses, as highlighted by the history of the site or from nearby present and past uses. These may be augmented by information provided by the regulators. Natural sources should be considered as well as man-made sources.
- **Potential Receptors:** Receptors may include those constructing the Proposed Development, the end-users of the Site post-completion, the proposed structures or environmental receptors, such as water bodies, which could be harmed if impacted by a source of contamination. On-site and off-site receptors should be considered, together with their sensitivity to any contamination.
- **Potential Pathways:** Pathways connect sources to receptors. They will be dependent on various factors, such as the nature of the source, and the receptor and other factors such as the environment, geology, etc. Potential changes and their impact should also be considered, either as a result of the Proposed Development itself or developments anticipated in the area.

8.5 Conceptual Site Model – Potential Receptors

10. The following receptors have been identified with respect to the Proposed Development:

- Site personnel during the Construction Phase
- Human end-users (mostly farmland)
- Groundwater (see **Chapter 7** – **Geology, Hydrology, Hydrogeology and Soils**)
- Surface Waters (see **Chapter 7** – **Geology, Hydrology, Hydrogeology and Soils**)
- The proposed cables themselves and associated buried concrete structures.
- Plant life.

11. The works required for the Onshore Project do not fit any of the “standard models” as defined by Contaminated Land Exposure Assessment (CLEA). However, the ground will be returned to its existing use (largely as farmland) after the cables are laid.

12. In terms of long-term human health, the most sensitive receptor is likely to be a female adult (taking into account gender-average body weights) working at the site her whole working life.

13. The ground will be returned to its existing use, which is mostly agricultural. Plant life does need to be considered.

8.6 Conceptual Site Model – Potential Pathways

14. Considering humans as potential receptors, pathways may exist from direct contact, inhalation of dust and vapours, ingestion of dust, direct ingestion or ingestion via the consumption of produce.

15. Possible pathways for contamination to reach groundwater and surface water are by leaching, contaminants infiltrating surface water and pore water and by free product flow of any more mobile contaminants such as hydrocarbons. Therefore, groundwater can be considered as both a pathway and a receptor for contamination. This chapter makes comment on any significant aspects with respect to the water environment. However, further detail is given in **Chapter 7 - Geology, Hydrology, Hydrogeology and Soils**.

16. Ground gas may arise from made ground, as well as from organic natural soils and from any significant spills of hydrocarbons, such as fuel spills. The ground will be returned to its present use after the cables are laid, so this is unlikely to be a significant issue unless the cable route creates new pathways for ground gas to follow.

17. Consideration should also be given to the risk of sulphate and acid attack on any buried concrete.

8.7 Conceptual Site Model – Potential Sources of Contamination Identified and Risk Assessment

18. Potential sources of contamination, such as those from old agricultural and industrial land uses, have been identified from old editions of the OS maps, dating back to the 19th Century. The small-scale maps are given in **Figures 8.1 a–8.1e**. Large scale maps have also been consulted and are available on request. These maps follow sections defined by the Construction Execution Plan prepared by Stockton (FLO-GRE-PLA-0007 v A2).

19. **Tables 8.3–Table 8.22** in the relevant sections below summarise the geoenvironmental features along each section of the route. The co-ordinates should be regarded as approximate due to variations in the meridian between surveys. Some features at either end of some sections may be relevant also to adjacent sections. Many of the features listed are too small and/or too distant from the route to be of any great significance. However, these are included for completeness. Where considered to be more significant, remarks have been added to the tables and a discussion is provided relating to the features considered most significant. Five areas have been identified as being of potentially higher risk and for these, a Groundsure report has been obtained to give wider background information. The implications of these areas are discussed in detail under each section.

    The approximate locations of these features with a potentially higher risk are shown relative to mapping and relative to satellite images in **Figures 8.01–8.10.**

20. Small quarries may have been infilled and so made ground may be encountered within these. Any contamination of these would depend on the material used to infill them. Any infill to quarries could generate hazardous ground gases. However, small quarries are unlikely to generate such gases in any significant amounts with respect to the proposed CRC, which will be open for a relatively short time before being backfilled. Ground gas monitoring is undertaken routinely in excavations on all sites in any case, where man-entry is required and should in most cases suffice to address this aspect.

21. Larger quarries close to or on the CRC are discussed and the implications are identified in each section below.

22. Wells, where present are likely to be very small in area. They do potentially present a health and safety risk during Construction, particularly if they were not backfilled properly and are therefore open or partially open. If they were backfilled with made ground, this could be contaminated. However, the affected area would be small indeed and therefore unlikely to be a significant issue. Small amounts of soil infill to these may need to be disposed of or tested before re-use. Wells might form a pathway by which contaminated groundwater may move up or down through the strata. However, unless there was some contamination in the area, this potential pathway is unlikely to be realised. It should be noted also that pumps would generally suggest that there may also be a well close by to these, at a position unknown.

23. Old landfills may present a significant risk during Construction even where fairly distant and so significant areas of landfill identified have been discussed in detail even where quite distant from the CRC.

24. Examination of the online information on the Zetica website suggests that the bombing density during World War II was low along the whole route, so the risks of encountering unexploded enemy munitions anywhere on the route is considered to be low. Where relevant, the risk that other types of unexploded ordnance (UXO) (such as from allied military training) may be encountered is discussed in the appropriate section.

8.7.1 Section 20 (Landfall to Road Crossing 20 – A90)

25. The Site in this section of the CRC lies in undulating farmland. Geoenvironmental features for this section can be seen in **Table 8.3.**

Table 8.3 Geoenvironmental Features

Description	Easting	Northing	Remarks
Sheep Wash	411556	848584	Off to south-east
Well	411456	849093	

Description	Easting	Northing	Remarks
Pump	411078	848542	

26. No significant sources of contamination have been identified in this section of the route. No source-pathway-receptor linkages are considered likely.

8.7.2 Section 19 (Road Crossing 20 – A90 to Road Crossing 19)

27. The route passes through relatively flat-lying farmland. Geoenvironmental features for this section of the route can be seen in **Table 8.4.**

Table 8.4 Geoenvironmental Features

Description	Easting	Northing	Remarks
Well	410502	848720	
Poultry House	410446	849424	
Pump	410272	849210	Close to route.
Pump	410180	848918	
Smithy	410166	848920	Converted into a dwelling
Corn Mill	409942	848600	

28. The poultryhouse at Lunderton (**Image 8.2**) was identified as a potential contaminative source by Aberdeenshire Council but the route as now intended lies approximately 150m south of this, in open fields as pictured in **Image 8.1.**

Image 8.1 Fields south of Lunderton

Image 8.2 Smithy converted to dwelling

29. The route also crosses the line of a former canal about 300m south-west of Lunderton. It is understood that the old canals in this area were constructed in the late 18th Century but never completed. They are understood to have silted up very quickly when the canals were abandoned. The process seems likely to have been natural, rather than that the canals were infilled with anthropogenic waste. On that basis, it is considered unlikely that there is significant contamination associated with these. However, there may well be soft soil, excess groundwater and potentially made ground encountered as the Construction crosses these. Consideration should be taken of potentially difficult access for machinery and personnel on soft ground as well as the need for groundwater pumping in open excavations.

30. Otherwise, no source-pathway-receptor linkages are considered likely.

8.7.3 Section 18 (Road Crossing 19 to Road Crossing 18)

31. The route passes mainly through relatively flat topography, comprising farmland but crosses the River Ugie. There are some structures and a car park used by a fishing club at Stonemills, just north of the River Ugie. The geoenvironmental features for this section can be seen in **Table 8.5**.

Table 8.5 Geoenvironmental Features

Description	Easting	Northing	Remarks
Well	409826	848531	
Mink Farm	409580	848590	South of river. Well away
Ravenscraig Castle	409560	848783	South of river. Well away
Archaeology	409526	848689	South of river. Well away
Well	409496	849096	
Pump	409480	849040	
Well	409471	848918	
Corn Mill	408980	848940	

Description	Easting	Northing	Remarks
Stone Mills	408980	848978	Close to route; discussed below
Pump	408930	848277	
Sluice	408913	848961	Close to route
Well	408804	848984	Close to route
Pump	408777	849207	
Well	408772	849212	
Tank	408770	849006	
Tank	408742	849044	
Pumping Station	408740	849016	
Sluice	408740	849282	
Tank	408606	848240	

32. The route also crosses the line of a former canal just north of the River Ugie, close to Stonemills, part of the same system referred to in the section above, constructed in the late 18th Century but never completed. They are understood to have silted up very quickly when the canals were abandoned. The process seems likely to have been natural, rather than that the canals were infilled with anthropogenic waste. On that basis, it is considered unlikely that there is significant contamination associated with these. However, it is likely that there will be soft soil, excess groundwater and potentially made ground encountered as the Construction crosses these.

8.7.3.1 Stonemills

33. The CRC runs immediately west of Stonemills. The topography here is very undulating and suggests some earthworks or reworking of the ground at some time in the past. A "drain" runs just north of the River Ugie itself but seems to disappear eastwards to form a series of ponds of varying sizes. It is likely that the drain and the line of ponds are all that remain of the canal here. Many of the trees here are old (100 years to probably 150 years or more), so the earthworks clearly took place in the distant past. That would be consistent with the age of the canal.

34. There is an old, ruined stone building here. Parts of a corrugated metal roof remain. The ruined building contained several 1m^3 plastic containers that had been cut up for some unknown use.

35. In the east of Stonemills stands an open shed as shown in **Image 8.3**. This appears to be constructed in timber with what appears to be a dilapidated corrugated cement-asbestos (asbestos-containing material (ACM)) roof. The ground within and immediately around comprises grass. Several broken fragments of suspected ACM could be seen on the ground here **(Image 8.4).**

Image 8.3 Open shed at Stone Mills

Image 8.4 ACM on ground at Stone Mills (example)

8.7.3.2 Stonemills – Discussion of Risks

36. There is made ground at Stonemills, north of the River Ugie. The nature of this is not known but the nearby trees suggest the made ground is likely to be over 150 years old. Given this age, it is considered unlikely to present any significant risk to the proposals or to human health during Construction unless there is asbestos present.

37. It is understood that the old canals in this area were constructed in the late 18th Century, which would be consistent with the age of the trees here. They are understood to have silted up very quickly when the canals were abandoned. In most locations, the process seems likely to have been natural, rather than that the canals were infilled with anthropogenic waste. On that basis, it is considered unlikely that there is significant contamination associated with these. However, in this location the industrial use at Stonemills might have used any depressions as a convenient location for the disposal of waste. Also, there may well be soft soil and excess groundwater, especially this close to the river.

38. The ACM debris at Stonemills may present a significant risk to the health of operatives during Construction if encountered either on the route itself or if the location was used as a site compound.

39. There may be other contaminants here in made ground, such as metals, acids and alkalis and hydrocarbons, including polyaromatic hydrocarbons.

40. A limited ground investigation will be undertaken to assess the human health risks during Construction with respect to asbestos but also to confirm the materials which infill the canal.

41. However, following Construction it is considered that the risks to any receptor should be no greater than they were before Construction. Indeed, if hand-picking and disposal of the ACMs was to be undertaken, then the long-term risks should actually be lower than they are presently.

8.7.4 Section 17 (Road Crossing 18 to Road Crossing 17)

42. The route passes through relatively flat topography comprising mixed farmland. The Geoenvironmental features for this section can be seen in **Table 8.6**.

Table 8.6 Geoenvironmental Features

Description	Easting	Northing	Remarks
Pond	408466	848806	
Well	408432	848860	
Pump	408138	849212	
Newseat Station	407770	848063	
Quarry	407744	848250	Close to route but only small.

43. No likely significant sources are identified for this section of the route. No source-pathway-receptor linkages are therefore considered likely.

8.7.5 Section 16 (Road Crossing 17 to Road Crossing 16)

44. The route passes through relatively flat farmland, crossing the North Ugie Water at its western end. The Geoenvironmental features for this section can be seen in **Table 8.7**.

Table 8.7 Geoenvironmental Features

Description	Easting	Northing	Remarks
Pump	407674	848681	
Smithy	407630	847805	
Quarry	407538	848270	Close to or on the route but only small
Well	407515	847877	
Pump	407498	848748	
Well	407480	848856	
Well	407395	848567	Close to or on the route
Sand Pit	407320	849236	

Description	Easting	Northing	Remarks
Well	406376	848597	
Well	406368	848600	
Gravel Pit	406360	848480	
Sluice	406360	848512	
Pond	405812	849353	
Pond	405800	849305	
Sheep Wash	405778	849264	
Sand and Gravel Pit	405316	848702	See discussion below
Tank	405108	849018	Defunct Slurry tank (see below)
Pump	405083	849064	
Sheep Wash	405059	849121	Not used for many years (see below)
Well	405000	849400	
Ruined Mill (cloth)	404613	848686	
Well	404555	849460	
Pond	404520	848530	
Well	404460	849056	
Well	404380	848682	
Gravel Pit	404268	849253	
Well	404063	849291	
Well	404060	849040	
Pump	404000	849551	

45. The route also crosses the line of a former canal just north of the River Ugie, west of Haughs of Rora, another part of the same canal system referenced in other sections. It is understood that the old canals in this area were constructed in the late 18th Century but never completed. They are understood to have silted-up very quickly when the canals were abandoned. The process seems likely to have been natural, rather than that the canals were infilled with anthropogenic waste. On that basis, it is considered unlikely that there is significant contamination associated with these. However, there may well be soft soil, excess groundwater and potentially made ground encountered as the Construction crosses these.

46. Aberdeenshire Council records a landfill at the Bridge of Rora, at the western end of this section of the route.

8.7.5.1 Wester Rora

47. A Groundsure report has been obtained for Wester Rora and is included in **Appendix 8.1 – Wester Rora**.

48. Aberdeenshire Council identified three potential sources of contamination in the vicinity of Wester Rora: a sheep dip, a large tank and a large sand pit.

49. The sheep dip lay at the north of Wester Rora farm about 150m north of the route. There is no longer any sign of this. The area now comprises part of a field. The farmer advises that the sheep dip has not been in existence for decades, since they stopped keeping sheep. Taking all this into account, this sheep dip is not therefore considered likely to be a significant source relative to the proposals.

50. The large tank still exists but is a slurry tank as seen in **Image 8.5**. Again, the farmer advises that this has not been used for many years. This is not considered to be a significant source relative to the proposals at the location where it lies.

Image 8.5 Slurry tank at Wester Rora (disused)

51. There is an unbunded, above-ground fuel tank within the south of the farm **(Image 8.6).** This appears to be used for the storage of fuel oil. It is therefore a potential source of hydrocarbon contamination and indeed there does appear to have been some spillage, though not very much, likely during fuelling of farm machinery. However, it is about 100m north of the route, so is considered unlikely to present any significant risk to the works and unlikely that the works could form any significant pathway for any spillage to migrate even if the whole tank was to rupture.

Image 8.6 Unbunded, above-ground fuel tank with minor spillage

52. South-east of the farm lies a substantial sand pit. In the north of this, roughly where the cable route is proposed to lie, dumped waste materials are present: wood, metal, plastic and masonry rubble (see below **Image 8.7**. There is some quarry machinery here which appears as if it has not been used for many years **(Image 8.8).** One sheet of what appears to be cement-asbestos (ACM) could be seen in this debris.

Image 8.7 Debris including Asbestos CM approximately on route

Image 8.8 Masonry rubble and machinery approximately on route

53. There is still some machinery located in the sand pit and the farmer suggests that the pit is worked intermittently. A few abandoned vehicles or parts of vehicles can be seen scattered about in **Image 8.9.**

Image 8.9 Sand pit and one abandoned vehicle (example)

8.7.5.2 Wester Rora - Discussion of Risks

54. There is made ground within the north of the sand pit at Wester Rora at a location where it is likely that the route will pass through. The nature of this is not known in detail but it can be seen that it contains at least some asbestos as ACM. This may present a significant risk to the health of operatives during construction and it is considered likely, given its location, that it will be encountered.

55. There may be other contaminants here, such as metals, acids and alkalis and hydrocarbons, including polyaromatic hydrocarbons but this aspect is currently unquantifiable.

56. A limited ground investigation will be undertaken to assess the human health risks to be anticipated during Construction with respect to asbestos, but also to confirm that no other significant contamination is present in the waste that has been placed here.

57. However, following Construction it is considered that the risks to any receptor should be no greater than they were before Construction. Indeed, if hand-picking and disposal of the ACMs was to be undertaken, then the long-term risks to human health should actually be lower than they are presently.

8.7.5.3 Bridge of Rora Landfill

58. Records held by Aberdeenshire Council indicate that there was a landfill located at the extreme western end of this section, bounded on the west by the north to south running unclassified road next to Woodside, on the north by the west to east running unclassified road across the bridge itself, on the east by drains or ditches which appear to run into the North Ugie Water and on the south by Woodside farm. It seems to have been about 250m from north to south, and 100m to 150m from west to east. The depth of the landfill is not known.

59. The landfill does not feature at all on any old Ordnance Survey maps or on the Groundsure report for the adjacent Sandyknapps area, though that report includes this area also.

60. The location is now a field. The farmer advises that the topsoil is thin and he occasionally ploughs up concrete objects such as kerbstones but is otherwise not aware of any waste.

61. The southern (closer) end of the Landfill is about 120m from the route.

8.7.5.4 Bridge of Rora Landfill – Discussion of Risks

62. Evidence associated with this landfill seems to be limited. Most likely this was an “inert” landfill, based on the materials found by the farmer and it was probably to some extent “landfilled” to restore the site as farmland. However, the definition of inert waste has changed over the years and the landfill is likely quite old, in which case it could have included such materials as timber or unsuitable soils such as topsoil and peat.

63. As indicated above, the route runs south of the landfill, about 120m away, rather than through it, so the Construction should not encounter the landfill itself. However, any landfill which contains putrescible matter (which may include this landfill) may generate methane and carbon dioxide, which may migrate in the ground away from the landfill.

64. This landfill appears to be fairly old and also the restoration is unlikely to have included a clay capping. This may increase the risk to the water environment from the landfill, which as noted above seems to drain to the North Esk Water. However, the cable construction should not affect this.

65. On the other hand, for an old landfill with likely a relatively ineffective capping, with low generation potential and where it is therefore unlikely that any pressure could build up within the Landfill, the risk that landfill gas could migrate to any great distance is likely to be low.

66. On that basis, it is considered unlikely that this landfill will significantly affect the cable construction. However, as a precaution, extra care should be undertaken to ensure that monitoring is undertaken within the excavation here for the presence of hazardous gases.

8.7.6 Section 15 (Road Crossing 16 to Road Crossing 15 – A950)

67. Geoenvironmental features for this section of the route can be seen in **Table 8.8**.

Table 8.8 Geoenvironmental Features

Description	Easting	Northing	Remarks
Well	403965	848050	
Longside Station	403940	847930	
Well	403908	849482	

Description	Easting	Northing	Remarks
Well	403778	849536	
Pump	403775	849537	
Well	403744	849570	
Well	403738	849590	
Gravel Pit	403680	849125	Large area of Sand pits (see below) Sandyknapps
Sand Pit	403636	849400	
Well	403620	849508	
Pump	403598	849298	
Well	403538	849524	
Sluice	403526	848000	
Gravel Pit	403448	847570	
Well	403396	847637	
Well	403395	849490	
Gravel Pit	403270	848646	Close to or on route
Well	402864	849464	
Sawmill	402690	848220	Gordon's Sawmills
Sawmill	402670	848020	
Quarry	402670	848194	
Quarry	402620	848260	
Gravel Pit	402525	848400	Near Gordon's Sawmills (see below)
Well	402384	848137	
Gravel Pit	402280	848132	
Sheep Wash	402110	848266	Slightly off route to east

68. Immediately east of Road Crossing 16 lies a series of former sand pits at Sandyknapps, west of Woodside, of differing ages.

8.7.6.1 Sandyknapps

69. The area south and west of the poultry houses at Bridge of Rora/Sandyknapps has been extensively worked for sand and gravel in the past. The most recent workings appear to be west and north-west of the poultry houses, so away from the route.

70. The ground through which the route runs comprises undulating farmland **(Image 8.10),** though the ground seems to be flatter in the south, local to where the route will pass through. This might never have been worked. More likely, though, it has been restored. It is therefore unclear whether it lies inside the former sand and gravel pits or just on their edge. The farmer advises that he occasionally ploughs up objects such as kerbstones in the fields just north of here, possibly as a result of partial restoration.

71. During the site reconnaissance, a half-buried rusty, empty 45 gallon drum was found in this area which can be seen in **Image 8.11**.

Image 8.10 Undulating ground at former Sand pits

Image 8.11 Rusty, half-buried 45 gallon drum

72. The farmer stores silage and other materials including some machinery in an area south-west of the poultry farm. This is unlikely to be significant for the cable route.

73. A Groundsure report has been obtained for this area and is included in **Appendix 8.2 - Sandyknapps**.

8.7.6.2 Sandyknapps – Discussion of Risks

74. Although apparently not a landfill as such, the ground here is considered likely to comprise restored or partially restored sand and gravel workings. Made ground is therefore likely to be present, at least in some areas. The nature of any contamination would depend on the nature of any backfill. However, it could well have been poorly controlled, as evidenced by the 45 gallon drum seen.

75. Contamination could include metals, acids and alkalis, hydrocarbons (both fuels and polyaromatic hydrocarbons) as well as asbestos. If the backfill includes putrescible matter or is relatively thick, it may generate hazardous ground gases.

76. The risk to human health here during Construction is not reliably quantifiable without intrusive ground investigation. A limited ground investigation will be undertaken to assess the human health risks to be anticipated during Construction, with respect to the contaminants of concern listed above.

77. However, following Construction it is considered that the risks to any receptor should be no greater than they were before Construction.

8.7.6.3 Sand Pits at Gordon Sawmills

78. The route now runs through gently undulating farmland and around the north and west of a large sand pit which lies north of Gordon Sawmills, though still lying in fields in that area. Ground level falls overall gently to the south, towards the South Ugie Water.

79. A Groundsure report has been obtained for this area and is given in **Appendix 8.3 – Gordon Sawmills**.

80. The most recent workings appear to lie about 200m south of the route. However, the ground seems to have been worked and reworked over the years and there may have been fairly recent workings not far from the route. Low areas of the old workings appear fairly waterlogged, with either ponds or rushes. There are occasional piles of what appears to be demolition rubble but these are not extensive, usually only very localised. Much of the area of the sand pits is covered by grass and ground elder, with some gorse, broom and occasional small trees as pictured in **Image 8.12**.

Image 8.12 Active sand pits

81. Occasional raised standpipe covers can be seen, an example is shown in **Image 8.13**. However, these seem to lie close to the active sand pit, so they are likely for a geotechnical purpose (giving warning of any groundwater level issues that might affect operations) rather than suggesting any perceived ground gas issue.

Image 8.13 Track and standpipe near active sand pit

Image 8.14 Undulating ground in north, nearer route

82. The sawmills lie about 350m south of the route. Given the overall topography, they are considered to be too far from the route to be considered a significant influence and likely lie down the hydraulic gradient in any case. They are not considered further.

8.7.6.4 Sand Pits at Gordon Sawmills – Discussion of Risks

83. There has been reworking of the ground at the sand pits. There has also been some dumping of masonry rubble over the years. However, the latter appears to be relatively limited. There is no evidence to suggest any substantial restoration, infilling or landfilling.

84. The route passes north of the sand pits, through farmland on the edge of the pits. On that basis, it appears unlikely that made ground will be encountered. Hazardous ground gas from any infill to the sand pits appears unlikely to be a substantial risk, based on the evidence available. It is considered unlikely that any pressure could build-up within the worked soils, since there is no evidence to suggest that any waste soils are extensive or have

been capped. The risk that landfill gas could migrate to any great distance is likely to be low. On that basis, it is considered that the sand pits are unlikely significantly to affect the cable construction. However, as a precaution, extra care should be undertaken to ensure that monitoring is undertaken within the excavation here for the presence of hazardous gases.

85. However, following Construction it is considered that the risks to any receptor should be no greater than they were before Construction.

8.7.7 Section 14 (Road Crossing 15 – A950 to Road Crossing 14)

86. This section comprises relatively flat-lying farmland but includes a crossing of the South Ugie Water. The Geoenvironmental features for this section can be seen in **Table 8.9**.

Table 8.9 Geoenvironmental Features

Description	Easting	Northing	Remarks
Well	403340	847687	
Well	403292	847680	
Gravel Pit	402953	847330	
Pump	402814	846930	
Well	402701	846913	
Well	402662	847990	
Gravel Pit	402340	847875	Off to east
Well	402242	846858	
Woolen Mill	402230	845090	
Gravel Pit	401970	848012	Close to route on west
Sluice	401680	847024	Connects to a drain which the route crosses

87. No significant sources of contamination have been identified in this section of the route. No source-pathway-receptor linkages are considered likely.

8.7.8 Section 13 (Road Crossing 14 to Road Crossing 13 – A952)

88. This section runs through generally flat-lying, occasionally gently undulating farmland. Geoenvironmental features for this section of the route can be seen in **Table 8.10**.

Table 8.10 Geoenvironmental Features

Description	Easting	Northing	Remarks
Quarry	401724	846234	Close to or on route
Well	401658	846044	Close to or on route
Quarry	401730	845829	Slightly south-east of route
Well	401658	846480	

Description	Easting	Northing	Remarks
Corn Mill	401600	846340	
Quarry	401600	845900	
Quarry	401580	844660	
Well	401178	845130	
Well	401173	845133	
Sluice	401124	847025	
Well	401060	845590	
Well	400832	844104	
Well	400639	844101	
Weir	400440	844380	
Quarry	400290	844640	See discussion below
Pump	400280	843922	
Sluice	400270	845064	
Sluice	400246	845210	
Well	400227	845228	

89. An old quarry lies just west of the A952, at Millbreck.

8.7.8.1 Millbreck Quarry

90. This appears to have been a sand and gravel quarry but seems to have been disused for many years. The route runs just north of this. There are soil bunds on the north-east side of the quarried area, probably of topsoil. The quarry is largely vegetated with ground elder, with occasional small bushes grass, and wild garlic.

91. There has been some fly-tipping undertaken here as shown in **Image 8.15** and this appears to include some corrugated sheet material which is considered likely to be cement-asbestos (ACM) **(Image 8.16).**

Image 8.15 Fly-tipped material

Image 8.16 Fly-tipped material - suspected Asbestos CM

8.7.8.2 Millbreck Quarry – Discussion of Risks

92. The route will not pass through the quarry, so there is no reason to expect that operatives will encounter the fly-tipped asbestos or any other material within the quarry.

93. The quantities of made ground present at the quarry are considered unlikely to be sufficient to generate significant quantities of hazardous ground gases at the route. Accordingly, routine gas monitoring should suffice in excavations.

8.7.9 Section 12 (Road Crossing 13 – A952 to Road Crossing 12)

94. The route passes through relatively flat or only gently undulating farmland. The Geoenvironmental features for this section can be seen in **Table 8.11.**

Table 8.11 Geoenvironmental Features

Description	Easting	Northing	Remarks
Sheep Wash	400140	845216	Well to north of site (>250m)
Well	400136	844866	
Well	400110	845162	
Corn Mill (Mill of Clola)	400108	844136	
Garage	400076	843780	Well to south of site (>250m)
Smithy	400060	843672	Well to south of site (>250m)
Tank	400056	844074	
Well	400040	844746	
Poultry House (Clola)	399985	844047	
Well	399954	843992	
Pump	399780	844294	
Well	399655	844530	
Well	399513	844264	Close to or on route
Well	399427	844853	
Sand Pit	399200	844730	
Mill Dam	399180	483815	
Tank	399174	843902	

95. No significant sources of contamination have been identified in this section of the route. No source-pathway-receptor linkages are considered likely.

8.7.10 Section 11 (Road Crossing 12 to Road Crossing 11)

96. The route runs through generally fairly flat-lying farmland. Geoenvironmental features for this section can be seen in **Table 8.12**.

Table 8.12 Geoenvironmental Features

Description	Easting	Northing	Remarks
Tank	398612	844415	
Quarry	398590	843920	
Well	398355	842590	
Quarry	398150	842290	

Description	Easting	Northing	Remarks
Well	398146	843520	
Pump	398136	843480	
Well	398038	843158	
Well	398026	843409	
Quarry	398025	843248	Slightly south of the route
Smithy	398025	844235	
Well	397971	843430	
Well	397920	843866	
Pump	397890	843901	
Well	397841	842981	
Well	397832	842984	
Quarry	397660	843972	

97. No significant sources of contamination have been identified in this section of the route. No source-pathway-receptor linkages are considered likely.

8.7.11 Section 10 (Road Crossing 11 to Road Crossing 10 – B9030)

98. The route runs through generally fairly flat-lying farmland. Geoenvironmental features for this section of the route can be seen in **Table 8.13.**

Table 8.13 Geoenvironmental Features

Description	Easting	Northing	Remarks
Quarry	397450	842850	Off to south
Well	397414	843474	
Well	397362	843216	Slightly south of route
Quarry	397328	843022	Off to south
Well	397319	843222	Slightly south of route
Tank	397281	843146	
Well	397164	842786	
Gravel Pit	397072	843672	
Well	397040	843063	
Pump	396946	843046	

Description	Easting	Northing	Remarks
Well	396716	843170	
Quarry	396540	843546	
Well	396362	843951	
Well	396350	843304	Close to or on route
Well	396230	842945	
Well	396190	842904	
Well	396072	842886	
Well	396039	843547	
Well	395970	843956	
Sluice	395834	843150	
Archaeology	395830	843620	
Well	395829	843120	
Saw Mill	395776	843636	
Sluice	395756	843647	
Smithy	395647	843722	
Quarry	395453	843580	
Pump	395077	842948	

99. No significant sources of contamination have been identified in this section of the route. No source-pathway-receptor linkages are considered likely.

8.7.12 Section 9 (Road Crossing 10 – B9030 to Road Crossing 09)

100. The route runs through generally fairly flat-lying farmland. Geoenvironmental features for this section can be seen in **Table 8.14**.

Table 8.14 Geoenvironmental Features

Description	Easting	Northing	Remarks
Pump	395122	843650	
Pump	394693	843215	
Well	394672	843813	
Well	394666	844625	

101. No significant sources of contamination have been identified in this section of the route. No source-pathway-receptor linkages are considered likely.

8.7.13 Section 8 (Road Crossing 9 to Road Crossing 8)

102. The route runs through generally fairly flat-lying farmland. Geoenvironmental features for this section can be seen in **Table 8.15**.

Table 8.15 Geoenvironmental Features

Description	Easting	Northing	Remarks
Well	394583	843143	
Quarry	394342	843948	
Pump	394338	843317	
Pump	394293	843478	
Well	394235	843168	
Well	394212	844244	
Well	394198	843718	Close to route on south-west
Well	394181	843743	Close to route on south-west
Archaeology	394158	844385	
Well	394151	843792	Close to route on south-west

103. No significant sources of contamination have been identified in this section of the route. No source-pathway-receptor linkages are considered likely.

8.7.14 Section 6/7 (Road Crossing 8 to Road Crossing 6/7 – A948)

104. The route runs through generally fairly flat-lying farmland. The Geoenvironmental features for this section of the route can be seen in **Table 8.16.**

Table 8.16 Geoenvironmental Features

Description	Easting	Northing	Remarks
Well	393950	844055	Close to route on south-west
Well	393924	843826	
Well	393867	843856	
Quarry	393857	843950	
Quarry	393846	843884	
Well	393719	843627	
Sluice	393683	844800	
Quarry	393566	844292	

Description	Easting	Northing	Remarks
Well	393560	843547	
Well	393529	843776	
Well	393454	843752	
Quarry	393355	844883	
Pump	393243	844871	
Quarry (Lime)	393225	844876	
Well	393018	844067	
Well	392981	844469	
Well	392972	844833	
Sheep Dip	392720	844860	
Pump	392605	844705	
Pump	392394	845260	
Pump	392246	843596	
Sluice	392123	845620	
Pump	392044	845581	
Threshing Mill	392015	845565	
Landfill	391656	845800	
Landfill	391603	845640	
Pump	391447	844666	
Threshing Mill	391380	845246	
Quarry	391360	845266	
Sluice	391360	845231	
Pump	391358	845252	
Pump	391276	845773	
Pump	391119	845396	
Sluice	391082	845430	
Pump	391050	845086	
Pump	391040	845062	
Quarry	390922	844970	Close to route on north

Description	Easting	Northing	Remarks
Quarry	390886	845155	
Well	390737	845598	
Pond	390686	845327	
Well	390673	845324	

105. There are areas of peat anticipated along this section of the route. These are natural soils but they may generate methane and/or carbon dioxide. Gas monitoring in excavations will be necessary but should be undertaken routinely in the excavations all along the route in any case.

106. The route also crosses the Formartine and Buchan Way that is now a walkway/cycle route but was formerly a railway line.

107. In addition to the above, Gilkhorn Landfill lies about 450m north of the site near the western end of this section.

8.7.14.1 Former Railway and Discussion of Risks

108. The ground level at the former railway appears to be approximately level with the surrounding ground level. There is likely to be some made ground, likely including railway ballast but the made ground unlikely to be of any substantial thickness. This having been a railway running line, rather than a station or siding, contamination is therefore less likely. However, ballast can contain contamination by metals, depending on its original source.

109. Any contamination is likely to be shallow and localised. A very limited investigation of the made ground at the former railway will be undertaken in order to ensure that the made ground is not contaminated. Testing should be undertaken for metals and pH value.

8.7.14.2 Gilkhorn Landfill and Discussion of Risks

110. A Groundsure report has been obtained for Gilkhorn Landfill and is contained in **Appendix 8.4 - Gilkhorn**.

111. The landfill appears to have covered an area about 300m from north to south and 150m from west to east and lies just west of the Formartine and Buchan Way. It now comprises rough grassland and is pictured in **Image 8.17.**

112. A standpipe was found east of the landfill on the Formartine and Buchan Way. It was badly damaged and does not appear to have been used for many years. However, its presence does suggest that there has been monitoring for landfill gas at some time in the past, so the landfill was at some time considered to be a potential source of landfill gas.

Image 8.17 Gilkhorn Landfill

113. Given the distance between the route and Gilkhorn Landfill, it is not considered to present any significant risk to the Construction Works. Routine monitoring for gas should suffice in the excavation.

8.7.15 Section 5 (Road Crossing 6/7 – A948 to Road Crossing 5)

114. The route passes through largely flat-lying farmland. Geoenvironmental features for this section can be seen in **Table 8.17.**

Table 8.17 Geoenvironmental Features

Description	Easting	Northing	Remarks
Smithy	390715	844215	
Pump	390446	845737	
Pump	389988	845820	
Landfill	389964	845412	Further discussion below. Moss at Clockhill
Quarry	389800	845173	
Well	389720	845494	
Well	389705	845063	
Well	389661	845745	
Well	389654	845635	
Well	389578	845424	
Archaeology	389542	844894	
Well	389538	845280	Close to or on route
Archaeology	389530	844883	
Pump	389522	846391	

Description	Easting	Northing	Remarks
Pump	389484	846358	
Well	389400	846445	
Well	389388	845441	
Pump	389378	845640	
Well	389370	845540	
Well	389340	845740	
Quarry	389287	846514	
Pump	389272	844906	
Well	389266	845504	
Well	389146	346366	
Well	389084	844930	

115. There are areas of peat anticipated along this section of the route. These are natural soils but they may generate methane and/or carbon dioxide. Gas monitoring in excavations will be necessary but should be undertaken routinely in the excavations all along the route in any case.

116. Moss at Clockhill Landfill lies about 100m north of the route.

8.7.15.1 Moss at Clockhill Landfill

117. An unclassified road runs along the north side of the landfill, westwards from a garage, Mile End Motors. The road is a little higher than the adjacent fields, the ground level here falling gently to the south. The landfill appears to have been constructed southwards from the road at that level, with the result that there is a scarp slope at its southern end, about 2.5m high and about 100m north of the route.

118. Indications are that this has been used as an informal tip over many years, including recently. Most of the exposed soil appears to be reworked natural soil (clay, sand and gravel). However, there are boulders, lumps of metal, fencing, timber, plastic oil containers (some of which appear to have been tipped very recently indeed), other plastic, tyres (both car and tractor tyres) and garden waste. This can be seen in **Image 8.18, Image 8.19** and **Image 8.20.**

Image 8.18 Scarp face of Moss at Clockhill Landfill (route will be on left)

Image 8.19 Scarp face of Moss at Clockhill Landfill

Image 8.20 Scarp face of Moss at Clockhill Landfill

119. A Groundsure report has been obtained for this location and is in the **Appendix 8.5 – Moss at Clockhill**.

8.7.15.2 Moss at Clockhill Landfill – Discussion of Risks

120. The route does not intersect the Clockhill Landfill. This significantly reduces any risks that this landfill may present, either to the Construction itself and indeed the risk that the excavation could create new pathways by which any contamination within the landfill could connect to any potential receptor (including the Water Environment) to this potential source.

121. No asbestos-containing materials were seen during the site reconnaissance. Although the presence of ACM cannot be ruled out, since the route does not intersect the landfill this risk to human health during Construction is considered to be low.

122. However, the landfill could contain contamination by metals, acids and alkalis, hydrocarbons (including fuel oils from dumped oil containers) and polyaromatic hydrocarbons. Some of these contaminants could present as mobile leachate.

123. A limited ground investigation will be undertaken on the route where close to this landfill, sampling and testing the soil and groundwater to ensure that the landfill is not causing contamination of the Water Environment. If it were, then the excavation and the cable track could offer a preferred route by which such contamination could migrate. However, the risk that this is the case is considered likely to be low, based on the information available at the present time, subject to confirmation.

8.7.16 Section 4 (Road Crossing 5 to Road Crossing 4)

124. The route runs through gently undulating farmland. The Geoenvironmental features for this section can be seen in **Table 8.18**.

Table 8.18 Geoenvironmental Features

Description	Easting	Northing	Remarks
Quarry	388990	346550	
Threshing Mill	388956	845154	Close to or on route
Well	388944	845244	

Description	Easting	Northing	Remarks
Well	388867	845659	
Well	388828	845665	
Lime Kiln	388769	845987	Well away to north (>250m)
Gravel Pit	388590	845820	Well away to north (>250m)
Smithy	388542	845236	Off route to south-west
Pump	388470	846444	
Well	388416	846020	
Well	388416	845927	
Well	388322	846306	
Well	388304	846194	
Pump	388258	845554	
Sluice	388255	845787	
Well	388255	844430	
Pump	388210	845726	

125. There is a possibility of contamination such as by oils (lubricating oil, for example) at the threshing mill that lies close to, or on the route. However, this risk is considered to be low and localised with respect to the proposed Construction, so is unlikely to be significant.

8.7.17 Section 3 (Road Crossing 4 to Road Crossing 3 – B9170)

126. The route runs through gently undulating farmland. The Geoenvironmental features for this section of the route can be seen in **Table 8.19.**

Table 8.19 Geoenvironmental Features

Description	Easting	Northing	Remarks
Pump	388138	846304	
Well	388020	846228	
Well	387997	845576	
Pump	387992	845500	
Well	387890	844310	
Well	387819	845944	
Sluice	387783	845560	
Threshing Mill	387762	845566	

Description	Easting	Northing	Remarks
Well	387690	844580	

127. No significant sources of contamination have been identified in this section of the route. No source-pathway-receptor linkages are considered likely.

8.7.18 Section 2 (Road Crossing 3 – B9170 to Road Crossing 2)

128. The route passes through gently undulating farmland. Geoenvironmental features for this section are listed in **Table 8.20**.

Table 8.20 Geoenvironmental Features

Description	Easting	Northing	Remarks
Well	387720	845606	
Well	387623	845686	
Well	387600	848800	
Pump	387516	846353	
Well	387470	846150	
Dam	387460	846360	
Well	387448	846142	
Smithy	387432	846140	Well off to north (>250m)
Threshing Mill	387425	846340	
Well	387242	844772	
Well	387173	844520	
Well	386908	846168	
Spring	386907	846126	
Quarry	386895	845208	Off to south

129. There are areas of peat anticipated near this section of the route. These are natural soils but they may generate methane and/or carbon dioxide. Gas monitoring in excavations will be necessary but should be undertaken routinely in the excavations all along the route in any case.

130. No significant sources of contamination have been identified in this section of the route. No source-pathway-receptor linkages are considered likely.

8.7.19 Section 1 (Road Crossing 2 to Road Crossing 1)

131. The route runs through undulating farmland. It crosses the Little Water towards the western part of this section. At the west end of this section will lie part of the proposed Substation Compound to be constructed (that part lying east of the road at Upper Mains of Asleid). The Geoenvironmental features for this section can be seen in **Table 8.21**.

Table 8.21 Geoenvironmental Features

Description	Easting	Northing	Remarks
Well	386548	845634	
Dam	386416	846440	
Threshing Mill	386400	846424	
Threshing Mill	386374	846422	
Pump	386342	845661	
Well	386321	845666	
Well	386138	845066	
Pump	386087	845178	
Gravel Pit	386034	845175	Well off to south (>250m)
Threshing Mill	385996	845720	Slightly off to north
Quarry	385920	845995	Off to north
Well	385900	844900	
Pump	385833	844882	
Well	385622	845568	
Gravel Pit	385473	844918	Well off to south (>250m)
Sluice	385335	845086	
Threshing Mill	385314	844982	
Well	385250	846510	
Well	385074	845341	
Sheep Wash	385040	845302	Off to south-east
Well	385008	845673	
Well	384728	825010	
Well	384671	845506	
Well	384666	843680	
Smithy	384600	845010	Off to south
Well	384588	844833	
Pump	384582	845020	
Well	384580	844938	

Description	Easting	Northing	Remarks
Well	384559	844196	
Sluice	384530	844142	
Well	384463	843459	
Quarry	384444	844153	
Well	384418	845852	
Gravel Pit	384364	845260	
Well	384311	844260	
Well	384301	845205	Close to route on north
Rifle Range (target)	384286	845008	Route crosses former rifle range (see below)
Dam	384190	846190	
Quarry	384058	845784	Well off to north (>250m)
Pump	383994	844219	Close by to south-east
Well	383992	845836	
Threshing Mill	383896	845070	
Sluice	383877	845093	
Well	383736	845010	
Well	383685	844728	
Well	383680	844403	At Upper Mains of Asleid
Pump	383660	844862	
Well	383635	845024	
Pump	383575	845730	
Sluice	383552	845778	
Well	383390	845141	
Sand Pit	383368	844920	
Well	383120	845522	
Well	383014	844238	

132. There are areas of peat anticipated in the east of this section of the route, near Moss-side. These are natural soils but they may generate methane and/or carbon dioxide. Gas monitoring in excavations will be necessary but should be undertaken routinely in the excavations all along the route in any case. The route crosses a former rifle range at a location just east of the Little Water.

8.7.19.1 Rifle Range at Little Water and Discussion of Risks

133. Old Ordnance Survey (OS) maps indicate that there was a rifle range just east of the Little Water during the late 19th Century. Such "volunteer rifle ranges" were common across the UK prior to World War I. It appears that shooting was undertaken from the north here, firing southwards towards a target in woodland. The norm in such ranges was for the target to stay fixed and for the shooting position to move, varying the distance of the shooters from the target. The rifle range was in use a very long time ago, so any "lost" ammunition may well be inactive by now. A close watching brief in this area will be adopted and it will be ensured that operatives are aware that there could be small arms ammunition in this vicinity, with a procedure agreed such that any such ammunition can be recovered safely for proper disposal.

8.7.20 New Deer Substation Compound

134. The Substation Compound will be located in fairly flat-lying farmland east and west of the road at Upper Mains of Asleid. The Geoenvironmental features for this section are listed in **Table 8.22**.

Table 8.22 Geoenvironmental Features

Description	Easting	Northing	Remarks
Well	383836	843459	Well off to south-east
Well	383345	843953	On site
Well	383282	843733	Close by or on site
Well	382994	844260	Close by site
Pump	382990	844248	Close by site
Sluice	382973	844240	Close by site
Well	382959	845005	
Well	383348	843952	On site, shown in current mapping

135. No significant sources of contamination have been identified close by the proposed Substation Compound. No source-pathway-receptor linkages are considered likely.

136. The well shown on site in the current mapping should be located and made safe.

8.8 Mitigation

8.8.1 Construction Mitigation

137. A targeted geoenvironmental ground investigation will be undertaken in the following areas prior to Construction (see **Table 8.23**).

Table 8.23 Locations of Geoenvironmental Investigation

Section	Location	Remarks
19	Stonemills	Investigation of soils in undulating ground. Testing for metals, pH, petroleum hydrocarbons, polyaromatic hydrocarbons, asbestos and organic matter content.
16	Wester Rora Sand Pit	Investigation of soils in tipped area where the route will cross. Testing for metals, pH, petroleum hydrocarbons, polyaromatic hydrocarbons, asbestos and organic matter content.
15	Sandyknapps	Investigation of ground where there appears to be a restored sand pit. Testing for metals, pH, petroleum hydrocarbons, polyaromatic hydrocarbons and organic matter content.
6/7	Former railway line	Very localised investigation on former railway line. Testing for metals and pH.
5	Moss at Clockhill	Localised investigation, primarily for petroleum hydrocarbons and polyaromatic hydrocarbons.

138. In addition, the following mitigation is proposed during or at an early stage of Construction (**Table 8.24**).

Table 8.24 Locations of Targeted Mitigation

Section	Location	Remarks
19	Stonemills	Hand-picking of ACMs and appropriate disposal.
16	Bridge of Rora	Increased monitoring for hazardous gases in excavations above routine monitoring.
15	Sand pit at Gordon Sawmills	Increased monitoring for hazardous gases in excavations above routine monitoring.
1	Former rifle range	Increased awareness of the possibility of “lost” small arms ammunition which could be found. Procedure to address this if it occurs.
0	New Deer Substation Compound	Locate and make safe the well on site shown on current OS maps.

139. The geoenvironmental investigations may reveal the need for further targeted mitigation.

8.8.2 Operation Mitigation

140. It is considered very unlikely that any potential sources may present any significant risk to any receptor as a result of the cable route after the Works are constructed and the excavation is backfilled.

GREEN VOLT

9

Chapter 9

Noise

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-0009-09	
Version Number:	00	
Date:	*Issue Date 01/08/23*	
Prepared by:	Paul Hawthorne	Paul Hawthorne
Checked by:	Merlin Garnett	Merlin Garnett
Approved by Client:	Tracey Clarkson-Donnelly	Tracey Clarkson-Donnelly

Version Number	Reason for Issue / Major Changes	Date of Change
A1	Draft Issue for comment	19/07/23
A2	Draft issue for comment	31/07/23
A3	Clean	01/08/23
00	Final	02/08/23

Contents

9 Noise

9.1 Introduction

9.1.1 Background

1. This chapter of the Onshore EIA Report considers the potential noise impacts associated with the construction, operation and decommissioning of the Proposed Development. The Proposed Development consists of a 35km Cable Route Corridor from the coastline near Peterhead to New Deer, and a new Proposed Substation located adjacent to the existing National Grid New Deer Substation (NGNDSS). Green Cat Renewables (GCR) have been tasked with conducting this assessment.

9.1.2 Assessment Overview

2. The assessment of construction noise considered both the construction of the Proposed Substation and the groundworks associated with the Cable Route Corridor. Decommissioning phase activities involve similar plant but utilised in fewer numbers while active over a shorter timeframe than during the construction phase. Therefore, noise associated with decommissioning activities is not likely to exceed that expected during the construction phase. The following construction noise assessment is therefore applicable to both construction and decommissioning phases of the development but is referred to simply as 'construction noise'.

3. Operational noise attributable to the Proposed Development was represented in noise modelling software to assess the noise levels predicted to occur at nearby Noise Sensitive Receptor (NSR) locations.

4. Background noise was previously surveyed in support of NGNDSS. The background noise profile showed relatively low background noise levels in the vicinity of NGNDSS and the adjacent substation associated with the Proposed Development. In the context of this type of noise environment, the use of Noise Rating (NR) criteria as a planning constraint was agreed as appropriate with the Local Planning Authority (LPA). This approach is consistent with that used to assess noise impacts from the operation of NGNDSS prior to planning consent being granted on 26 September 2014.

9.2 Terminology

9.2.1 Acoustic terms

5. **Sound Pressure Level (SPL):** a ratio of sound pressure to a reference pressure (L_{ref}) of 20 µPa. The ratio is calculated logarithmically by 20 log (L/L_{ref}) and is given in decibels (dB).

6. **A-weighted Sound Pressure Level (dBA):** At lower listening levels, mid-band frequencies of sound are observed as being more prominent. Applying an 'A weighting' to a linear frequency response approximates this non-linear aspect of our hearing.

7. **Equivalent sound level (L_{eq}):** The equivalent sound level measured over a specific time. L_{eq} is the single figure sound level that contains the same acoustical energy as the actual fluctuating sound level. Given in decibels; usually (dB) or (dBA).

8. **Sound power level:** The decibel equivalent of the rate of energy (or power) emitted in the form of sound. The sound power level is an inherent property of a sound source.

9. **Emission:** Another way of describing sound power.

10. **Immission:** The sound pressure level that reaches a receptor or the far field of a sound source.

11. **Octave Band:** An octave band is defined as a frequency band whose upper band frequency is twice the lower band frequency. Human hearing spans almost 10 octave bands.

12. **Third-Octave Band:** A third-octave band is defined as a frequency band whose upper band frequency is 1.26 times the lower band frequency. Three third-octave bands make up an octave band.

13. **Response Time (F,S,I):** The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.
14. **Tonality:** The degree to which a sound contains narrow band amplitude peaks or resonances.
15. **Noise:** The unwanted portion of sound.
16. **Noise Rating (NR):** NRs provide a standard way to measure and specify noise in buildings and occupied spaces. The single figure rating also takes into account the frequency content of the noise.

9.3 Leglislation, Guidance and Policy

9.3.1 Planning Advice Note 1/2011: planning and noise

17. Planning Advice Note (PAN) 1/2011[1] provides guidance on how the planning system helps to prevent and limit the adverse effects of noise. Information and advice on Noise Impact Assessment (NIA) methods is provided in the associated Technical Advice Note (TAN)[2]. It includes details of the legislation, technical standards and codes of practice for specific noise issues.
18. The PAN promotes the principles of good acoustic design and a sensitive approach to the location of new development. It promotes the appropriate location of new potentially noisy development, and a pragmatic approach to the location of new development within the vicinity of existing noise generating uses, to ensure that quality of life is not unreasonably affected, and that new development continues to support sustainable economic growth. Environmental health officers and/or professional acousticians should be involved at an early stage in development proposals which are likely to have significant adverse noise impacts or be affected by existing noisy developments.
19. Issues which may be relevant when considering noise in relation to a development proposal include:
    - Type of development and likelihood of significant noise impact,
    - Sensitivity of location (e.g. existing land uses, Noise Management Areas, Quiet Area),
    - Existing noise level and likely change in noise levels,
    - Character (tonality, impulsivity etc.), duration, frequency of any repetition and time of day of noise that is likely to be generated, and
    - Absolute level and possible dose-response relationships e.g. health effects if robust data available.
20. PAN 1/2011 also details areas of opportunity for mitigation measures that can be used to control the source of or limit exposure to noise and states that such measures should be proportionate and reasonable.

9.3.2 Construction Phase

21. Guidance for the assessment of construction noise is given in:
    - British Standard (BS) 5228-1:2009+A1:2014 - Code of Practice for noise and vibration control on construction and open sites.
22. The standard provides indicative source noise level data for a variety of construction plant for use within the calculations and suggests appropriate fixed noise limits. Assessment of the significance of impacts can be made through comparison of predicted levels with defined criteria.

9.3.3 Operational Phase

23. Noise assessment guidance for the operational phase of the project is given in:
    - BS 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound.

1. ---

[1] *https://www.gov.scot/publications/planning-advice-note-1-2011-planning-noise/*

[2] *https://www.gov.scot/publications/technical-advice-note-assessment-noise/pages/1/*

24. Guidance on operational noise limit criteria is given in:

- BS 8233:2014 Sound insulation and noise reduction for buildings – Code of Practice; and,
- World Health Organisation (WHO) recommendations presented within its *Guidelines for Community Noise* (1999)[3] and *Environmental Guidelines for the European Region* (2018)[4].

25. Methods to calculate the propagation of sound is given in:

- ISO 9613, Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2.

9.3.3.1 BS 4142:2014 Overview

26. BS 4142:2014 is used to assess the impact of industrial and commercial sound. The standard details measurements procedures and guidance on collecting suitable data. It acknowledges that the influence of the context in which the sound is heard is a significant modifier of the impact, in line with subjective assessments. The standard supports current UK planning guidance and SEPA/EA requirements on NIAss.

27. When assessing the character of a sound source to determine the Rating Level, the standard provides various methods that may be deemed suitable by the assessor depending on the context and level of detail required. These include the subjective, objective, and reference methods which can be used to verify the prominence/audibility of tones or impulsive sounds.

28. Source noise characteristics covered by BS 4142:2014, that should be considered when deriving a rating penalty, are tonality, impulsivity, intermittency or any other distinctive characteristic that readily differentiates the source noise from its acoustic environment:

29. Tonality: A rating penalty of +2 dB is applicable for a tone which is “just perceptible”, +4 dB where a tone is “clearly perceptible”, and +6 dB where a tone is “highly perceptible”.

30. Impulsivity: A rating penalty of +3 dB is applicable for impulsivity which is “just perceptible”, +6 dB where it is “clearly perceptible”, and +9 dB where it is “highly perceptible”.

31. Intermittency: “… if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.”

32. Other Sound Characteristics: Where the specific sound features “characteristics that are neither tonal nor impulsive, though are otherwise readily differentiated against the residual acoustic environment, a penalty of +3 dB can be applied.”

33. Noise source levels are assessed at the location of nearby NSR as Specific Sound Levels ($L_{Aeq,t}$), which are then adjusted for any inherent characteristics to produce a Rating Level. Residual Sound Levels ($L_{aeq,t}$) are assessed at the same location in the absence of the specific source when active sources are being assessed (as opposed to modelled sources). Representative typical Background Sound Levels ($L_{A90,t}$) are ascribed to each receptor and a differential comparison made with the Rating Level.

34. Differences of +10dB or more may indicate significant adverse impact. Differences of +5dB indicate a degree of adverse impact, depending on the context. The lower the differential, the lower the predicted impact of the source noise on the receptor. A difference of -10dB is considered to be of negligible impact.

9.4 Consultation

35. A Scoping Report was submitted to Aberdeenshire Council during late 2022 (**Appendix 1.3**). Scoping Opinion regarding application reference: **ENQ/2023/0008,** including responses regarding noise impacts, was received on 24th January 2023 (**Appendix 1.4**). A summary of the response and action taken is provided in **Table 9.1**.

1.

[3] *https://apps.who.int/iris/handle/10665/66217*

[4] *https://www.who.int/europe/publications/i/item/9789289053563*

Table 9.1 Scoping Consultation Response

Consultee	Scoping Response	Action
Environmental Health Service (EHS)	States that service is agreeable that construction noise can be constrained to recommended limits via a suitable planning condition.	Indicative construction noise assessment has been included.
	States that EHS is agreeable with the proposed methodology for the operational noise assessment, proposed in Section 11.5 of the EIA Scoping report.	Section 11.5 methodology has been used for the operational noise assessment.

36. Aberdeenshire EHS is in agreement that construction noise can be constrained via planning condition. It is suggested that the planning condition reference the significance thresholds for construction noise that are provided at **Table 9.2**. The construction noise assessment included in this study is therefore provided to assist the developer in identifying NSRs that have the highest potential to be impacted.

37. Prior to the receipt of the Scoping Opinion, email communication from the LPA requested that operational noise levels from the Proposed Development should reference NR20, rather than NR25; GCR had proposed that NR25 be used in the previously submitted scoping methodology.

38. Therefore, NR20 is the criteria adopted for operational noise levels from the Proposed Development. NR25 remains the applicable criteria for cumulative noise. NR25 criteria is consistent with World Health Organisation (WHO) recommendations presented within their *Guidelines for Community Noise* (1999).

9.5 Assessment Methodology

9.5.1 Construction phase methodology

39. An indicative desktop assessment using BS 5228-1 has been conducted. The factors influencing the impact of plant noise are: the number and character of noise sources; the duration of activity and hours of work; the separation distance between source and receptor; and reduction of noise absorption or screening. An indicative construction schedule is provided in the **Chapter 5 – Project Description** therefore, an estimate of worst-case impacts can be made. These should be treated as indicative.

40. During the construction phase of the project, it is expected that noise levels in the area may increase due to the operation and movement of plant. In BS 5228-1:2009 the 'ABC method', as outlined in Annex E3 of the standard, sets out the following criteria for classifying the significance of the construction noise:

41. *"Noise levels generated by construction activities are deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{aeq, Period}$, from construction noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant impact."*

42. As construction activities are largely occurring in rural locations, it is expected that the baseline sound levels would be at least 5 dB below the lower thresholds of the ranges provided above. Therefore, the lower cut-off values have been used as a basis for the assessment. A summary of the criteria used for the assessment is provided in **Table 9.2.**

Table 9.2 Construction noise significance criteria

Period	Threshold value (dB LAeq,T)
Night-time (23:00 – 07:00)	45
Evenings and weekends (19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays)	55
Daytime (07:00 – 19:00 weekdays, 07:00 –23:00 Saturdays)	65

43. During the construction phase, works and operation of plant on this site are expected to be limited to the day-time periods: Monday to Friday (07.00−19.00) and Saturdays (07.00−13.00). As a result, the cut-off value for significant construction noise impact is deemed to be 65dB(A) $L_{aeq,T}$. For any activity that extends beyond daytime periods, the lower cut-off limits of 55dB(A) and 45dB(A) would apply dependent on time of day. No assessment has been made against the pre-construction ambient noise levels.

44. The methodology for determining the levels of the construction noise involves calculating the total sound pressure level for each NSR for a construction activity, $L_{aeq(12hr)}$, [equation 1], by summing the total potential sound power level for a given construction phase [equation 2] and subtracting a correction for its distance from the nearest property, K_S [equation 3]. These three equations are shown below:

45. [1] $L_{aeq,T} = L_{WA} - K_S$

46. [2] $L_{WA} = 10\log\{10^{(Lactivity1/10)} + 10^{(Lactivity2/10)}...\}$

47. [3] $K_S = 25\log FAÇade+1$ [for R > 25m]

48. The calculations assume by default that each activity lasts for the full day-time period at 100% intensity.

9.5.2 Operational noise methodology

49. The International Standard ISO 9613 Acoustics – Attenuation of Sound During Propagation Outdoors - Part 2, noise propagation model, as implemented within the iNoise-2023 modelling software package from DGRM[5], was used for this assessment. **Table 9.3** shows the propagation assumptions recommended by ISO 9613.

Table 9.3 Propagation Input Parameters

Atmospheric Attenuation Assumptions	
Temperature (°C)	10
Humidity (%)	70
Ground Attenuation Assumptions	
Attenuation factor, G (all regions)	0.5 (semi-soft or mixed ground)
Receptor assessment height (m)	4.0

50. The attenuation of sound as it travels through the air varies with frequency. The atmospheric attenuation coefficients used in this NIA, corresponding to the assumptions in **Table 9.3**, are tabulated in **Table 9.4** across eight octave bands.

Table 9.4 Attenuation Coefficients Used for the Noise Propagation Model

Octave Band (Hz)	63	125	250	500	1000	2000	4000	8000
Attenuation Coefficient	0.0001	0.0004	0.0010	0.0019	0.0037	0.0097	0.0328	0.1170

51. Due to the absence of spectral data for plant items, the use of ISO 9613-2:1996 simplified prediction method assuming atmospheric attenuation at 500Hz has been employed.

1. ———————————

[5] *https://dgmrsoftware.com/products/inoise/*

52. Mapping and topographic data from the Ordnance Survey[6] was used to describe the study area within the model.

53. The model assumed point source dispersion for all sound sources relating to the project.

54. Sound emission data for noise sources associated with the Proposed Development have been adapted from planning application: APP_2018-0624, for the existing NGNDSS. It is expected that data corresponding to the final plant selection will be submitted to the LPA during the discharge of planning conditions.

55. The specific sound level has been calculated at the façade of the nearest noise-sensitive properties at a height of 4m using the environmental noise propagation model ISO 9613-2:1996.

56. While in operation, the sound produced by the Proposed Substation would be continuous and is not expected to be impulsive in character, however, the plant may exhibit a tonal component. During daytime periods, masking of tonality from other sources in the noise environment is expected. During quiet periods or night-time hours there is potential for the character of the sound sources, to be noticeable, therefore a +4 dB penalty has been applied across all plant sources; as per BS 4142:2014. No further character penalties are applicable. The external NSR Rating Levels are therefore Specific Sound Levels +4 dB.

57. Due to low existing background noise levels, the BS 4142:2014 assessment criteria was determined to be unsuitable, therefore, the use of NR criteria have been agreed with the LPA. These NR criteria define acceptable levels within noise sensitive dwellings and other noise sensitive buildings.

58. The Rating Level must be adjusted, for the attenuation of sound as it passes through building fabric, for an assessment of internal levels at NSRs to be made. BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' suggests that an attenuation factor of -15 dB[7] can be expected from outdoor levels to indoor where the room has a window that is partially open for ventilation - as is expected for bedrooms in the summertime. The standard goes on to caution that this level of attenuation is dependent on the frequency content of the sound incident at the building façade. As the spectral content of the source noise has not yet been specified, a more conservate attenuation factor of -12 dB is assessed to be appropriate in this case. Rating Levels have therefore been reduced by 12 dB to determine internal NSR levels.

59. Internal NSR levels are not directly comparable with NR as the nominal NR value specifies the acoustic energy in only the 1 kHz octave band; BS 8233:2014 includes the following: "*Although there is no direct relationship between dBA and NR, the following approximate relation applies in the absence of strong low frequency noise"; NR ≈ dBA – 6*[8]. Strong low frequency noise is not anticipated, however, a more conservative 3dB reduction of internal NSR levels is deemed appropriate to account for source noise spectra uncertainty.

60. Predicted internal NSR levels were therefore assessed against the following target noise criteria: For internal levels <=23 dB(A), it was assumed that NR20 is satisfied. For internal levels <=28 dB(A), it was assumed that NR25 is satisfied. 28 dB $LAeq_{,8hOUr}$ is 2 dB lower than the target level of 30 dB specified by BS 8233:2014 for ambient noise in bedrooms during night hours (23:00 – 07:00) [9]. **Table 9.5** shows the NR Criteria.

Table 9.5 NR Criteria

Scenario	Internal NSR limit (dB $L_{Aeq, 8hour}$)	NR Criteria
Internal Bedroom Areas – Proposed development	23	20
Internal Bedroom Areas – Cumulative development	28	25

1.

[6] *https://osdatahub.os.uk/downloads/open/Terrain50*

[7] *BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice', p64, para G.1*

[8] *BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice', p23, para 7.4*

[9] *BS 8233:2014 'Sound insulation and noise reduction for buildings – code of practice', p24, para 7.7.2, Table 4*

61. A margin to account for uncertainty in the presented results can be applied. For this assessment, safety margins have been built into the assessment methodology. As such, no additional margin has been attributed.

9.6 Baseline

9.6.1 Study Area - Cable Route Corridor

62. The Cable Route Corridor is approximately 35km in length, running east to west from the Landfall approximately 1.25km north of Peterhead – to the Substation Compound, approximately 0.45km southeast of the existing NGNDSS. The area surrounding the Cable Route Corridor is primarily rural farmland where potential receptors are mostly detached dwellings typical of rural Aberdeenshire, with few notable major settlements adjacent to the development.

63. For the assessment of construction noise, NSRs have been identified as occupied dwellings lying within a 100m buffer of the Application Site Boundary. For trenchless crossing activity, the buffer was extended to 200m.

64. An indicative layout showing the Cable Route Corridor with NSR buffers are shown in **Figures 9.1a-e;** provided separately.

9.6.2 Cable Route Corridor NSRs

65. The details of the NSRs located within the Cable Route Corridor construction noise buffers, are listed in **Table 9.6**. The approximate minimum distance to the nearest potential construction activity is given.

Table 9.6 Nearest NSRs to Cable Route Corridor

NSR ref	Name	Type	Coordinates		Min. Approx. Distance to Construction Activity (m)
			Easting	Northing	
1	Lunderdon Cottage	detached	410586	849344	90
2	Lunderdon Cottage	detached	410577	849298	55
3	Lunderdon Cottage	detached	410445	849335	95
4	Lunderdon Cottage	detached	410403	849347	95
5	Cattlemans	detached	409954	849063	80
6	The Lilies	detached	410052	848970	180
7	Cairnhill House	detached	409481	849071	100
8	Cairnhill House	detached	409449	849085	100
9	Peachtree	detached	409312	849360	75
10	Stonemills	detached	408998	848984	40
11	Unknnown	detached	408756	849006	60
12	Unknnown	detached	408670	849031	155
13	Wester Rora Farm	farm	405092	849010	90
14	Wester Rora Farm	farm	405110	849079	150
15	Wester Rora Farm	farm	405084	849046	120
16	Millbank	detached	404403	849030	100
17	Millbank	detached	404379	849081	150
18	Unknnown	farm	403952	849052	115
19	Unknnown	detached	402131	848267	70
20	Unknnown	farm	402196	847987	150
21	Yokieshill Cottages	semi-detached	401916	846609	90
22	Yokieshill Cottages	semi-detached	401879	846585	40
23	Yokieshill Cottages	detached	401943	846534	110
24	Mill Croft	detached	401708	846499	40
25	Greenhill	detached	401834	845948	130
26	Fordmouth	detached	401228	845663	40
27	Millbreck Cottage	detached	400121	844906	50
28	Ridgewood	detached	400167	844523	190

NSR ref	Name	Type	Coordinates		Min. Approx. Distance to Construction Activity (m)
			Easting	Northing	
29	Milton of Clola	farm	399671	844535	80
30	Aultmill	detached	399753	844292	75
31	The Steading House	detached	399031	844047	85
32	The Steading House	farm	398987	844097	150
33	North Auchtylair	farm	398115	843474	180
34	Denview	detached	397340	843181	130
35	Kinnadie Cottage	detached	397147	843092	180
36	Tollybrae	detached	396682	843128	175
37	Slampton	detached	395638	843381	75
38	Slampton	detached	395640	843423	115
39	Maple House	detached	394940	843308	150
40	Clochan Cottage	detached	394681	843297	160
41	Clochan Farm	farm	394314	843240	190
42	Rockwell	farm	393629	844277	80
43	North Kiddshill Cottage	detached	392824	844015	190
44	Badnyrieves	farm	391017	845081	150
45	Da-Bhinn	detached	389860	845388	105
46	Jims Cabin/Ebrie Lodge Pet Hotel	detached	389711	845131	150
47	Auchmaliddie Croft	detached	389569	845428	150
48	Unknnown	detached	389185	845303	165
49	Greenacres	farm	389267	844926	170
50	Mitchelhill Farm	farm	389062	844945	120
51	Unknnown	detached	389012	845176	50
52	Harry D Brown	farm	388418	845242	180
53	Keilingha	detached	388233	845251	160
54	Merenda View	detached	388268	845574	130
55	Unknnown	farm	388008	845514	120
56	Myre of Bedlam Dairy	farm	387728	845486	100
57	Myre of Bedlam Cottage	detached	387535	845675	130
58	Tanamara	detached	387077	845677	80
59	Benview/Rashboglea	farm	386544	845583	95
60	Piltaig	farm	386017	845747	85
61	Earnhill	farm	385657	845597	150
62	High Ness	farm	385063	845334	90
63	Gamekeepers Lodge	detached	384618	845266	65
64	The Anvil Cottage	detached	384576	845039	115
65	North Mains of Asleid	detached	383906	845117	90
66	Upper Mains of Asleid	detached	383648	844386	60
67	Upper Mains of Asleid Cottage	detached	383709	844176	50
68	Burnside	farm	382980	844219	95

9.6.3 Construction parameters

66. The cables would be buried in parallel trenches approximately 3m wide and 2m deep. The Cable Route Corridor has a working width of around 40m. An example cross section diagram is shown in **Figure 9.1.**

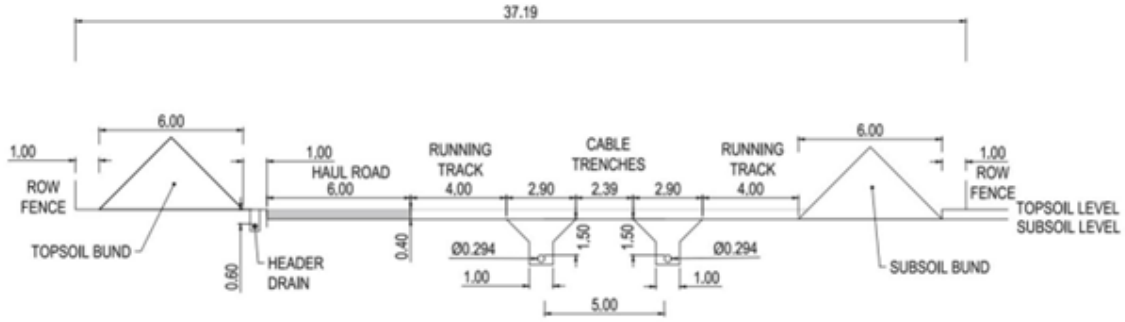

Figure 9.1 Example cross-section through Construction strip

67. Work would commence with installation of a main construction compound, working width, and Landfall Trenchless Compound. Once complete, the working width would be fenced out from RDX1 to RDX 20, with subsequent activities (topsoil strip, crossings, trench excavation, cable installation etc) to follow in succession. Further details can be found in the Construction Execution Plan (CEP).

68. The trench would be back filled with the arisings keeping transportation and movement of material to a minimum. It is intended that a Trenchless Compound would be used to enable the cable to pass under, e.g. roads and water courses, thereby minimising any disruption, but other trenchless methods could be used.

9.6.4 Study area – Substation

69. The Proposed Substation will be located on an area of agricultural land approximately 5.5km southeast of New Deer and approximately 0.45km south of the existing NGNDSS. The study area (enclosed by a dotted red line) consists of detached dwellings and farmhouses with associated outbuildings.

70. **Figure 9.2** Shows a Map of Study Area.

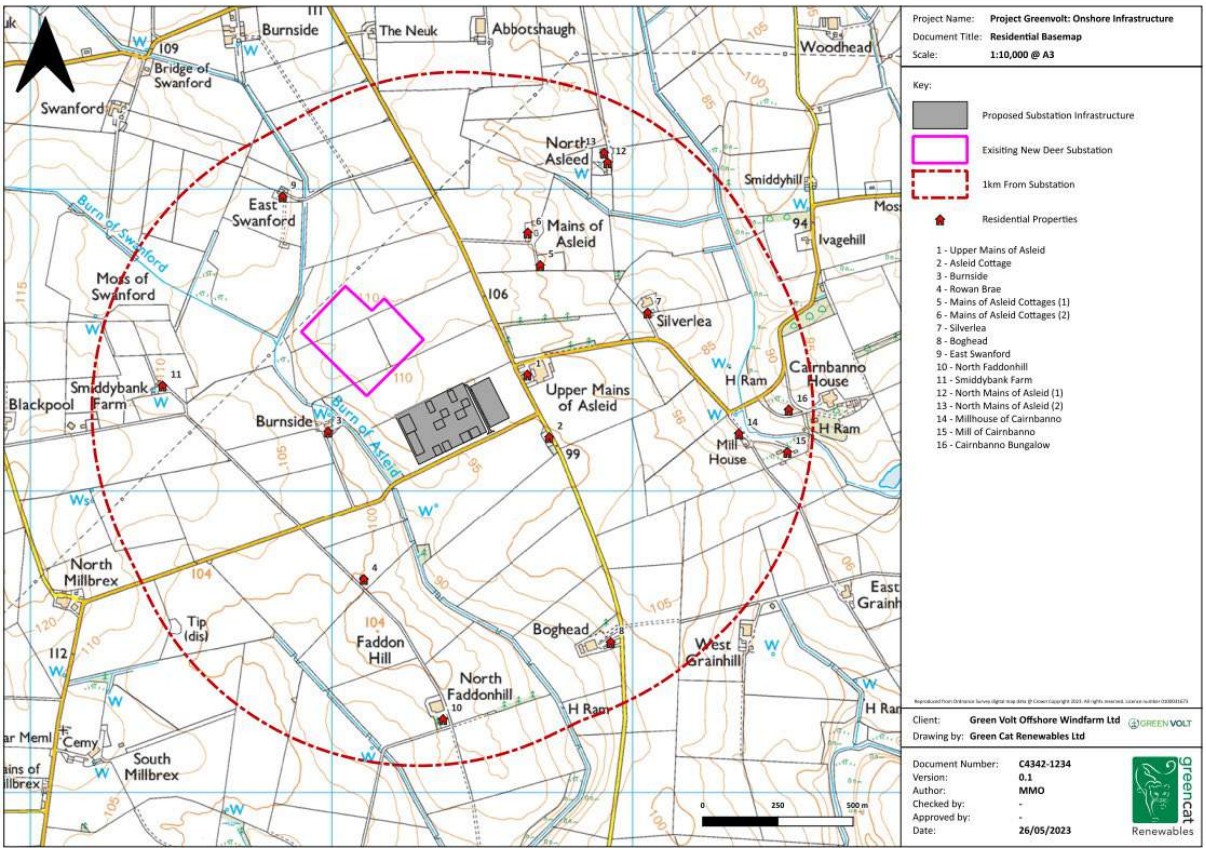

Figure 9.2 – Study area

71. **Table 9.7** lists the nearest NSRs to the Proposed Substation. Demonstrating compliance with operational assessment criteria at these locations will indicate that more distant NSRs in the study area can be expected to be similarly compliant. Note that the NSR references given differ from those use in the construction noise assessment.

Table 9.7 – Nearest sensitive receptors

Property Name (NSR)	NSR Ref	Easting	Northing	Approx. Distance to Development
Upper Mains of Asleid	H1	383654	844384	100m
Asleid Cottage	H2	383701	844191	130m
Burnside	H3	383006	844198	200m
Rowan Brae	H4	383101	843718	340m
Mains of Asleid Cottage (1)	H5	383652	844854	320m
East Swanford	H9	382836	844973	740m
Smiddybank Farm	H11	382443	844353	700m

9.6.5 Proposed Substation Construction Parameters

72. The Proposed Substation will comprise:

- Control Building
- Dynamic Compensation Building
- GIS Switchgear Buildings (220kV and 400kV)
- Filter Buildings (220kv and 400kV)
- Two Super-Grid Transformers
- Shunt Reactors
- Construction Compound
- Sustainable Urban Drainage Systems (SuDS) Pond

73. The assumed primary noise sources associated with the development are presented in **Table 9.8.**

Table 9.8 – Substation Plant Item Assumed Source Noise Levels

Plant Item	Quantity	Location	Assumed Source Height (m)	Sound Power Level (dB L_{WA})
Super Grid Transformer	2	Open	2.75	75
400kV Filter Reactor	9	Housed	1.55	75
400kV Filter Capacitor	9	Housed	3.00	64
220kV Filter Reactor	9	Housed	4.35	75
220kV Filter Capacitor	9	Housed	3.00	61
MSRs	6	Open	2.75	70
SVC Ph. Reactor	6	Open	2.25	66
220kV Shunt Reactor	4	Open	2.25	66
ET	2	Open	1.60	70
SVC Cooler	2	Open	1.25	76
SVC Pump Skid	2	Housed	0.25	74
A/C Units	3	Open	0.75	80

74. **Table 9.8** differentiates the location of plant as 'Housed' or 'Open'. Housed plant would be installed within three buildings; a Dynamic Compensation Building, GIS Switchgear Buildings and Filter Buildings. These buildings have been modelled at a height of 10m[10] and are assumed to attenuate internal sources by 20dB (corresponding to a louvered enclosure). Otherwise, plant is located outside (open) where propagated sound is only attenuated by these buildings if the propagation pathway is interrupted by the presence of a building (barrier effect).

75. External noise will be dominated by contributions from the two Super-Grid Transformers and mounted A/C equipment. Both housed, and open-air equipment, have been accounted for in the predictions presented, based on the most accurate and recent data provided.

76. It should be noted that the design specification for the Proposed Substation is not yet finalised, therefore, details such as the location and source height of some plant equipment a have been estimated using assumptions based on generic site designs of a similar nature.

9.6.6 Background noise Data

77. Background noise data was not surveyed for this assessment. Background levels were measured in support of planning application APP/2014/2430 and reported in the associated Noise Impact Assessment (NIA)[11]. The most

1.

[10] *Buildings with a height of up to 18m have been specified.*

[11] *APP_2014_2430-VOL_5_CH_03.03_A_-_NOISE_TECHNICAL_REPORT-6847863, Table A2.2*

relevant locations for the study area are shown in the following extract. **Table 9.9** shows that, during all but the busiest times of day are expected to be quieter than 30 dB(A), $L_{90,10min}$.

Table 9.9 – Third party background survey results

Table A2.2			$L_{90,10min}$ survey results dB(A)		
Location Ref	E	N	Day	Evening & Weekend	Night
LT28	383857	844485	35	28	27
LT30	382672	845603	32	24	25

78. As stated in **Section 9.1.2**, the use of BS 4142:2014 noise limit criteria was determined not be applicable in this assessment due to the low existing background noise level. BS4142:2014 states that the standard is unsuitable when background noise and Rating Levels L_{Aeq} are low. Within BS4142, the standard identifies that a background noise level of around 30dB and an NR level of around 35dB LAeq are very low. The levels shown in **Table 9.9** for quiet times of day, meet the 30dB(A) threshold.

9.6.7 Cumulative noise baseline

79. NGNDSS was approved on 26 September 2014 under application APP/2014/2430. The conditions of approval required that the NIA be updated once the site design had been finalised. The NGNDSS Project was finalised under application APP/2018/0624, that included an amended NIA[12], and was assessed to meet an external operational noise limit of 29dB L_{Aeq} and internal noise levels were predicted to be below 19dB L_{Aeq}.

80. No other projects have been identified as potential cumulative noise contributors.

9.7 Assessment of impacts

9.7.1 Construction Phase (Cable Run)

81. **Table 9.10** shows the calculation to assess the combined sound power level for each construction activity. Decommissioning noise will involve similar activities, in reverse order, but at a lower intensity.

Table 9.10 Construction activity assessment

Activity	Task	Plant/ equipment	Sound Power[13] Level (dB(A))	Total L_w for activity (dB(A))	Round to nearest 5dB(A)
Prep Work	Right of way	25t Excavator	103	110	110
	Land Drainage	20t Excavator	103		
		5t Excavator	106		
	Haul Road	25t Excavator	103		
Trenching	Trench Excavation	25t Excavator	103	110	110
	Top Soil Strip and storage	Dozer	102		
		25t Excavator	103		
	Minor Crossings	Small Trenchless Compound	103		
		25t Excavator	103		
Compounding	Compound Construction	20t Excavator	103	103	105
Trenchless Drilling	Major Crossings	250t Rig	110	113	115
Cabling	Cable Laying/Install	40T Crawler	101	105	105

1. ———————————

[12] *APP_2018_0624-CONDITION_1_M_-NOISE_IMPACT_ASSESSMENT-7989346*

[13] *Sound power values were provided by the construction contractor and are specific to their plant.*

Activity	Task	Plant/ equipment	Sound Power[13] Level (dB(A))	Total L_w for activity (dB(A))	Round to nearest 5dB(A)
	Backfill included import	25T Excavator (vibrating plate)	103		
		Vibratory Roller	80		
Reinstatement	Re-instate sub soil and topsoil	Dozer	102	106	105
		25T Excavator	103		

82. **Figures 9.1a-e** showed buffers identifying NSRs located within a certain distance of the Site Application Boundary. For major crossings, involving trenchless construction, that buffer was 200m. Only three NSRs were identified in relation to major crossings and associated compounding activities.

83. **Table 9.11** shows the construction noise assessment for the three NSRs identified.

Table 9.11 Major crossings impact assessment

NSR Ref	Name	Approx. minimum distance to activity (m)	Max Activity Levels dB(A)	
			L_W for compounding	L_W for trenchless drilling
			105	115
10	Stonemills	95	55	65
11	Unknown	100	54	64
20	Unknown	120	52	62

84. The assessment of major crossing activities is that these activities could produce NSR levels up to the 65dB cut off threshold. A degree of mitigation may therefore be advisable to ensure that the 65dB cutoff threshold is not exceeded.

85. **Table 9.12** presents the maximum levels predicted for the remaining individual construction activities at each NSR identified within the Cable Route Corridor construction buffers.

Table 9.12 – Construction Noise Impact Assessment for Nearest Receptor (Cable Run)

NSR Ref	Name	Approx. distance to activity (m)	Max Activity Levels dB(A)			
			Ground Prep L_W	Trenching L_W	Cabling L_W	Reinstate-ment L_W
			110	110	105	105
1	Lunderdon Cottage	90	60	60	55	55
2	Lunderdon Cottage	55	65	65	60	60
3	Lunderdon Cottage	95	60	60	55	55
4	Lunderdon Cottage	95	60	60	55	55
5	Cattlemans	80	61	61	56	56
6	The Lilies	180	53	53	48	48
7	Cairnhill House	100	59	59	54	54
8	Cairnhill House	100	59	59	54	54
9	Peachtree	75	62	62	57	57
10	Stonemills	40	69	69	64	64
11	Unknown	60	65	65	60	60
12	Unknown	155	54	54	49	49
13	Wester Rora Farm	90	60	60	55	55
14	Wester Rora Farm	150	55	55	50	50
15	Wester Rora Farm	120	57	57	52	52
16	Millbank	100	59	59	54	54
17	Millbank	150	55	55	50	50
18	Unknown	115	57	57	52	52
19	Unknown	70	63	63	58	58
20	Unknown	150	55	55	50	50

NSR Ref	Name	Approx. distance to activity (m)	Max Activity Levels dB(A)			
			Ground Prep L_W	Trenching L_W	Cabling L_W	Reinstate-ment L_W
			110	110	105	105
21	Yokieshill Cottages	90	60	60	55	55
22	Yokieshill Cottages	40	69	69	64	64
23	Yokieshill Cottages	110	58	58	53	53
24	Mill Croft	40	69	69	64	64
25	Greenhill	130	56	56	51	51
26	Fordmouth	40	69	69	64	64
27	Millbreck Cottage	50	67	67	62	62
28	Ridgewood	190	52	52	47	47
29	Milton of Clola	80	61	61	56	56
30	Aultmill	75	62	62	57	57
31	The Steading House	85	61	61	56	56
32	The Steading House	150	55	55	50	50
33	North Auchtylair	180	53	53	48	48
34	Denview	130	56	56	51	51
35	Kinnadie Cottage	180	53	53	48	48
36	Tollybrae	175	53	53	48	48
37	Slampton	75	62	62	57	57
38	Slampton	115	57	57	52	52
39	Maple House	150	55	55	50	50
40	Clochan Cottage	160	54	54	49	49
41	Clochan Farm	190	52	52	47	47
42	Rockwell	80	61	61	56	56
43	North Kiddshill Cottage	190	52	52	47	47
44	Badnyrieves	150	55	55	50	50
45	Da-Bhinn	105	58	58	53	53
46	Jims Cabin/Ebrie Lodge Pet Hotel	150	55	55	50	50
47	Auchmaliddie Croft	150	55	55	50	50
48	Unknown	165	54	54	49	49
49	Greenacres	170	53	53	48	48
50	Mitchelhill Farm	120	57	57	52	52
51	Unknown	50	67	67	62	62
52	Harry D Brown	180	53	53	48	48
53	Keilingha	160	54	54	49	49
54	Merenda View	130	56	56	51	51
55	Unknown	120	57	57	52	52
56	Myre of Bedlam Dairy	100	59	59	54	54
57	Myre of Bedlam Cottage	130	56	56	51	51
58	Tanamara	80	61	61	56	56
59	Benview/Rashboglea	95	60	60	55	55
60	Piltaig	85	61	61	56	56
61	Earnhill	150	55	55	50	50
62	High Ness	90	60	60	55	55
63	Gamekeepers Lodge	65	64	64	59	59
64	The Anvil Cottage	115	57	57	52	52
65	North Mains of Asleid	70	63	63	58	58
66	Upper Mains of Asleid	50	67	67	62	62
67	Upper Mains of Asleid Cottage	40	69	69	64	64
68	Burnside	70	63	63	58	58

86. Eight NSRs (shaded in amber) show sound levels marginally in excess of 65dB indicating that mitigation may be required to bring worst case sound levels back into compliance with the 65dB cutoff threshold criteria for daytime periods. Potential mitigation measures are detailed in the sections that follow. It is notable that all eight NSR locations were deemed to be located 50m or less from their nearest construction activity. The eight NSR locations identified are: 10, 22, 24, 26, 27, 51, 66 and 67.

87. The assumptions made in assessing construction noise via the 'ABC method[14]', as adopted for this assessment, make for a very conservative assessment of the worst-case scenario. In practice not all construction activities and plant would be running at full intensity, and at the same time, for the duration of the work to be carried out. Due to the modest scale of the development, each activity would also be of relatively short duration though activities are scheduled to follow in succession.

88. Some individual plant may run beyond normal working hours but these are expected to be operated at low intensity and therefore be compliant with the lower thresholds of; 55dB(A) and 45dB(A), for evening and night time periods, respectively.

9.7.2 Construction Phase (Substation)

89. An estimate of typical activities required for each construction activity has been made based on details given in the Outline Construction Environmental Management Plan (CEMP). The following construction assessment assumes all plant always runs at full capacity. It assumes that all plant involved in activities operates concurrently and at their minimum distance to each receptor. Where a BS 5228-1:2009 reference is not given, the sound power value reported has been sourced from the construction contractor.

90. The assessment of substation construction activities is given in **Table 9.13.**

Table 9.13 Assessment of substation construction activities

Task	Plant/ equipment	Sound Power Level (dB(A))	BS 5228-1:2009 Ref	Total SPL for activity (dB(A))	to nearest 5dB(A)
Site Establishment / Enabling Works	20t Excavator	103	n/a	106	105
	Vibratory pokers	75	n/a		
	Vibratory Roller	80	n/a		
	14m Telehandler	80	n/a		
	Dozer	102	n/a		
Civil Works	20t Excavator	103	n/a	111	110
	14m Telehandler	80	n/a		
	12t Dumper	102	n/a		
	20t Concrete Lorry	100	Table D.6-19		
	M24 Concrete Pump	109	Table D.7-71		
	Vibratory pokers	75	n/a		
	Vibratory Roller	80	n/a		
	10t Dumper	80	n/a		

91. The assessment of project construction activities and resulting sound levels for the nearest NSRs can be seen in **Table 9.14.**

1.

[14] *BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice', Annex E*

Table 9.14 – Construction Noise Assessment for Substation

NSR Ref	Name	Approx. minimum distance to activity (m)	Max Activity Levels dB(A)	
			L_W for Enabling works	L_W for Civil Works
			105	110
66	Upper Mains of Asleid	55	60	65
67	Upper Mains of Asleid Cottage	95	55	60
68	Burnside	100	54	59

92. Activities related to the construction of the Proposed Substation are assessed to have the potential to reach 65dB, the cutoff threshold criteria for working daytimes at NSR 66. It is therefore recommended that mitigation be considered before progressing construction activities in close proximity to this location.

9.7.3 Operational Phase Noise Impact Assessment

93. Predicted noise levels from the Proposed Development on the seven nearest NSRs is presented in **Table 9.15**.

Table 9.15 – Predicted Noise Levels of Proposed Substation on Nearest Sensitive Receptors

Location Name	NSR ref	Specific Sound Level (L_{Aeq})	Rating Level (L_{Aeq})	Level after BS8233:2014 adjustments (L_{Aeq})	NR	Level of Exceedance
Upper Mains of Asleid	H1	27	31	16	20	-4
Asleid Cottage	H2	25	29	14	20	-6
Burnside	H3	19	23	8	20	-12
Rowan Brae	H4	20	24	9	20	-11
Mains of Asleid	H5	19	23	8	20	-12
East Swanford	H9	12	16	1	25	-24
Smiddybank Farm	H11	13	17	2	25	-23

94. The results show a maximum Rating Level of 31dB for H1, the nearest NSR. Results of the operational noise assessment of the Proposed Development isolation, show that the noise levels would meet the adopted NR20 limit criteria.

95. Should the final Proposed Substation design specification differ significantly from that described in this assessment, it is suggested that this assessment be updated based on the final specification.

9.7.4 Cumulative Assessment

96. A baseline Specific Sound Level of 29dB(A) has been assumed to apply at all the seven nearby NSRs included in this assessment in accordance with that specified by the most recent NIA[15] relating to NGNDSS. While this level is consistent with that predicted for the nearest NSR, it will overestimate the level at more distant NSRs.

97. The cumulative noise assessment incorporating NGNDSS and the Proposed Development is shown in **Table 9.16**:

1.

[15] *APP_2018_0624-CONDITION_1_M_-NOISE_IMPACT_ASSESSMENT-7989346*

Table 9.16 – Predicted Noise Levels of Existing Substation

Location Name	NSR ref	Specific Sound Level (L_{Aeq})	Rating Level (L_{Aeq})	Level after BS8233:2014 adjustments (L_{Aeq})	NR	Level of Exceedance
Upper Mains of Asleid	H1	31	35	20	25	-5
Asleid Cottage	H2	30	34	19	25	-6
Burnside	H3	29	33	18	25	-7
Rowan Brae	H4	30	34	19	25	-6
Mains of Asleid	H5	29	33	18	25	-7
East Swanford	H9	29	33	18	25	-7
Smiddybank Farm	H11	29	33	18	25	-7

98. The results shown in **Table 9.16** indicate that a maximum cumulative Rating Level of 35dB(A) can be expected. The adopted NR25 limit criteria are met by a minimum margin of 5dB.

99. This assessment therefore indicates that operational sound levels due to the Proposed Development would meet limit criteria for both the individual and cumulative scenarios and could therefore be accommodated into the prevailing noise environment without any significant impact on amenity at any NSR identified in the study area.

100. Given that all criteria are met, the impact of operational noise is considered to be of low significance.

9.8 Mitigation

9.8.1 Construction Mitigation

101. The construction impact assessment assumes that plant involved in a particular activity will operate concurrently, at full intensity, for the duration of the working day. In practice not all construction equipment will be operated at the same time and most activities will be for a much shorter duration.

102. The construction noise assessment identified that NSRs at around 50m or less of construction activities, or within 100m of major crossings, have potential to receive sound levels marginally in excess of the 65dB(A) cut-off criteria for working hours. It is advised that particular care should be employed when working around these locations.

103. To minimise impact of construction noise, the contractor will employ best practicable means to reduce noise impacts via maintaining equipment and limiting activities to daytime hours where possible.

104. The working width employs earth bunds at each extent with a height of approximately 6m. These bunds have not been accounted for in the construction noise assessment but may reduce the impact of some activities that occur close to ground level between the bunds e.g. trenching activities, due to barrier attenuation.

105. Where the bunds are not effective, straw bale barriers can be deployed close to louder plant to reduce NSR levels. Noise barriers mounted on HERAS security fencing may also be effective in some locations.

106. Most trenchless works along the Cable Route Corridor are restricted to distances of less than 100m, where works are expected to be short lived and restricted to normal daytime working hours.

107. Areas that have been identified as major crossings i.e., trenchless distances of over 200m which will employ the use of a Trenchless Compound and have associated compounding activities, are expected to last for a little longer duration but these activities tend to be more distant from NSRs.

108. The CEMP includes a 'Noise Management Plan' which is available separately.

9.8.2 Operation Mitigation

109. NIA results indicate that operational sound levels from the Proposed Development, both in isolation and cumulatively, meet the adopted limit criteria and are therefore judged to be acceptable.

110. The Proposed Substation design specification may be amended at a later stage and it is recommended that acoustic performance characteristics form part of that process to ensure the NR20 limit criteria can be met.

111. If mitigation were to be required once final design specifications are known, then positioning of equipment and positioning of barriers close to external plant equipment (SGT1 and SGT2, Shunt Reactors and Cooling Equipment) may be considered to achieve operational noise compliance.

9.9 Conclusions

112. The Proposed Development will enable significant offshore electricity generation from the Project to access the Transmission Network.

113. A desk-based NIA has been undertaken with regard to the construction and operational phases of the Proposed Development.

9.9.1 Construction Noise

114. Noise levels from construction activity have been assessed in accordance with BS 5228-1:2009 criteria. The assessment concluded that, for working daytime hours (Monday to Friday 07.00−19.00 and Saturdays 07.00−13.00), noise levels from construction activity are not significant for the majority of assessed NSRs. For a minority of 8 locations, levels of up to 70dB(A) were predicted. It is advised that care should be employed to ensure that the 65dB(A) cutoff criteria can be met at these locations and that best practical means are employed across all activities to keep construction noise to a minimum.

115. Approximately one-third of NSRs, located >150m from construction activities, showed levels below the 55dB(A) cut-off criteria given for evening and weekend periods. With suitable mitigation employed, working at distances of >100m from NSRs should be possible, without significant impact, during these periods.

9.9.2 Operational Noise

116. Using the current assumptions put forward for the Proposed Substation design specification, an assessment of operational sound levels has been conducted. The current assumptions include the use of buildings to house around half of the noise producing plant. The main contributor to NSR sound levels are therefore the two Super Grid Transformers as these operate externally.

117. Should the design specification undergo a significant amendment, the updated specification will be designed to meet the relevant BS8233:2014 internal noise criteria of NR20 and NR25 for project and cumulative operational noise, respectively.

118. This assessment concludes that the NR20 and NR25 criteria, as used in this assessment, would be consistent with NGNDSS limit criteria and would provide a suitable operational noise constraint, should the Proposed Development be approved.

9.10 Appendix A - Noise Management Plan

119. The Proposed Development is situated along a semi-rural location, construction and vehicle movements will be regulated to avoid excessive noise and vibration pollution.

120. The construction works shall take place between 07:00 and 19:00 Monday to Friday and 07:00 to 13:00 on Saturday. Outside of these hours works shall be limited to maintenance, emergency works and dust suppression, unless otherwise agreed with the Local Authority. Operating plant noise will be kept within the applicable standards and within the site opening hours. Any non-complying plant will be stopped and stood down until it can be rectified or removed from the site. The Principal Contractor will ensure that any diesel generators which are running outside of the construction hours of the site will not cause noise disturbance to any nearby residential properties.

121. In the event of machinery such as pumps or compressors having to work 24 hours per day, special attention will be directed towards minimising noise disturbance affecting the local population. Approved measures such as earth bunds or bales of straw will be employed to screen off the working area.

122. The British Standard which gives guidance on noise from construction and mineral working sites is BS 5228-1:209+A1:2014. This document does not specify absolute noise limits relating to construction activities; however it does provide detailed guidance on the steps that can be taken to minimise potential noise & vibration effects. Reasonable mitigating measures are as follows:

- Construction activity will be restricted to the hours outlined in section 5.2;
- A site agent will be available on-site during construction hours as a point of contact for any potential noise complaints;
- Care will be taken to choose machinery with low sound emissions where feasible;
- All equipment should be maintained and in good working order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable;
- Movement of vehicles to and from site will be controlled and employees will be instructed to ensure compliance with the noise control measures adopted;
- Plant will, as far as possible, be oriented away from the nearest NSR;
- Equipment and vehicles should not be kept running when not in use;
- When loading and unloading material, attempts shall be made not to drop material from a height; and risk assessment and method statements to include sections on noise and vibration.

123. Should it be considered necessary to further reduce noise levels, then the following mitigation measures may be considered:

- Reduction in the number of simultaneous construction activities.
- Reduction in construction traffic where possible.

GREEN VOLT

10

Chapter 10

Landscape and Visual Impact Assessment

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-REP-0009-10	
Version Number:	00	
Date:	*Issue Date 02/08/23*	
Prepared by:	Alasdair Warnock	*Alasdair Warnock*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First Issue for Review	13 July 2023
A2	Second issue for review	26 July 2023
A3	Final issue for review	01 August 2023
00	Final	02 August 2023

Contents

10 Landscape and Visual Impact Assessment

10.1 Introduction

1. The purpose of this assessment has been to determine the landscape and visual effects of construction, operation and decommissioning of the Proposed Development on the existing landscape and visual resource. The following landscape and visual receptors have been assessed.

   - Landscape character, key characteristics, and elements;
   - Landscape Designations; and
   - Views and visual amenity experienced by residents, tourists, visitors, and road users.

2. This chapter is accompanied by:

   - Landscape and Visual Impact Assessment (LVIA) **Figures 10.1 to 10.6**
     - **Figure 10.1 a-e** – Landscape Character Types and Landscape Designations
     - **Figure 10.2 a-e** – Existing Woodland within the Study Area
     - **Figure 10.3 a-e** – Routes within the Study Area
     - **Figure 10.4** – Substation Zone of Theoretical Visibility (ZTV)
     - **Figure 10.5** – Residential Amenity
   - Landscape and Visual Impact Assessment **Figures 10.6 to 10.8** Photomontages
     - **Figure 10.6** – Viewpoint 1 South-East
     - **Figure 10.7** – Viewpoint 2 North-East
     - **Figure 10.8** – Viewpoint 3 West

3. The aim of the design and assessment process is to promote the best "environmental fit" for a development through consideration of the existing landscape resource, the potential landscape and visual effects and design alternatives. The assessment process will refer to landscape value, and in particular landscape designations and related planning policy, as well as landscape character and capacity for development at this Site.

10.2 Legislation, Guidance and Policy

10.2.1 Legislation

4. National legislation relating to landscape and visual includes:

   - *The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations*, The Scottish Government, 2017; and
   - *Climate Change Act (Scotland),* The Scottish Government, 2009.

10.2.2 Policy

5. National and local policy relating to landscape and visual includes:

   - *National Planning Framework 4 (NPF4),* The Scottish Government, February 2023;
   - *Policy Statement No. 05/01 – Landscape Policy Framework*, Scottish Natural Heritage, December 2005;
   - *Policy R2 – Development Proposals Elsewhere in the Countryside, Aberdeenshire Local Development Plan,* Aberdeenshire Council, June 2022;
   - *Policy P1 – Layout, Siting and Design, Aberdeenshire Local Development Plan*, Aberdeenshire Council, June 2022;
   - *Policy E2 – Landscape, Aberdeenshire Local Development Plan*, Aberdeenshire Council, June 2022; and

- *Policy E3 – Forestry and Woodland, Aberdeenshire Local Development Plan*, Aberdeenshire Council, June 2022.

10.2.3 Guidance

6. National and local guidance relating to landscape and visual includes:

- *The Guidelines for Landscape and Visual Impact Assessment*, *Third Edition*, the Landscape Institute, 2013
- *National Landscape Character Assessment*, NatureScot, 2019;
- *Landscape Character Assessment Topic Paper 6 - Techniques and Criteria for Judging Capacity and Sensitivity*, Countryside Agency and NatureScot, 2015;
- *Visual Representation of Wind Farms Good Practice Guidance,* prepared by Horner + Maclennan and Envision for Scottish Natural Heritage, The Scottish Renewables Forum and the Scottish Society of Directors of Planning, March 2006;
- *Photography and Photomontage in Landscape and Visual Assessment*, Landscape Institute Advice Note 01/2011, 2011; and
- *Assessing the Cumulative Impacts of Onshore Wind Energy Developments*, NatureScot, 2021.

10.3 Consultation

7. A Scoping Report was issued to Aberdeenshire Council in December 2022. Following this, a Scoping Opinion was issued by Aberdeenshire Council in March 2023. **Table 10.1** details some of the key points related to landscape and visual impact from this Scoping Opinion Scoping advice was provided by Aberdeenshire Council.

Table 10.1 – Scoping Consultation Responses

Consultee	Scoping Response	Action
Aberdeenshire Council	Visualisations showing the baseline and built development should be included within the Environmental Impact Assessment (EIA) Report. The construction compound for the jointing bay should also be included within the visualisations and include any landscaping or mitigation. The visualisations should be based on a ZTV which the Council would be happy to consider and assist with viewpoint selection.	Visualisations have been produced to show the Proposed Substation which will be the main component of the Proposed Development that is visible during operation. A ZTV of the jointing bay construction compound at the Landfall has not been provided as it will be a temporary structure and have limited visual influences given the low-lying nature.
Aberdeenshire Council	Visual impact should be considered by a range of receptors where possible and include various landscape character types and landscape designations as appropriate.	Visual receptors in assessment include residential, drivers, and walkers. Landscape receptors include five different Landscape Character Areas (LCA) as well as one Special Landscape Areas (SLA).

10.4 Assessment Methodology

10.4.1 Defining the Study Area

8. An overall study area of 1km radius from the centre of the Cable Route Corridor was agreed in the Scoping Opinion from Aberdeenshire Council, and a 10km study area from the Proposed Substation is proposed.

10.4.1.1 Zone of Theoretical Visibility

9. A ZTV has been calculated using the ReSoft© WindFarm computer software to produce areas of potential visibility of the Proposed Substation, illustrating the visual influence of the buildings. The ZTV however, does not take account of built development and vegetation, which can significantly reduce the area and extent of actual visibility in the field and as such provides the limits of the visual assessment study area.

10. LVIA **Figure 10.4** illustrates the ZTV for the Proposed Substation at 1:110,000 scale. During the scoping phase a ZTV for jointing pits construction compound was requested, however this component will have no visual presence on completion therefore it is not appropriate to produce a ZTV for this.

10.4.2 Baseline Landscape and Visual Resource

11. This part of the LVIA refers to the existing landscape character, quality or condition and value of the landscape and landscape elements on the Site and within the surrounding area, as well as general trends in landscape change across the study area. This will include a brief description of the existing landscape character and land use of the area which includes reference to settlements, transport routes, vegetation cover, as well as landscape planning designations, local landmarks, and tourist destinations provided in **Section 10.5.**

10.4.3 Assessing Landscape Effects

12. Landscape effects are defined by the Landscape Institute as "changes to landscape elements, characteristics, character, and qualities of the landscape as a result of development". The potential landscape effects, occurring during the construction and operation period, may include, but are not restricted to, the following:

- Changes to landscape elements: the addition of new elements or the removal of trees, vegetation, and buildings and other characteristic elements of the landscape character type;
- Changes to landscape quality: degradation or erosion of landscape elements and patterns, particularly those that form characteristic elements of landscape character types;
- Changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities and the cumulative addition of new features, the magnitude of which is sufficient to alter the overall landscape character type of a particular area; and
- Cumulative landscape effects: where more than one development may lead to a potential landscape effect.

13. The Proposed Development may have a direct (physical) effect on the landscape as well as an indirect effect or effect perceived from outwith the landscape character area. Landscape effects are assessed by considering the sensitivity of the landscape against the degree of change posed by the Proposed Development. The sensitivity of the landscape to a particular development is based on factors such as its quality and value and is defined as high, medium or low. Examples of landscape sensitivity and criteria are described below:

- ***High Sensitivity*** – This would primarily be rare landscapes, or landscapes which have been afforded either a national or local designation such as National Parks, National Scenic Areas or Areas of Great Landscape Value. These landscapes can be fairly dramatic in terms of scale and may feature a number of attractive landscape features, including mature woodland, intricate gorges and river valleys, prominent summits and features of cultural heritage. Man-made features or modifications to the landscape will be minimal and the landscape may have a wild or remote feeling to it.
- ***Medium Sensitivity*** – This would include landscapes which are still relatively attractive and generally rural but do contain some man-made elements. It may be landscapes which have been modified to accommodate farming practices and landscapes which include more prominent settlement patterns and road networks. These landscapes may also contain woodland including plantation forestry and shelterbelts.
- ***Low Sensitivity*** – This would only be reserved for landscapes which may be deemed unattractive due to heavy modification and prominent man-made features, such as industrial units.

14. The magnitude or degree of change considers the scale and extent of the Proposed Development, which may include the loss or addition of particular features, and changes to landscape quality, and character. Magnitude can be defined as high, medium, low or negligible, examples of magnitude are shown below:

- ***High Magnitude*** – This would be a major change to baseline conditions, where the character of the landscape may be altered from its existing state into a landscape with development;

- ***Medium Magnitude*** – This would be a noticeable change in the baseline condition but not necessarily one which would be enough to alter the character of the landscape and will generally diminish with distance;
- ***Low Magnitude*** – This would be a minor change to the baseline conditions where the development would be readily missed by a casual viewer and any character of the landscape would remain intact; and
- ***Negligible Magnitude*** – This would be a change which would be difficult to notice and the baseline conditions are likely to remain almost as they were.

15. The level of effect is determined by the combination of sensitivity and magnitude of change as shown in **Table 10.2**.

Table 10.2 - Magnitude and sensitivity matrix for assessing overall level of effect

Sensitivity	Magnitude of Change			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Minor/Negligible
Key		Significant in terms of EIA regulations		
		Not Significant		

16. The significance of any identified landscape or visual effect has been assessed in terms of Major, Major/Moderate, Moderate, Moderate/Minor, Minor or Minor/Negligible. These categories are based on the juxtaposition of receptor sensitivity with the predicted magnitude of change. The matrices should not be used as a prescriptive tool but must allow for the exercise of professional judgement. In the first instance the assessment of effects would be pre-mitigation. Following this, there would be an assessment of residual effects addressing the impact mitigation has on the overall effects.

17. Where the visual effect has been classified as Major or Major/Moderate this is considered to be equivalent to likely significant effects referred to in the EIA Regulations. Careful consideration has also been given to Moderate effects to test whether (in the professional opinion of the landscape architect) they are significant in EIA terms or not. In all cases, whether an effect is significant or not is confirmed within the assessment.

10.4.4 Assessing Visual Effects

18. Visual effects are recognised by the Landscape Institute as a subset of landscape effects and are concerned wholly with the effect of the Proposed Development on views, and the general visual amenity. The visual effects are identified for different receptors (people) who will experience the view at their places of residence, during recreational activities, at work, or when travelling through the area. These may include:

- Visual effect: a change to an existing view, views or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view; and
- Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect. Either:
    - Simultaneously - where a number of developments may be viewed from a single fixed viewpoint simultaneously within the viewer's field of view without moving;
    - Successively - where a number of developments may be viewed from a single viewpoint successively by turning around at a viewpoint, to view in other directions; and
    - Sequentially - where a number of developments may be viewed sequentially or repeatedly from a range of locations when travelling along a route.

19. The general principles adopted for the assessment of visual effects were taken from *The Guidelines for Landscape and Visual Impact Assessment*, Third Edition, produced by the Landscape Institute, 2013. These Guidelines outline the approach to define a 'sensitivity' for a given view and a 'magnitude of change' that would be caused by the development in question over its lifetime. A significance matrix is then used to assess the overall 'level of effect'. This matrix is the same format as used to understand landscape effects and can be seen in **Table 10.2**. Examples of visual sensitivity are highlighted below:

    - ***High Sensitivity*** – These include residential receptors, such as views from individual properties or views from within settlements. Views from both recreational locations, such as hill summits, long distance footpaths, cycle paths and tourist locations such as castles and visitor centres are also considered to be of high sensitivity;
    - ***Medium Sensitivity*** – This would include most other visual receptors such as views from roads, other areas of landscape which would not be classed as recreational areas and views from areas within settlements which would not be considered residential; and
    - ***Low Sensitivity*** – This would cover views experienced by people at work and views where the existing view is already dominated by significant man-made features.

20. In the context of this project, the effects during operation are always direct and long-term (reversible upon decommissioning). Effects may also be individual or cumulative. None of the visual effects relating to this project have been considered positive in order to present a realistic view of any effects.

10.4.5 Visual Assessment Residential Properties

21. A residential amenity assessment for all dwellings inside 1km of the final Proposed Substation location has been carried out. This includes an assessment of the impact on the dwelling house, the environs including any driveways or access tracks but not including views from upper floor windows. The *Residential Visual Amenity Assessment*, Landscape Institute, 2019 has been used when conducting this part of the assessment**. Figure 10.5** illustrates the location of the properties assessed in relation to the Proposed Development.

10.4.6 Cumulative Landscape and Visual Assessment

22. In addition to the Landscape Institute methodology for LVIA, the cumulative landscape and visual assessment (CLVIA) has considered the guidance from Scottish Natural Heritage's *Assessing the Cumulative Impact of Onshore Wind Energy Developments*, Scottish Natural Heritage, March 2012. The CLVIA is however, not a substitute for individual landscape and visual impact assessment.

10.4.6.1 Predicting Cumulative Landscape Effects

23. The assessment considers the extent to which the Proposed Development, in combination with others, may change landscape character through either incremental effect on characteristic elements, landscape patterns and quality, or by the overall cumulative addition of new features. Identified cumulative landscape effects are described in relation to each individual Landscape Character Area and for any designated landscape areas that exist within the study area.

10.4.6.2 Predicting Cumulative Visual Effects

24. The assessment of cumulative visual effects involves reference to the cumulative visibility of the Proposed Development in conjunction with other similar developments. ZTV maps in conjunction with **Figure 3.1** were analysed to identify the residential and recreational locations and travel routes where cumulative visual effects on receptors (people) may occur as a result of the Proposed Development.

10.5 Baseline

25. Information on the existing landscape and visual resource has been collected by reference to Local Plans, Ordnance Survey (OS) maps and relevant literature, including the Banff and Buchan Landscape Character Assessment (part of a NatureScot produced description of Scotland's landscapes) as well as information gathered from field surveys.

10.5.1 Landscape Baseline

26. The 1km study area for the Proposed Development (**Figure 10.1a-e**) is located primarily within the Banff and Buchan Landscape Character Assessment, with a small section in the South and Central Aberdeenshire assessment. The Banff and Buchan area covers the landscapes of north Aberdeenshire, including the east coast and the Moray Firth coast. The landscapes feature a variety of scales, character and uses, although there is a strong presence of agricultural activities across the area. Inland from the coastal dunes and grasslands are rolling, large-scale agricultural fields which are dissected by shallow valleys and have more pronounced hills to the south and west. This study area is increased to 2km for cumulative and 10km to cover the impacts of the Proposed Substation.

27. **Figures 10.1 a-e** illustrates the various landscape character types, which have been classified by NatureScot and their consultant landscape architects.

10.5.1.1 Regional Landscape Area

28. The Proposed Development is situated entirely within the Banff and Buchan Regional Landscape Area as identified by NatureScot in their *Landscapes of Scotland* document, which includes a large section of the northern section of Aberdeenshire stretching west into Moray. A brief description is offered by NatureScot:

29. "*An area of low-lying and rolling coastline and farmland with a strong sense of exposure and openness to the changing sky. There are wide views to distant hills and mountains. Mormond Hill, with its telecom masts and the White Horse, is an important local landmark. There are few trees, although clusters of mature woodland on small knolls punctuate the open landscape. Drystone dykes edge the fields. Prehistoric settlement and funerary monuments are visible throughout. Small villages are located near rivers, and large farmsteads are widespread. Several fishing villages huddle at the foot of cliffs, the houses set gable ends to the sea. The ports of Peterhead and Fraserburgh are larger and more formal. Remains of the Rattray Line along the coast bear witness to the area's strategic importance during WWII.*"[i]

10.5.1.2 Key Landscape Character Types Within the Study Area

30. While the Banff and Buchan landscape is a wider regional area, locally, the Proposed Development crosses through a number of Landscape Character Types (LCT) and Areas (LCA) which comprise this Regional Landscape. **Table 10.3** summarises the landscape character areas that are situated within the study area and have potential to be affected both directly and indirectly by the Proposed Development.

Table 10.3 - Landscape character types and areas

LCT – 1 Agricultural Heartlands	
LCA	**Landscape Description (source [ii] and [iii])**
1(ii) Agricultural Heartlands	This larger area typifies the characteristic agricultural heartland of Banff & Buchan. The gently rolling landform allows open views of the surrounding landscape, and on clear days the movement of clouds overhead forms patterns of light and shade across the broad plains. The frequent scattering of broad-leaved trees in shelterbelts along hill-ridges, around farms and, more occasionally, in small coniferous blocks, combine to enliven the landscape and prevent any feeling of bleakness in this vast agricultural plain. Field boundaries vary, including fence-lines, beech and thorn hedges to the south and east, and the occasional stone walls and consumption dykes to the north near Strichen. Farmsteads are frequent in this relatively well-settled landscape, as are small hamlets such as New Byth. Larger villages include Strichen a fine example of a planned village, set in the sheltered North Ugie valley; New Deer, set on a ridge overlooking rolling farmland; and Cuminestown, the plan of which resembles the letter Z.
1(iii) Wooded Estates Around Old Deer	The concentration of remaining estates which cluster in this pocket of land overlooking the coastal plain to the east give this area a very distinctive character. These estates are spread along gently rolling hills lying on either side of the South Ugie Water which, as it is little more than a stream at this point, is visually insignificant. Restricted views are channelled along the narrow twisting roads which follow the landform. The comparative dominance of woodland, which is unusual in the District, adds to the enclosed, sheltered character and undulating landform of this area. Coniferous and deciduous planting is generally well-mixed and sensitively laid out, occurring along ridge lines, in valleys bottoms and on hill-slopes. Hedgerows are a dominant and highly distinctive type of field boundary in this area, although beech is most common, some are of mixed hawthorn and beech. Many of these hedges are further emphasised by avenue planting of mature beech trees. This is a well-settled area, with a concentration of planned villages such as Stuartfield, Mintlaw and Fetterangus, numerous farmsteads and prosperous manses and farmhouses. The old estates of Aden and Pitfour, and the ancient Abbey of Old Deer, add to the sense of a long history of settlement and prosperity.
1(v) Northern Rolling Lowlands	This is a large-scale character area whose character stems from its powerful relief and simple landscape pattern. It is swollen with large, rounded hills whose sides rise and fall in waves forming smooth sweeping curves that draw the eye across the terrain. The topographic shapes and farms are overlain by a bold, simple landscape pattern, large rectilinear fields form a patchwork of simple tones and textures, while thick woodland shelterbelts follow and emphasise the landform and embolden the farmland pattern. The simple curving lines of this character area tend to draw the eye across the landscape onto more distant views, away from the detail of clutter in the immediate landscape. However, the landscape is sometimes disrupted by scruffy and gappy skyline shelterbelts, scrubby fields or prominent, sprawling farmsteads. But its large scale is generally able to accommodate these and other features which would potentially impinge upon its character such as transmission lines and pylons.
LCT – 7 Coastal Farmland	
7(i) Eastern Coastal Agricultural Plain	This low coastal plain is composed of a broad sweep of very gently undulating land bordering the eastern coast of Banff & Buchan. Generally open and windswept, almost constant views of the sea is a dominant feature of travel through this huge area. The predominance of agriculture along this coastal stretch occasionally gives way to local variations such as St Fergus Moss, Rora Moss and the Moss of Cruden, where boggy land and coniferous plantations are interspersed. Medium-sized blocks of coniferous trees are scattered elsewhere throughout the area, which is in general quite sparsely wooded. Broad-leaved trees are restricted to occasional shelterbelts and groups around

LCT – 1 Agricultural Heartlands	
	farmsteads, or as more substantial fringes on the outskirts of villages such as Hatton, which lie alongside the wooded valley of the Water of Cruden. The large and open fields are mostly bounded by post-and-wire fencing, with dilapidated and overgrown stone walls becoming more prominent in the north of this area than in other parts of Banff & Buchan. The general uniformity of the topography has allowed a random network of farmsteads to become scattered across the landscape. Villages such as Hatton, Longside and New Leeds are a legacy from the nineteenth century.
LCT – 26 The Coast	
26(ii) Dunes and Beaches from Fraserburgh to Peterhead	Running in an almost constant stretch from Fraserburgh to Peterhead lies a dramatically different coastline, one of the longest stretches of beach in Europe, where huge sweeps of deserted sand are backed by rolling dunes. The ephemeral, wind-sculpted seaward dunes merge with ever-shifting sands to the east and the comparative solidity of the landward dunes to the west, forming a wider, gentler transition between land and sea than the cliffs elsewhere along the coast. Views from the adjoining low coastal plains out to sea are almost uninterrupted. Vegetation is limited to the spreading, knitted mats of coastal grassland and marram which hold together the shifting sands of the dunes and are themselves swept and combed by the wind, thus emphasising the strong sense of movement created by sand, waves and skies. This unstable landscape is almost devoid of settlement, although one prominent man-made feature of the Ron Lighthouse, which marks the jagged teeth of reefs submerged off Rattray Head. The flat coast also accommodates St Fergus Gas Terminal, the high chimneys of which dominate the dune landscape and can be viewed from miles inland. Although an unexpected and startling development it is, like the lighthouse, a dramatic focal point in this smooth, flat landscape.

10.5.1.3 Landscape Planning Designations

31. The study area for the Proposed Development is fully located within the Aberdeenshire Council Area. The Aberdeenshire Local Development Plan 2023 (ALDP) contains policies which seek to protect landscape resources. Landscape planning designations and policies are considered in the determination of the sensitivity of landscape and visual receptors as they provide an indication of value ascribed to the landscape or visual resource.

32. Those designated landscapes that are within the study area and may potentially have direct or indirect impacts as a result of the Proposed Development, have been considered as part of this Assessment and are listed in **Table 10.4** and illustrated on **Figure 10.1a**.

Table 10.4 - Landscape planning designations

Aberdeenshire Local Development Plan	
Designation	**Details**
North-East Aberdeenshire Coast SLA	The North-East Aberdeenshire Coast is a strip of coastal farmland with a strong sense of place. The SLA is unified by its east-facing orientation onto the North Sea and wide sandy beaches backed by extensive dynamic dune systems with some outcrops of rugged cliffs. The following aspects and features of this landscape are considered worthy of recognition through SLA designation: ▪ Overriding horizontal composition, emphasised by low laying landform and "soft" gradual transition from land to sea. ▪ Expansive beaches backed by rolling dunes, views from beaches are typically directed out to sea or along the coast.

Aberdeenshire Local Development Plan	
	▪ Rugged and dramatic cliffs to the south of Boddam, with intricate landforms such as the Bullers of Buchan. ▪ Important nature conservation sites: Forvie National Nature Reserve covering an extensive area around the mouth of the Ythan; and the Loch of Strathbeg. ▪ Lighthouses such as Rattray form landmark features along the coast as by necessity they have prominent locations and colours, and a vertical form. ▪ A popular coast for visitors, with coastal paths, accessible dunes, golf courses and popular beaches. ▪ Prehistoric sites of national importance, including the Mesolithic landscapes at Sands of Forvie and Blackdog. ▪ Features of built heritage typically prominent in the open landscape. ▪ The iconic Slains Castle and its association with Bram Stoker. ▪ Remains of WWII anti-invasion defences along the beaches, in particular at the mouth of the Ythan River and around Rattray Head. ▪ Coastal settlement generally associated with small harbours, such as at Collieston and Cruden Bay. The siting and orientation of buildings can be highly distinctive, as seen at Inverallochy. ▪ Panoramic views out to sea from cliff tops and open beaches. Special Landscape Areas are covered by **Policy 10** in the Aberdeenshire Local Development Plan.

10.5.1 Visual Baseline

33. Visual effects are recognised by the Landscape Institute as a subset of landscape effects and are concerned wholly with the effect of the Proposed Development on views, and the general visual amenity. Visual receptors would include anyone who may have visibility of the Proposed Development, such as people who may work in the area, residents or tourists. **Table 10.5** below identifies all visual receptors that were considered as part of the assessment.

Table 10.5 - Key visual receptors

Visual Receptor	Description
Residents	Views from the local community, particularly from residential properties along the corridor route, and those within 5km of the Proposed Substation.
Settlements	No settlements are predicted to be impacted, with none situated inside the 1km buffer from the Cable Route Corridor or the 5km study area around the Proposed Substation.
Road Users	There are a number of roads which pass through the 1km buffer from the cable route, including the A90, A950, A952, B9030, A948, B9170, as well as a number of minor roads.
Recreational	Recreational receptors in the area mostly refer to visitors to historical sites and those partaking in outdoor pursuits such as walking, cycling and horse riding, particularly along the Formartine and Buchan Way.

10.5.1.1 Broad Visual Context

34. The overall visual character of the landscape is influenced primarily by the topography, and its position adjacent to the coast. In the strip east of the A90 the coastline dominates views and the eye is naturally drawn to the dunes and out over the sea. In some instances, the dunes themselves restrict visibility of the coastline. Inland the topography allows for open expansive views in some instances, with uniform agricultural lands continuing on into the distance, while in other parts gently rolling hills restrict longer range views, as the topography dips down into one of the shallow valleys created by the many burns and drainage ditches.

10.5.1.2 Weather Conditions

35. Changing weather patterns and local climatic conditions will influence the visibility of the Proposed Development in terms of the extent of view, the colour and contrast of the Proposed Substation as well as the visibility of the construction and thus the perceived visual impact. There will be periods of low visibility (fog, low cloud, and bright sunny conditions that are accompanied by haze generated by temperature inversions) as well as periods of high visibility in clear weather. This Assessment has been conducted in periods of fine weather and assumes good visibility and limited seasonal leaf cover.

10.6 Potential Effects

10.6.1 Landscape Effects

36. Landscape effects are defined by the Landscape Institute as "*Change in the elements, characteristics, character, and qualities of the landscape as a result of development.*" These effects are assessed by considering the landscape sensitivity against the magnitude of change. A matrix is used to guide the evaluation or level of effect as illustrated in **Table 10.2**. The type of effect may also be described as temporary or long-term/permanent, direct or indirect, cumulative and negative, neutral, or negative.

10.6.1.1 Construction

37. The following, **Table 10.6** to **Table 10.10**, detail the predicted landscape impacts caused by construction of the Proposed Development for the Cable Route Corridor, which has been divided into five sections and for the Proposed Substation, which is included in Section 5.

Table 10.6 - Construction impacts on Section 1

Section 1 – Figures 10.1a and 10.2a	
Landscape Receptor	**Impact**
26 (ii) Dunes and Beaches from Fraserburgh to Peterhead LCA	The Onshore Cable will be laid using a trenchless construction method, which will bypass the dunes system along the eastern coast. Landfall will take place immediately west of the dunes, where an 800m long section of trenching will occur between the dunes and the A90. This will include an 80m Cable Route Corridor which would be home to both the cable trench and a haul road. Soil stripping, trenching and the construction of the haul road would be a notable temporary effect, with diggers and other construction vehicles seen from the A90. At this point views over the dunes and out over the sea are restricted by topography, as such the presence of these vehicles would not have a prominent impact on the setting of the dunes. There would be a greater impact from the south, where construction activity would appear in conjunction with the dunes and the coast in proximity and would be a contrast to the calm, simple, remote nature of this landscape. While the scenic views from within the dune system itself would be along the coast and out to sea, unaffected by the machinery, secondary views inland and the close proximity of the construction would have an indirect impact on their character. These impacts will be temporary. West of the A90 there would be a Main Site Yard and Mobilisation Area, this would be along the western boundary of the LCA, where it meets the East Coastal Agricultural Plain LCA. Around half of the Main Site Yard would be within this LCA. Impacts here would be longer term, as the site will be used to house a temporary dry store for perishable material, a quarantine compound for bunded materials, car parking area to accommodate the workforce and visitors, along with stores, offices, and canteen and welfare facilities. This will be a considerable change in character to this more agricultural section of the Dunes and Beaches LCA. Currently this is an agricultural field, and while there is a substantial agricultural complex immediately north, the Main Site Yard and Mobilisation Area will be significantly more prominent in the landscape and a greater deviation from its existing character.

<table>
<tr><th colspan="3">Section 1 – Figures 10.1a and 10.2a</th></tr>
<tr><th>Landscape Receptor</th><th colspan="2">Impact</th></tr>
<tr><td></td><td colspan="2">While these impacts will be experienced by the Dunes and Beaches LCA, this would be the least sensitive section of the LCA, as it is furthest from the dunes themselves and views over this will be inland from the more sensitive coastal areas. Impacts on this section of the LCA will be experienced for the full duration of the construction phase.</td></tr>
<tr><td>7(i) Eastern Coastal Agricultural Plain LCA</td><td colspan="2">The western half of the Main Site Yard and Mobilisation Area will be within this LCA, on its eastern side where it meets the Dunes and Beaches LCA. This will be a contrast to the distinctly agricultural character of the LCA where temporary cabins, material storage and vehicle parking will bring activity and movement to a simple landscape. The rolling nature of the landscape will provide some shelter to these activities however glimpses of these features will occur from all directions. The scale of the landscape is such that it is able to accommodate this, without it being overwhelmed and it would still retain its current character, although locally the presence of these activities would be significant.

This section of the Cable Route Corridor will affect 4.5km of the Eastern Coastal Agricultural Plain LCA, where the Cable Route Corridor consisting of the trench and haul road will cut through the agricultural fields. The most notable landscape feature during this section would be the River Ugie. Trenchless construction would be carried out to avoid impacting this feature and the associated vegetation on either bank. During construction the presence of the trenchless plant adjacent to the River would cause some indirect impacts on the setting and character of the River Ugie at this point. While the presence of the stripped Cable Route Corridor and the movement of digger and other construction vehicles along this would be prominent, the rolling nature of the topography minimises impacts somewhat. The full extent of the Cable Route Corridor would never be apparent, as it dips down behind small, rounded hills and becomes obscured from view. Where there are a number of hedgerows, typically acting as field boundaries, each of these will be by-passed by trenchless construction and only one small section of thinning, gappy hedge will be removed between Mains of Buthlaw and Newseat. Cable Route Corridor construction impacts on the LCA are likely to be of shorter duration, while impacts from the Main Site Yard and Mobilisation Area will be experienced for the full term of construction.</td></tr>
<tr><td rowspan="4">North-East Aberdeenshire Coast SLA</td><td>SLA Key Attribute</td><td>Impact</td></tr>
<tr><td>Overriding horizontal composition, emphasised by low laying landform and “soft” gradual transition from land to sea.</td><td>The presence of construction activity directly adjacent to the dune system will reduce this gradual transition between the land and sea, creating a starker transition, where the stripped corridor and vehicles appear in some views over the dunes.</td></tr>
<tr><td>Expansive beaches backed by rolling dunes, views from beaches are typically directed out to sea or along the coast.</td><td>Construction would be inland from this and the presence of vehicles and activity would not be apparent in views along the coast or out to sea. In addition to this, views from the beach itself inland are likely to be screened by the dunes.</td></tr>
<tr><td>Rugged and dramatic cliffs to the south of Boddam, with intricate landforms such as the Bullers of Buchan.</td><td>Construction will have no impact on this attribute.</td></tr>
</table>

Section 1 – Figures 10.1a and 10.2a		
Landscape Receptor	**Impact**	
	Important nature conservation sites: Forvie National Nature Reserve covering an extensive area around the mouth of the Ythan; and the Loch of Strathbeg.	Construction will have no impact on this attribute.
	Lighthouses such as Rattray form landmark features along the coast as by necessity they have prominent locations and colours, and a vertical form.	The Rattray Head Lighthouse is over 8km north and beyond the St Fergus Gas Terminal, as such the presence of construction activities along the SLA would have no impact.
	A popular coast for visitors, with coastal paths, accessible dunes, golf courses and popular beaches.	Visitors walking through the dune system and along the beach will experience views of the construction corridor between the A90 and the dunes. This will only affect a small section of this landscape, however, this impact would be prominent due to the contrast between the remote, tranquil dunes and the construction.
	Prehistoric sites of national importance, including the Mesolithic landscapes at Sands of Forvie and Blackdog.	Construction will have no impact on this attribute.
	Features of built heritage typically prominent in the open landscape.	The closest Scheduled Monument (SM) within the SLA is the St Fergus's Old Parish Church, 1.7km to the north. Given the distance and a band of mature coniferous woodland between the construction corridor and the church, impacts on its landscape setting are unlikely.
	The iconic Slains Castle and its association with Bram Stoker.	This feature is over 12km to the south and construction will have no impact on its setting or scenic value.
	Remains of WWII anti-invasion defences along the beaches, in particular at the mouth of the Ythan River and around Rattray Head.	There are a series of anti-tank measures and pillboxes along the coast either side of the corridor. These are very much associated with the beaches and dunes and with the construction taking place inland, impact on their landscape setting will be minimal.
	Coastal settlement generally associated with small harbours, such as at Collieston and Cruden Bay. The siting and orientation of buildings can be highly distinctive, as seen at Inverallochy.	Construction will have no impact on this attribute.
	Panoramic views out to sea from cliff tops and open beaches.	Given that these views are out to sea and experienced from the beaches and higher dunes in this area, view will not be interrupted. This is due to construction taking place inland from these viewing locations.

Table 10.7 - Construction impacts on Section 2

Section 2 – Figures 10.1b and 10.2b	
Landscape Receptor	**Impact**
7(i) Eastern Coastal Agricultural Plain LCA	This section of the Cable Route Corridor runs for 6.5km through the Eastern Coastal Agricultural Plain LCA, and is the only LCA affected by this section, again it will include a 80m corridor with trenching and associated haul road. In addition to the Cable Route Corridor, this section will also feature a small Mobilisation Area, used to store materials and equipment. This will be immediately north of the farm at Crookedneuk. This Mobilisation Area will be prominent from the A950, however is afforded good shelter by topography to the south and woodland to the east and south-west, restricting impacts across the wider LCA. This section will cross the River Ugie a further two times, and the South Ugie once, again utilising trenchless construction to mitigate impacts on the form of the river and the vegetation associated with the rivers. The trenchless plant and other construction vehicles and activities adjacent to the river will have some indirect impacts on its setting. Impacts on the River and its landscape will be temporary. For the most part all field edge vegetation including trees and hedgerows will be avoided by using trenchless construction methods, however 7 poor quality, gappy hedgerows which act as field boundaries will be removed during construction, resulting in the loss of some minor landscape features. The vast majority of this landscape are large-scale agricultural fields, which are able to accommodate the Cable Route Corridor without fundamentally altering its character. However, there is a section of wetter rough grasslands associated with the South Ugie Water, which would be more sensitive to construction. Trenchless construction methods will be used to avoid impacts on this landscape element. At Crookedneuk Farm, the corridor will temporarily result in the loss of a section of dry stone dyke, which will be reinstated. This would be a temporary impact on a sensitive feature of this landscape.

Table 10.8 – Construction impacts on Section 3

Section 3 – Figures 10.1c and 10.2c	
Landscape Receptor	**Impact**
7(i) Eastern Coastal Agricultural Plain LCA	The first 2.3km of this section will continue through the Eastern Coastal Agricultural Plain LCA, immediately after the South Ugie Water. The trenchless construction will bypass the wetter rough grassland associated with the South Ugie Water. After this, the trench and Cable Route Corridor would pass through agricultural fields. There will be one small Trenchless Compound during this stretch; in the field north of Inverquhomery. Inverquhomery has deciduous, estate woodland forming shelterbelts around the fields, these will be by-passed using the trenchless construction method and no trees will be removed. The shelterbelts at Inverquhomery, along with a square of coniferous plantation forestry further south-west will provide good screening to the Trenchless Compound. This section of the Eastern Coastal Agricultural Plain LCA is undulating which will limit the visual impact of construction to more localised areas, with the Cable Route Corridor often disappearing beyond low, rounded rises in topography, also the presence of occasional areas of woodland also provides some visual mitigation. North of Inverquhomery, there are more open views over the South Ugie Water, where the Cable Route Corridor will have a notable presence in the landscape.

Section 3 – Figures 10.1c and 10.2c	
Landscape Receptor	**Impact**
	While this area is agricultural and not particularly remote, the presence of the Cable Route Corridor and the construction vehicles will contrast to the simple uniform nature of the landscape and provide a strong focal point. There will be no loss of woodland through this stretch of the Eastern Coastal Agricultural Plain LCA, and most hedgerows will be by-passed using trenchless construction, however there will be one poor quality hedge and one dry stone dyke crossed to the east of Millbreck, resulting in small sections of those landscape features being removed. The dry stone dyke will be reconstructed on completion of the works. Impacts on this landscape will be temporary although impacts caused by the Trenchless Compound will be experienced for a longer duration of the construction.
1(iii) Wooded Estates Around Old Deer LCA	Just east of the A952, the landscape becomes the Wooded Estates Around Old Deer LCA, and the construction corridor would affect a 3.1km stretch of this landscape during Section 3. There would be a Mobilisation Area on the eastern side of the A952, south of Millbreck. This would be a prominent feature seen from the A952, although an area of woodland to the west restricts the impact stretching further beyond the immediate area. This would bring activity and movement to a simple landscape, although the presence of the A952 and agricultural building to the north would mitigate the impacts slightly. West of the A952 the Cable Route Corridor follows a shallow valley section of the landscape between Denvale and Kinnadie. Typically, the Cable Route Corridor will be seen from the south where any construction activities will be backdropped by the topography at Coynach Hill. The strong presence of the large-scale electricity pylons along this section of the route will mitigate the contrast to the rural character during construction, however the movement of vehicles and stripping of the soil will be a notable impact on the landscape. This will be particularly contrasting around Milton of Clola where the landscape is smaller in scale and more intimate. The Cable Route Corridor will snake through the shallow valley, where it will have three minor water crossings, all of which will be trenchless construction, although the associated corridor and soil stripping will have temporary impacts on the setting of the water courses and thus the character of the area. During this same stretch between Denvale and Kinnadie three dry stone dykes will need to be temporarily removed as the Cable Route Corridor will pass over them, this will further alter the character of the area on a temporary basis. The primary characteristics of this LCA, the estate woodland, will be unaffected, as no trees are scheduled to be removed during this section of the route. Impacts on this part of the route would be shorter term bar the Trenchless Compounds and Mobilisation Areas, which would have impacts for the duration of the construction.
1(ii) Agricultural Heartlands LCA	There would be no direct impacts on this LCA and any indirect effect would relate to views of the construction corridor at around 1km, where the activities would be a minor presence and seen alongside existing electricity pylons and wind turbines.

Table 10.9 - Construction impacts on Section 4

Section 4 – Figures 10.1d and 10.2d	
Landscape Receptor	**Impact**
1(iii) Wooded Estates Around Old Deer LCA	The first 6.1km of this section will traverse the Wooded Estates Around Old Deer LCA. It will also contain a Mobilisation Area between the farms at Wakenwae and Hogshillock, on the northern side of the B9030. This section of the Wooded Estates Around Old Deer LCA is considerably open and gently rolling, as such, the Cable Route Corridor will have high visibility across the landscape. This will be particularly evident from the minor road north of Clochcan Cottage, where the views extend north-west for some distance and the soil-stripped corridor will be a prominent feature running from the foreground into the distance. During much of this section the Cable Route Corridor will run in parallel to the existing overhead electricity pylons. These currently have a strong influence over the landscape character and the construction activities will typically appear in parts of the landscape where the pylons are also seen, which will mitigate the impact of the Proposed Development somewhat, however it is likely that the disruption to the landscape and the movement of vehicles would constitute a considerable contrast to the baseline. The wooded estates themselves are not particularly evident in this part of the LCA, where it is the southern part of the LCA that is affected by the construction. There will be the loss of three sections of hedgerow which act as field boundaries. While the construction activities will have a notable change to character temporarily, it would not impact on the more sensitive and character defining sections of this LCA. Impacts on this part of the route would be short term, bar the Mobilisation Area, which would have impacts for a longer duration of the construction.
1(ii) Agricultural Heartlands LCA	During Section 4 the route will pass over 3.4km of the Agricultural Heartlands LCA. On the eastern edge of the LCA the Cable Route Corridor will cross the Annochie Burn, this will be done by trenchless construction. While there will be no direct impacts on the Annochie Burn, the presence of the trenchless plant and other vehicles either side would have an indirect impact on the character of the Annochie Burn. Generally, for much of this section, the Cable Route Corridor would follow a lower dip in the topography between the rises at Little Elrick and Kidds Hill. This offers some containment to the construction and reduces the influence the Cable Route Corridor would have over the wider LCA. Similar to the adjacent part of Section 4 within the Wooded Estates Around Old Deer LCA, the Cable Route Corridor follows a similar path to the existing electricity pylons, which reduces the contrast to the baseline slightly. Impacts on this part of the route would be experienced temporarily. There is a large section of woodland at Capelstones, however at this point trenchless construction is proposed, which will by-pass this and no trees will be required to be removed. However, immediately west of this, there is a shelterbelt associated to the Nethermuir Estate, where around 1,000m² is proposed to be removed, as the Cable Route Corridor passes through the Estate. The removal of these mature, deciduous trees will have a notable impact on this section of the LCA. This shelterbelt has already been eroded by the overhead line which has cut a gap through the trees. A second gap would diminish the estate-like character to the Nethermuir area. This would only affect the eastern edge of the Nethermuir Estate as the trees along the western edge are proposed to be by-passed by trenchless construction. Some of the trees which comprise the Nethermuir Estate are Ancient

Section 4 – Figures 10.1d and 10.2d	
Landscape Receptor	**Impact**
	Woodland, none of the Ancient Woodland would be removed. This small section of the Agricultural Heartlands LCA has more in common with the Wooded Estates Around Old Deer LCA and is of a higher value than the remainder of the LCA. Construction in this part of the LCA will have a considerable impact on this local character, which is more enclosed and smaller scale than the wider LCA. Impacts on this part of the route would be experienced temporarily, other than the removal of trees, however these will be replanted.

Table 10.10 - Construction impacts on Section 5

Section 5 – Figures 10.1e and 10.2e	
Landscape Receptor	**Impact**
1(ii) Agricultural Heartlands LCA	The Cable Route Corridor during Section 5 would cross 8.2km of the Agricultural Heartlands LCA, before arriving at the Substation Compound location. It will feature a small Trenchless Compound on the western side of the A948 at the junction with the B9106. Trees to the south-east provide some screening but generally this area is open and the Trenchless Compound will be a prominent feature within this simple uniform landscape. There will be a second Trenchless Compound immediately south of Myre of Bedlam. This area will be screened from the north by mature trees, however, will be seen from the west due to its higher position in the landscape. There will be some loss of woodland during Section 5, with 750m² deciduous trees south of Lang Stracht Road removed as the Cable Route Corridor runs parallel to the road, at the western end on which will also have a gappy hedgerow removed. Three further poor quality and gappy hedges will need to be removed at Tannochbrae, North Asleed and Mains of Asleid, as well as a single tree between Woodend and Smiddy Hill. East of the Substation Compound location approximately 780m² of coniferous woodland will be removed as the Cable Route Corridor passes through the shelterbelt to the north of Upper Mains of Asleid. This landscape is gently rolling, with some open sections allowing for views into the distance creating a vast landscape. It has a uniformity to it, and a strong agricultural character, with farmsteads dotted across a patchwork of fields. The Cable Route Corridor typically follows the route of the existing overhead pylons which minimises the contrast to the baseline. Despite this, the Cable Route Corridor and movement of vehicles will be a notable contrast to the landscape, despite the existing presence of agricultural practises. Occasionally views open up which will allow for views along the Cable Route Corridor increasing the impact on the LCA. However, generally the rolling nature of the topography limits the presence of the construction within the LCA. Impacts on this part of the route would be experienced temporarily. The greatest impacted section of the landscape would be at the Substation Compound. Not only would this component of the Proposed Development have the biggest single footprint but would also be home to the Main Site Yard and Mobilisation Area. As such, this area would be a place of activity for the full term of construction and have a strong presence within the landscape due to groundbreaking activities, construction, storage and vehicle movements, including both construction vehicles and workers personal cars. While the existing National

	Grid New Deer Substation (NGNDSS) is located directly adjacent, to the north, the construction would bring an intensification of activity and movement to the area.
1(v) Northern Rolling Lowlands LCA	There would be no direct impacts on this LCA. Any impacts would be indirect and relate to the visibility of construction activity and the stripped Cable Route Corridor. It would only affect a very minor area along the northern edge of the Northern Rolling Lowlands LCA.

10.6.1.1.1 Summary of Landscape Effects During Construction`

38. Construction of the Proposed Development will have the potential to directly impact four different landscape character areas; Dunes and Beaches from Fraserburgh to Peterhead LCA, Eastern Coastal Agricultural Plain LCA, Wooded Estates Around Old Deer LCA, and the Agricultural Heartlands LCA. In addition to this, there are potential indirect impacts on the Northern Rolling Lowlands LCA. Direct and indirect impacts would be experienced by one designated landscape, the North-East Aberdeenshire Coast SLA.

39. ***Dunes and Beaches from Fraserburgh to Peterhead LCA*** – This landscape would be the least physically impacted given it only covers the opening 1.4km of the route. The most sensitive part of the LCA would be the dunes and beaches themselves which are avoided by using trenchless construction. While there would be direct impacts through stripping topsoil and the construction of the trench and haul road, these would affect agricultural fields. Arable agricultural fields will be regularly ploughed and as such, this disruption to the soil would not look uncommon, or be a notable departure from the baseline. There would be indirect impacts on the character by virtue of the construction activities occurring adjacent to the dunes and visibility of the vehicles and Cable Route Corridor in conjunction with the dunes would cause some impacts. The sensitivity of this landscape is considered to be high, and the magnitude of change caused by construction would be medium, resulting in a major/moderate level of effects, these effects would be temporary.

40. ***Eastern Coastal Agricultural Plain LCA*** – Sections 1, 2 and 3 pass through this LCA, and would include multiple crossings of the River Ugie. While this will be carried out using trenchless methods, there will still be indirect impacts on the character setting of the river due to the presence of the Cable Route Corridor either side as well as the trenchless plant, and the movement of other construction vehicles along the haul road. In general, this landscape is of a large-scale and has the ability to accommodate the Proposed Development without significant impacts on its wider character. There would be locally significant effects, however the undulating nature of the topography limits the visual influence over the LCA. The sensitivity of this landscape is considered to be medium, and the magnitude of change caused by construction would be medium, resulting in a moderate level of effects, these effects would be temporary.

41. ***Wooded Estates Around Old Deer LCA*** – This LCA would be affected by Sections 3 and 4 of the Proposed Development. This landscape is a bit more exposed and more of the Cable Route Corridor is likely to be visible at any one time, stretching across the landscape over the horizon. Within this landscape, the Cable Route Corridor often follows the path of the overhead line, which mitigates the impact slightly, however when visible the construction activities will remain one of the most prominent features of the landscape during construction. The wooded estates themselves tend to be located in the northern part of the LCA and impacts on them are minimal. The sensitivity of this landscape is considered to be medium, and the magnitude of change caused by construction would be medium, resulting in a moderate level of effects, these effects would be temporary.

42. ***Agricultural Heartlands LCA*** – Sections 4 and 5 of the Cable Route Corridor, plus the Proposed Substation would traverse this LCA. Given the presence of the Proposed Substation it is likely to be one of the most affected landscapes. This would also be the landscape with the greatest vegetation loss, with three fairly significant sections of woodland removed to accommodate the cable route. The presence of the Main Site Yard and Mobilisation Area at the Proposed Substation for the entirety of the construction period would be a notable presence and disruption to the landscape, introducing a sense of business to the area that is not particularly evident. The location adjacent to the NGNDSS would mitigate this impact somewhat, however the Cable Route Corridor construction, Proposed Substation construction and Main Site Yard would be prominent. The sensitivity of this landscape is considered to be medium, and the magnitude of change caused by construction would be medium, resulting in a moderate level of effects, these effects would be temporary.

43. ***Northern Rolling Lowlands LCA*** – Impacts on this landscape would be indirect only and relate to potential views of the construction activities. Typically, these activities would take place at around 1km and affect only a small section of the LCA. The sensitivity of this landscape is considered to be medium, and the magnitude of change caused by construction would be negligible, resulting in a minor level of effects, these effects would be temporary.

44. ***North-East Aberdeenshire Coast SLA*** – Impacts on this designated landscape would be similar to those on the Dunes and Beaches LCA, as the designation covers the same section of the landscape. The Proposed Development construction would affect six of the twelve key attributes of the SLA, none of which would be affected to a high level. The greatest impact would be the views over the dunes from the south, where construction activities would appear adjacent to the dunes in views. Although prominently visible when seen from the dunes, due to the close proximity, the impact is mitigated by the fact that these views are inland, while the scenic views are over the beaches and out to sea, in the opposite direction. The sensitivity is considered to be high, and the magnitude of change caused by construction would be medium, resulting in a major/moderate level of effects, these effects would be temporary.

10.6.1.2 Operation

45. Once the construction phase is completed the majority of impacts on the Dunes and Beaches from Fraserburgh to Peterhead LCA, Eastern Coastal Agricultural Plain LCA, Wooded Estates Around Old Deer LCA, and the North-East Aberdeenshire Coast SLA would be reduced to a negligible level. Agricultural fields will be replanted with crops and any hedgerows or dry-stone dykes removed will be restored. The only permanent changes to these landscapes would be a small manhole cover every 600m-1000m along the Cable Route Corridor to provide access to the link box. Visually these would only be apparent in the immediate area around them, typically within a few metres and would never be prominent nor sufficient additions to alter the character of the landscape.

46. While the majority of the fields are arable, there are some fields used for grazing, as well as strips of grassland which occasionally divide fields, acting as field boundaries, sandwiched between two rows of post and wire fencing. If not reinstated this would leave scarring across sections of the landscape, which would be a notable feature and have locally significant impacts, however, impacts on the wider LCAs would still remain low on those landscapes which contain notable areas of rough grassland, the Eastern Coastal Agricultural Plain LCA, the Wooded Estates Around Old Deer LCA and the Agricultural Heartlands LCA.

47. The Agricultural Heartlands LCA would be the only landscape to receive notable permanent effects on its character, with the addition of the Substation. The location of the Substation would be directly adjacent to the NGNDSS which has created a more industrial sub-landscape within this part of the Agricultural Heartlands. While the Proposed Development would add to this, it would only be around 50% of the existing infrastructure. This would intensify this type of development in the landscape however the scale and uniformity of the landscape is able to accommodate the Proposed Development well, without diminishing the existing character of the landscape. Locally, the proposed Substation would be a prominent feature and when seen alongside the existing NGNDSS the two would appear as a single large-scale development within an open, uniform landscape. In addition to this there would be some loss of woodland across the Agricultural Heartlands LCA, and some minor hedgerow disruption in the Eastern Coastal Agricultural Plains and Wooded Estates Around Old Deer LCAs. **Table 10.11** below summarises the operational impacts on the landscape.

Table 10.11 - Operational landscape effects

Landscape Character Area	Sensitivity	Magnitude	Significance
Dunes and Beaches from Fraserburgh to Peterhead LCA	High	Negligible	Moderate/Minor
Eastern Coastal Agricultural Plain LCA	Medium	Low	Moderate/Minor
Wooded Estates Around Old Deer LCA	Medium	Low	Moderate/Minor
Northern Rolling Lowlands LCA	Medium	Negligible	Minor

Landscape Character Area	Sensitivity	Magnitude	Significance
Agricultural Heartlands LCA	Medium	Low	Moderate/Minor
North-East Aberdeenshire Coast SLA	High	Negligible	Moderate/Minor

10.6.2 Visual Impacts

10.6.2.1 Construction

10.6.2.1.1 Residential Receptors

48. While there are no settlements within the 1km study area of the Cable Route Corridor, there are a number of individual residential dwellings. Typically, these are related to farmsteads dotted across the agricultural landscape, interconnected through a series of minor roads.

49. For the majority of these residential receptors, construction effects will be of a negligible to low level, with the movement of vehicles and disruption to the landscape appearing as a minor feature. In addition to this many of these are surrounded by mature shelterbelts, restricting outward visibility and screening views of construction activities. Construction of the Cable Route Corridor would not involve the use of tall cranes, as such no visual effects would be overbearing, and effects would relate primarily to the movement of construction vehicles including the trenchless plant. It is anticipated that there would be no significant visual effects during construction for all residential properties, due to a combination of distance, vegetation and/or topographical screening or direction, bar those listed in **Table 10.12** below, which would have temporary significant visual effects.

Table 10.12 - Significant impacts on residential properties

Residential Property	Component of development visible		
Section 1			
Lunderton Farm	Cable Route Corridor	Mobilisation Area/ Trenchless Compound	Main Site Yard
Hallmoss x 3	Cable Route Corridor	Mobilisation Area/ Trenchless Compound	Main Site Yard
The Lillies	Cable Route Corridor	Mobilisation Area/ Trenchless Compound	Main Site Yard
Hallmoss Cottage	Cable Route Corridor		
Peachtree	Cable Route Corridor		
Section 2			
Wester Rora	Cable Route Corridor		
Millbank	Cable Route Corridor		
Crookedneuk	Cable Route Corridor	Mobilisation Area/ Trenchless Compound	
Dwelling north of Crookedneuk	Cable Route Corridor	Mobilisation Area/ Trenchless Compound	

Residential Property	Component of development visible		
Section 3			
Yokieshill Cottages x 4	Cable Route Corridor		
Mill Croft of Inverquhomery	Cable Route Corridor		
Greenhill	Cable Route Corridor	Mobilisation Area/ Trenchless Compound	
Fordsmouth	Cable Route Corridor	Mobilisation Area/ Trenchless Compound	
Barnyards	Cable Route Corridor		
Millbreck	Cable Route Corridor		
Milton of Clola	Cable Route Corridor		
Brae of Coynach	Cable Route Corridor		
Section 4			
North Auchtylair	Cable Route Corridor		
Denview	Cable Route Corridor		
Kinnadie	Cable Route Corridor		
Kinaddie Cottage	Cable Route Corridor		
Tollybrae	Cable Route Corridor		
Little Elrick	Cable Route Corridor		
Badnyrieves	Cable Route Corridor	Mobilisation Area/ Trenchless Compound	
Section 5			
Da-Bhinn	Cable Route Corridor		
Auchmaliddie	Cable Route Corridor		
Dwelling south of Auchmunziel	Cable Route Corridor		
North Asleed	Cable Route Corridor		
Mains of Asleid	Cable Route Corridor		
Upper Mains of Asleid	Cable Route Corridor	Mobilisation Area/ Trenchless Compound	Main Site Yard

50. While all of the above residential receptors would have medium to high visual impacts during construction, causing significant effects, none were considered to breach the residential visual amenity threshold due to the

types of views, availability of the views and the existing baseline views they have. In addition to this, these effects would be temporary, and views would return to their original state on completion.

10.6.2.1.2 Road and Footpath Receptors

51. The Cable Route Corridor would cross a number of key routes (A and B Class Roads, plus Core Paths) in the area, as such there will be temporary visual effects caused by construction activities, disruption to the landscape and movement of construction vehicles, and in some instances views of temporary facilities. All impacts will be temporary and highly localised and all routes crossed by the cable will be constructed using trenchless construction methods.

Route	Potential Visual Impact	Sensitivity	Magnitude of Change	Level of Impact
Craigewan Links Core Path	Visibility unlikely due to screening by sand dunes	High	Negligible	Moderate /Minor
A90	Visibility to both north and south bound traffic of the Main Site Yard and Mobilisation Area for the duration of the construction. This would only affect a ~700m section, however impacts would be considerable, with construction occurring on either side of the road.	Medium	High	Major /Moderate
Formartine and Buchan Way	A 6.5km section between Torterston in the east and Keplahill in the west would have theoretical visibility of the Cable Route Corridor . Views would be experienced obliquely to the north, with the construction taking place on a slightly lower section of the landscape along the path of the River Ugie, the topography will often screen the disrupted soil and the vehicles. In addition to this, much of the route has mature hedges along its edges providing further screening. The construction will not always be apparent and would not be happening along the entirety of this section all at once, thus walkers likely to only experience significant impacts briefly. The greatest impacts would be at the western end of this section between Crookedneuk and Keplahill where the route crosses the Formartine and Buchan Way, and similarly much further west between Little Elrick and Badnyrieves, where again the Cable Route Corridor crosses the path.	High	Medium	Major /Moderate
A950	The route crosses the A950 perpendicular to the road between Longside and Mintlaw. For a brief (~450m) stretch construction activity will be prominent to road users traveling in either direction, seen on either side of the road obliquely.	Medium	Medium	Moderate
A952	In a ~200m section between Millbreck and Denvale, the A952 will run alongside a Trenchless Compound, which will be directly adjacent to the road, on its eastern side. During this stretch impacts will be high and will last for longer with activity here possibly occurring at the Trenchless Compound longer than the	Medium	High	Major /Moderate

Route	Potential Visual Impact	Sensitivity	Magnitude of Change	Level of Impact
	construction of the Cable Route Corridor at this section, where it also crosses the road.			
B9030	In a ~180m section east of Wakenwae, the B9030 will run alongside a Trenchless Compound, which will be directly adjacent to the road, on its northern side. During this stretch impacts will be high and will last for longer with activity here possibly occurring at the Trenchless Compound longer than the construction of the Cable Route Corridor at this section, where it also crosses the road.	Medium	High	Major /Moderate
B9106	The route will cross this road at its junction with the A948, effects are likely to only impact road users travelling south-west on the road. Woodland along the southern side of the road will screen part of the construction, although a small Trenchless Compound will appear on the western side of the A948, directly in front of the receptor.	Medium	Medium	Moderate
A948	Road users travelling both north and south on the A948 will have oblique views to the west of a small Trenchless Compound. Although the Cable Route Corridor crosses this route, the eastern section construction is likely to be screened by a mature shelterbelt.	Medium	High	Major /Moderate
B9170	The Cable Route Corridor crosses this route perpendicular just south-west of Myre of Bedlam. A ~100m stretch of this road would be directly adjacent to a Trenchless Compound. During this stretch impacts will be high and will last for longer with activity here possibly occurring at the Trenchless Compound longer than the construction of the Cable Route Corridor at this section, where it also crosses the road. Impacts are likely only experienced by north-east bound traffic, as views will be greater screened for those travelling in the opposite direction by vegetation associated with Myre of Bedlam.	Medium	High	Major /Moderate

10.6.3 Operation

52. Once construction is complete and as the landscape starts to reinstate, the visual impact experienced by receptors along the Cable Route Corridor would be negligible, the only remaining elements would be the jointing pits, which would be seen as a manhole cover in the ground every 600m-1000m. The only likely operational visual impacts would be experienced by receptors in the vicinity of the Proposed Substation. **Table 10.13** details the visual impact experienced by residential properties.

Table 10.13 - Operational residential impacts

Residential Property	Potential Visual Impact
1 - Upper Mains of Asleid	This is a two-storey farm cottage located on the opposite side of the minor road from the Proposed Substation. It features a number of large-scale agricultural

Residential Property	Potential Visual Impact
	buildings to the east and a band of mature trees on the southern and western side. There is also a dense shelterbelt to the north. The property is accessed directly off the minor road. **Distance:** The Proposed Substation would be situated ~100m away on ground of a similar level. **Type:** The existing view towards the Proposed Substation location is restricted by the mature trees along the western edge of the property. However, given the proximity and particularly in winter months, there would be open views between gaps in the vegetation from the environs. **Direction:** The primary windows and orientation the dwelling is to the south, with secondary views to the north and west. The garden areas to the south and west provide more open views. **Extent:** Theoretically, the Proposed Development would occupy a major extent of the view, seen on the opposite side of the road from the property. **Scale of Change:** The Proposed Substation would result in a notable scale of change as the building would restrict what is currently an open view with long-range visibility to the west. These impacts would be experienced by the garden areas and by a secondary window on the western side, as well as the access when departing the property. **Degree of Contrast:** While the Proposed Substation would be seen in views already containing the NGNDSS, this feature is a more minor feature in the view and seen more obliquely from the secondary window. The Proposed Substation would be a prominent feature. **Duration:** View would be permanent constant. **Mitigation:** Woodland planting is proposed along the development's southern and western extents which would minimise the visual impact from this property. The property is considered to be of high sensitivity. Overall, the magnitude of change would be high, and the overall level of effect would be major, direct, negative and **significant**. Although significant, the proposed development would not breach any visual thresholds.
2 - Upper Mains of Asleid Cottage	This is a single storey farm cottage located on the opposite side of a minor road from the Proposed Substation. The property is accessed directly off the minor road and has some local vegetation along its western and northern edges. **Distance:** The Proposed Substation would be situated ~130m away on ground of a similar level. **Type:** The existing view towards the Proposed Substation location looks over rolling agricultural land with the NGNDSS and associated pylons seen on the horizon. This view is somewhat restricted by vegetation along the property's northern edge. **Direction:** The primary windows and orientation of the dwelling is to the east over the minor road, however there are secondary windows orientated west, along with a conservatory, also orientated to the east. **Extent:** Theoretically, the Proposed Development would occupy a major extent of the view, seen on the opposite side of the road from the property. **Scale of Change:** The Proposed Substation would result in a notable scale of change as the building would represent a major new feature in views in this direction. However, views from the dwelling itself are unlikely give the relative angle of view and while there would be views from the rear garden areas, these would be constrained by vegetation on the property's northern edge. Views of the Proposed Substation would still remain apparent. **Degree of Contrast:** The Proposed Substation would appear directly in front of views towards the existing NGNDSS. While this view already contains a similar development, the Proposed Substation would be more prominent given its

Residential Property	Potential Visual Impact
	closer proximity, it would also block views of the NGNDSS. As such, it would not offer a notable contrast to the baseline. **Duration:** View would be permanent. **Mitigation:** Woodland planting is proposed along the development's southern and western extents which would minimise the visual impact from this property. The property is considered to be of high sensitivity. Overall, the magnitude of change would be high, and the overall level of effect would be major, direct, negative and **significant**. Although significant, the Proposed Development would not breach any visual thresholds.
3 - Burnside	This is a two-storey farmhouse located on the western side of the Burn of Asleid. There are agricultural buildings to the north and notable areas of mature woodland to the north and east. The dwelling is accessed via a short track from the minor road to the south. **Distance:** The Proposed Substation would be situated ~200m away on ground slightly higher by around 10m. **Type:** The existing view towards the Proposed Substation location is characterised by the gently sloping eastern banks on the Burn of Asleid. These form a rounded ridgeline to the east which also forms part of the horizon. Views to the south are open across the landscape. **Direction:** The primary windows and orientation of the dwelling is to the south, with secondary views to the north. There is a small garden area to the south, which has open views south. **Extent:** Theoretically, the Proposed Development would occupy a major extent of the view and will appear on the horizon on the opposite side of the Burn of Asleid. **Scale of Change:** The Proposed Substation would result in a notable scale of change, as it would introduce a new, large-scale element into the view to the east. It is likely to be a prominent feature, seen on the horizon. Despite this, it will not be an overbearing element. Views from the dwelling itself, will be hampered due to the southern orientation of the windows, although highly oblique views may be available. The Proposed Substation would be a prominent feature when seen from the access track and front garden. **Degree of Contrast:** While the NGNDSS is positioned directly to the north, views from this dwelling are not overly apparent due to agricultural buildings and vegetation providing screening. As such, the Proposed Substation would provide some degree of contrast to the baseline. Views from the access track heading towards the dwelling would have visibility of the existing NGNDSS and the degree of contrast would be lessened for these views. **Duration:** View would be permanent constant. **Mitigation:** Woodland planting is proposed along the development's southern and western extents which would minimise the visual impact from this property. The property is considered to be of high sensitivity. Overall, the magnitude of change would be high, and the overall level of effect would be major, direct, negative and **significant**. Although significant, the Proposed Development would not breach any visual thresholds.
4 - Rowan Brae	This is a two-storey modern property, located to the south of the Proposed Development and accessed via a long track off the minor road which runs between the property and the Proposed Development, which also acts as access to North Faddonhill. There are garden areas to the north and north-east and a cluster of trees to the south. **Distance:** The Proposed Substation would be situated ~340m away on ground of a similar level.

Residential Property	Potential Visual Impact
	Type: The existing view towards the Proposed Substation location is open and looks across an area of agricultural fields. **Direction:** The primary windows and orientation of the dwelling is to the north-east, with secondary views to south-west, as well as a small window on the north-west façade. **Extent:** Theoretically, the Proposed Development would occupy a moderate extent of the view and will appear on the horizon adjacent to the NGNDSS. **Scale of Change:** The Proposed Substation would result in a notable scale of change, as it would introduce a new, large-scale element into the view to the north. It is likely to be a prominent feature, although would be partially backdropped by topography and woodland. Views from the dwelling itself, will be hampered due to the orientation of the windows, although there may be oblique views from the front primary windows. **Degree of Contrast:** The NGNDSS is positioned directly to the north, and will always appear in views of the Proposed Development, seen to the left. As such, the degree of contrast to the baseline is limited. **Mitigation:** Woodland planting is proposed along the development's southern and western extents which would minimise the visual impact from this property. The property is considered to be of high sensitivity. Overall, the magnitude of change would be medium, and the overall level of effect would be major/moderate, direct, negative and **significant**. Although significant, the Proposed Development would not breach any visual thresholds.
5 - Mains of Asleid	This features two, two storey farm cottages, which is situated in a small dip in the landscape to the east of the minor road from which the dwellings are accessed via a long track. There is some vegetation on most sides, with considerable mature woodland on the southern side. **Distance:** The Proposed Substation would be situated 406m away on ground slightly higher in the landscape to the south-west. **Type:** The existing view towards the Proposed Substation location is restricted by the mature shelterbelts at Upper Mains of Asleid. Other views are also restricted by vegetation associated with the property and by its lower position in the landscape. **Direction:** The primary windows and orientation of both dwellings are to the south, with secondary views to the north. The garden areas to the south and west provide more open views, however, even from here views of the Proposed Substation would be limited. **Extent:** Theoretically, the Proposed Development would occupy a moderate extent of the view, however it is likely to be significantly screened by the mature woodland at Upper Mains of Asleid. **Scale of Change:** The Proposed Substation is unlikely to be visible from either dwelling, as such there would be limited scale of change to the existing views. There will be some open views from the access track where the Proposed Substation will be seen to the left of the existing NGNDSS, albeit slightly further away. The scale of change on the property as a whole would be limited. **Degree of Contrast:** The Proposed Substation would affect a section of the view which is heavily influenced by the NGNDSS. The Proposed Substation is likely to only be notable from the access track, where it will be indistinct from the operational development. **Duration:** View would be permanent. **Mitigation:** No mitigation is proposed. The property is considered to be of high sensitivity. Overall, the magnitude of change would be low, and the overall level of effect would be moderate, direct, negative and **not significant**.

Residential Property	Potential Visual Impact
6 - Silverlea	This is a two-storey farm cottage located within the shallow valley of the Little Water. There are agricultural buildings to the north and a few mature trees on the property's southern and western sides. The dwelling is accessed via a short track from the minor road to the south. **Distance:** The Proposed Substation would be situated 545m away on ground slightly lower by around 10-20m. **Type:** The existing view towards the Proposed Substation location is heavily restricted by the mature shelterbelt associated with Upper Mains of Asleid, to the west. There are more open views north and south along the shallow valley. **Direction:** The primary windows and orientation of the dwelling is to the south, with secondary views to the north. There is a small garden area to the south, which has open views south. **Extent:** Theoretically, the Proposed Development would occupy a moderate extent of the view, however, is likely to be completely screened by vegetation. **Scale of Change:** The Proposed Substation would not result in a notable scale of change to the view given the mature woodland which restricts visibility in this direction. There may be a brief glimpse of part of the Proposed Substation from the end of the access track where it meets the minor road. Degree of Contrast: Given the lack of visibility the Proposed Substation is unlikely to provide a notable degree of contrast to the baseline. Although it should be noted that the NGNDSS would not be apparent from this property. **Duration:** View would be permanent constant. **Mitigation:** No mitigation is proposed. The property is considered to be of high sensitivity. Overall, the magnitude of change would be negligible, and the overall level of effect would be moderate/minor, direct, negative and **not significant**.
7 - Boghead	This is a two-storey farm cottage located to the south of the Proposed Development and south of Upper Mains of Asleid Cottage. It features agricultural buildings to the west and a mature band of coniferous trees to the north. The dwelling is accessed via a short track of the minor road. **Distance:** The Proposed Substation would be situated ~760m away on ground of a similar level. **Type:** The existing view towards the Proposed Substation location is heavily restricted by the mature trees along the property's northern edge. **Direction:** The primary windows and orientation of the dwelling is to the south, with secondary views to the north. There are garden areas surrounding the dwelling which have more open views, however even these are restricted to the north. **Extent:** Theoretically, the Proposed Development would occupy a moderate extent of the view, however, is likely to be completely screened by vegetation. **Scale of Change:** The Proposed Substation would not result in a notable scale of change to the view given the mature woodland which restricts visibility in this direction. **Degree of Contrast:** If seen the Proposed Development would appear directly in front of the NGNDSS. As such, it would affect a section of the view already characterised by a similar development, leading to only a minor contrast to the baseline. However, views of the development are unlikely given the vegetation screening. **Duration:** View would be permanent constant. **Mitigation:** No mitigation is proposed. The property is considered to be of high sensitivity. Overall, the magnitude of change would be negligible, and the overall level of effect would be moderate/minor, direct, negative and **not significant**.

Residential Property	Potential Visual Impact
8 - East Swanford	This features two, two storey farm cottages, which is situated on the northern side of the NGNDSS. It is accessed via a long track of the minor road to the east and has agricultural buildings to the north and mature trees to the east. **Distance:** The Proposed Substation would be situated ~740m away on ground slightly higher in the landscape to the north-west. **Type:** The existing view towards the Proposed Substation location is restricted by the existing NGNDSS and as well as vegetation along the Burn of Swanford. The NGNDSS and the electricity pylons are strong elements on the character of the existing views. **Direction:** The primary windows and orientation of the dwelling is to the south-west, with secondary views to the north-east. The garden areas to the south-west provide more open views, however, even from here views of the Proposed Substation would be limited due to the topography, vegetation and existing infrastructure. **Extent:** Theoretically, the Proposed Development would occupy a minor extent of the view, however it is likely to be significantly screened by intervening woodland and the NGNDSS. **Scale of Change:** The Proposed Substation is likely to only be obliquely visible from the dwelling, as such there would be limited scale of change to the existing views. Even in these views and the more open views form the access track and the garden areas, views would be heavily screened. **Degree of Contrast:** The Proposed Substation would be heavily screened by the topography, vegetation and the existing NGNDSS. It would be indistinct from the NGNDSS and as such, its contrast to the baseline would be negligible. **Duration:** View would be permanent. **Mitigation:** No mitigation is proposed. The property is considered to be of high sensitivity. Overall, the magnitude of change would be negligible, and the overall level of effect would be moderate/minor, direct, negative and **not significant**.
9 - North Faddonhill	This property is located ~770m to the south of the Proposed Substation, however the ZTV indicates that there will be no visibility of the development from North Faddonhill.
10 - Smiddybank Farm	This is a two-storey farm cottage located to the north-west of the Proposed Development. It features an agricultural building to the north and there is only minimal vegetation around the property. The dwelling is accessed via a long track of the minor road to the south-east. **Distance:** The Proposed Substation would be situated ~700m away on ground of a similar level, although there is a dip in the topography between the property and the development. **Type:** While the existing wider views in the direction of the Proposed Substation are open and look across rolling farmland, the agricultural building and vegetation associated with Burnside would restrict some of the views. **Direction:** The primary windows and orientation of the dwelling is to the south. **Extent:** Theoretically, the Proposed Development would occupy a moderate extent of the view, however, will be afforded some screening by the vegetation at Burnside. **Scale of Change:** The Proposed Substation would result in a moderate scale of change. It would introduce a new, large-scale element into the surrounding landscape. However, views from the dwelling would be unlikely and any views would be from the access track and environs. There would be sufficient separation between the dwelling to limit the scale of change when seen, however the vegetation and agricultural buildings at Burnside will provide significant screening to the Proposed Substation. **Degree of Contrast:** When seen, the Proposed Development would appear directly adjacent to the NGNDSS. As such, it would affect a section of the view

Residential Property	Potential Visual Impact
	already characterised by a similar development, leading to only a minor contrast to the baseline. **Duration:** View would be permanent constant. **Mitigation:** No mitigation is proposed. The property is considered to be of high sensitivity. Overall, the magnitude of change would be low, and the overall level of effect would be moderate, direct, negative and **not significant**.
11 - North Asleed	This is a farm complex with agricultural buildings to the north and area of mature woodland to the south. The property has garden areas on all sides. **Distance:** The Proposed Substation would be situated 825m away on ground of a similar elevation, however there is slight rise in topography between the dwelling and the development. **Type:** The existing view towards the Proposed Substation location is restricted by the mature shelterbelts at Upper Mains of Asleid. There are some open views to the east and west over the rolling farmland, however longer range views are limited by the topography. **Direction:** The primary windows and orientation of the dwelling are to the south, with secondary views to the north, east and west. Most outward views are restricted by vegetation surrounding the dwelling. **Extent:** Theoretically, the Proposed Development would occupy a moderate extent of the view, however it is likely to be completely screened by the mature woodland at Upper Mains of Asleid. **Scale of Change:** The Proposed Substation is unlikely to be visible from the dwelling or the environs, as such there would be limited scale of change to the existing views. Degree of Contrast: The Proposed Substation would affect a section of the view which is heavily influenced by the NGNDSS. There may be some glimpses of the Proposed Substation from the edges of the environs, however it would be indistinct from the existing development. **Duration:** View would be permanent. **Mitigation:** No mitigation is proposed. The property is considered to be of high sensitivity. Overall, the magnitude of change would be negligible, and the overall level of effect would be moderate/minor, direct, negative and **not significant**.
12 - Mill House	This property is located 793 to the east of the Proposed Substation, however the ZTV indicates that there will be no visibility of the development from Mill House.
13 - Mill of Cairnbanno	This property is located 988m to the east of the Proposed Substation, however the ZTV indicates that there will be no visibility of the development from Mill of Cairnbanno.
14 - Cairnbanno House Cottage	This property is located 928m to the east of the Proposed Substation, however the ZTV indicates that there will be no visibility of the development from Cairnbanno House Cottage.

10.7 Mitigation

10.7.1 Construction Mitigation

53. As per the Construction Execution Plan, during construction of the Cable Route Corridor and haul road, topsoil will be stripped to its full depth and kept separate from the subsoil. The topsoil will be pulled back from the fence line using excavators to allow dozers to push it evenly back across the easement and leaving it generally level. During the reinstatement, hedge mounds will be replaced using an excavator and the topsoil will be given a final trim to leave it ready for reseeding by the landowner.

54. While the majority of the fields through which the Cable Route Corridor travels are arable fields and will be reseeded with crops by the landowner, there are a number of pasture fields with a rough grassland landcover. These will not be reseeded with crops and would potentially result in landscape scarring. While they can be reseeded with native grass, it is suggested that the original turves are saved and stored to help reinstatement work quicker and more effectively.

55. Turves cannot be stored in large piles and require careful storage, typically in a single layer and should be watered to prevent them drying and the vegetation dying. Turves should be stored the right way up and kept separate from the topsoil and subsoil piles. Guidance on this is offered in Constructed Tracks in the Scottish Uplands, NatureScot, September 2015, which states that:

56. *The success of vegetation re-establishment can be increased by carrying out track construction and habitat restoration in short sections, rather than building the entire track and revegetating edges at the end of the process. Rapid reinstatement techniques involve building sections of track up to 500m in length and using freshly lifted turfs to revegetate the margins of the most recently completed section of track. This minimises the storage time and handling of turfs and avoids the cost of undertaking a separate operation.*

57. While guidance provided within this document is for the construction of tracks, the principles still relate to the Cable Route Corridor and should be followed. If the original turves are saved, stored correctly and used for reinstatement, the impacts on landscape character should be reduced and reinstatement will be more effective.

10.7.2 Operation Mitigation

58. Significant visual effects during operation would be as a result of the visual impact from the Proposed Development. It was found that three properties would have significant visual impacts. These are Upper Mains of Asleid, Upper Mains of Asleid Cottage and Burnside. While none of these properties would have significant visual effects from the dwelling itself, all would have significant visual effects from the environs. In order to mitigate these effects planting is suggested along the western, eastern and southern edges of the Proposed Substation. Once vegetation reaches maturity, it will provide screening to these views. While it will not completely remove the visibility of the Proposed Substation, it will reduce it to a non-significant level.

59. There are three sections of notable tree removal as a result of the Cable Route Corridor. It is proposed that these are replanted at a 2:1 ratio to maintain the shelterbelts as landscape features important to the LCAs.

10.8 Residual Effects

Table 10.14 – Summary of Residual Effects

Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
	Sensitivity	Magnitude	Significance		
Construction					
Eastern Coastal Agricultural Plain LCA	Medium	Medium	Moderate	Re-use of turves	Minor
Wooded Estates Around Old Deer LCA	Medium	Medium	Moderate	Re-use of turves	Minor
Agricultural Heartlands LCA	Medium	Medium	Moderate	Re-use of turves	Minor
Operation					
Eastern Coastal Agricultural Plain LCA	Medium	Low	Moderate/Minor	Replacement of any trees removed	Minor

Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
	Sensitivity	Magnitude	Significance		
Wooded Estates Around Old Deer LCA	Medium	Low	Moderate/Minor	Replacement of any trees removed	Minor
Agricultural Heartlands LCA	Medium	Low	Moderate/Minor	Replacement of any trees removed	Minor
Upper Mains of Asleid	High	High	Major	Coniferous tree planting	Moderate/Minor
Upper Mains of Asleid Cottage	High	High	Major	Coniferous tree planting	Moderate/Minor
Burnside	High	High	Major	Coniferous tree planting	Moderate/Minor
Rowan Brae	High	High	Major	Coniferous tree planting	Moderate/Minor

10.9 Decommissioning

60. The majority of the underground cabling will be removed, where the effects on the landscape will be as similar to those described in **Sections 10.6.1.1** and **10.6.2.1.** It is anticipated that sections at road crossings, watercourses and woodland where trenchless methods were used would be capped and left in place. As per the impacts during construction, these would be temporary and the landscape character will revert back to its original state.

61. All of the visible, above ground structures at the Proposed Substation will be removed upon decommissioning, thus rendering the landscape and visual effects of the Proposed Development as reversible. There would, therefore, be no landscape and visual effects remaining after decommissioning as a result of the Proposed Development.

10.10 Cumulative Assessment

62. The cumulative assessment has considered all EIA scale developments within 2km of the Cable Route Corridor and 10km of the Proposed Substation location. The assessment covers temporary cumulative construction impacts on the Cable Route Corridor and Proposed Substation, and operational cumulative impacts on the Proposed Substation. The cumulative developments included in this assessment are listed in **Chapter 3 – EIA Methodology** and are shown in **Figure 3.1 – Cumulative Developments**.

10.10.1 Construction

10.10.1.1 Cumulative Landscape Effects

63. This part of the assessment looks at any EIA scale developments that are currently in planning or consented, that would have the potential to have cumulative construction effects. This could either be construction of the Proposed Development happening concurrently or consecutively with other proposals. The North-East 400kv Overhead Line reinforcement Works (ECU00000677) is consented, however it is in its final phase and construction is well underway. Thus, it is assumed that any construction work for this proposal would be completed well before any work starts on the Proposed Development and would not have cumulative construction impacts.

64. For all other cumulative projects, it is assumed that construction impacts would either be happening at the same time, or directly before or after construction of the Proposed Development in order to present a worst-case scenario. In the case of developments happening concurrently impacts would be intensified, while construction occurring consecutively would lengthen the period that landscape and visual impacts could occur. The section

below identifies the potential cumulative effects on areas of landscape character and designated landscapes within the study area.

10.10.1.1.1 Dunes and Beaches from Fraserburgh to Peterhead LCA/North-East Aberdeenshire Coast SLA

65. There are currently two proposed developments, one of which is consented and one in planning; both within 1km of the Cable Route Corridor. The Kirkton Solar PV Farm (ECU00003226) is to the north and an 800 House Residential Mixed Use (A99/2022-0369) development is to the south.

66. The consented solar development is separated from the Proposed Development by a section of mature trees. While it is unlikely that construction of both would be visible at the same time, movement of construction vehicles for both Kirkton Solar PV Farm and the Proposed Development along the A90 may occur.

67. Simultaneous visibility of the residential development (in planning) and the Proposed Development would be more likely. This would potentially occur when crossing the River Ugie on the A90, or near the property at Hallmoss. From the summit of Castle Hill there would be open views towards both developments, however they would appear in different directions. So, while they would appear simultaneously, there may be the feeling of being surrounded by construction activity.

68. If all three developments were to occur during the same period, there would be a considerable disruption to the landscape. Construction activities would be a primary feature of this part of the LCA. While the other two developments will have a permanent impact on the way the LCA is perceived, the Proposed Development would return to its natural state post construction. The cumulative impact is considered to be high, resulting in a major level of effect, which would be significant.

10.10.1.1.2 Eastern Coastal Agricultural Plain LCA

69. The only other proposal within this study area and within this LCA is the Formation of a Footpath (APP/2019/0421). This path would intersect the Cable Route Corridor at two separate points, as well as running parallel to the corridor along the River Ugie.

70. Path construction would have a relatively minor disruption of the landscape and will only affect a small section of a large-scale LCA. If occurring at the same time, the Proposed Development would have a considerably larger footprint than the path and contribute greater to cumulative impacts. Despite this, even the combination of both would not constitute a significant impact given the scale and character of the landscape. The cumulative impact is considered to be medium, resulting in a moderate/minor level of effect, which would not be significant.

10.10.1.1.3 Wooded Estates Around Old Deer LCA

71. No other consented or in planning developments within this LCA and within 2km of the Cable Route Corridor.

10.10.1.1.4 Northern Rolling Lowlands LCA

72. No other consented or in planning developments within this LCA and within 2km of the Cable Route Corridor.

10.10.1.1.5 Agricultural Heartlands LCA

73. While there is nothing within 2km of the Cable Route Corridor, a 10km study radius was placed on the Proposed Substation due to its greater presence in the landscape. Within this there are three consented / in planning developments:

- New pair of terminal towers to connect into New Deer Substation (ECU00000649)
- Overhead Line (ECU00003242)
- Residential Development (ENQ/2019/0563)

74. The residential development would be on the northern side of Maud and it is not considered that construction of both would appear simultaneously. While both would have a temporary impact on the landscape due to construction, the scale of this landscape is able to accommodate such activity.

75. To the north, at ~4km distance from the Proposed Substation, there would be a short section of overhead line constructed. There is sufficient separation between this proposal and the Proposed Development and the relatively minor section of overhead line proposed, that cumulative impacts would be limited.

76. The greatest impact would be from the new pair of terminal towers to connect into New Deer. This would be directly north of the Proposed Substation and if both developments were being constructed at the same time, they would appear in views from across the landscape simultaneously. Given the similar location and similarity of the developments characters, it may be assumed that they would be part of the same development. This would mitigate the impacts somewhat, although would still result in a greater intensity of construction activity in this part of the LCA. The cumulative impact is considered to be medium, resulting in a moderate level of effect, which would not be significant.

10.10.1.2 Cumulative Visual Effects

77. Cumulative visual impacts would only be experienced from a few receptors given the spread of other potential construction proposals.

10.10.1.2.1 Lunderton Farm

78. This property may experience a higher volume of traffic on the A90, over which the dwelling looks due to the construction of the Kirkton Solar PV Farm (ECU00003226) and the Residential Development (A99/2022-0369) to the south. Views of construction of these other proposals would not be possible due to screening provided by topography and vegetation. The cumulative magnitude of change would be low, resulting in moderate level of effect, which would not be significant.

10.10.1.2.2 A90

79. If both of the Kirkton Solar PV Farm and the Residential Development construction was to occur at the same time as the construction for the Proposed Development, there would be sequential cumulative effects for road users travelling both north and south on the A90. All three proposals would represent a notable feature, directly adjacent to the road, and there would be little respite between the three, although it would be uncommon for even two of them to appear simultaneously. With perhaps a brief section travelling south near Hallmoss, which would see the Proposed Development alongside the Residential Development. As a worst-case scenario if all projects were being constructed together, the cumulative magnitude of change would be high, resulting in major/moderate level of effect, which would be significant.

10.10.1.2.3 Formartine and Buchan Way

80. Departing Peterhead, there will be prominent views of the construction of the Residential Development, and a notable gap (~1.5km) before any visual impact of the Proposed Development. At which point both the Proposed Development and the Formation of a Footpath would be prominently seen, with the impacts typically lasting for ~1.5km. Around 13km later, there would be visibility of the second Residential Development as the route passes Maud. It is unlikely that this would contribute much to cumulative impacts given the separation.

81. If all three proposals, plus the Proposed Development were to be constructed simultaneously there would be some localised effects around the eastern end of the route, however for the route as a whole, the contribution of the Proposed Development to cumulative impacts would be low. As a worst-case scenario if all three proposals were constructed simultaneously it would result in a moderate level of effect, which would not be significant.

10.10.2 Operation

82. Regarding operational cumulative impacts, these would only be experienced as a result of the impacts from the Proposed Substation, as the impacts from the Cable Route Corridor would only be experienced during construction.

10.10.2.1 Cumulative Landscape Effects

10.10.2.1.1 Agricultural Heartlands LCA

83. With regards to operational developments, the Proposed Development would be located directly adjacent to the NGNDSS, allowing it to impact a section of the LCA which is already characterised by this type of development. It will, however, increase the presence of industrial development within this part of the LCA giving rise to some cumulative effects. However, the Proposed Development, when seen alongside the existing NGNDSS, would not overwhelm the landscape, which is of a scale able to accommodate both the developments

together. The North-East 400kv Overhead Line reinforcement Works (ECU00000677) is also likely to be operational by the time the Proposed Development is constructed. This development already has a strong influence over the LCA as the existing pylons are in situ, providing a more vertical elements, which has a wider visual influence over the landscape.

84. Regarding cumulative impacts from proposed developments, the Residential Development (ENQ/2019/0563) will be on the far side of Maud and is unlikely to give rise to any cumulative impacts in relation to the Proposed Substation. The New pair of terminal towers to connect into New Deer Substation (ECU00000649) would appear alongside the Proposed Substation as well as the existing NGNDSS adding further industrial elements to this part of the LCA, however their contribution to cumulative impacts would be minor. The Overhead Line (ECU00003242) is almost 4km to the north and would be a relatively small addition to the landscape but would still have some contribution to impacts on the LCA when considered alongside the Proposed Development, the existing NGNDSS, and the new terminal towers.

85. While the addition of the Proposed Development into the LCA would have a notable presence, its position adjacent to the existing NGNDSS and North-East 400kv Overhead Line, allows the Proposed Development to affect a section of the LCA which is already characterised by this type of development. The proposal will increase these existing impacts, but not to the point where the landscape is overwhelmed. As such, the cumulative magnitude of change caused by the Proposed Development on the Agricultural Heartlands as a whole is low, resulting in a moderate/minor level of effect, which would not be significant.

10.10.2.1 Cumulative Visual Effects

86. Cumulative visual effects would be restricted to visual receptors within 1km of the Proposed Substation, as beyond this the influence of the Proposed Substation is likely to be minimal. This primarily includes residential receptors, whose impact is described in **Table 10.15** below.

Table 10.15 - Cumulative impacts on residential receptors

Residential Property	Potential Visual Impact
1 - Upper Mains of Asleid	From the garden areas on the western side and the driveway, the Proposed Development would be seen alongside the NGNDSS, and the North-East 400kv Overhead Line. This would add a similar type of development into this view. While these existing features are present, the Proposed Development would be more prominent by virtue of being closer to the property. The views are somewhat restricted by vegetation along the property's edge, as such the presence of all three developments would not overwhelm views on the property. The cumulative magnitude of change would be medium, resulting in a major/moderate level of effect which would be significant.
2 - Upper Mains of Asleid Cottage	The Proposed Substation would appear directly in front of the existing NGNDSS, where it would likely block the existing views towards the NGNDSS. Visually, the Proposed Substation would be a more notable feature and would bring development closer to the receptor, however it would still affect the same section of the view and views from the same part of the property, primarily the rear garden area. While the Proposed Substation, would have a greater visual influence, the character of the view would remain as one where there are industrial elements seen within the landscape. The cumulative magnitude of change would be low, resulting in a moderate level of effect which would not be significant.
3 - Burnside	Currently the NGNDSS and the North-East 400kv Overhead Line are prominent features backdropping the property when arriving via the long driveway. Despite this, the existing NGNDSS is not visible from the dwelling or garden areas. The Proposed Substation would also be prominent from the driveway, seen to the right when arriving. This may give the impression that the property is beginning to be surrounded by developments. However, again, from the dwelling itself and the garden, impacts are limited, and when departing the property, the existing developments are to the rear. Although cumulative effects are likely to be significant from the end of the driveway where it meets the minor road, impacts on

Residential Property	Potential Visual Impact
	the dwelling and garden area would not be. This is as a result of the existing developments being screened by mature vegetation which sits to the north and views of the Proposed Development being heavily obscured. Overall, cumulative impacts on this property would be medium, resulting in a major/moderate level of effect which would be significant.
4 - Rowan Brae	The Proposed Substation would appear directly in adjacent of the existing NGNDSS, where both would appear together. Visually, the Proposed Substation would be indistinct from this and the two would appear as a single development. While it would still affect the same section of the view and views from the same part of the property, it would increase the extent to which this type of development occupies the view. Despite this increase, the character of the view would remain as one where there are industrial elements seen within the landscape. The cumulative magnitude of change would be medium, resulting in a major/moderate level of effect which would be significant.
5 - Mains of Asleid	While the NGNDSS and the North-East 400kv Overhead Line are notable features to the west, the Proposed Substation is likely to be significantly screened by the mature woodland at Upper Mains of Asleid. There will be no views from the dwelling itself and any views would be from the environs, primarily the access track. Here, the Proposed Substation will appear alongside the existing developments and will contribute to the visual impact, albeit to a lesser extent than the existing development. The cumulative magnitude of change would be low, resulting in a moderate level of effect which would not be significant.
6 - Silverlea	The mature woodland at Upper Mains of Asleid to the west of the property screen current views of the NGNDSS and the North-East 400kv Overhead Line. This same woodland will screen views of the Proposed Development and the cumulative magnitude of change would be negligible, resulting in a moderate/minor level of effect which would not be significant.
7 - Boghead	The property has a band of mature woodland along its northern edge, which currently screens views of the NGNDSS and the North-East 400kv Overhead Line developments. This same woodland will also screen views of the Proposed Development and the cumulative magnitude of change would be negligible, resulting in a moderate/minor level of effect which would not be significant.
8 - East Swanford	This property will have open views towards the NGNDSS and the North-East 400kv Overhead Line developments. The addition of the Proposed Development would be well screened and indistinct from these existing developments. The cumulative magnitude of change would be negligible, resulting in a moderate/minor level of effect which would be significant.
9 - North Faddonhill	The ZTV indicates that there will be no visibility of the development from North Faddonhill, as such it will not contribute to cumulative impacts.
10 - Smiddybank Farm	While views of the NGNDSS are heavily obscured by a combination of topography, vegetation and agricultural buildings, views of the 400kv Overhead Line are prominent. Views of the Proposed Substation from the dwelling would be unlikely and any views would be from the access track and environs, which would also be subject to screening from trees and agricultural buildings at Burnside. It is unlikely that the full extent of either the NGNDSS or the Proposed Substation would be visible, however elements of both would appear alongside the 400kv Overhead Line. The cumulative magnitude of change would be medium, resulting in a major/moderate level of effect which would be significant.
11 - North Asleed	The NGNDSS and the North-East 400kv Overhead Line heavily influences views across the landscape to the west. Although theoretically visible adjacent to these, the Proposed Development is likely to be completely screened by the mature woodland at Upper Mains of Asleid. While there may be glimpses of the Proposed Substation, it would be indistinct from the NGNDSS and its contribution to cumulative impacts limited. The cumulative magnitude of change would be

Residential Property	Potential Visual Impact
	negligible, resulting in a moderate/minor level of effect which would not be significant.
12 - Mill House	The ZTV indicates that there will be no visibility of the development from North Mill House, as such it will not contribute to cumulative impacts.
13 - Mill of Cairnbanno	The ZTV indicates that there will be no visibility of the development from Mill of Cairnbanno, as such it will not contribute to cumulative impacts.
14 - Cairnbanno House Cottage	The ZTV indicates that there will be no visibility of the development from Cairnbanno House Cottage, as such it will not contribute to cumulative impacts.

10.10.3 Residual Cumulative Effects

87. Proposed planting around the Proposed Substation will reduce the visual impact on some residential properties, which will in turb reduce the cumulative impact. In **Table 10.16** below the residual effects on the three significantly cumulative impacted receptors are outlined. Tree planting should reduce impacts from Major/Moderate to Moderate in all three cases.

Table 10.16 - Residual cumulative effects

Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
	Sensitivity	Magnitude	Significance		
Upper Mains of Asleid	High	Medium	Major/Moderate	Coniferous tree planting	Moderate
Burnside	High	Medium	Major/Moderate	Coniferous tree planting	Moderate
Rowan Brae	High	Medium	Major/Moderate	Coniferous tree planting	Moderate
Smiddybank Farm	High	Medium	Major/Moderate	Coniferous tree planting	Moderate

10.11 Conclusion

88. Impacts from the Proposed Development are divided into two sections; landscape and visual impacts caused during the construction of the Cable Route Corridor and Proposed Substation; and operational landscape and visual impacts as a result of the Proposed Substation. Impacts from the Cable Route Corridor will be temporary and will return to the existing nature post construction. Additional mitigation has been suggested in order to minimise these impacts and ensure that the landscape character returns back to its original state as quick as possible. Significant effects were found on one LCA and one SLA, as well as a number of residential dwellings, however these effects would be short term and temporary.

89. In terms of permanent impacts caused by the Proposed Substation, the assessment found that there would be no significant landscape effects and only three significant visual effects found on the closest residential dwellings. While these effects were found to be significant, they did not breach any residential amenity thresholds. In addition to this, an additional dwelling was found to have significant cumulative visual effects. Proposed tree planting would reduce all of these effects to a non-significant level.

10.12 References

7. ———————————————

[i] NatureScot, Landscapes of Scotland: Descriptions 11-20, page 5, 2012.

[ii] Cobham Resource Consultants, NatureScot National Programme of Landscape Character Assessment No.37: Banff and Buchan, 1997.

[iii] Environmental Resources Management, NatureScot National Programme of Landscape Character Assessment No.102: South and Central Aberdeenshire, 1998.

GREEN VOLT

11 Chapter 11

Cultural Heritage and Archaeology

Onshore EIA Report: Volume 1

Document Code: FLO-GRE-REP-0009-11		
Version Number:	00	
Date:	*Issue Date 19/07/23*	
Prepared by:	Isla Ferguson	*Isla Ferguson*
Checked by:	Alasdair Warnock	*Alasdair Warnock*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First draft for review	19/07/2023
A2	Second draft for review	27/07/2023
A3	Final draft for approval	01/08/2023
00	Final	03/08/2023

Contents

11 Cultural Heritage and Archaeology

11.1 Introduction

1. Cultural heritage is represented by a wide range of features, both above and below ground, which result from past human use of the landscape. These include standing buildings, many of which are still in use; sub-surface archaeological remains and artefact scatters; industrial remains; earthwork monuments; and landscape features such as field boundaries. The aim of this study is to identify elements of cultural heritage value that may be impacted upon by the Proposed Development and provide an assessment of likely significant effects and identify any mitigation.
2. This assessment was carried out by Green Cat Renewables Ltd except from **Section 11.6.1** which has been undertaken by AOC Archaeology Group. The entire chapter and assessment has been peer-reviewed by AOC Archaeology Group.

11.2 Legislation, Policy and Guidance

11.2.1 Legislation

3. National legislation relating to the planning and protection of cultural heritage assets includes:

- *The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations* 2017;
- *The Town and Country Planning (Scotland) Act* 1997;
- *Ancient Monuments and Archaeological Areas Act 1979*;
- *Historic Environment Scotland (HES) Act* 2014; and
- *Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997*.

11.2.2 Policy

4. National and local planning policy relating to the Proposed Development includes:

- *National Planning Framework for Scotland 4,* Scottish Government, 2023;
- *Historic Environment Policy for Scotland,* Historic Environment Scotland, May 2019;
- *Designation Policy and Selection Guidance,* Historic Environment Scotland, April 2019 (updated 2020);
- *Planning Advice Note (PAN) 2/2011 – Planning and Archaeology,* Scottish Government, 2011;
- *Policy HE1 Protecting Listed Buildings, Scheduled Monuments and Archaeological Sites (including other historic buildings),* Aberdeenshire Local Development Plan, Aberdeenshire Council, 2023; and
- *Policy HE2 Protecting Historic, Cultural and Conservation Areas,* Aberdeenshire Local Development Plan, Aberdeenshire Council, 2023.

11.2.3 Guidance

5. A number of guidance documents have been produced relating to the assessment and protection of cultural heritage assets:

- *Historic Environment Circular 1,* Historic Environment Scotland, June 2016;
- *Environmental Impact Assessment Handbook,* Historic Environment Scotland and NatureScot, April 2018; and
- *Managing Change in the Historic Environment: Setting,* Historic Environment Scotland, June 2016 (updated 2020).

11.3 Consultation

6. A Scoping Report was submitted to Aberdeenshire Council in December 2022. Following this, a Scoping Opinion was issues by Aberdeenshire Council in March 2023. **Table 11.1** outlines the Cultural Heritage and Archaeology responses and how these were actioned.

Table 11.1 – Scoping Consultation Responses

Consultee	Scoping Response	Action
Historic Environment Scotland	Content on the study areas for nationally important historic environment assets to be assessed (5km from the Proposed Substation location and 500m from the Cable Route Corridor).	These study areas have been employed during the assessment below.
	State that consideration should be given to features outwith the Zone of Theoretical Visibility (ZTV) in terms of third-party location intervisibility with the Proposed Development.	An assessment of third-party intervisibility has been undertaken as part of the assessment below.
Aberdeenshire Council Archaeology Service (ACAS)	Stated that the methodology was acceptable, and the baseline (500m with 50m buffer) area was felt to be sufficient. Anything outwith this should not raise significant concerns.	This methodology and baseline area have been used for the assessment.
	Suggested that a walkover survey would be required as part of the assessment.	A desk-based review has been undertaken by AOC Archaeology to determine the archaeological context of the route and determine where a walkover survey would be appropriate. Further consultation has been undertaken with Aberdeenshire Council Archaeology Service (ACAS) on this approach and a targeted walk over survey was agreed and was undertaken in June 2023, this has informed the physical impact assessment and can be found in **Appendix 11.1**.

11.4 Assessment Methodology

7. In the preparation of this assessment, a range of historical and technical data was collected and analysed. This includes a review of all potential features that fall under the umbrella term of cultural heritage, such as historic buildings and landscapes. The following sources were consulted:

- Desk top review undertaken by AOC Archaeology Group in April 2023;
- Walkover Survey undertaken by AOC Archaeology Group in June 2023;
- Aberdeenshire Historic Environment Record (HER);
- National Record of the Historic Environment (NRHE);
- Aerial photograph collection held by HES;
- LiDAR Data from the Scottish Government Scottish Remote Sensing Portal;

- National Library of Scotland (Map Library); and
- HES's database of; Listed Buildings (LBs), Scheduled Monuments (SMs), Gardens and Designed Landscapes (GDLs), Conservation Areas, Inventory Battlefields, World Heritage Sites, and monuments proposed for scheduling.

11.4.1 Study Area

8. This assessment utilises two study areas. These are defined below and have been agreed with HES and ACAS through the scoping process.

- Outer Study Area: 500m either side of the Application Site Boundary; and
- Inner Study Area; 50m either side of the Application Site Boundary.

11.4.2 Physical Impacts

9. The assessment includes any impacts that would physically alter or damage the feature. This could involve the removal, partial removal, or minor loss of key features or evidence important to the historic character and integrity of the feature and may result in the loss of physical integrity of the feature.

11.4.2.1 During Construction

10. The area most at risk of physical impact was assessed to be all land within the Cable Route Corridor and land 50m either side of the proposed redline boundary. A 500m search area either side of the redline boundary has been undertaken with a 50m assessment area employed. This assessment considered both designated and non-designated heritage assets that are nationally important, regionally important, or locally important. See **Figures 11.1a-11.1e**. This assessment has also been informed by a targeted walkover survey undertaken by AOC Archaeology and more detail can be found in **Appendix 11.1**.

11.4.3 Impacts on Setting

11. This assessment includes any visual impacts both to and from the monument and any impacts to sense of place, sense of remoteness, cultural identity, evocation of historical past and associated spiritual responses as outlined in the guidance document *Managing Change in the Historic Environment: Setting* (HES, 2020)[i].

12. It is acknowledged that any woodland and vegetation that currently restricts potential views of the Proposed Development from any of the historic features within the study radius is subject to change. External factors such as felling, disease, and wind damage are outwith the Applicant's control. The assessment has considered the setting of historic features at the time of the application submission but recognises that screening provided by vegetation and woodland is potentially subject to change.

11.4.3.1 During Construction

13. Temporary setting impacts resulting from construction works along the Cable Route Corridor have been assessed as part of this assessment. These setting impacts have been considered for nationally significant features within 500m of the Application Site Boundary such as:

- Scheduled Monuments,
- Category A Listed Buildings,
- Inventory Gardens and Designed Landscapes,
- Inventory Battlefields; and
- World Heritage Sites.

14. Regionally significant features such as Category B Listed Buildings, Category C Listed Buildings and Conservation Areas within 500m of the Application Site Boundary See **Figures 11.1a-11.1e**.

15. Temporary setting impacts resulting from construction works at the Proposed Substation have been included within this assessment. These setting impacts have been considered for nationally significant features such as Scheduled Monuments, Category A Listed Buildings, Gardens and Designed Landscapes and World Heritage Sites within 5km and regionally significant features such as Category B Listed Buildings, Category C Listed Buildings and Conservation Areas within 2km of the Proposed Substation infrastructure. See **Figure 11.2**.

11.4.3.2 During Operation

16. Setting impacts on features may also occur during the operational stage of the Proposed Substation. This assessment has considered nationally designated features such as Scheduled Monuments, Category A Listed Buildings, Gardens and Designed Landscapes and World Heritage Sites within 5km of the Proposed Substation and associated infrastructure and regionally significant features such as Category B Listed Buildings, Category C Listed Buildings and Conservation Areas within 2km of the Proposed Substation and associated infrastructure. See **Figure 11.2**. Operation effects would not occur along the Cable Route Corridor as once the construction is complete, the setting of the features would return to baseline.

11.4.4 Cumulative Impacts

17. The assessment considers the extent to which the Proposed Development, in combination with others, may impact the setting of a cultural heritage feature or the ability to understand the feature, its function and setting by the overall cumulative addition of new features. Identified cumulative-setting effects are described in relation to each individual cultural feature that exists within the study area.

11.4.4.1 During Construction

18. This assessment considers all consented and In Planning Environmental Impact Assessment (EIA) level applications within 2km of the Proposed Cable Route Corridor and 10km of the Proposed Substation as illustrated in **Figure 3.1**. This assessment will consider cumulative effects on setting that could occur from the construction of the Proposed Development in conjunction with the construction of the applications found within the study area. This assessment assumes that the construction of these projects would be undertaken at the same time and therefore assumes a worst-case scenario.

19. Cumulative effects on physical impacts have been scoped out of the assessment.

11.4.4.2 During Operation

20. This assessment considers the existing National Grid New Deer Substation (NGNDSS) in conjunction with the Proposed Substation. This assessment will consider the cumulative effects on setting that could occur during the operational phase as a result of these two substations. Additionally, it will also consider the cumulative effects on setting that could occur with other consented and in planning EIA level applications within 10km of the Proposed Substation as outlined in **Chapter 3 – EIA Methodology** and illustrated on **Figure 3.1**.

11.4.5 Figures

21. The assessment has made use of the following visual aids:

- The Cable Route Corridor, Landfall and Proposed Substation have been mapped out in context of the surrounding heritage assets;
- The ZTV map areas that the Substation is theoretically visible from. This is a 'bare earth' representation which does not take into account local screening from the natural and built environment.

22. All maps used in making judgement on impact on cultural heritage features have been included within the supporting figures that accompany this EIA Report.

23. Figures included in this assessment are as follows:

- **Figure 11.1a-e – Cultural Heritage Resource Sections**
- **Figure 11.2 – Proposed Substation ZTV**

11.4.6 Limitations of Scope

24. HER data was acquired from ACAS in May 2022. Data on designated heritage assets was downloaded from the HES Geographic Information Systems (GIS Software) portal in January 2023 and reviewed again in July 2023 and data from NRHE as held by HES was downloaded in January 2023; and reviewed again in July 2023. The assessment does not include any assets that have been added to these datasets beyond these dates.

25. A desk-top survey was undertaken by AOC Archaeology Group in April 2023 and the findings have informed this assessment. It was not possible to undertake a LiDAR review of the entire Site as there was only LiDAR data

available for the eastern half of the Site on the Scottish Remote Sensing Portal, however all available LiDAR coverage for the Site has been reviewed.

26. A Site walkover survey was undertaken by AOC Archaeology Group in June 2023 and the findings have informed this assessment. It was not possible to undertake a walkover survey of the entire Site due to the majority of it being under crop, or long pasture grass. Therefore, the walkover survey was limited to areas that were accessible and these are outlined in **Appendix 11.1**.

27. Given that it was not possible to walk the entire route due to vegetation and that the LiDAR information only covers part of the Site, there is the potential for unrecorded features to be present along the Cable Route Corridor.

11.4.7 Assessment Criteria

28. The following general criteria outlined in **Table 11.2** and **Table 11.3** have been used in the assessment of the level of effect of any direct or indirect impact on all features of cultural heritage importance within the study radius.

Table 11.2- Sensitivity of Cultural Heritage and Archaeological Features

Sensitivity	Definition
High	Category A Listed Buildings Scheduled Monuments Non-designated heritage assets likely to be of national importance Inventory Gardens and Designed Landscapes World Heritage Sites Inventory Battlefields
Medium	Category B Listed Buildings Category C Listed Buildings Non-designated heritage assets on Historic Environment Record and National Record of the Historic Environment of regional importance Conservation Areas
Low	Non-designated heritage assets on Environment Record and National Record of the Historic Environment of local importance Non-designated heritage assets of lesser importance Non-Inventory Gardens and Designed Landscapes

Table 11.3 - Magnitude of Cultural Heritage and Archaeological Effects

Magnitude	Definition
High	Any component of the Proposed Development that would result in: ▪ the removal or partial removal of key features, areas, or evidence important to the historic character and integrity of the feature, which could result in the substantial loss of physical integrity; and/or ▪ a substantial obstruction or addition to the setting where it significantly alters the quality of its key characteristics, or the key characteristics of the setting and visual amenity in views both to and from the feature.

Magnitude	Definition
Medium	Any component of the Proposed Development that would result in: ▪ the removal of one or more key features, parts of the feature, of evidence at the secondary or peripheral level, but are not features fundamental to its historic character and integrity; and/or ▪ a partial obstruction or addition to the setting where it alters the quality of its key characteristics, or the key characteristics of the setting and visual amenity in views both to and from the feature.
Low	Any component of the Proposed Development that would result in: ▪ a partial removal/minor loss, and/or alteration to one or more peripheral and/or secondary elements/features, but not significantly affecting the historic integrity of the feature or affect the key features of the feature; and/or ▪ an introduction of elements that could alter to a small degree the quality of its key characteristics or the key characteristics of the setting and visual amenity in views both to and from the feature.
Negligible	Any component of the Proposed Development that would result in: ▪ a relatively small removal, and/or alteration to small, peripheral and/or unimportant elements/features, but not affect the historic integrity of the feature or the quality of the surviving evidence; and/or ▪ an introduction of elements that could be visible but not intrusive in views both too and from the feature, and a non-intrusive impacts on the quality of the key characteristics of the feature, or its setting.
No Change	There would be no change to the baseline.

29. The level of effects that the Proposed Development may have on the surrounding features of heritage significance is determined by the combination of the sensitivity and magnitude of change. The following matrix in **Table 11.4** is used to determine the overall significance of effect.

Table 11.4 - Significance of Effects Matrix

Sensitivity	Magnitude of Change				
	High	**Medium**	**Low**	**Negligible**	**No Change**
High	Major	Major/ Moderate	Moderate	Moderate/ Minor	None
Medium	Major/ Moderate	Moderate	Moderate/Minor	Minor	None
Low	Moderate	Moderate/ Minor	Minor	Minor/ Negligible	None
Key	Significant in EIA Terms				
	Non-Significant in EIA Terms				

30. The significance of any identified effects will be assessed in terms of Major, Major/Moderate, Moderate, Moderate/Minor or Minor/Negligible. The matrix should not be used as a prescriptive tool but allows for the exercise of professional judgement.

31. Any effects that are classified as Major or Major/Moderate, will be considered to be equivalent to likely significant effects referred to in the EIA Regulations. Careful consideration will also be given to Moderate effects to test whether they are significant in EIA terms or not. In all cases, whether an effect is significant or not is confirmed within the assessment.

11.5 Baseline

11.5.1 Baseline Assets Identified for Physical Impact Assessment

32. **Table 11.5** below lists the nationally, regionally and locally significant features within 50m of the Application Site Boundary. Additionally, it lists undesignated features that were highlighted through a desktop review undertaken by AOC Archaeology in April 2023, and a walkover survey undertaken by AOC Archaeology in June 2023 located within 50m of the Application Site Boundary. These assets are illustrated on **Figures 11.1a-11.1e** and the features are generally listed in order from east to west along the Cable Route Corridor.

Table 11.5 - Features within 50m of the Application Boundary

Reference	Distance to Application Site Boundary	Designation/ Record Number	Name	Type of Feature
Key:	CAN: NRHE (Canmore) Site, HER: Aberdeenshire HER Feature, DS: Desktop Survey Feature, WS: Walkover Survey Feature, LB: Listed Building Where a feature falls into more than one category, all references are listed.			
CAN01	32m	**CAN -** 156568 **HER -** NK14NW0601 **DS –** 122 LB - LB19799	Lunderton Cottage	Farmhouse.
CAN02	16m	**CAN -** 159547 **HER -** K14NW0086	Lunderton	Unidentified flints found on the farm of Lunderton.
CAN03	1m	**CAN -** 230387 **HER -** NK14NW0404 **DS -** 120	Lunderton House	House and associated surroundings.

Reference	Distance to Application Site Boundary	Designation/ Record Number	Name	Type of Feature
CAN04	0m	**CAN -** 21152 **HER -** NK14NW0001 **DS -** 117	Lunderton	Site of a prehistoric souterrain found in the 1860s.
CAN05	0m	**CAN -** 81849 **HER -** NK14NW0598 **DS -** 116	Saint Fergus and North Ugie Water Canal, Inverquinzie Branch, Hallmoss Aqueduct	Ruined aqueduct.
CAN06	9m	**CAN -** 156539 **HER -** NK04NE0117 **DS -** 113	Hallmoss Cottage	Farmhouse.
CAN07	45m	**CAN -** 143696 **HER -** NK04NE0030 **DS -** 112	Cairnhill	Ruined farmstead.
DS01	49m	**DS -** 111	Building	Building depicted on historic map.
HER01	0m	**HER -** NK04NE0025	Ugie Canal	Remains of disused canal.
CAN08	4m	**CAN –** 216299 **HER –** NK04NE0113	Saint Fergus and North Ugie Water Canal, Stonemills Corn Mill Bridge	Bridge over canal.
HER02	0m	**HER -** NK04NE0038	Stonemills	Lades, stones.
HER03	0m	**HER -** NK04NE0083	St Fergus Pipeline	Pipeline – watching brief.
HER04 (Another section of HER01)	0m	**HER -** NK04NE0025	Ugie Canal	Remains of disused canal.
CAN09	14m	**CAN -** 143684 **DS -** 101	Millbank	Monument – enclosure.
CAN10	41m	**CAN -** 21021 **DS -** 97	Auchlee	Monument – enclosure.
CAN11	0m	**CAN -** 128946 **DS -** 98	Woodside	Medieval rig and furrow.
CAN12	12m	**CAN -** 128948 **DS -** 96	Ardlaw Hill	Possible prehistoric kerb cairn, and medieval rig and furrow.
DS02	11m	**DS -** 94	Rifle Range	A rifle range annotated on historic map.
HER05	0m	**HER -** NK04NW0075 **DS -** 90	Inverquhomery	Remains of a designed landscape probably dating from the 19th century.

Reference	Distance to Application Site Boundary	Designation/ Record Number	Name	Type of Feature
CAN13	23m	**CAN -** 46349 **DS -** 91	Mill-Croft	Farmstead.
HER06	44m	**HER -** NK04NW0063	Greenhill	Farmstead.
HER07	4m	**HER -** NK04NW0064	Greenhill	Remains of a quarry.
DS03	28m	**DS -** 88	Fordmouth	Farmstead.
DS04	32m	**DS -** 86	Buildings and well.	Two buildings associated with an annotation of a well on a historic map.
DS05	46m	**DS -** 81	Mill of Clola	Farmhouse, associated with a well.
DS06	0m	**DS -** 82	Cowles Well	Annotation of a well on a historic map.
CAN14	38m	**CAN -** 167672 **HER -** NJ94SE0085 **DS -** 72	Kinnadie	Farmstead.
CAN15	0m	**CAN -** 264804 **HER -** NJ94SE0039 **DS -** 66	Skipleton	Site of a destroyed farmstead.
DS07	40m	**DS -** 56	Well	A well annotated on a historic map.
HER08	44m	**HER -** NJ94SW0054 **DS -** 55	Clochan	Site of a now destroyed rectangular cottage depicted on the 1867 1st edition OS map.
HER09	16m	**HER -** NJ94SW0053 **DS -** 53	Clochan	Site of a now destroyed farmstead with three rectangular cottages, depicted on the 1867 1st edition OS map.
DS08	48m	**DS -** 52	Well	A well annotated on a historic map.
DS09	26m	**DS -** 48	Well	A well annotated on a historic map.
DS10	47m	**DS -** 47	Well	A well annotated on a historic map.
WS01	0m	**WS** - 126	Field Drain	Open section of ground full of water. Modern.
DS11	0m	**DS -** 46	Building	A rectangular building depicted on a historic map.
DS12	0m	**DS -** 43	Farmstead	A farmstead depicted on a historic map.

Reference	Distance to Application Site Boundary	Designation/ Record Number	Name	Type of Feature
CAN16	40m	**CAN -** 20630 **DS -** 42	Bulwark Moss	Two stone balls from this location are in the Royal Museum of Scotland.
DS13	0m	**DS -** 41	Great North of Scotland Railway – Formartine and Buchan Section	Formartine and Buchan section of the Great North of Scotland Railway. Now the Formartine and Buchan Way.
HER10	0m	**HER -** NJ94SW0094 **DS -** 35	Nethermuir House	Remains of a designed landscape which may date to the 18th century.
DS14	0m	**DS -** 37 **HER -** NJ94SW0070	Badnyrieves	Cropmarks of two quarries depicted on the 1st edition OS map.
DS15	21m	**DS -** 30	Building	A building associated with a well.
HER11	11m	**HER -** NJ84NE0081 **DS -** 27	Auchmaliddie	Site of a cottage with enclosed garden area depicted on the 1st and 2nd edition OS maps but not the 2006 edition.
HER12	0m	**HER -** NJ84NE0060 **DS -** 23	Mitchellhill Cottage	Site of a now destroyed mill depicted on the 1867 OS map.
DS16	0m	**DS -** 15	Building	Building depicted on historic OS maps.
DS17	36m	**DS -** 8	Well	Well annotated on historic map.
WS02	0m	**WS** - 127	Ditch	Linear ditch leading downhill towards a drainage ditch.
HER13	1m	**HER -** NJ84SW0089 **DS -** 1	Upper Mains of Asleid	Farmstead depicted on historic OS maps.
DS18 (Another section of DS13)	32m	**DS -** 92	Great North of Scotland Railway – Formartine and Buchan Section	Formartine and Buchan section of the Great North of Scotland Railway. Now the Formartine and Buchan Way.
HER14	0m	**HER –** NK04NE0039	Stonemills	Remains of cornmill complex and farmstead
CAN17	0m	**CAN –** 319941 **HER –** NK14NW0084	Craigewan Links/ Beach	Remains of a line of World War II anti-tank blocks lining the beach. Several hundred blocks are present in total.

Reference	Distance to Application Site Boundary	Designation/ Record Number	Name	Type of Feature
				They are supported by regularly spaced pillboxes.

11.5.2 Baseline Assets Identified for Setting Impact Assessment

33. **Table 11.6** below outlines all the nationally significant features such as Scheduled Monuments, Category A Listed Buildings, Inventory Gardens and Designed Landscapes, Inventory Battlefields and World Heritage Sites and regionally significant features such as Category B Listed Buildings and Conservation Areas within 500m of the Cable Route Corridor and Landfall and 5km of the Proposed Substation which will be considered as part of the setting assessment in **Sections 11.6.1.2** and **11.6.2.1**.

34. Within these study areas, there are a total of seven Scheduled Monuments and nine Category B Listed Buildings. Details of these features are outlined in **Table 11.6** below and illustrated on **Figures 11.1a-e** and **11.2**.

Table 11.6 - Features within 500m of the Cable Route Corridor and 5km of the Proposed Substation

Reference	Distance to Proposed Development	Schedule / Listing Number	Name	Description	Figure
SM01	363m from Cable Route Corridor	SM3259	Castle Hill, motte	The monument comprises a medieval motte standing near the South bank of the River Dee; it is about 7m high on the landward side and has been shaped from a natural hillock.	Figure 11.1a
SM02	277m from Cable Route Corridor	SM2496	Ravenscraig Castle	The monument comprises the remains of Ravenscraig Castle, a ruined L-plan tower house with an irregularly shaped courtyard sat on a craggy rock above the River Ugie.	Figure 11.1a
SM03	495m from Cable Route Corridor and 4.6km from Proposed Substation	SM9392	North Mains of Auchmaliddie, stone circle	The monument comprises the remains of a recumbent stone circle.	Figures 11.1e and 11.2
SM04	4.8km from Proposed Substation	SM8229	Gight Castle, dovecot	The monument comprises the remains of a dovecot associated with Gight Castle. The dovecot stands in woodland on the north edge of the Ythan Gorge, 200m WSW of Gight Castle.	Figure 11.2
SM05	4.9km from Proposed Substation	SM2508	Gight Castle	The Monument comprises the remains of Gight (or Formartine) Castle and associated features.	Figure 11.2

Reference	Distance to Proposed Development	Schedule / Listing Number	Name	Description	Figure
LB01	90m from Cable Route Corridor	LB9421 (B Listed)	Millbank House	Two-storey house associated with former mill dating to before 1828.	Figure 11.1b
LB02	352m from Cable Route Corridor	LB9422 (B Listed)	Bridge of Rora	South-east part early 18th century or earlier. Remainder rebuilt in widening of circa 1860.	Figure 11.2b
LB03	292m from Cable Route Corridor	LB9425 (B Listed)	Steading, Inverquhomery	Early 19th century courtyard plan steading. Had waterwheel of 30' dia. demolished c.1962. The house is much altered.	Figure 11.1c
LB04	254m from Cable Route Corridor	LB9426 (B Listed)	SW, Centre and NE Dovecote Inverquhomery	Probably early 19th century. Centre dovecot is larger with later gothic spirelet.	Figure 11.1c
LB05	80m from Cable Route Corridor	LB16055 (B Listed)	Brae of Coynach House	Mackenzie and Matthews 1851. Cottage style 1/2-storey and attic.	Figure 11.1c
LB06	1.1km from Proposed Substation	LB16160 (B Listed)	Cairnbanno House	Now farmhouse. Late 18th century. 2-storey granite rubble with margins.	Figures 11.1e and 11.2
LB07	1.5km from Proposed Substation	LB9629 (B Listed)	Millbrex Church	Ecclesiastical building in use as such. Pirie and Clyne 1881-12 Rectangular plan with U-gallery. Original furnishing, no features of special note.	Figure 11.2
LB08	60m from Cable Route Corridor	LB19799 (C Listed)	Lunderton House	Circa 1800 two-store, three-window house with coursed red granite and blue granite lintels.	Figure 11.1a
LB09	380m from Cable Route Corridor	LB16056 (C Listed)	Skelmuir House	Late 18th Century two-storey and dormer-less attic house.	Figure 11.1d

11.6 Potential Effects

11.6.1 Potential for Surviving Archaeological Evidence

35. The potential for surviving archaeological evidence of past activity within the Application Site Boundary is expressed in the report as ranging between the scales of:

- High – The available evidence suggests a high likelihood for past activity within the Site and a strong potential for archaeological evidence to survive intact or reasonably intact;
- Medium – The available evidence suggests a reasonable likelihood for past activity within the Site and consequently there is a potential that archaeological evidence could survive.
- Low – The available evidence suggests archaeological evidence of activity is unlikely to survive within the Site, although some minor land-use may have occurred.
- Uncertain - Insufficient information to assess

36. Based on the historically depicted and modern land use recorded within the Application Site Boundary and the Inner and Outer Assessment Areas, the impact of long-term agricultural activities, including ploughing and the construction of drainage infrastructure has likely had an adverse impact on underlying archaeological remains[ii&iii]. A report (DS-31) noted the detrimental impact of historic and modern agricultural activities on paleoenvironmental remains in that area, to the south of the Application Site Boundary (Section E). As such whilst archaeological remains may survive within the Application Site Boundary, any remains are likely to be truncated, damaged or may even have been destroyed by historic and modern agricultural activities. The following discussion of archaeological potential takes cognisance of the likely impact of agricultural activities on buried archaeological remains.

37. There are a low number of invasive previous archaeological investigations recorded within or extending into the Application Site Boundary and within the surrounding area. This may be due to the lack of extensive development in the vicinity of the Application Site Boundary and the Outer Assessment Area. As such there has not been material opportunity to assess the impacts of agricultural activity as outlined above and, therefore, there is considered to be the potential for hitherto unknown buried remains to survive within the Application Site Boundary.

11.6.1.1 Prehistoric (12000BC-AD400)[1]

38. There is a general paucity of prehistoric remains recorded within 500m of the Application Site Boundary. Prehistoric remains in this area largely consist of individual or small collections of finds. In general, there is judged to be a Low potential for prehistoric remains to survive across the Application Site Boundary; exceptions to this are noted below.

39. A souterrain (**CAN04**; CAN-21152; HER-NK14NW0001; DS-117) recorded as being destroyed in the 19th century was located on a natural hillock. Souterrains are often dated to the Iron Age, between the last century BC and the first two centuries AD[iv]. Whilst the souterrain itself may have been destroyed there is the potential for deposits associated with the construction, use and abandonment of the souterrain to survive as buried deposits in the surrounding area. The location of prehistoric flints (**CAN02**; CAN-159547; HER-NK14NW0086, DS-120) c.275m to the north-east and c. 25m north of Section A, as well as the prehistoric flints, possible prehistoric agricultural remains and a ring ditch in the wider area suggest the presence of prehistoric activity in the vicinity of Section A. Watching briefs along the St Fergus Pipeline in 1998 identified several prehistoric sites, including a possible prehistoric pit (HER-NK04NE0034, DS106) within the Outer Assessment Area, also within Section A. A modern agricultural tank was found in the vicinity of the souterrain and the land use was found to comprise arable agriculture during a walkover survey (**Appendix 11.1**). Whilst continuing agricultural activities and the construction of a tank may have had an adverse impact on any surviving deposits which may survive there is judged to be a Medium potential for prehistoric remains in the vicinity of the souterrain.

40. Within a wetland area centred DS-31, c. 300m south of the Application Site Boundary in Section E, two Bronze Age shields (HER-NJ84SE0002, DS-32) and wooden objects of unknown date (HER-NJ84SE0003, DS33) were found. Whilst the nearest area of the Application Site Boundary was found to be in agricultural use and no upstanding remains were visible from the road (Appendix 11.1- Areas 6 & 7) there is judged to be a Medium potential for prehistoric remains to survive in this area.

41. A cist containing an urn (HER-NK04SW0002, DS-85) and hammer stone (HER-NK04SW0002, DS-84) were identified in the late 19th century around a discrete area of quarrying works. Whilst these assets are located over 50m south of the Application Site Boundary there is considered to be a Medium potential for prehistoric remains to survive in the surrounding area (Section C).

42. Two possible prehistoric heritage assets (CAN-346374 & DS-95, **CAN12**, CAN-128948 & DS-96) have been identified via aerial photography in Section B. Access into this area was limited during the walkover survey (Appendix 11.1- Area 14) due to the agricultural land use. There is the potential for remains and deposits

[1] Periods based on Aberdeenshire Historic Environment Record (HER) - https://online.aberdeenshire.gov.uk/smrpub/master/default.aspx

associated with these assets to survive and as such there is judged to be a Medium potential for remains to survive within the Application Site Boundary, within Section B.

11.6.1.2 Roman (AD1-AD400)

43. No Roman remains have been recorded in the Application Site Boundary or within the Outer Assessment Area. There is considered to be a Low potential for Roman remains to survive within the Application Site Boundary.

11.6.1.3 Early Medieval (AD 400 – c AD 1000)

44. There are no Early Medieval remains recorded within the Application Site Boundary or Outer Assessment Area. As such there is considered to be a Low potential for Ealy Medieval remains to survive within the Application Site Boundary.

11.6.1.4 Medieval (AD1100 - AD1560)

45. The medieval landscape was unlikely much different than the post-medieval and indeed the present landscape, in that it was in all probability largely rural and agrarian in nature. Rig and furrow (**CAN12,** CAN-128948 & DS-96 and HER-NK04NW0033 & DS-98), often attributed to the medieval period, although the practice did continue into the post-medieval period, has been identified in the vicinity of Section B. No rig and furrow was identified during the walkover survey, although access and ground visibility was limited (Appendix 11.1). Two medieval defensive Scheduled Monuments (SM02, SM2496 & SM01, SM3259) are recorded within 500m of the eastern end of the Application Site Boundary (Section A) and these likely controlled the surrounding land, which may have included land within the Application Site Boundary.

46. It is possible that the post-medieval farmsteads and mills within the Application Site Boundary and Assessment Areas had earlier, medieval antecedents.

47. Overall, there is considered to be a Low potential for medieval remains to survive within the Application Site Boundary. Any remains of this date are likely to be truncated cultivation remains.

11.6.1.5 Modern (AD1900-Present)

48. The majority of the Application Site Boundary is located within agricultural land, which based on historic maps has not undergone any great changed since at least the post-medieval period. As such there is considered to be a High potential for modern remains to survive on the Site. Any such remains would likely be associated with modern agricultural activities as well as demolition and construction activities associated with historically recorded buildings, modern roads and service/utility infrastructure and would likely be considered to be of Low or lesser sensitivity.

11.6.2 Construction

11.6.2.1 Physical Impacts

49. Physical impacts have the potential to occur from the construction of the Landfall, Cable Route Corridor, Mobilisation Areas and the Proposed Substation. This assessment looks at impacts before mitigation is applied.

50. **Table 11.7** below assess the potential physical impact on locally, regionally and nationally significant features within the Application Site Boundary. Additionally, the potential impact on unknown archaeological features is assessed within the Application Site Boundary. The assessment is accompanied by an archaeological walkover survey as found within **Appendix 11.1**. For the purpose of the assessment the route has been divided into five sections illustrated on **Figures 11.1a-e**. Impacts on each section are detailed in **Table 11.7** to **Table 11.11.**

51. There will be no impact on any assets that lie outwith the Application Site Boundary and these have been scoped out of the assessment.

Table 11.7 - Potential Physical Effects on Features within 50m of the Application Boundary in Section A

Section A		
Feature Reference	**Name/Type**	**Potential Effects**
CAN04	Lunderton – Prehistoric Souterrain	This feature is within the Cable Route Corridor and therefore could be impacted by construction activities. The construction of the trench would extend into the southernmost extent of the recorded area. This feature is recorded as destroyed, however, there is potential for evidence to remain subsurface. The sensitivity of the feature is considered to be medium. The magnitude of change is considered to be low resulting in a **moderate/minor** level of effect which is not significant.
CAN05	Saint Fergus and North Ugie Water Canal, Inverquinzie Branch, Hallmoss Aqueduct	This feature is located within the Cable Route Corridor and therefore could be impacted by the construction activities. The Cable Trench is not proposed to cross this feature. The feature is located within an area of woodland and at this point, a trenchless crossing will be used to take the route under the treeline. Therefore, the Proposed Development is unlikely to have any impact on this feature. The sensitivity of the feature is considered to be medium. The magnitude of change is considered to be negligible resulting in a **minor** level of effect which is not significant.
CAN08	Saint Fergus and North Ugie Water Canal, Stonemills Corn Mill Bridge	The proposed Cable Route Corridor does not cross this feature, however, it is located within the Application Site Boundary. Therefore, erosion and damage from construction vehicles and activities have the potential to occur. The sensitivity of the feature is considered to be medium. The magnitude of change is considered to be negligible resulting in a **minor** level of effect which is not significant.
HER01	Ugie Canal	The Cable Trench and Cable Route Corridor will cross this feature and therefore, the asset has the potential to be impacted by the construction activities. The canal is incomplete and at this point there is no visible evidence of the canal, and the field is regularly used for agricultural practices. Despite this, there is potential for evidence of the canal to remain subsurface. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be low resulting in a **minor** level of effect which is not significant.
HER02	Stonemills – Lades & Stone	The Cable Route Corridor and Cable Trench crosses this feature and therefore, the asset has the potential to be impacted by the construction activities. At this point, a trenchless crossing is proposed to take the corridor under the River Ugie, this trenchless crossing would also incorporate this feature. Therefore, the Proposed Development is unlikely to have any impact on this feature. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be negligible resulting in a **minor/negligible** level of effect which is not significant.
HER03	St Fergus Pipeline – Watching Brief	This was a watching brief that was undertaken during the construction of the St Fergus Gas Pipeline. None of the features discovered during the watching brief are within the 50m assessment area with the closest feature located approximately 207m to the north-west of the Proposed

Section A		
		Development. Therefore, the Proposed Development will not have any impact on the features associated with this watching brief. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be **none** resulting in no level of effect.
DS18	Great North of Scotland Railway – Formartine and Buchan Section	This feature is the Formartine and Buchan section of the Great North of Scotland Railway which is now the Formartine and Buchan Way. The route is proposed to be trenchless at this point and therefore will be going under the former railway and no groundbreaking activities will occur here. Please see **Chapter 5 – Project Description** for a description of the construction activities. It is unlikely there will be any impact to this feature. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be negligible resulting in a **minor/negligible** level of effect which is not significant.
HER14	Stonemills – Remains of Cornmill	The Cable Route Corridor would cross the most north-easterly extent of the feature's recorded area and therefore the construction activities have the potential to impact the features. The area within the Cable Route Corridor does not appear to have any upstanding remains however, it is possible that there are remains associated with the feature subsurface. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be low resulting in a **minor** level of effect which is not significant.
CAN17	Craigewan Links/ Beach	This feature is located within the Application Site Boundary. All works in this area will involve a trenchless construction method in order to bring the cable on to land (see **Chapter 5 – Project Description**). These construction works will be deep underground. As such, it is unlikely that the Proposed development would have impact on this feature. The sensitivity of the feature is considered to be medium. The magnitude of change is considered to be negligible resulting in a **minor** level of effect which is not significant.

Table 11.8 - Potential Physical Effects on Features within 50m of the Application Boundary in Section B

Section B		
Feature Reference	**Name/Type**	**Potential Effects**
CAN11	Woodside – Medieval Rig and Furrow	The Cable Trench and Cable Route Corridor would cut through the field in which the rig and furrow is situated. This section of rig and furrow has been recently ploughed and is therefore, no longer evident on satellite imagery and can therefore, be described as destroyed, however, there is potential for subsurface evidence to exist and therefore there is potential that the Proposed Development could result in a loss of information associated with the rig and furrow. See **Appendix 11.1** for more details. The sensitivity of the feature is considered to be medium. The magnitude of change is considered to be low resulting in a **moderate/minor** level of effect which is not significant.
HER04	Ugie Canal	The Cable Route Corridor and Cable Trench crosses this feature and therefore, has the potential to be impacted by the construction activities. At this point, a trenchless crossing is proposed to take the corridor under the feature. Please see **Chapter 5 – Project Description** for a description of

Section B		
		the construction activities. As such, the Proposed Development is unlikely to have any impact on this feature. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be negligible resulting in a **minor/negligible** level of effect which is not significant.

Table 11.9 - Potential Physical Effects on Features within 50m of the Application Boundary in Section C

Section C		
Feature Reference	**Name/Type**	**Potential Effects**
HER05	Inverquhomery – remains of a designed landscape	The Cable Route Corridor and Cable Trench cross this feature and therefore, the asset has the potential to be impacted by the construction activities. At this point a trenchless crossing is proposed to take the corridor under an area of woodland which forms part of the asset. Therefore, the Proposed Development is unlikely to have any impact on this feature. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be negligible resulting in a **minor/negligible level** of effect which is not significant.
DS06	Cowles Well	This feature is located within the application boundary and therefore, has the potential to be affected by construction activities. At this point, the Cable Route Corridor is proposed to be trenchless to take the route under a section of woodland. Please see **Chapter 5 – Proposed Development** for a description of the construction activities. It is possible that subsurface evidence of the well exists and therefore, a loss of information that provides an understanding of the feature could occur. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be medium resulting in a **moderate/minor** level of effect which is not significant.

Table 11.10 - Potential Physical Effects on Features within 50m of the Application Boundary in Section D

Section D		
Feature Reference	**Name/Type**	**Potential Effects**
CAN15	Skipleton – Site of destroyed Farmstead	The Cable Trench is proposed to extend into the northern section of the recorded extent of this feature. This feature is recorded as destroyed, however, there is potential that evidence could remain subsurface. The sensitivity of the feature is considered to be medium. The magnitude of change is considered to be low resulting in a **moderate/minor** level of effect which is not significant.
HER10	Nethermuir House	The Cable Trench and Cable Route Corridor cross this feature in two different locations. These are both sections of woodland associated with the former Nethermuir House designed landscape. It is proposed that the more westerly section is crossed using a trenchless crossing to take the route under the Ancient Woodland and the neighbouring road junction. The most easterly of the sections is proposed to have a trenched crossing and therefore, would require the removal of trees within the designed landscape. This would result in the loss of around 1,000m² of mature woodland which comprises the shelterbelt. This would be similar in size to

Section D		
		the gap created 60m south of the corridor where the overhead line passes. This would further erode this element of the estate. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be medium resulting in a **moderate/minor** level of effect which is not significant.
WS01	Field Drain	This feature is located within the proposed Cable Route Corridor and therefore, has the potential to be impacted by the Proposed Development. The entire extent of the feature would be impacted by the Proposed Development resulting in the loss of the feature. This feature has been indicated to be modern in age (AD1900 onwards). Please see **Appendix 11.1** for further information. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be high resulting in a **moderate** level of effect which is not significant.
DS11	Building	This feature is located within the Application Site Boundary and therefore, has the potential to be affected by construction activities. No ground-breaking activities are proposed to take place at the location of this feature and the feature is no longer standing. Therefore, the Proposed Development is unlikely to have any impact on this feature. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be negligible resulting in a **minor/negligible** level of effect which is not significant.
DS12	Farmstead	This feature is located within the Application Site Boundary and therefore, has the potential to be affected by construction activities. No ground-breaking activities are proposed to take place at the location of this feature and the feature is no longer standing. Therefore, the Proposed Development is unlikely to have any impact on this feature. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be negligible resulting in a **minor/negligible** level of effect which is not significant.
DS13	Great North of Scotland Railway – Formartine and Buchan Section	This feature is the Formartine and Buchan section of the Great North of Scotland Railway which is now the Formartine and Buchan Way. The route is proposed to be trenchless at this point and therefore will be going under the former railway and no groundbreaking activities will occur here. It is unlikely there will be any impact to this feature. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be negligible resulting in a **minor/negligible** level of effect which is not significant.
DS14	Badnyrieves - Cropmarks	This feature is located within the Application Site Boundary and therefore, has the potential to be affected by the construction activities. Only the southern section of the recorded asset is within the Application Site Boundary. The proposed Cable Trench does not cross the feature and therefore impact could occur from vehicle movements or activities associated with the construction of the Cable Trench, not the Cable Trench itself. As such, the impact on the feature is likely to be minimal. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be negligible resulting in a **minor/negligible** level of effect which is not significant.

Table 11.11 - Potential Physical Effects on Features within 50m of the Application Boundary in Section E

Section E		
Feature Reference	**Name/Type**	**Potential Effects**
HER12	Mitchellhill Cottage – destroyed mill	The southern half of this feature is situated within the Cable Route Corridor and therefore has the potential to be impacted by the construction activities. This feature is recorded as destroyed, however there is potential for subsurface evidence to remain. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be low resulting in a **minor** level of effect which is not significant.
WS02	Ditch	The Cable Route Corridor and Cable Trench crosses this feature and therefore, has the potential to be impacted by the construction activities. The entire extent of the feature would be impacted by the Proposed Development resulting in the loss of the feature. The sensitivity of the feature is considered to be low. The magnitude of change is considered to be high resulting in a **moderate** level of effect which is not significant.

11.6.2.2 Setting Impact

52. Temporary setting impacts have the potential to occur from the Landfall, along the Cable Route Corridor and at the Proposed Substation during the construction period and would result from the visibility of construction activity, use of lay down areas, and mobilisation areas. The construction activities would involve:

- Trenchless methods to bring the cable onto the land;
- The creation of the Cable Trench, storage of soil and laying of the cable;
- Trenchless crossings under watercourses, roads and existing infrastructure; and
- The construction of the Proposed Substation and associated infrastructure.

53. **Table 11.12** below assesses the temporary setting impact on nationally significant features such as Scheduled Monuments, Category A Listed Buildings, Inventory Gardens and Designed Landscapes, Inventory Battlefields and World Heritage Sites and regionally significant features such as Category B Listed Buildings. Category C Listed Buildings and Conservation Areas resulting from the construction activities.

54. All impacts outlined in **Table 11.12** would be temporary and limited to a restricted period of time. Upon completion, other than the Proposed Substation, the setting of these features would be fully restored, the landscape would return to the current baseline and the setting of the features and the ability to appreciate them would revert to their original state. These features have been assessed before mitigation is applied.

Table 11.12 – Assessment of Temporary Setting Effects on Features from Construction Activities

SM01 Castle Hill, motte	
Schedule/ Listing Number	SM3259
Setting Baseline	Castle Hill motte is situated within an arable agricultural field on an elevated section of land approximately 363m south-west of the Mobilisation Area 5 as illustrated on **Figure 11.1a**. Due to the elevated position, the feature has a wide-ranging view across the landscape and over the coastline which also gives it a prominence throughout the localised area. The surrounding setting is comprised of arable agricultural fields, additionally woodland to the south and west. There are a number of manmade features around the motte including transmission lines and agricultural buildings. There is a pylon 68m to the north-east of the Scheduled Monument.

Assessment of Impact	During construction, Mobilisation Area 5 will be visible to the north-east of the motte as seen on **Figure 11.1a.** This visibility would be in the same section of the setting as the pylon directly north-east of the feature. Additionally, construction activity on the Cable Route Corridor would also be visible to the north-east and north-west of the Scheduled Monument. Due to the elevated position in the landscape, the motte would have visibility of these activities and they would be prominent but not overbearing. However, the Proposed Development would only minimally interrupt views out over the coastline. Due to the size of the mobilisation area, there would be a considerable amount of activity. The temporary units, car parks and activity would be visible in conjunction with other man-made and agricultural elements, including the A90. Due to the prominence of the feature, it is likely that there will be third-party intervisibility from the north of the Mobilisation Area, where the units would be backdropped by the hill on which the Scheduled Monument is situated. Woodland to the south would restrict the intervisibility from this direction, however there would be points where both the Scheduled Monument and the Mobilisation Area would appear together, where the Mobilisation Area and corridor would be prominent features. These impacts would not be to a level that the ability to appreciate the setting of the feature would be diminished.
Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	Yes
Sensitivity	High
Magnitude of Change	Medium
Level of Effect	Major/Moderate
SM02 Ravenscraig Castle	
Schedule/ Listing Number	SM2496
Setting Baseline	Ravenscraig Castle is situated within an area of woodland on the southern banks of the River Ugie approximately 277m south-west of the Proposed Development as illustrated on **Figure 11.1a**. The castle has an enclosed setting due to the surrounding woodland, some being Ancient Woodland and therefore, this restricts outwards views from the feature. Additionally, the woodland restricts views towards the castle and as such, the feature does not have any wider prominence. Additionally, the steeper topography of the riverbanks, further create an enclosed setting to the feature.
Assessment of Impact	Due to the enclosed setting created by the woodland and the banks of the river, visibility from the castle of the construction activity on the Cable Route Corridor in unlikely. Additionally, the lack of prominence means that intervisibility of the Scheduled Monument with the Proposed Development from third-party locations is also unlikely. The setting of the feature and the ability to understand it would remain intact.
Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	Yes
Sensitivity	High
Magnitude of Change	Negligible

Level of Effect	Moderate/Minor
SM03 North Mains of Auchmaliddie, stone circle	
Schedule/ Listing Number	SM392
Setting Baseline	North Mains of Auchmaliddie Stone Circle is located on a low hill adjacent to a farm track and arable fields approximately 495m to the south-east of the Cable Route Corridor and 4.6km to the east of the Proposed Substation as illustrated in **Figures 11.1e** and **11.2**. The agricultural land is active and therefore, the feature experiences a sense of occasional movement. The stones, while distinctive, are not prominent in the wider landscape due to their current low-lying nature and the surrounding topography and hedgerows. The elevated position of the feature gives a wide-ranging view across the landscape. Due to the recumbent nature of the stone circle, views over the feature are key as the stones are designed to create a false horizon during astronomical events.
Assessment of Impact	The stone circle would have theoretical visibility of construction the Cable Route Corridor and the Proposed Substation. Due to the lack of prominence due to the recumbent nature of the stones, intervisibility from third-party locations is unlikely to occur. The elevated position gives the feature views across the landscape and therefore, it will have visibility of the construction activities. Given its location on active agricultural land, the feature already features some movement in close proximity, however the presence of the construction corridor will be significantly more intense. Due to the distance, while the construction activities would be visible over the stone circle, this would only occur when the receptor is located next to the stone circle and the views would not be prominent nor would they dominate the setting. The setting of the feature and the ability to appreciate it would remain intact.
Impact from Proposed Substation Construction	Yes
Impact From Cable Route Corridor Construction	Yes
Sensitivity	High
Magnitude of Change	Low
Level of Effect	Moderate
SM04 Gight Castle, dovecot	
Schedule/ Listing Number	SM229
Setting Baseline	Gight Castle Dovecot is located on the northern edge of the Ythan Gorge in an area of woodland. The dovecot is located approximately 4.8km from the proposed Substation as illustrated in **Figure 11.2**. There are limited upstanding remains with only the NE wall and parts of the adjacent wall still standing. The feature is surrounded by ancient woodland and areas of grassland. The woodland and surrounding topography provide an enclosed setting, limiting outwards views as well as providing a strong sense of place to both this feature and the associated SM05 – Gight Castle.
Assessment of Impact	The ZTV does not predict any visibility from the dovecote. Additionally, due to the surrounding woodland, third-party intervisibility from the south where the ZTV does predict visibility of the substation is unlikely to occur. Therefore, the addition of construction activities at the proposed substation temporarily into the setting of the feature would not detract from the ability to appreciate or understand it or its setting. The proposed construction activities would not alter the relationship with SM05, having no impact on either.

Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	No
Sensitivity	High
Magnitude of Change	No Change
Level of Effect	None
SM05 Gight Castle	
Schedule/ Listing Number	SM508
Setting Baseline	Gight Castle is located on the northern edge of the Ythan Gorge within an area of grassland approximately 222m south-east of Gight Castle Dovecote (SM04) and 4.9km form the proposed Substation as illustrated on **Figure 11.2.** The castle remains as an upstanding feature in the form of overgrown ruins. The surroundings of the feature comprise of grassland, scattered trees and extensive areas of ancient woodland in most directions. The surrounding woodland and topography give the castle an enclosed setting restricting all outwards views from the castle to the immediate surroundings. Additionally, this woodland, and the valley location provided key setting elements to the feature.
Assessment of Impact	The ZTV does not predict any visibility from the castle. Additionally, due to the surrounding woodland, third-party intervisibility from the south, where the ZTV does predict visibility of the substation, is unlikely to occur. Therefore, the construction activities at the proposed would not detract from the ability to appreciate or understand the castle or its setting.
Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	No
Sensitivity	High
Magnitude of Change	No Change
Level of Effect	None
LB01 Millbank House	
Schedule/ Listing Number	LB9421 (B Listed)
Setting Baseline	Millbank House is located within an area of woodland which is surrounded by agricultural farmland and is located approximately 90m from the Proposed Development as seen on **Figure 11.1b.** The surrounding woodland, which is a key setting element to the house, creates an enclosed setting and restricts the majority of outwards views from the house. This additionally restricts views towards the house. The house is approached from the north-west and key views from the house are likely to be to the south-east where there is a terrace and a small break in the woodland.
Assessment of Impact	The construction activities would be directly south of the house and therefore, could be partially visible through the break in the trees from the key views to the front of the house. The activities visible at this point would be associated with a trenchless crossing. There would be no other views of the construction activities anywhere else on the property due

	to the screening created by the woodland. Therefore, visibility of the construction activities would be prominent from this location due to the proximity and direction but would be isolated to one aspect of the feature. Due to the proximity of the house to the Proposed Development, noise and vibration impacts may be experienced from the house. This would likely be a distinct addition and may interrupt the appreciation of the building, but this would be temporary.
Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	Yes
Sensitivity	Medium
Magnitude of Change	Medium
Level of Effect	Moderate
LB02 Bridge of Rora	
Schedule/ Listing Number	LB9422 (B Listed)
Setting Baseline	The Bridge of Rora carries a minor road over the River Ugie approximately 352m north of the Proposed Development near Millbank as illustrated on **Figure 11.1b.** The bridge carries the road from south-east to north-west/north-west to south-east. The feature is surrounded by agricultural land and buildings and areas of woodland. Its position on the River Ugie is the primary aspect of its setting.
Assessment of Impact	The construction activities would be visible to the south of the bridge and therefore, would appear in the oblique view of the bridge-user. The primary function of the bridge is to carry vehicles or people over the water and therefore, while visible and somewhat prominent, the construction activities to the south would not detract from the function of the bridge or the ability to perform it.
Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	Yes
Sensitivity	Medium
Magnitude of Change	Low
Level of Effect	Moderate/Minor
LB03 Steading, Inverquhomery	
Schedule/ Listing Number	LB9425 (B Listed)
Setting Baseline	Inverquhomery Steading is located next to a number or agricultural buildings within an area of woodland approximately 292m to the east of the Proposed Development as illustrated on **Figure 11.1c.** The feature is set within a designed landscape (HER05) and therefore, the woodland creates an enclosed setting and estate character to the feature, and along with the agricultural buildings restricts inward and outwards.
Assessment of Impact	The Proposed Development would be to the west of the Listed Building, however due to the presence of woodland and buildings, it is unlikely that the construction activities would

	be prominently visible from the steading. Additionally, these factors also restrict views towards the steading and as such, intervisibility from a third-party location is unlikely to occur. For these reasons, the ability to appreciate and understand the features would remain intact, despite the close proximity of a Mobilisation Area and any noise or vibration associated with this or the Cable Route Corridor construction.
Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	Yes
Sensitivity	Medium
Magnitude of Change	Low
Level of Effect	Moderate/Minor
LB04 SW, Centre and NE Dovecotes, Inverquhomery	
Schedule/ Listing Number	LB9426 (B Listed)
Setting Baseline	Inverquhomery Dovecotes are located next to a number or agricultural buildings within an area of woodland approximately 254m to the east of the Proposed Development and approximately 64m from the previously mentioned Inverquhomery Steading (LB03) as illustrated on **Figure 11.1c.** The Dovecotes add to the setting of the steading, which in turn is a strong influence over the setting of the Dovecotes. The agricultural buildings and the woodland create an enclosed setting to the feature and outwards views are restricted.
Assessment of Impact	The Proposed Development would be to the west of the Listed Buildings, however due to the presence of woodland and buildings, it is unlikely that the construction activities would be visible from the Dovecotes. Additionally, these factors also restrict views towards the steading and as such, intervisibility from a third-party location is unlikely to occur. The close proximity of the construction activities, and the impact on the above LB03 will have an impact on the setting of the Dovecotes, regarding general noise in the area and movement. However, the ability to understand and appreciate the feature and its setting would remain intact.
Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	Yes
Sensitivity	Medium
Magnitude of Change	Low
Level of Effect	Moderate/Minor
LB05 Brae of Coynach House	
Schedule/ Listing Number	LB16055 (B Listed)
Setting Baseline	Brae of Coynach House is located in an area of woodland approximately 80m to the north-west of the Proposed Development as illustrated on **Figure 11.1c.** The woodland provides a sense of enclosure to the feature and restricts outwards views. The house is approached from the south-east and the primary views from the property are to the north-east.

Assessment of Impact	The construction activities would be theoretically visible to the south-east of the Listed Building. The woodland surrounding the house would screen the majority of visibility and the construction activities would be seen intermittently. This would not be from the primary views of the house and would be from secondary views and the driveway area. Noise from construction and vehicle movement would reduce any sense of tranquillity and remoteness the building has. There would be some temporary impacts on the ability to appreciate the feature or its setting, particularly when seen from the south, where the construction activities would be a prominent feature of the foreground.
Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	Yes
Sensitivity	Medium
Magnitude of Change	Medium
Level of Effect	Moderate
LB06 Cairnbanno House	
Schedule/ Listing Number	LB16160 (B Listed)
Setting Baseline	Cairnbanno House is located within an area of woodland next to a farmstead approximately 1.1km to the east of the Proposed Substation as illustrated in **Figure 11.2**. The woodland surrounding the property provides a key setting element and screens the Listed Building from the wider area. Additionally, it provides an enclosed setting and screens visibility from the house and towards the house. The house is accessed from the east and west and the key views from the house are to the south.
Assessment of Impact	The Proposed Substation construction activity would be theoretically visible to the west of Cairnbanno House and therefore, would not appear within the key views from the house but would appear in secondary views to the west. Additionally, the woodland and farm buildings to the west of the house would restrict views in this direction and as such, it is unlikely that the construction activity at the substation would be visible from Cairnbanno House. Due to the woodland surrounding the house and other nearby woodland, intervisibility from third-party locations of both the construction activity and the Listed Building are unlikely to occur. As such, the temporary construction activity would not detract from the ability to appreciate the setting of the house.
Impact from Proposed Substation Construction	Yes
Impact From Cable Route Corridor Construction	No
Sensitivity	Medium
Magnitude of Change	Negligible
Level of Effect	Minor
LB07 Millbrex Church	
Schedule/ Listing Number	LB9629 (B Listed)

Setting Baseline	Millbrex Church is located in an elevated area of grassland on the edge of a minor road approximately 1.5km to the south-west of the proposed Substation as illustrated in **Figure 11.2.** There is limited surrounding vegetation and therefore, the church has relatively wide-ranging views across the landscape in all directions and has some prominence in the surrounding area.
Assessment of Impact	There is theoretical visibility of the construction activity to the north-east of the church. The elevated position and lack of vegetation means that the construction activity would be visible within the wider landscape setting of the church. These activities would be next to the operational NGNDSS and therefore, the activities would be in keeping with the current activities. Intervisibility of the Proposed Development with the feature may also occur. Therefore, the construction activities would not detract from the setting or the ability to appreciate the feature.
Impact from Proposed Substation Construction	Yes
Impact From Cable Route Corridor Construction	No
Sensitivity	Medium
Magnitude of Change	Low
Level of Effect	Moderate/Minor
LB08 Lunderton House	
Schedule/ Listing Number	LB1799 (C Listed)
Setting Baseline	Lunderton House is located within an area of woodland beside a working farm approximately 60m from the Proposed Development as illustrated on **Figure 11.1a.** The woodland creates an enclosed setting and restricts all open views from the house.
Assessment of Impact	Mobilisation Area 5 would be directly south of the Listed Building. Despite this, the woodland would restrict all views towards the Proposed Development. Due to the proximity of the house to the Proposed Development, noise and vibration impacts may be experienced from the house. The farming-setting, will likely provide baseline intermittent noise, however the construction noise would be a distinct addition and may interrupt the appreciation of the building, but this would be temporary.
Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	Yes
Sensitivity	Medium
Magnitude of Change	Medium
Level of Effect	Moderate
LB09 Skelmuir House	
Schedule/ Listing Number	LB16056 (C Listed)

Setting Baseline	Skelmuir House is located within an area of woodland on a working farm approximately 380m to the south of the Proposed Development as illustrated on **Figure 11.1d.** The woodland creates an enclosed setting and restricts all open views from the house.
Assessment of Impact	The woodland surrounding the house would restrict all views towards the Proposed Development. Noise and vibration impacts from construction may be experienced from the house. The farming setting will likely provide baseline intermittent noise and the noise from the construction would be a minor addition to this and would be temporary.
Impact from Proposed Substation Construction	No
Impact From Cable Route Corridor Construction	Yes
Sensitivity	Medium
Magnitude of Change	Negligible
Level of Effect	Minor

11.6.3 Operation

11.6.3.1 Setting Impacts

55. Setting effects during operation would only occur from the Proposed Substation. The Landfall and Cable Route Corridor would return to their current state with occasional maintenance vehicles requiring access which would be consistent with the baseline setting and vehicle movements in the area, given the agricultural nature of the surrounding landscape. As such, there would be no impact to the setting of the features along the Cable Route Corridor and the ability to appreciate and understand their setting would remain intact. Therefore, these elements have been scoped out of the following operation assessment.

56. **Table 11.13** below assesses the setting impact on nationally significant features such as Scheduled Monuments, Category A Listed Buildings, Inventory Gardens and Designed Landscapes, Inventory Battlefields and World Heritage Sites within 5km of the Proposed Substation and regionally significant features such as Category B Listed Buildings, Category C Listed Buildings and Conservation Areas within 2km of the Proposed Substation during the operational phase of the Proposed Substation. This assessment considers the impacts before mitigation is applied.

Table 11.13 - Assessment of Setting Effects during the Operational Phase of the Proposed Substation

SM03 North Mains of Auchmaliddie, stone circle	
Schedule/ Listing Number	SM392
Setting Baseline	North Mains of Auchmaliddie Stone Circle is located on a low hill adjacent to a farm track and arable fields approximately 4.6km to the east of the Proposed Substation as illustrated in **Figure 11.2.** The agricultural land is active and therefore, the feature experiences a sense of movement. The stones, while distinctive, are not prominent in the wider landscape due to their current low-lying nature and the surrounding topography and hedgerows. The elevated position of the feature gives a wide-ranging view across the landscape.
Assessment of Impact	The stone circle would have theoretical visibility of the Proposed Substation. Due to the lack of prominence caused by the low-lying nature of the stones, intervisibility from third-party locations is unlikely to occur. The elevated position gives the feature views across the landscape and therefore, it will have visibility of the Proposed Substation. Given its location on active agricultural land, the feature already experiences movement in close proximity. Due to the distance, while the Proposed Substation would be visible over the

	stone circle, this would only occur when the receptor is located next to the stone circle and the views would not be prominent, nor would the Proposed Substation dominate the setting. The Proposed Substation would appear next to the existing NGNDSS and therefore would occupy the same section of the setting, only marginally increasing its extent. As such, the setting of the feature and the ability to appreciate it would remain intact.
Sensitivity	High
Magnitude of Change	Low
Level of Effect	Moderate
SM04 Gight Castle, dovecot	
Schedule/ Listing Number	SM229
Setting Baseline	Gight Castle Dovecot is located on the northern edge of the Ythan Gorge in an area of woodland. The dovecot is located approximately 4.8km from the Proposed Substation as illustrated in **Figure 11.2.** There are limited upstanding remains with only the NE wall and parts of the adjacent wall still standing. The feature is surrounded by ancient woodland and areas of grassland. The woodland and surrounding topography provide an enclosed setting, limiting outwards views as well as providing a strong sense of place to both this feature and the associated SM05 (Gight Castle).
Assessment of Impact	The ZTV does not predict any visibility from the dovecote. Additionally, due to the surrounding woodland, third-party intervisibility from the south where the ZTV does predict visibility of the Proposed Substation is unlikely to occur. Therefore, the addition of the Proposed Substation into the surrounding landscape would not detract from the ability to appreciate or understand it or its setting.
Sensitivity	High
Magnitude of Change	No Change
Level of Effect	None
SM05 Gight Castle	
Schedule/ Listing Number	SM508
Setting Baseline	Gight Castle is located on the northern edge of the Ythan Gorge within an area of grassland approximately 222m south-east of Gight Castle Dovecote (SM04) and 4.9km from the Proposed Substation as illustrated on **Figure 11.2.** The castle remains as an upstanding feature in the form of overgrown ruins. The surroundings of the feature comprise of grassland, scattered trees and extensive areas of ancient woodland in most directions. The surrounding woodland and topography give the castle an enclosed setting restricting all outwards views from the castle to the immediate surroundings. Additionally, this woodland, and the valley location provided key setting elements to the feature.
Assessment of Impact	The ZTV does not predict any visibility from the castle. Additionally, due to the surrounding woodland, third-party intervisibility from the south where the ZTV does predict visibility of the Proposed Substation is unlikely to occur. Therefore, the addition of the Proposed Substation into the surrounding landscape would not detract from the ability to appreciate or understand it or its setting.
Sensitivity	High
Magnitude of Change	No Change
Level of Effect	None
LB06 Cairnbanno House	

Schedule/ Listing Number	LB16160 (B Listed)
Setting Baseline	Cairnbanno House is located within an area of woodland next to a farmstead approximately 1.1km to the east of the Proposed Substation as illustrated in **Figure 11.2**. The woodland surrounding the property provides a key setting element and screens the Listed Building from the wider area. Additionally, it provides an enclosed setting and screens visibility from the house and towards the house. The house is accessed from the east and west and the key views from the house are to the south.
Assessment of Impact	The Proposed Substation would be theoretically visible to the west of Cairnbanno House and therefore, would not appear within the key views of the house. Additionally, the woodland and farm buildings to the west of the house would restrict views in this direction and as such, it is unlikely that the Proposed Substation would be visible from the Listed Building. Due to the woodland surrounding the house and other nearby woodland, intervisibility from third-party locations of both the Proposed Substation and the Listed Building are unlikely to occur. As such, the addition of the Proposed Substation into the surrounding landscape would not detract from the ability to appreciate the setting of the house.
Sensitivity	Medium
Magnitude of Change	Negligible
Level of Effect	Minor
LB07 Millbrex Church	
Schedule/ Listing Number	LB9629 (B Listed)
Setting Baseline	Millbrex Church is located in an elevated area of grassland on the edge of a minor road approximately 1.5km to the south-west of the Proposed Substation as illustrated in **Figure 11.2.** There is limited surrounding vegetation and therefore, the church has relatively wide-ranging views across the landscape in all directions and has some prominence in the surrounding area.
Assessment of Impact	There is theoretical visibility of the Proposed Substation to the north-east of the church. The elevated position and lack of vegetation means that the Proposed Substation would be visible in the wider landscape setting of the church. This would be visible next to the operational NGNDSS and therefore, would be in keeping with the existing character of the Church's setting. Intervisibility of the Proposed Development with the feature may also occur. Despite this, the addition of the Proposed Development into the landscape setting of the feature would not detract from the ability to appreciate the feature or its setting.
Sensitivity	Medium
Magnitude of Change	Low
Level of Effect	Moderate/Minor

11.7 Mitigation

57. Planning guidance states that it is Government policy to protect and preserve archaeological sites and monuments *in situ* wherever feasible. Where preservation *in situ* is not possible, planning authorities should ensure that an appropriate level of excavation, recording, analysis, publication, and archiving is carried out, before and/or during development.

11.7.1 Construction Mitigation

11.7.1.1 Physical Impacts

58. Current proposals indicate that a number of features within the study area will be outwith the area of ground-breaking and construction activity. For those features that are within the area of groundbreaking and construction activity mitigation will be implemented.

- HER10 – a trenchless crossing is proposed to limit the removal of trees associated with the feature, alternatively, replanting of the trees removed could be undertaken.
- HER14 – while not in the Cable Route Corridor, it is in the Application Site Boundary and therefore, fencing may be appropriate to avoid damage and erosion.
- DS11 – fencing off the feature to avoid accidental damage and erosion from vehicle movements may be appropriate.
- DS12 - fencing off the feature to avoid accidental damage and erosion from vehicle movements may be appropriate.

59. It is possible that remains may survive in close proximity to known features or that subsurface remains associated with the features may survive within the Application Site Boundary and therefore, it is suggested that an archaeological watching brief may be appropriate for some features where groundbreaking works are required within approximately 10m of known features and this would inform further understanding of the features. Features where this may be appropriate include:

- CAN04
- CAN11
- CAN15
- WS01
- WS02
- HER01
- HER10
- HER12
- HER14

60. Where Trenchless Crossings are proposed, an archaeological watching brief would not be appropriate for underground works. For such features, a preconstruction Site visit to identify any remains and record them. This is proposed for feature DS06.

61. The following areas are proposed for mitigation given the judged of medium potential for prehistoric remains to survive. Recommended mitigation for these features includes a Watching Brief or targeted trial trenching. These features can be seen illustrated within the figures of **Appendix 11.1.**

- Section north of the extent of DS-31.
- Section north-west of urn (HER-NK04SW0002, DS-85) and hammer stone (HER-NK04SW0002, DS-84).
- Section north of CAN-346374 & DS-95 and **CAN12**, CAN-128948 & DS-96).

62. It is possible that unknown archaeology may exist in the Application Site Boundary. Given the identified physical impacts and potential for unknown remains to survive in the Application Site Boundary, a programme of works may be required to be undertaken. This programme of archaeological works would be implemented to the satisfaction of Aberdeenshire Council's Archaeologist and an Archaeological Clerk of Works may be used if appropriate.

11.7.1.2 Setting Impacts

63. These effects would be temporary and for a short period of time, and the setting of the features would return to its previous condition upon completion and as such, no mitigation is proposed.

11.7.2 Operation Mitigation

11.7.2.1 Setting Impacts

64. Current proposals indicate that the majority of the features within the study area would not be significantly impacted by the Proposed Substation due to screening provided by the surrounding topography, vegetation and buildings.

65. However, LB07 would have visibility of the Proposed Substation due to its elevated position and third-party intervisibility is likely to occur. As such, mitigation planting on the south-western side of the Proposed Substation may be appropriate. This planting would be appropriate with the vegetation in the surrounding area.

11.8 Decommissioning

66. All the visible, above ground structure associated with the Proposed Substation will be removed upon decommissioning, thus rendering the setting effects of the Proposed Development as reversible. There would, therefore, be no setting effects remaining after decommissioning as a result of the Proposed Development.

11.9 Residual Effects

67. **Table 11.14** outlines the residual effects of the features where mitigation is proposed. Where mitigation does not apply, the level of effect on these features would remain the same as outlined in the assessment in **Section 11.6.**

Table 11.14 – Summary of Residual Effects

Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
	Sensitivity	Magnitude	Significance		
Construction					
CAN04	Medium	Low	Moderate/ Minor	Proposed Watching Brief	Minor adverse – not significant
CAN11	Medium	Low	Moderate/ Minor	Proposed Watching Brief	Minor adverse – not significant
CAN15	Medium	Low	Moderate/ Minor	Proposed Watching Brief	Minor adverse – not significant
HER01	Low	Low	Minor	Proposed Watching Brief	Minor/Negligible adverse – not significant
HER10	Low	Low	Minor	Proposed Trenchless Crossing or Proposed Replanting and a Watching Brief	Minor/Negligible adverse – not significant
HER12	Low	Low	Minor	Proposed Watching Brief	Minor/Negligible adverse – not significant
HER14	Low	Low	Minor	Proposed Fencing and Watching Brief	Minor/Negligible adverse – not significant
DS06	Low	Low	Minor	Proposed Site Visit ahead of construction activities	Minor/Negligible adverse – not significant
DS11	Low	Negligible	Minor/ Negligible	Proposed Fencing	None
DS12	Low	Negligible	Minor/ Negligible	Proposed Fencing	None
WS01	Low	High	Moderate	Proposed Watching Brief	Moderate/Minor – not significant
WS02	Low	High	Moderate	Proposed Watching Brief	Moderate/Minor – not significant

Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
	Sensitivity	Magnitude	Significance		
Operation					
LB07	High	Low	Moderate	Proposed Vegetation Screening	Moderate/Minor adverse – not significant

11.10 Cumulative Assessment

11.10.1 Construction

68. This assessment considers the cumulative setting impacts of the Proposed Substation and Cable Route Corridor in conjunction with the consented and in planning applications illustrated in **Figure 3.1** resulting from the construction activities. The assessment will consider nationally significant features such as Scheduled Monuments, Category A Listed Buildings, Inventory Gardens and Designed Landscapes, Inventory Battlefields and World Heritage Sites within 500m of the Cable Route Corridor and 5km of the Proposed Substation and regionally significant features such as Category B Listed Buildings and Conservation Areas within 500m of the Cable Route Corridor and 2km of the Proposed Substation.

69. All cumulative effects outlined in **Table 11.5** are temporary construction impacts.

Table 11.15 – Assessment of Cumulative Impacts during Construction

SM01 Castle Hill, motte	
Schedule/ Listing Number	SM3259
Assessment of Cumulative Impact	**Consented Projects** There is one consented project within 2km of this feature, ECU00003226 Kirkton Solar PV Farm and Energy Storage Facility, which is located 1.5km to the north of the Scheduled Monument which has the potential to have cumulative construction impact with the Proposed Development. This development would be located behind woodland and therefore, it is unlikely that construction activity would be visible as anything more than glimpses of construction vehicles arriving and departing the Site. The sensitivity of the feature is high. The magnitude of change is considered to be medium resulting in a **major/moderate** level of effect that is significant. **In Planning Projects** There is one In Planning project within 2km of this feature, APP/2022/0369 Residential Mixed Use Development (800 houses), which is located 480m to the south-east of the SM. There would be open views of this application from the feature, these views would be in the opposite direction of the Proposed Development. While they would appear simultaneously, there may be the feeling of being surrounded by construction activity, which would have an impact on the setting of the motte. The sensitivity of the feature is high. The magnitude of change remains medium - resulting in a **major/moderate** level of effect that is significant.
SM02 Ravenscraig Castle	
Schedule/ Listing Number	SM2496
Assessment of Cumulative Impact	Due to the presence of intervening vegetation and buildings, the construction of the Proposed Development would not be visible from this feature. Therefore, there would be no cumulative impact on this feature.

	The sensitivity of the feature is high. There is no magnitude of change and therefore, the level of effect is **none.**
SM03 North Mains of Auchmaliddie, stone circle	
Schedule/ Listing Number	SM392
Assessment of Cumulative Impact	**Consented Projects** The closest consented project to this feature is the ECU00000677 North-East 400kV Overhead Line Reinforcement Works application. The construction work for this area is "well underway"[v] and as such, it is unlikely that these works will result in any cumulative impacts either consecutively or concurrently. The sensitivity of the feature is high. The cumulative magnitude of change would be no change and the level of effect is **none**. **In Planning Projects** There are no In Planning projects within 2km of the feature and therefore the cumulative level of effect remains **none.**
SM04 Gight Castle, dovecot	
Schedule/ Listing Number	SM229
Assessment of Cumulative Impact	The construction activities would not be visible from this feature. Therefore, there would be no cumulative impact on this feature. The sensitivity of the feature is high. There would be no magnitude of change and the level of effect is **none.**
SM05 Gight Castle	
Schedule/ Listing Number	SM508
Assessment of Cumulative Impact	The construction activities would not be visible from this feature. Therefore, there would be no cumulative impact on this feature. The sensitivity of the feature is high. There would be no magnitude of change and the level of effect is **none.**
LB01 Millbank House	
Schedule/ Listing Number	LB9421 (B Listed)
Assessment of Cumulative Impact	**Consented Projects** The only consented project within 2km of the feature is APP/2019/0421 Formation of Footpath. This would be to the east and south-east of the feature. Views from the house are screened by the woodland surrounding the house in this direction and therefore, the developments would not be seen in conjunction with each other. The sensitivity of the feature is medium There would be no magnitude of change and the level of effect is **none.** **In Planning Projects** There are no In Planning projects within 2km of the feature and therefore the cumulative level of effect remains **none.**
LB02 Bridge of Rora	
Schedule/ Listing Number	LB9422 (B Listed)

Assessment of Cumulative Impact	**Consented Projects** The only consented project within 2km of the feature is APP/2019/0421 Formation of Footpath. Due to the raised topography and the woodland that intervene between the bridge and the formation of the footpath, the two developments would not be seen in conjunction with each other from the feature. The sensitivity of the feature is medium There would be no magnitude of change and the level of effect is **none.** **In Planning Projects** There are no In Planning projects within 2km of the feature and therefore the cumulative level of effect remains **none.**
LB03 Steading, Inverquhomery	
Schedule/ Listing Number	LB9425 (B Listed)
Assessment of Cumulative Impact	**Consented Projects** There are no consented projects located within 2km of the Listed Building and as such there will be no cumulative impact on this feature. The sensitivity of the feature is medium There would be no magnitude of change and the level of effect is **none** **In Planning Projects** There are no In Planning projects within 2km of the feature and therefore the cumulative level of effect remains **none.**
LB04 SW, Centre and NE Dovecote, Inverquhomery	
Schedule/ Listing Number	LB9426 (B Listed)
Assessment of Cumulative Impact	**Consented Projects** There are no consented projects located within 2km of the Listed Building and as such there will be no cumulative impact on this feature. The sensitivity of the feature is medium There would be no magnitude of change and the level of effect is **none** **In-Planning Projects** There are no In Planning projects within 2km of the feature and therefore the cumulative level of effect remains **none.**
LB05 Brae of Coynach House	
Schedule/ Listing Number	LB16055 (B Listed)
Assessment of Cumulative Impact	**Consented Projects** The closest consented project to this feature is the ECU00000677 North-East 400kV Overhead Line Reinforcement Works application. The construction works for this are "well underway" and as such, it is unlikely that these works will result in any cumulative impacts either consecutively or concurrently. The sensitivity of the feature is medium There would be no magnitude of change and the level of effect is **none** **In Planning Projects** There are no In Planning projects within 2km of the feature and therefore the cumulative level of effect remains **none.**
Sensitivity	Medium

Magnitude of Change	None
Level of Effect	None
LB06 Cairnbanno House	
Schedule/ Listing Number	LB16160 (B Listed)
Assessment of Cumulative Impact	Due to the presence of intervening vegetation and buildings, the construction would not be visible from this feature. Therefore, there would be no cumulative impact on this feature.
Sensitivity	Medium
Magnitude of Change	None
Level of Effect	None
LB07 Millbrex Church	
Schedule/ Listing Number	LB9629 (B Listed)
Assessment of Cumulative Impact	**Consented Projects** There are two consented projects located within 2km of this feature. The first is the ECU00000677 North-East 400kV Overhead Line Reinforcement Works application. The construction work for this are "well underway" and as such, it is unlikely that these works will result in any cumulative impacts either consecutively or concurrently. The second is the ECU00000649 New Pair of Terminal Towers to Connect into NGNDSS. This will appear next to the existing NGNDSS. As such, the construction activities for the Proposed Development would appear in the same section of the setting. The construction activities associated with the Proposed Development would increase the extent of the setting in which these impacts would occur to the south, however, given their proximity, the works would be indistinct from each other and the ability to understand and appreciate the setting of the feature would remain intact. The sensitivity of the feature is medium. The magnitude of change is considered to be low resulting in a **moderate** level of effect that is not significant. **In Planning Projects** There are no In Planning projects within 2km of the feature. The sensitivity of the feature is medium. The magnitude of change remains low resulting in a **moderate** level of effect that is not significant.
LB08 Lunderton House	
Schedule/ Listing Number	LB1799 (C Listed)
Assessment of Cumulative Impact	The construction activities would not be visible from this feature. Therefore, there would be no cumulative impact on this feature. The sensitivity of the feature is medium. There would be no magnitude of change resulting in a level of effect of **none.**
LB09 Skelmuir House	
Schedule/ Listing Number	LB16056 (C Listed)
Assessment of Cumulative Impact	The construction activities would not be visible from this feature. Therefore, there would be no cumulative impact on this feature.

	The sensitivity of the feature is medium. There would be no magnitude of change resulting in a level of effect of **none.**

11.10.2 Operation

70. This assessment considers the cumulative setting impacts of the Proposed Substation in conjunction with the existing NGNDSS and the consented and in planning applications illustrated on **Figure 3.1**. The assessment considers nationally significant features such as Scheduled Monuments, Category A Listed Buildings, Inventory Gardens and Designed Landscapes, Inventory Battlefields and World Heritage Sites within 5km of the Proposed Substation and regionally significant features such as Category B Listed Buildings and Conservation Areas within 2km of the Proposed Substation.

71. Features along the Cable Route Corridor have been scoped out of this assessment as they would be unaffected after the construction phase is complete.

Table 11.16 - Assessment of Cumulative Impacts During Operation

SM03 North Mains of Auchmaliddie, stone circle	
Schedule/ Listing Number	SM392
Assessment of Cumulative Impact	**Operational Projects** The Proposed Development would be visible in conjunction with the existing NGNDSS. Due to the design and position of the Proposed Substation adjacent to the existing NGNDSS the Proposed Substation will appear as part of the existing scheme. It would only extend the view of development marginally to the south and the developments would appear as one. Both the Proposed Substation and the NGNDSS would appear in the same section of the setting to the west of the feature, however, the presence of both together in this section would not be enough to detract from the setting of the feature and the ability to appreciate it and its setting. The sensitivity of the feature is high. The cumulative impact on this feature during operation would be low resulting in a **moderate/minor** level of effect which is not significant. **Consented Projects** The only consented application in close proximity to this feature is ECU00000677 North East 400kV Overhead Line Reinforcement Works. At this section of the line, none of the towers are proposed to be replaced and as such the baseline will remain the same. The sensitivity of the feature is high. The magnitude of change would remain low resulting in a **moderate/minor** level of effect which is not significant. **In Planning Projects** There are no In Planning projects in the vicinity of this feature. The sensitivity of the feature is high. The magnitude of change would remain low resulting in a **moderate/minor** level of effect.
SM04 Gight Castle, dovecot	
Schedule/ Listing Number	SM229
Assessment of Cumulative Impact	The Proposed Development would not be visible from this feature. Therefore, there would be no cumulative impact on this feature. The sensitivity of the feature is high. There would be no magnitude of change resulting in a level of effect of **none.**
SM05 Gight Castle	

Schedule/ Listing Number	SM508
Assessment of Cumulative Impact	The Proposed Development would not be visible from this feature. Therefore, there would be no cumulative impact on this feature. The sensitivity of the feature is high. There would be no magnitude of change resulting in a level of effect of **none.**
LB06 Cairnbanno House	
Schedule/ Listing Number	LB16160 (B Listed)
Assessment of Cumulative Impact	Due to the presence of intervening vegetation and buildings, the Proposed Development would not be visible from this feature. Therefore, there would be no cumulative impact on this feature. The sensitivity of the feature is medium. There would be no magnitude of change resulting in a level of effect of **none.**
LB07 Millbrex Church	
Schedule/ Listing Number	LB9629 (B Listed)
Assessment of Cumulative Impact	**Operational Projects** The Proposed Development would be visible in conjunction with the existing NGNDSS from the feature. Due to the design and position of the Proposed Substation adjacent to the existing NGNDSS, the Proposed Substation will appear as part of the existing scheme. The church sits on an elevated section of land and has a 360-degree view of the surrounding landscape. The Proposed Development would only extend the view of development marginally to the south and the developments would appear as one and therefore, the ability to understand and appreciate the feature would remain intact. The sensitivity of this feature is medium. The magnitude of change would be low resulting in a **moderate/minor** level of effect which is not significant. **Consented Projects** There are two consented applications in close proximity to this feature. The first of these is ECU00000677 North-East 400kV Overhead Line Reinforcement Works. At this section of the line, none of the towers are proposed to be replaced and as such the baseline will remain the same. The second is the ECU00000649 New Pair of Terminal Towers to Connect into NGNDSS. This will appear next to the existing NGNDSS. As such, would appear in the same section of the setting and would increase the extent of the setting in which these impacts would occur to the south, however, given their proximity, the developments would be indistinct from each other and the ability to understand and appreciate the setting of the feature would remain intact. The sensitivity of this feature is medium. The magnitude of change would remain low resulting in a **moderate/minor** level of effect which is not significant. **In Planning Projects** There are no In Planning projects in the vicinity of this feature. The sensitivity of this feature is medium. The magnitude of change would remain low resulting in a **moderate/minor** level of effect which is not significant.

11.11 Conclusion

72. Regarding physical effects, there were no significant impacts found. There were 15 features found to be within the development footprint. An archaeological watching brief may be required during ground-breaking at certain points along the Cable Route Corridor. Additionally, further features should be fenced-off during the construction phase where appropriate to avoid accidental damage or erosion from activities outwith the ground-breaking area. A further 30 features were found to be within 50m of the Proposed Development.

73. Regarding setting effects, there were significant impacts found on the setting and understanding of one feature within the relevant assessment area. This effect was found to be during the construction period and therefore would be temporary and the setting would return to baseline condition upon completion. There is a large presence of vegetation within the study area, and around a number of the historic features and this not only provides a strong setting element but also a large degree of screening from views towards the Proposed Development thus minimising any impacts to setting on some of the features.

74. In terms of cumulative impacts, there was one significant impact found. This effect is a temporary effect on the setting of a Scheduled Monument and therefore the impacts will only occur for a short period of time. This would also be a worst-case scenario of both the Proposed Development and a cumulative development occurring simultaneously. The combination of the two Substations would not overwhelm the setting of any cultural heritage assets in the study area.

11.12 References

[i] HES (2020). Managing Change in the Historic Environment: Setting

[ii] Dunwell, A and Ralston, I 2008 The Management of Cropmark Archaeology in Lowland Scotland: A Case Study From the Lunan Valley, Angus Historic Scotland, Edinburgh

[iii] Noble, G Lamont, P and Masson-Maclean, E. 2019. Assessing the ploughzone: The impact of cultivation on artefact survival and the cost/benefits of topsoil stripping prior to excavation, Journal of Archaeological Science: Reports, Volume 23, 2019, Pages 549-558, ISSN 2352-409X. https://doi.org/10.1016/j.jasrep.2018.11.015

[iv] Archaeology for Communities in the Highlands (ARCH). 2023. Highland Archaeology Research Framework (HighARF). Available at: https://scarf.scot/regional/higharf/ (Accessed 24/07/2023)

[v] SSEN (2023). North East 400kV. Available online at: https://www.ssen-transmission.co.uk/projects/project-map/north-east-400kv/

GREEN VOLT

Chapter 12

12

Socio-economics, Tourism and Recreation

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-REP-0009-12	
Version Number:	00	
Date:	*Issue Date 02/08/23*	
Prepared by:	Andy Maclean	*Andy Maclean*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First draft for review	10/07/23
A2	Second draft for review	27/07/23
A3	Clean	01/08/23
00	Final	02/08/23

Contents

12 Socio-Economics, Tourism and Recreation

12.1 Introduction

1. This chapter describes the tourism and recreation baseline conditions, identifies potential impacts, and assesses the significance of effects which may arise from the construction, operation (including maintenance) and decommissioning of the Proposed Development. Where required, mitigation measures to avoid, reduce or offset potential adverse effects or further enhance potential beneficial effects are identified. This chapter also discusses the potential impacts of the Proposed Development to socio-economics at a very high level.
2. There are other environmental topics that have relevance to aspects considered within this chapter such as **Chapter 9 - Noise**, **Chapter 11 - Cultural Heritage and Archaeology**, **Chapter 10 - Landscape and Visual Impact Assessment**, and **Chapter 13 - Traffic and Transport**. The potential effects of these topics are assessed in their respective chapters and are not reassessed in this chapter.
3. This chapter considers onshore socio-economic, tourism and recreation impacts only. For offshore impacts, please refer to the separate Offshore EIA Report, where they are appropriately addressed. It is understood that it is desirable to understand the socio-economic impacts to the Project as a whole. However, given that the Proposed Development is still at the conceptual design stage, it is difficult to predict the socio-economic impacts at this early stage. These will be detailed once the contractors have been appointed and it is understood if such contractors will have their own workforce or employee a local workforce and whether workforces will use local accommodation and services.

12.2 Legislation, Guidance and Policy

4. There is no recognised legislation, policy, or guidance specific to assessing the effects of electricity infrastructure development applications on socio-economics, tourism, or recreation. The methods used in this assessment will be based upon previous experience and established Environmental Impact Assessment (EIA) best practices, including those used in UK Government and industry reports within the renewable energy sector, where possible.

Table 12.1 – Legislation, Guidance and Policy

Type	Document
Legislation	Land Reform Act (Scotland) 2003) (amended 2016) Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations (2017)
National Policy	National Planning Framework 4 (2023)
Local Policy	Aberdeenshire Council Local Development Plan (2023).
Guidance	Scottish Tourism Alliance (2020) Tourism Scotland (TS2020) VisitScotland (2014) Position Statement

Type	Document
	Destination Aberdeenshire and Aberdeen. A Framework for Growth (2022-2030) The Scottish Outdoor Access Code Aberdeenshire Council Core Path Plan (2013) Sustrans - Documents – Cycling, Walking & Safety

12.3 Consultation

5. Following the request for a Scoping Opinion on the Proposed Development from Aberdeenshire Council, the environmental officer highlighted in their response what they required to be included in the EIA Report. **Table 12.2** below provides comments made by the environmental officer and the actions taken by the Applicant. This scoping response has informed the content of this chapter.

Table 12.2 – Scoping Consultation Responses

Consultee	Scoping Response	Action
Aberdeenshire Council – Environmental	Impact of Proposed Development on public access should not be scoped out of the EIA. The coast and Formartine & Buchan Way are very popular for public access and so potential impacts cannot be dismissed.	Formartine & Buchan Way and coastal core paths to be included in assessment within the Tourism and Recreation chapter of EIA Report (scoped in).
Aberdeenshire Council – Environmental	Impact of the Proposed Development on the local economy.	Discuss the potential effects within the Socio-Economic, Tourism and Recreation chapter of the EIA.

6. Green Cat Renewables (GCR) did not propose to include an assessment of the Proposed Development on the local economy in the Scoping Report issued to Aberdeenshire Council in December 2022 (**Appendix 1.4**). It was not included in the scope because it was felt that there would not be significant effects (adverse or beneficial) to the local economy as a result of the Proposed Development, due to a limited number of local economic receptors within the 5km study area. While it is expected that there will be jobs created and Gross Value Added (GVA) as a result of the construction phase of the Proposed Development it is not known yet how many local jobs might be created. This will be dependent on the contractor commissioned to install the Onshore Export Cable and the Proposed Substation and their work-force procurement methods.
7. There is expected to be socio-economic benefit associated with the Proposed Development. Employment opportunities are expected to arise indirectly and across various sectors as a result of the Proposed Development. These sectors include development, surveying, consenting, project management, manufacturing, and the installation of component parts. Additionally, engineering and design activities associated with maintenance requirements, as well as the transportation of components, are anticipated to generate employment opportunities.
8. Aberdeenshire has a notable history in the Oil and Gas (O&G) industry, which has led to an abundance of transferable skills among the local workforces. The onshore infrastructure work associated with the Project presents an opportunity for local services procurement (as well as individual employment opportunities), enabling the diversification of the O&G sector and tapping into the existing skill base of the region.

9. At this point it is not known where impacts relating to socio-economic benefits are expected to manifest. As the Project moves into the procurement phase, it will seek to maximise local content, where possible. However, this information is unknown at this stage. In the absence of certainty regarding contractor procurement it is not possible to accurately calculate the local socio-economic benefit arising from the Proposed Development. Thus, socio-economy will not feature within this chapter. The Applicant will commit to the following:

   - Maximise local content where possible;
   - Creating a strong link between the local community and the Proposed Development through regular information and updates on project progress;
   - The ability for individuals to contact the Applicant with questions and concerns surrounding the Proposed Development via hello@greenvoltoffshorewind.com;
   - The promotion of sustainable local products and businesses;
   - Hold supply chain events in Scotland to enable local businesses to engage with the Proposed Development;
   - There is a supply chain contact form available on the Project website to enable local suppliers to contact the Project (Green Volt Windfarm - The future of renewable energy (greenvoltoffshorewind.com))

12.4 Assessment Methodology

10. There are no recognised standards or methodologies for assessing the tourism and recreation effects of electrical infrastructure developments.

11. As such, previous experience established EIA best practices, and professional judgment has informed the approach to this assessment. This is set out below:

   - Desk-based studies to establish the baseline conditions of the Site;
   - Consultation with relevant statutory and non-statutory bodies;
   - An assessment of the impact of the Proposed Development on tourism and recreational receptors using a sensitivity/magnitude/significance matrix; and
   - Identification of possible measures to avoid, and mitigate against, any potential adverse effects as a result of the Proposed Development.

12.4.1 Data Sources

12. The information sources used to acquire baseline information can be seen below:

   - Aberdeenshire Council Outdoor Access Strategy (2021-2024)
   - Aberdeenshire Council Local Development Plan (2023)
   - Aberdeenshire Council Visitor Management Plan (2023)
   - Visit Scotland – Grampian Fact Sheet (2019)
   - Sustrans - Documents – Cycling, Walking & Safety

12.4.2 Study Area

13. Impacts upon tourists/recreation are considered within a 5km radius of the site to capture the receptors that are most likely to be affected by the Proposed Development.

14. A study area with a 5 km radius around the Proposed Development was selected to assess the potential impacts on tourism and recreation attractions induced by the Proposed Development. This study area aligns with the radius used in **Chapter 10 - Landscape and Visual**, that focuses on the Landscape and Visual Assessment (LVIA) of the Proposed Development on the surrounding landscape.

15. Beyond this 5 km distance, it is not expected that there will be any significant impacts on tourism and recreation receptors because of the Proposed Development. This means that the tourism and recreational receptors and related travel routes located farther than 5 km from the Application Site are not likely to experience notable changes in visitor numbers or usage due to the visual impacts of the Proposed Development.

16. By utilising this study area, the assessment can specifically target areas that may potentially be influenced by the visual impacts of the Proposed Development. This helps to identify and address any potential effects on tourism and recreation in the vicinity of the Proposed Development and ensures that any concerns or

considerations related to tourism and recreation are appropriately accounted for in the project planning and decision-making process.

12.4.3 Baseline Studies

17. The desk-based study included a review of the following information sources to establish tourism and recreational receptors in the area. Where applicable, national, and regional information/studies are referenced to provide context on local results.

18. The tourism baseline assessment provides information on:

- Tourist and visitor trends;
- Accommodation occupancy;
- Tourist trips and expenditure; and
- Tourist activities.

19. The recreation baseline assessment provides information on:

- Core paths;
- Cycle routes; and
- Other recreational receptors in the study area.

12.4.4 Study Limitations

- Limited published guidance on tourism and recreation assessments for the EIA process;
- Limited research of the likely effects of electricity infrastructure developments on tourism and recreational activity.

12.4.5 Assessment of Impacts

12.4.5.1 Tourism

20. The criteria used to assess the significance of effects on tourism are qualitative and have been based on any estimated changes to tourism in the local area. This includes changes in the availability, accessibility, and amenity of tourist receptors. For the purpose of this assessment, amenity refers to a combination of visual amenity and noise levels experienced by the users of tourist attractions.

12.4.5.2 Recreation

21. The criteria used to assess the significance of effects on recreation is qualitative and has been based on any estimated changes to recreational facilities in the local area. This includes changes in the accessibility and amenity of recreational receptors, which for this assessment will include core paths, cycle routes and other recreational activities. For the purpose of this assessment, amenity refers to a combination of visual amenity and noise levels experienced by the users of tourist attractions.

22. All receptors will be highlighted within **Figure 12.1**. The receptors included within **Figure 12.1** are as follows:

- Core Path;
- Local Paths; and
- Recreational Facilities.

12.4.5.3 Receptor Sensitivity and Significance of Impact

23. Sensitivity is determined based on the baseline conditions and their ability to adapt to change. Tourism and recreation receptors will be assessed in different ways. The sensitivity criteria of socio-economic, tourism and recreation receptors are outlined in **Table 12.3**

Table 12.3 – Receptor Sensitivity for Socio-Economic, Tourism and Recreation Receptors

Sensitivity	Tourism	Recreation
High	The receptor is defined as being of International/ National	The receptor wholly relies on its present amenity status.

Sensitivity	Tourism	Recreation
	status or has high visitor numbers.	
Medium	The receptor/resource is defined as being of regional status or has medium visitor numbers.	The receptor relies somewhat on its present amenity status.
Low	The receptor/resource is defined as being of local status or has low visitor numbers.	The receptor does not rely on its present amenity status.
Negligible	Sensitivity is not discernible.	Sensitivity is not discernible.

24. **Table 12.4** below outlines the criteria for assessing the magnitude of impact on socio-economic, tourism and recreation receptors. This considers the scale of these changes, and more weight is given to permanent changes than to temporary ones. Temporary impacts are generally associated with the construction works, and may be short, medium, or long-term impacts are generally those associated with the operation of the Proposed Development.

Table 12.4 - Magnitude of Impact for Socio-Economic, Tourism and Recreational Receptors

Magnitude of Impact	Tourism	Recreation
High	Visitor numbers and/or economic income is significantly reduced.	There are obvious views of the Proposed Development which will affect a large number of people/activities.
Medium	Visitor numbers and/or economic income is somewhat reduced.	There are obvious views of the Proposed Development which will affect a small number of people/activities; or, there are minor views of the Proposed Development which will affect a large amount of people/activities.
Low	Visitor numbers and/or economic income is minimally reduced.	The are minor views of the Proposed Development which will affect a small number of people/activities.
Negligible	Effect is not discernible.	Effect is not discernible.

12.4.5.4 Significance

25. The significance of an effect considers both the sensitivity of the receptor and the magnitude of the impact. **Table 12.5** below details the levels of significance.

Table 12.5 - Significance of Effect on Tourism and Recreation

Sensitivity	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

26. A description of the different significance levels is noted below. In the context of this report, a moderate or major effect is considered significant within the scope of this chapter.

- Major – The value of the receptor, and significance of effect, is predicted to give rise to major, detectable impacts that may be fundamental in the decision-making process.
- Moderate – The value of the receptor, and significance of effect, is predicted to give rise to moderate, detectable impacts but will not be fundamental in the decision-making process alone.
- Minor – The value of the receptor, and significance of effect, is predicted to give rise to minor, detectable effects that will not be fundamental in the decision-making process.
- Negligible – The value of the receptor, and significance of effect, is not predicted to give rise to any discernible or detectable effects outside the norm of typical variation.

12.5 Baseline

12.5.1.1 Population

27. To provide some context, information surrounding the area in which the Proposed Development is situated has been provided below:

28. The Proposed Development is situated within the administrative area of Buchan. The area of Buchan can be described as settled. Buchan has a land area of 587 square kilometres and a population density of just above 57 people per square kilometre. The total population of Buchan is 40,300 with an almost 50:50 split between males and females. Buchan represents approximately 16% of Aberdeenshire's total population. Within the Buchan area and within 10km of the Proposed Development there are a number of different-sized settlements. Peterhead sits to the south of the starting point of the Proposed Development and has the largest population of 19,170. Also, within 10km of the Proposed Development is:

- Longside (1.5km north) population 1,030
- Mintlaw (1.6km east) population 2,721
- Maud (2.4km south-west) population 780
- New Deer (1.4km south) population 750

12.5.2 Tourism

29. The following section gives an overview of the tourism sector within Aberdeenshire whilst using Scotland's tourism sector for comparative context.

30. The most up-to-date tourism strategy for Aberdeenshire is the **Destination Aberdeen and Aberdeenshire Framework for Growth 2022-2030.** The document aims to grow and expand Aberdeenshire's tourism sector and maximise their social, economic, and cultural benefits. The target is to grow visitor spend in Aberdeenshire to £1 billion per year by 2030. To do this, strategic development priorities have been set order to maximise the benefits Aberdeen and Aberdeenshire can offer to the tourism industry. Some of these are:

- Increase the quantity of visitors who already live in proximity or in Aberdeenshire; and
- Increase accommodation capacity and new infrastructure developments; and
- Increase the uptake of business events, golf, cruises, cultural, and cultural, heritage and events.

31. These have been set with the aim that they will have a positive influence on the tourism industry locally, regionally, and nationally. The strategic development priorities are aligned with the onshore aspect of the Proposed Development, the Cable Route Corridor contributes to the need to increase new infrastructure developments.

32. **Scotland's Tourism Strategy (2020)**[1] is focussed on 4 key areas:

- To attract, develop and retain a skilled, committed, diverse and valued workforce;
- To create and develop Scotland as a sustainable destination;
- Provide the best, authentic and memorable experiences; and

1. ———————————————

[1] Scottish Tourism Alliance (2020) Scotland Outlook 2030: Responsible Tourism for a Sustainable Future

- Build business resilience, sustainability, and profitability.

33. It also states that within their strategy that 'Scotland's tourism sector will make a full contribution to our national ambition to become a net-zero society by 2045'.

12.5.2.1 Tourism in Scotland

34. Tourism is one of Scotland's largest industries which supports an estimated 217,100 jobs and 9% of Scotland's population.[28] In 2019, there were approximately 17.6 million overnight trips and 34 million-day trips taken within Scotland, which totalled a visitor expenditure of around £5.7 billion. Tourism is a key aspect in the social, economic, and cultural well-being of Scotland, as the industry is often relied upon for jobs and infrastructure, from cities to rural areas.

12.5.2.2 Tourism in Aberdeenshire

35. Tourism statistics for Aberdeenshire are collected as part of the Grampian area of north-east Scotland. This area encompasses data from Aberdeenshire, Aberdeen City and Moray. In 2019 total spend attributed to tourism for Grampian was £856 million.

36. Since the recent COVID-19 pandemic, tourism statistics have greatly altered due to travel restrictions. During the period of April-December 2021, restrictions on tourism were still present. Despite these restrictions, 5% of tourists who travelled to Scotland visited Aberdeenshire, making it the 10th most popular area to visit in Scotland in late 2020[2].

37. The most up-to-date tourist information is from 2019, before COVID-19. As a result of this, the data used to assess tourism in the Grampian region may not be wholly representative. However, it is expected that 2019 data will more accurately reflect present tourism numbers due to a sharp fall in tourism and turnover in Scotland in 2020 and 2021, due to lockdown restrictions[3].

38. **Table 12.6** shows the number of tourist trips to Grampian from Great Britain and overseas in 2019.

Table 12.6 – Tourist trips to Grampian from Great Britain and overseas (VisitScotland 2019)

	Scotland (000s)	Scotland (%)	Grampian (000s)	Grampian (%)
Scotland	7,692	56	850	78
Rest of Great Britain (GB)	6,119	44	243	22
Total GB overnight	13,810	100	1,093	100
Europe	//		163	72
North America	//		36	15
Rest of the World	//		30	13
Total international overnight	3,718	100	230	100
Total overnight tourism	17,528	12	1,323	8
Totally day tourism	133,600	88	14,603	92
Grand Total	151,128	100	15,926	100

1.

[2] Visit Scotland (2021) The Scotland Visitor Experience During 2019

[3] VisitScotland (2021) Impact of Coronavirus (Covid 19)

39. **Table 12.6** shows that 83% of overnight visitors to Grampian are from Scotland and Great Britain. Of these visitors, 64% come from Scotland. Overseas visitors make up 17% of all overnight tourists. This is above the national average of 56% of all overnight visitors to Scotland are from Scotland. These visitor numbers are not directly reflective, they provide an accurate indication of the numbers of visitors to Grampian.

40. **Table 12.7** shows the overnight tourist spend in Grampian and Scotland from Great Britain and overseas in 2019.

Table 12.7 – Overnight tourist spend within Grampian and Scotland

	Scotland (£M)	Grampian (£M)
Great Britain	3,200	203
International & Northern Ireland	2.665	114
Total overnight tourism spend	5,865	317
Total day tourism spend	5,777	539
Total tourism spend	11,642	856

41. **Table 12.7** shows that direct spending by overnight and day tourism in Grampian totalled £856 million, which accounts for 15 percent of the £5.7 billion national total. Although this total tourist spend is not directly reflective of that in Aberdeenshire, it provides an indication of the importance of East Ayrshire's tourist industry to the local economy.

42. **Table 12.8** shows the overnight trip purpose to Grampian from Great Britain and overseas in 2019.

Table 12.8 – Overnight trip purpose when visiting Grampian and Scotland in 2019 (VisitScotland 2019)

	Scotland		Grampian	
	GB visitors (%)	Overseas visitors (%)	GB visitors (%)	Overseas visitors (%)
Business	13	11	16	29
Holiday	56	61	46	44
Visiting friends/relatives	29	25	36	26
Other	2	3	2	1
Total	100	100	100	100

43. **Table 12.8** shows that 46% of GB visitors come to Grampian for a holiday, followed by 36% who come to visit friends and family. It also shows that the main trip purpose for overseas visitors is for a holiday at 44% and then for business at 29%.

44. Visitor purpose is important to consider within the scope of this assessment as visitors coming to Grampian, specifically Aberdeenshire, for business or to visit friends and family are unlikely to be swayed by the presence of the Proposed Development; however, it is possible those visiting for the purposes of a holiday may change their behaviour because of the Proposed Development. This may be due to a loss of amenity in tourist and recreational facilities, lack of availability in nearby accommodation or increased traffic on main roads.

12.5.2.3 Accommodation

45. There is the potential for tourists to be affected by views of the Proposed Development (particularly the sub-station) from their place of lodging, or whilst en-route to their accommodation. The key aspect of this is whether views of the Proposed Development would affect visitor's decisions to visit or return to an area. It is also important to consider if increased traffic will impact a tourist's decision to visit, or return, to a specific accommodation provider. **Figure 12.1;** shows the accommodation within a 5km study area of the Proposed Development, and **Table 12.9** shows the occupancy of different types of accommodation.

Table 12.9 – Monthly occupancy rates (%) by accommodation type in Grampian (VisitScotland, 2021)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Hotel	48	58	63	71	81	84	83	86	82	72	61	54	71
B&B	27	29	35	37	52	56	59	64	67	54	49	33	32
Self-Catering	32	35	37	52	56	59	64	67	54	49	33	32	48
Hostel	27	41	44	59	71	71	78	75	63	51	37	33	60

46. **Table 12.9** shows that the availability of accommodation varies across accommodation types, and at different times throughout the year. Hotels appear to have the highest occupancy rate, with August being the busiest month, reaching 86% occupancy. B&Bs have the lowest occupancy rates, at only 27% in January and 32% annually.

47. For the purpose of the assessment, it is important to note the accommodation availability as it is likely that accommodation will be needed for some of the on-site workers during the construction and operational phases of the Proposed Development. Accommodation types can be avoided at their busiest times by on-site workers, in favour of alternatives with a lower occupancy rate, to avoid increasing demand for tourism accommodation.

12.5.2.4 Tourist Attractions

48. There are a variety of different attractions within the Grampian region that attract tourists from the UK and overseas. The top rated paid tourist attractions in Grampian in 2019, according to Visit Scotland, are listed in **Table 12.10** below.

Table 12.10 – Top rated, paid tourist attractions in Grampian in 2019 (VistScotland, 2021)

Attraction	Visitor numbers (2019)	Distance from Proposed Development
Crathes Castle	153,217	48km
Brodie Castle	79,634	85km
Pets Corner	71,660	39km
Fyvie Castle	66,039	8.5km
Castle Fraser	56,822	39km

49. The top-rated, free tourist attractions in Grampian in 2019, according to Visit Scotland are listed in **Table 12.11** below.

Table 12.11 – Top-rated, free tourist attractions in Grampian in 2019 (VisitScotland, 2021)

Attraction	Visitor numbers (2019)	Distance from Proposed Development
Duthie Park	1,007,982	42km
David Welch Winter Gardens	297,367	44km
Scottish Dolphin Centre	94,933	56km
Bennachie Forest	86,234	31km
Aberdeen Maritime Museum	78,415	42km

50. Of the top listed free and paid tourist attractions in the Grampian region, none are located within 5km of the Proposed Development.

51. The following table lists any tourist facilities that are located within 4km of the proposed Development. There is the potential for tourist facilities to be affected by views of the Proposed Development (particularly the sub-station), especially if that tourist facility relies on its amenity to function, as it may impact visitors' decisions to visit a specific attraction. **Table 12.12** shows the available visitor attractions within 5km of the Proposed Development. The following receptors are also highlighted in **Figure 12.1.**

Table 12.12 – Tourist attractions within 4km of the Proposed Development

Attraction Name	Description	Distance to the Site
Aberdeenshire Farming Museum	The museum has a Recognised Collection of farming material, telling the agricultural story of north-east Scotland over the last 150 years. Temporary exhibitions and family-friendly events run throughout the open season. The museum is located within the northern grounds of Aden Country Park.	4km
Aberdeenshire Museum Headquarters	Located within Mintlaw industrial estate the museum hosts collections from archaeology, costume and textiles, natural history, ethnography, and geology. The museum headquarters also holds archival material from the north-east of Scotland and is available for researching family histories.	3.6km
Simpsons Garden Centre	Simpsons Garden Centre has a mix of covered and open space packed full of garden products from seasonal bedding and shrubs to trees and hardy plants. Alongside the plant area, Simpsons at Happy Plant also has a large gift and homeware department as well as garden care, bird & pet care section, outdoor clothing and a foodhall. Simpsons at Happy Plant also has a restaurant. The establishment is aimed at families, gardeners, and outdoor enthusiasts	1.8
Buchanhaven Heritage Society	Set up to safeguard the heritage of the former fishing village of Buchanhaven, the Heritage Centre now supports classes on a wide range of subjects along with art, crafts and performing arts	2.1km

Attraction Name	Description	Distance to the Site
	events. The society provide a wide range of exhibitions surrounding the coastal community, WW1 and local history.	
Rhuallan Raptors	Rhuallan Raptors is a falconry centre offering educational talks, flying displays, hunting trips and photography sessions. The centre cater to weddings, shows, events and tourist groups.	2.4km
Maud Railway Museum	Housed in the former station building at Maud Junction the museum is open from April to October and exhibits items from the now ceased Aberdeen to Peterhead and Fraserburgh line. The museum also provides outdoor seating and a picnic area. Many visitors use the Formartine and Buchan Way to access the museum.	2.9km

12.5.3 Recreation

52. Aberdeenshire Council Outdoor Access Strategy[4] provides an overview of Aberdeenshire Council's aims for recreation, with the key priorities focusing on the maintenance and improvement of existing recreational infrastructure. This plan includes details of different recreational activities such as core paths, local paths and cycle routes which have been utilised for the purposes of this assessment.

12.5.3.1 Recreational Facilities

53. A number of recreational facilities are located within 4km of the Proposed Development. These are listed in **Table 12.13** below, along with a description and the sensitivity of the receptor. The following receptors are also highlighted in **Figure 12.1**

Table 12.13 – Table of recreational facilities within XK of the Proposed Development and their sensitivity

Attraction Name	Description		Sensitivity
Core Paths	Core Paths in Aberdeenshire are viewed as important connections to the region's natural capital. They are used commonly for recreational purposes such as walking, jogging, cycling and horse riding. They are protected under the Land Reform (Scotland) Act 2003.[5]		Medium
	Core Path Name	Distance to the Site	
	7LD.01.18 (Coastal path)	1.6km	
	7DL.03MP.04 – Formartine and Buchan Way	0.0km (Crosses Path)	
	7DL.03FM.10 – Formartine and Buchan Way	0.0km (Crosses Path)	
	208.01	1km	
Local Paths	Local paths are short routes that are like core paths but with a less strategic connection value. They are utilised more for local rambles between, and within, local communities. They are also protected under the Land Reform (Scotland) Act 2003.		Medium
	Local Path Name	Distance to the Site	

1. [4]Aberdeenshire Council Outdoor Access Strategy (2021) Aberdeenshire Local Development Plan 2023 - Aberdeenshire Council (Accessed May 2023)

Attraction Name	Description		Sensitivity
	Nether Aden River Walk	3km	
Cycle Routes	There are no designated cycle routes in the study area; however, all core and local paths can be used to cycle on. National Cycle Network Route 1d is 3.2k from the Proposed Development and crosses the proposed Development at some points. Formartine and Buchan Way makes up part of the cycle route. The route incorporates sections of the traffic-free Formartine and Buchan Way		Medium
Aden Country Park	Aden Country Park is a 230-acre country park in the heart of Buchan. It provides a wide range of opportunities for relaxation and recreation. The park is located 3km north of the Proposed Development.		Low
Fishing	Both inland and shore fishing is popular with locals and tourists in Aberdeenshire. The River Ugie is used by anglers in Aberdeenshire. The river enters the sea to the north of Peterhead, one of the biggest fishing ports in Scotland for landings of white fish and pelagic fish.[6] The River Ugie Angling Association The Proposed Development crosses 3 angling spots along the River Ugie: Port Sunken, Grilse Pool and Whin Pool. South Ugie Water – Strawberry Bank Pool - 1km south.		Low
Golfing	Aberdeenshire is a popular destination for golf. There are two courses within the study area. Craigewan Links Golf Club is 0.9km north-east of the Proposed Development and Longside Golf Club is 1km south of the Proposed Development.		Low
Picnic Areas	Aden Country Park has a designated picnic area which is 3km north of the Proposed Development. Maud Railway Museum provides outdoor seating and picnic areas and is situated off the Formartine and Buchan Way.		Low

12.6 Assessment of Impacts

12.6.1 Tourism

54. This section will assess how tourism will be affected as a result of the Proposed Development. This will be assessed qualitatively through the use of receptor sensitivity and the anticipated significance of impact to give an estimated significance of effect.

55. This assessment will consider changes to the availability, accessibility, and amenity of different tourist receptors. This will largely depend on:

- The status of the tourist facility;
- Any anticipated changes to tourist numbers as a result of the Proposed Development; and
- Any anticipated change to the tourism economy as a result of the Proposed Development.

1.

[6] Untitled (riverugie.co.uk) (Accessed May 2023)

12.6.1.1 Construction Phase Impacts

56. The main impacts that would be experienced during construction are:

- Disruptions on the local road networks during the transportation of associated infrastructure, machinery, and workforce; and
- Visual/noise impacts from workers, machinery, and on-site activity.

57. **Table 12.14** provides a summary of the predicted impacts during the construction phase, along with the receptor sensitivity, significance of impact and the significance of effect.

12.6.1.2 Operational Phase Impacts

58. The main impact that would be experienced during operation is:

- Views of the Proposed Substation.

59. **Table 12.15** provides a summary of the predicted impacts during the Operational phase, along with the receptor sensitivity, significance of impact and the significance of effect.

12.6.1.3 Decommissioning Phase Impacts

60. The potential adverse and beneficial effects that could arise during the decommissioning phase are predicted to be similar to those identified for the construction phase.

Table 12.14 - Construction Phase Assessment of Effects

Tourist Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
Aberdeenshire Farming Museum	Medium	Low	Minor	There will be no views of the Proposed Development during the construction phase when on the grounds of the attraction and inside the museum itself. There will be a small increase in traffic when travelling on the A950 and A952 of 3.3% for both roads, as highlighted in **Chapter 13 - Traffic and Transport**. This will be due to an increase in the number of vehicles visiting points where the cable route crosses these roads, however, it is unlikely that there will be a noticeable increase from the standard day-to-day haulage. Construction traffic will be minimised by utilising a traffic management plan. The facility is of regional status and attracts a moderate number of visitors. There is expected to be a **minor** effect on Aberdeenshire Farming Museum during the construction phase of the Proposed Development.
Aberdeenshire Museum Headquarters	Medium	Low	Minor	The facility is of regional status and attracts a moderate number of visitors. It is expected that there will be no views of the Proposed Development during the construction phase when inside the attraction.

Tourist Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
				There will be a small increase in traffic when travelling on the A950 and A952 of 3.3% for both roads, as highlighted in **Chapter 13 - Traffic and Transport**. This will be due to an increase in the number of vehicles visiting points where the cable route crosses these roads, however, it is unlikely that there will be a noticeable increase from the standard day-to-day haulage. Construction traffic will be minimised by utilising a traffic management plan. The facility is of regional status and attracts a moderate number of visitors. There is expected to be a **minor** effect on Aberdeenshire Museum Headquarters during the construction phase of the Proposed Development.
Simpsons Garden Centre	Low	Low	Minor	Some views of construction works may be visible when entering and exiting the facility, via the A950 and/or A952; however, this is not expected to impact tourist numbers, economic revenue, or the appreciation of the facility. There will be a small increase in traffic when travelling on the A950 and A952 of 3.3% for both roads, as highlighted in **Chapter 13 - Traffic and Transport**. This will be due to an increase in the number of vehicles visiting points where the cable route crosses these roads, however, it is unlikely that there will be a noticeable increase from the standard day-to-day haulage. Construction traffic will be minimised by utilising a traffic management plan. The facility is of local status and attracts a moderate number of visitors. There is expected to be a **minor** effect on Simpsons Garden Centre during the construction phase of the Proposed Development.
Buchanhaven Heritage Society	Low	Low	Minor	Construction works and plant compound will be visible when entering and exiting the facility, via the A90, however, this is not expected to impact tourist numbers, economic revenue, or the appreciation of the facility.

Tourist Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
				There may be an increase in traffic if travelling along the A90 as there will be an increase in the number of vehicles visiting the point where the cable route crosses the roads. **Chapter 13 - Traffic and Transport** states traffic will increase by 5.1% on areas of the A90 north of the Howe o' Buchan Roundabout and 0.2% at the point of the A90 which passes through St Fergus. However, it is unlikely that there will be a noticeable increase from the standard day-to-day haulage. Construction traffic will be minimised by utilising a traffic management plan. The facility is of local status and attracts a low to medium number of visitors. There is expected to be a **minor** effect on the Buchanhaven Heritage Society during the construction phase of the Proposed Development.
Rhuallan Raptors	Low	Low	Minor	Some views of construction works may be visible when entering and exiting the facility, via the A950 and/or A952; however, this is not expected to impact tourist numbers, economic revenue, or the appreciation of the facility. Much of the work associated with Rhuallan Raptors involves traveling to clients, attending shows, and setting-up demonstration stalls at events. Therefore, a large proportion of customers are engaged with at locations outwith the study area. There will be a small increase in traffic when travelling on the A950 and A952 of 3.3% for both roads, as highlighted in **Chapter 13 - Traffic and Transport**. This will be due to an increase in the number of vehicles visiting points where the cable route crosses these roads, however, it is unlikely that there will be a noticeable increase from the standard day-to-day haulage. Construction traffic will be minimised by utilising a traffic management plan. The facility is of local status and attracts a low/medium number of visitors. There is expected to be a **minor** effect Rhuallan Raptors during the construction phase of the Proposed Development.

Tourist Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
Maud Railway Museum	Low	Medium	Minor	Some views of construction works may be visible when entering and exiting the facility, via the A950 and/or A952, however, this is not expected to impact tourist numbers, economic revenue, or the appreciation of the facility. Maud Railway Museum relies on a flow of visitors using the Formartine and Buchan Way. As the museum is located at the point where the path splits (to Peterhead or Fraserburgh) it is used as a natural break spot. It is expected that there may be a small decrease in footfall due to the Proposed Development crossing the Formartine and Buchan Way approximately 2km south of the attraction. The trenchless methodology used to cross the path will allow paths to remain open to the public. However, it is likely that construction work will be visible and audible from the points the Proposed Development crosses the Formartine and Buchan Way. It is anticipated that any disruption and effects on accessibility/usability of the Formartine and Buchan Way will be short-term. There may be an increase in traffic if travelling on the B9106 as there will be an increase in the number of vehicles visiting points where the cable crosses this road. However, it is unlikely that there will be a noticeable increase from the standard day-to-day haulage. Construction traffic will be minimised by utilising a traffic management plan. The facility is of local status and attracts a low/medium number of visitors. There is expected to be a **minor** effect Maud Railway Museum during the construction phase of the Proposed Development.
Accommodation	Low	Low	Minor	Some views of workers, machinery and on-site activity may be visible if the accommodation is facing the Proposed Development. There are a range of accommodation providers within the study area, some of which would not be disrupted by the

Tourist Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
				construction of the Proposed Development. Therefore, it is not considered that the construction phase of the Proposed Development would affect accommodation availability. If workforces aren't procured locally then it is likely that during the construction phase, accommodation will be needed for some on-site workers. Attempts can be made to have any on-site workers staying in accommodation with lower occupancy rates to reduce any increase in demand for tourist accommodation. As such, it is not considered that the additional demand would affect the availability of accommodation and any small increase in numbers is expected to have a minor, positive impact on the local economy. If workforces are procured locally then there will be less need for accommodation as on-site workers can commute from their residences. There may be an increase in traffic if travelling on the A982, A950, A952 B9106, B9030 and B9170 as there will be an increase in the number of vehicles visiting points where the cable crosses these roads. **Chapter 13 - Traffic and Transport** predicts rises in traffic of 9% on the A950 north of Old Deer, 3.2% on the A950 south of Mintlaw, 3.2% on the A952, 35.9% on the B9030 and 15% on the B9170. However, apart from the increase on the B9030, it is unlikely that there will be a noticeable increase from the standard day-to-day haulage. Construction traffic for all impacted roads will be minimised by utilising a Construction Traffic Management Plan (CTMP) and Abnormal Load Transport Management Plan. There is expected to be a **minor** effect on local accommodation during the construction phase of the Proposed Development.

Table 12.15 - Operational Phase Assessment of Effects

Tourist Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
Aberdeenshire Farming Museum Aberdeenshire Museum Headquarters Simpsons Garden Centre Buchanhaven Heritage Society Rhuallan Raptors Maud Railway Museum	Low	Negligible	Negligible	The cable element of the Proposed Development will be housed underground and will not be visible to the public. The Proposed Substation is the most visible element of the Proposed Development. The rolling landscape and woodland between the Proposed Substation and the tourist attractions will provide sufficient blocking. It is estimated that there will be no visual or noise effects which will impact tourist numbers, economic revenue, or the appreciation of the facility. Expected effects on the Aberdeenshire Farming Museum, Aberdeenshire Museum Headquarters, Simpsons Gardenn Centre, Buchanhaven Heritage Society, Rhuallan Raptors and Maud Railway Museum are **negligible** during the operational phase of the Proposed Development.
Accommodation	Low	Low	Minor	The cable element of the Proposed Development will be housed underground and will not be visible to the public. The Proposed Substation is the most visible element of the Proposed Development. Some views of the Proposed Substation may be visible if the accommodation is facing it. There are a range of accommodation providers within the study area, some of which would not be disrupted by views of the Proposed Development. Therefore, it is not considered that the operational phase of the Proposed Development would affect accommodation availability. Occasionally during the operational phase, accommodation will be needed for a small team of between 2 and 5 workers visiting the Proposed Substation. Attempts can be made to have any workers staying in accommodation with lower occupancy rates to reduce any increase in demand for tourist accommodation. As attempts will be made to select accommodation with lower occupancy rates, the availability of accommodation is not expected to change. Any small increase in numbers is expected to have minor, positive impacts on the local economy.

Tourist Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
				Minor effects are expected to impact accommodation providers within the study area during the operational phase of the Proposed Development.

12.6.2 Recreation

61. This section will assess how recreation will be affected as a result of the Proposed Development. This will be assessed qualitatively through the use of receptor sensitivity and the anticipated significance of impact to give an estimated significance of effect.

62. This assessment will consider changes to the accessibility and amenity of different recreational receptors. This will largely depend on:

- The extent to which the recreational feature relies on its present amenity status to attract visitors and;
- Any anticipated changes to visitor numbers as a result of the Proposed Development.

12.6.2.1 Construction

63. The main effects that would be experienced during the construction phase are visual/noise impacts from workers, machinery, on-site activity, and construction traffic. The effects of construction traffic are detailed in **Chapter 13 - Traffic and Transport.**

64. **Table 12.16** provides a summary of the predicted effects during the construction phase for receptors in the study area, along with the receptor sensitivity, significance of impact and the significance of effect.

12.6.2.2 Operational

65. The main effects that would be experienced during the operational phase are views of the Proposed Development, such as the Proposed Substation. Landscape and visual impacts of the Proposed Development on the existing landscape are detailed further in **Chapter 10 - Landscape and Visual.**

66. **Table 12.17** provides a summary of the predicted effects during the operational phase, along with the receptor sensitivity, significance of impact and the significance of effect.

12.6.2.3 Decommissioning

67. Any potential adverse and beneficial decommissioning phase effects are anticipated to be similar to those identified during the construction phase and as a result are not repeated again.

Table 12.16 - Construction Phase Assessment of Effects

Recreation Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
Core Paths	Medium	Medium	Moderate	Noise and visual impacts relating to the link corridor and plant compound located less than 1km from 7LD.01.18 (Coastal path) and 208.01 are unlikely to have any visibility of construction works due to screening from sand dunes in the case of 7LD.01.18 and the residential area of Longside and natural woodland areas in relation to 208.01.

Recreation Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
				The Proposed Development crosses the Formartine and Buchan Way in two places as shown in **Figures 12.1b** and **12.1d**. The trenchless methodology used within the onshore cable element of the Proposed Development will allow paths to remain open to the public. However, it is likely that construction work will be visible and audible from the points the Proposed Development crosses the Formartine and Buchan Way. It is anticipated that techniques used to lay the cable underground such as trenchless crossings will reduce installation time and minimise plant. It will take approximately 1 week per 100m of cable construction. Therefore, it is expected that any construction work will take place over a time short-time period, minimising the number of users/activities affected. **Chapter 13 - Traffic and Transport** states that there is a major effect on the amenity of core paths which the Cable Route Corridor crosses. Therefore, the amenity of 7DL.03MP.04 and 7DL.03FM.10 will be compromised. However, it is anticipated that the use of trenchless methodologies and implementation of a Path Management Plan will reduce the impact of construction activities on these core paths. **Chapter 10 - Landscape and Visual** states that the highest levels of impact will be at the two points where the Cable Route Corridor crosses the core paths. The level of visual impact attributed to construction activities on core paths is major/moderate. The Formartine and Buchan Way will only have a long-distance view of the Proposed Substation element of the Proposed Development. The rolling landscape and woodland between the Proposed Substation and core path will also provide sufficient shielding. The construction will not always be apparent and will not be happening along the entirety of this section all at once, thus recreational walkers are likely to only experience significant impacts briefly.

Recreation Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
				The overall significance of effect on core paths during the construction phase of the Proposed Development are anticipated to be **moderate**.
Local Paths	Low	Low	Minor	Most local paths will only have long-distance views of the construction work associated with the Proposed Development. Views of the Proposed Development will not be constant from the Nether Aden River Walk due to natural screening from surrounding topography, settlements, and forestry along the path. Construction noise will not be audible from the 3km distance between the path and the Proposed Development. No views of the construction will dominate the landscape and it is predicted that there will be a **minor** significance of effect during the construction phase which will only affect a small number of users/activities.
Cycle Routes	Medium	F	Minor	National Cycle route 1d forms part of the Formartine and Buchan Way. The amenity of the route will be subject visual and noise effects arising from construction. The Noise Impact Assessment (NIA) and the LVIA are detailed within **Chapters 9 & 10** respectively. At the stage of construction when the cycle route has to be crossed, the use of trenchless methodology will allow routes crossed to remain open to the public. Trenchless techniques can speed-up installation time and minimise plant. Therefore, it is expected that any construction work will take place over a short time period, minimising the number of users/activities affected. It is expected that views of construction work surrounding the cable element and particularly the Proposed Substation element of the Proposed Development will be partially blocked by the natural topography and woodland situated along the route. The significance of effect on the National Cycle Route 1d is anticipated to be **minor**.
Aden Country Park	Low	Negligible	Negligible	Any effects on Aden Country Park during the construction phase are estimated to be **negligible.** The park is located within a dense area of forestry which will screen any views of the Proposed Development. Construction noise is not anticipated to be audible from the park location.

Recreation Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
Fishing	Medium	Medium	Moderate	The construction phase of the Proposed Development will be visible to a number of designated fishing spots along the River Ugie. The cable element of the Proposed Development interacts with three fishing spots as the cable infrastructure crosses the River Ugie at these points. The three points directly effected are Port Sunken, Grilse Pool and Whin Pool. It is anticipated that due to trenchless construction methods, it will still be possible to fish at the three sites. However, for a short period of time there will be visual and noise impacts associated with the trench digging and feeding of the cable from one bank of the river to the other. There are a broad variety of fishing locations to choose from within the study area and along the River Ugie, most of which will be screened from any construction activity due to the natural topography and woodland areas located along the river. The ability to fish will not be impacted and any construction works impacting designated fishing spots will be short-term. As such, it is anticipated that only a small number of people/activities will be affected by views of the Proposed Development's construction. Effects on the three fishing spots (Port Sunken, Grilse Pool and Whin Pool) during the construction phase of the development are estimated to be **moderate**.
Golfing	Low	Low	Minor	Views of construction activity and the Trenchless Compound will be visible on some parts of Craigewan Links when facing north, however, these views will not be constant when moving through the course and will not dominate the surrounding landscape. No views will be visible in any direction from Longside Golf Club Golf Course due to screening from surrounding topography. There is potential for noise from construction activity to be audible on some parts of the course. Any effects from noise will be short-term. The effects on golf courses during the construction phase are estimated to be **minor**.

Recreation Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
Picnic	Low	Negligible	Negligible	Any views from Aden Country Park and Maud Railway Museum picnic areas are anticipated to be screened due to surrounding forestry. No construction noise is anticipated from either location. Effects on picnic areas are expected to be **minor**.

Table 12.17 - Operational phase Assessment of Effects

Recreation Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
Core Paths	Medium	Low	Minor	Some long-distance views of the Proposed Substation element of the Proposed Development may be visible but will not be constant - as New Deer and the surrounding forestry/topography will screen most views of the Proposed Development on the Formartine and Buchan Way. The core path 7LD.01.18 (Coastal path) is one of the furthest core paths from the Proposed Substation element of Proposed Development, so no views will be detrimentally affected. Effects on core paths during the operational phase of the Proposed Development are expected to be **minor**.
Local Paths	Medium	Low	Minor	The paths identified will only have long-distance views of the Proposed Substation element of the Proposed Development and views will not be constant due to screening from surrounding topography, settlements, and forestry. The effects on local paths within the study area is expected to be **minor.**
Cycle Routes	Medium	Low	Minor	There is potential that views of the Proposed Substation will be visible, however views will not be constant due to the natural topography, settlements and forestry which provide screening against the Proposed Development. The effects on National Cycle Route 1d that forms part of the Formartine and Buchan Way are expected to be **minor.**
Aden Country Park	Medium	Negligible	Negligible	The Park is surrounded by dense forest which will screen any views of the Proposed Development. It is estimated that no impacts are to be expected as a result of the Proposed Development.

Recreation Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Discussion
				There is anticipated to be a **negligible** effect on Aden Country Park during the operational phase.
Fishing	Medium	Negligible	Negligible	The Proposed Substation element of the Proposed Development is over 10km southeast of Port Sunken, Grilse Pool and Whin Pool. The distance of the Proposed Substation to the fishing/angling spots means the Proposed Development will not dominate the landscape and will not be visible due to distance and screening provided by natural topography/woodland. It is estimated that no impacts are to be expected as a result of the Proposed Development. There is anticipated to be a **negligible** effect on fishing/angling spots along the River Ugie during the operational phase.
Golfing	Medium	Negligible	Negligible	The nearest golf course to the visible Proposed Substation element of the Proposed Development is Longside Golf Course, located approximately 12km north-east of the Proposed Substation. At this distance the settlements of Stuartfield, Old Deer and New Deer and the natural topography/forestry will screen any views of the Proposed Development. Craigewan Links is located in close proximity to the Landfall site and Trenchless Compound. During the operational phase the majority of infrastructure will be housed underground, therefore visual effects will be minimal. There is anticipated to be a **negligible** effect on golf courses during the operational phase.

12.6.3 Community Benefit

68. In order to encapsulate a course of community benefit, a wider community benefits package will be made available to the public during the construction and operation phase of the Proposed Development.

69. The community benefit package will focus on local projects or initiatives aimed at enhancing the economy, society, and/or environment through services and/or financial initiatives. The community benefit scheme will provide an avenue for local communities to access funding for such initiatives. The package may vary in terms of funding levels, eligibility criteria and types of benefits provided.

12.7 Mitigation

12.7.1 Construction Mitigation

70. Moderate significant effects have been attributed to the three fishing locations along the River Ugie of Port Sunken, Grilse Pool and Whin Pool during the construction period of the Proposed Development. The significance of effect is mainly due to the visual and noise impacts relating to the construction works taking place near the fishing locations.

71. Mitigation for the fishing locations will take the form of the implementation of the appropriate measures in the Construction Environmental Management Plan (CEMP) that will be developed and agreed prior to construction; and the use of trenchless methodologies to reduce plant and installation time. The moderate effects on the three fishing locations will be temporary in nature.

72. Moderate significant effects have been attributed to core paths during the construction period of the Proposed Development. The significance is mainly due to the construction traffic, visual and noise impacts relating to the construction works taking place on the identified core paths.

73. Mitigation for the core paths will take the form of the implementation of appropriate measures within the Core Path Management Plan and CTMP that will be developed and agreed prior to construction and the use of trenchless methodologies to reduce plant and installation time. The moderate effects on the core paths will be temporary in nature.

74. No other significant effects have been predicted for tourism or recreation during the construction phase, therefore no additional mitigation will be required.

75. Although not significant, it has been noted that accommodation types with higher occupancy rates will be avoided, where possible, during peak seasons.

12.7.2 Operation Mitigation

76. No significant effects have been predicted for tourism or recreation during the operational phase, therefore no additional mitigation will be required.

77. Although not significant, it has been noted that accommodation types with higher occupancy rates will be avoided where possible during peak seasons.

12.8 Summary

78. The assessment has considered the effects of the Proposed Development on tourism and recreation during the construction and operation phases of the Proposed Development.

79. The assessment has highlighted no significant effects on tourism and recreation within the study area.

80. To further assess the potential effects of the Proposed Development on tourism and recreation receptors within the study area a cumulative impact assessment has been carried out. The cumulative impacts are provided in **Table 12.19**.

12.9 Residual Effects

81. **Table 12.18** below lays out the residual effects attributed to the Proposed Development.

Table 12.18 - Residual Effects Assessment

Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
	Sensitivity	Magnitude	Significance		
Construction					
Tourism					
Aberdeenshire Farming Museum	Medium	Low	Minor	None	Minor adverse – not significant
Aberdeenshire Museum Headquarters	Medium	Low	Minor	None	Minor adverse – not significant

Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
	Sensitivity	Magnitude	Significance		
Simpsons Garden Centre	Low	Low	Minor	None	Minor adverse – not significant
Buchanhaven Heritage Society	Low	Low	Minor	None	Minor adverse – not significant
Rhuallan Raptors	Low	Low	Minor	None	Minor adverse – not significant
Maud Railway Museum	Medium	Low	Minor	None	Minor adverse – not significant
Accommodation	Low	Low	Minor	None	Minor adverse – not significant
Recreation					
Core Paths	Medium	Medium	Moderate	Core Path Management Plan and CTMP Proposals. Trenchless Methodologies.	Minor adverse – not significant
Local Paths	Low	Low	Minor	None	Minor adverse – not significant
Cycle Routes	Medium	Medium	Minor	None	Minor adverse – not significant
Aden Country Park	Low	Negligible	Negligible	None	Negligible – not significant
Fishing	Medium	Medium	Moderate	CEMP Proposal. Trenchless Methodologies.	Minor adverse – not significant
Golfing	Low	Low	Minor	None	Minor adverse – not significant
Picnic	Low	Low	Negligible	None	Minor adverse – not significant
Operation					
Tourism					
Aberdeenshire Framing Museum	Low	Negligible	Negligible	None	Minor adverse – not significant
Aberdeenshire Museum Headquarters	Low	Negligible	Negligible	None	Negligible – not significant

Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
	Sensitivity	Magnitude	Significance		
Simpson Garden Centre	Low	Negligible	Negligible	None	Negligible – not significant
Buchanhaven Heritage Society	Low	Negligible	Negligible	None	Negligible – not significant
Rhuallan Raptors	Low	Negligible	Negligible	None	Negligible – not significant
Maud Railway Museum	Low	Negligible	Negligible	None	Negligible – not significant
Accommodation	Low	Negligible	Negligible	None	Negligible – not significant
Recreation					
Core Paths	Medium	Low	Minor	None	Minor adverse – not significant
Local Paths	Medium	Low	Minor	None	Minor adverse – not significant
Cycle Routes	Medium	Low	Minor	None	Minor adverse – not significant
Aden Country Park	Medium	Negligible	Negligible	None	Negligible – not significant
Fishing	Medium	Negligible	Negligible	None	Negligible – not significant
Golfing	Medium	Negligible	Negligible	None	Negligible – not significant
Picnic	Low	Negligible	Negligible	None	Negligible – not significant

12.10 Cumulative Assessment

82. The impacts identified in this chapter are presented and evaluated in terms of their potential cumulative impacts when combined with other projects in **Table 12.19**. This assessment has considered the projects detailed in Chapter 3 – EIA Methodology and **Figure 3.1.**

Table 12.19 - Potential Tourism and Recreational Cumulative Impacts

Impact	Potential for Cumulative Impact	Significance	Discussion
Construction			
Interference with planned infrastructure improvements in the local area	Yes	Minor	There is potential for construction activities (particularly along the onshore cable route) to have an impact on local infrastructure improvements. Particularly infrastructure upgrades

Impact	Potential for Cumulative Impact	Significance	Discussion
			to the **Northeast 400kV Overhead Line**, running along and crossing sections of the Proposed Development. However, due to the infrastructure work being in a later stage it is assumed works will be complete by the time the Proposed Development construction work kicks-off. Impacts are deemed to be minor.
Impact on tourist receptors	Yes	Minor	**Minor** impacts of the Proposed Development on tourism are to be expected e.g., increase in traffic may be exacerbated by similar developments.
Disturbance of tourist receptors	No	Minor	Due to the movement of construction activities along the cable route, cumulative construction impacts are expected to be short-term and temporary.
Impact on recreational activities	Yes	Minor	Minor impacts of the Proposed Development on recreational activities are to be expected. The formation of a footpath approximately 2.5km east of Longside has the potential to interfere with cable installation works. However, due to the movement of construction activities and efficiencies attributed to trenchless methodologies along the cable route it is assumed impacts at specific areas will only be on a short-term basis and therefore minor.

Impact	Potential for Cumulative Impact	Significance	Discussion
Disturbance of recreational activities	No	Minor	Due to the movement of construction activities along the cable route, cumulative construction impacts are expected to be short-term and temporary.
Operation			
Interference with planned infrastructure improvements in the local area	No	Negligible	At a highly localised scale, interference with planned infrastructure developments was observed, but the impacts of the Project were considered negligible.
Impact on tourist receptors	No	Negligible	Tourism receptors will not present a cumulative impact during the operational phase.
Disturbance of tourist receptors	No	Negligible	The operations and maintenance (O&M) activities will be limited in scope, short-term in duration, and of a temporary nature.
Impact on recreational activities	No	Negligible	Recreational activities will not present a cumulative impact during the operational phase.
Disturbance of recreational activities	No	Negligible	The operations and maintenance (O&M) activities will be limited in scope, short-term in duration, and of a temporary nature.

83. There are two planned developments within 2km of the Landfall or Trenchless Compound. These are Kirkton Solar Farm and Energy Storage facility and a residential housing development of approximately 800 properties. The planned trenchless methodology for export cable landfall will avoid any impacts on surface infrastructure and developments. The routing of the cable during trenchless methodology will avoid sensitive buried infrastructure. In the eventuality that cable crossings are required, for example, this will be managed through crossing agreements.

84. The timing of cumulative developments, especially those in earlier stages of the planning process, introduces uncertainties. It is difficult to confidently determine which projects will progress as planned. Even projects that have obtained consent may undergo design changes or seek variations in consent. The assessment relies on the available information to date, but it remains uncertain regarding the precise timing of all projects.

12.10.1 Construction Cumulative Impacts

85. During the construction and installation phases, there is a possibility of negative impacts on existing businesses and the local populations of Peterhead and Buchan due to short-term disruptions in the vicinity of onshore construction works. However, these impacts are expected to be highly localised and confined to specific areas near Peterhead and settlements within the study area. Currently, there are seven concurrent construction projects in the region, and therefore there is potential for cumulative impacts to arise. However, due to the movement of construction activities and efficiencies attributed to trenchless methodologies along the onshore cable route it is assumed impacts at specific areas will only be on a short-term basis and are therefore minor.

86. Cumulative projects within the 5km study area are listed in **Table 12.20** below:

Table 12.20 – Cumulative Construction Projects

Construction Project	Status	Distance from Proposed Development
Kirkton Solar PV Farm and Energy Storage Facility (APP/2021/1712)	No Objection	0.8km
Residential Development (800 houses) (APP/2022/0369)	Awaiting Decision	0.5km
Formation of Footpath (APP/2019/0421)	Approved	0km
New pair of terminal towers connecting to existing New Deer Substation (NGNDSS) (APP/2018/2764)	Consented	0km
Northeast 400kV Overhead Line Reinforcement Works	Consented	0km
Overhead Line (APP/2021/0292)	Consented	2.6km
Residential Development (ENQ/2019/0563)	Pre-Application Consultation (PAC) Agreed	3km

87. In summary, the cumulative impacts on planned infrastructure improvements in the study area are considered of minor significance, resulting in some detectable short-term impacts. It is concluded that no additional mitigation measures are necessary.

12.10.2 Operation Cumulative Impact

88. The overall impact on the demand for local goods and services, including accommodation, relies on the scale of the influx of non-resident workers from outside the local area. This, in turn, is influenced by the timing of key activities across all relevant projects and the balance between locally recruited workers and those recruited from other locations.

89. In general, though it is challenging to make precise predictions, the combined impact of other potential infrastructure projects and the Proposed Development on the demand for local private services and goods is deemed to be of minor significance. No additional mitigation measures are deemed necessary.

12.10.3 Summary

90. There might be a minor adverse impact on tourism and other potential infrastructure projects, due to short-term disruptions caused by the installation of the onshore High Voltage Alternating Current (HVAC) cables. Nevertheless, these effects are considered not to be significant.

91. During the operation phase, the Proposed Development is expected to bring about an overall minor effect on other potential infrastructure projects, tourism, and recreation within the local area. Any negative impacts on tourism, recreation and other potential infrastructure development during the operation phase are deemed negligible.

GREEN VOLT

13

Chapter 13

Traffic and Transportation

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-REP-0009-13	
Date:	*Issue Date 02/08/23*	
Prepared by:	E Moran	*E Moran*
Checked by:	S Cochrane	*S Cochrane*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First draft for review	14/07/23
A2	Update following legal review	31/07/23
A3	Final Update	02/08/23
00	Final	02/08/23

Contents

13 Traffic and Transport

13.1 Introduction

1. This chapter provides an assessment of the potential effects of the Proposed Development on receptors along the transport routes resulting from vehicle movements associated with the construction, operation and decommissioning phases.

2. The specific objectives of the chapter are to:

   - Describe the baseline transport conditions;
   - Describe the assessment methodology and significance criteria used in undertaking the assessment;
   - Describe the potential effects, including direct, indirect and cumulative effects;
   - Describe the mitigation measures proposed to avoid, reduce and offset likely potential significant adverse effects; and
   - Assess the significance of residual effects remaining following the implementation of mitigation.

3. A high-level overview of the effects of the traffic movements has been considered in accordance with the Institute of Environmental Assessment (now Institute of Environmental Management and Assessment (IEMA)) Guidelines for the Environmental Assessment of Road Traffic. The document is referred to as the IEMA Guidelines in this chapter.

4. The assessment was carried out by Pell Frischmann Consultants Limited.

5. This chapter should be read in conjunction with **Appendix 13.1: Transport Assessment**, **Appendix 13.2 Framework Construction Traffic Management Plan** and the following figures:

   - **Figure 13.1 – Study Area**
   - **Figure 13.2 – Traffic Count Locations**
   - **Figure 13.3 – Accident Locations**
   - **Figure 13.4 – Delivery Routes**

13.2 Legislation, Guidance and Policy

6. Relevant policy and guidance documents have been reviewed and taken into account as part of this assessment, which includes the following:

   - National Planning Framework 4 (NPF4) (2023):
   - Planning Advice Notice (PAN) 75;
   - Transport Assessment Guidance (2012);
   - Aberdeenshire Local Development Plan (2023);
   - Use of Energy in Aberdeenshire: Guidance for Developers Supplementary Planning Guidance (2005);
   - The Guidelines for the Environmental Assessment of Road Traffic (1993);
   - Guidelines for Environmental Impact Assessment (2005);
   - LA 104 Environmental Assessment and Monitoring (Revision 1) of the Design Manual for Roads and Bridges;
   - Guidance on the Preparation of Transport Assessments (2014); and
   - Design Manual for Roads and Bridges, Volume 15, Part 5 “The NESA Manual” (2013).

13.3 Consultation

7. In undertaking the assessment, a request for a Scoping Opinion was issued to transport agencies that have an interest in the surrounding road network, which includes Aberdeenshire Council as local roads agency and Transport Scotland as the trunk road agency.

8. **Table 13.1** provides a summary of the consultation responses received to date in relation to the Proposed Development.

Table 13.1 – Scoping Consultation Responses

Consultee	Scoping Response	Action
Aberdeenshire Council 11 May 2022	Environmental issues are of obvious key importance such as those aspects of the environment that would be likely to be significantly affected. Detailed survey work would be required to inform the Environmental Impact Assessment (EIA). Following analysis of the aspects of the environment which would be likely to be significantly affected, a detailed assessment of the effects themselves would be required along with mitigation measures proposed. Examples of the types of issues that should be addressed include: ▪ Transport and Traffic including road safety issues and impact on local road network during and after construction work ▪ Proposed mitigation measures	Automatic Traffic Counts (ATCs) were undertaken at four locations within the Study Area to complement existing traffic data to determine a baseline against which the traffic impacts of the Proposed Development could be measured. The assessment of construction effects in outlined in **Section 13.6.** Potential Effects of this chapter in relation to the following impacts: severance, driver delay, pedestrian delay, pedestrian amenity, fear and intimidation and accident and safety. Proposed mitigation measures are outlined in **Section 13.7**.
	<u>Public Rights of Way/Core Path Assessment</u> The impact of the Proposed Development on public access should not be scoped out of the assessment given the popularity of coastal routes and the Formartine and Buchan Way for public access. Impacts cannot be dismissed as the scoping report acknowledges there will be an impact on core paths and rights of way.	A Path Management Plan will be produced and will contain measures to address the impact of construction vehicles on the Core Path network. Examples of the measures which will be contained within the Path Management Plan are outlined in **Section 13.7 Mitigation**.
	It should be confirmed within the EIA Report the method of cable laying to be used at the various crossing sites – Horizontal Directional Drilling (HDD) or open trenching?	The method of cable laying is outlined in **Appendix 13.1** and further detail is provided in **Appendix 5.1 Construction Execution Plan.** It will include both open trenching and trenchless methodologies.
	Engagement with the Council to discuss impacts and mitigation is encouraged.	The impacts and mitigation are presented in **Sections 13.6** and **13.7.**
	Traffic and Transport The contents of **Section 11[1].2** of the scoping report are noted. The Study	**Section 13.2** of the scoping report outlines the Baseline for the Proposed Development as:

1. [1] Assumed 13.2.

Consultee	Scoping Response	Action
	Area identified appears acceptable at this stage. The method of construction/cable laying is not identified within the Scoping Report and should be addressed within the EIA Report (i.e. HDD/open trenching) as this will affect the potential impacts and mitigation required.	"The main road in the area is the A90 which runs around Peterhead (north-south) and the A952 which runs through Mintlaw (north-south). Linking the roads in the A950 which runs west from Peterhead through Mintlaw. Most of the road network within the vicinity of the works comprise "B" or unnamed roads which provide links for the small settlements and individual properties to the wider network." **Appendix 13.1** presents further details on the Study Area, which is shown in **Figure 13.1.** With regards to the methodology for the construction / cable laying please refer to the Construction Execution Plan included as **Appendix 5.1**.
	Environment and Infrastructure Services (Roads Development and Transportation) are generally satisfied with the proposals contained within the scoping report, however it is suggested that the EIA Report include all details of new or temporary junctions formed on the public road network (i.e. haul roads, storage compounds etc). These must meet the local authority standards in terms of visibility. Engagement with the local authority is advised to discuss proposals.	Details of the proposed access locations are presented in **Appendix 13.1 Transport Assessment.** Indicative drawings of the accesses are also presented as part of **Appendix 13.1.** A construction haul road, comprising a minimum width of 5 m, will be provided adjacent to the Cable Route Corridor which will facilitate the movement of construction plant involved in construction activities.
	Transport Scotland (TS) acknowledges that the development will require to cross the A90 Trunk Road for any of the potential routes under consideration. TS makes no comment on the Scoping Report, but does outline that any proposed changes to the trunk road network (including any changes to its operation) must be discussed and approved. It is advised early engagement is taken with TS to discuss proposals, potential impacts and likely mitigation measures.	Consultation was undertaken with Transport Scotland in relation to the proposed access from the A90 (T) to a temporary compound area.
Transport Scotland 27/06/2023	Thank you for your email regarding plans for a temporary works access on the A90 trunk road associated with the Greenvolt proposals near Peterhead.	Comment regarding the design of the junction noted. Consultation was undertaken with Transport Scotland in relation to access

Consultee	Scoping Response	Action
	In the first instance, I'm happy to be the point of contact for dialogue around any planning application. In that regard, I would be content with what you outline below. As you allude to, any upgraded access will ned to conform with the design requirements of the Design Manual for Roads & Bridges (DMRB), specifically CD 123 - Geometric design of at-grade and signal-controlled junctions, a link to which is included below: CD 123 - Geometric design of at-grade priority and signal-controlled junctions - DMRB (standardsforhighways.co.uk) Further information on the design parameters (design speed etc) can be found by referring to CD109 Highway Link Design, a link to which is included below: CD 109 - Highway link design - DMRB (standardsforhighways.co.uk) Where the design requirements of the DMRB cannot be achieved, an application for a Departure from Standard would need to be submitted to, and positively determined by, Transport Scotland in advance of a formal consultation response on any planning application. A link to the forms and guidance is included below: https://www.transport.gov.scot/publication/departures-from-standard-advice-and-procedures-guide/ In addition, where a new or upgraded access is provided, a Stage 1 Road Safety Audit (RSA) should be undertaken in accordance with DMRB GG119. We would ask that the RSA brief and proposed audit team be agree with Transport Scotland before the audit is undertaken.	to the proposed temporary compound to the west of the A90 (T). It should be noted that there will also be an access east of the A90 (T) to facilitate cable route and landfall construction. An indicative layout of the proposed access junction is presented in **Appendix 13.1,** which has been prepared taking cognisance of the relevant guidance. It is anticipated that a Stage 1 Road Safety Audit form part of the planning conditions should consent be granted.

13.4 Assessment Methodology

9. A high-level overview of the effects of the traffic movements has been considered in accordance with Institute of Environmental Assessment (now Institute of Environmental Management and Assessment (IEMA)) Guidelines

for the Environmental Assessment of Road Traffic. The document is referred to as the IEMA Guidelines in this chapter.

10. This chapter considers effects on the following:

- The existing baseline transport conditions of the Study Area surrounding the Proposed Development Site;
- The likely infrastructure requirements necessary to enable the Proposed Development;
- The likely effects and changes associated with the imposition of construction traffic on the local road network during the construction phase (future year);
- What measures would be required to mitigate against any potential significant effects of the temporary construction traffic;
- The likely traffic conditions during the operational phase of the Proposed Development; and
- The likely traffic conditions during the decommissioning phase of the Proposed Development.

13.4.1 Study Area

11. The Study Area includes local roads that are likely to experience increased traffic flows resulting from the Proposed Development. The geographic scope was determined through a review of Ordnance Survey (OS) plans and an assessment of the potential origin locations of construction staff and supply locations for construction materials.

12. Access to the Proposed Development will be taken from newly provided access junctions along the Cable Route Corridor. Materials will be delivered to the Proposed Development via these access junctions.

13. Materials for the construction of the access tracks will come from local quarries, the closest of which are located along the B9005, near Methlick, and is approximately 9 kilometres (km) to the south-east of the Proposed Substation, as the crow flies. The closest concrete plant is located along the A950, to the south-east of Longside and is approximately 22.7 km to the northeast of the Proposed Substation, as the crow flies.

14. The construction supply contracts have not yet been let and the Applicant will confirm exact sources of material with Aberdeenshire Council prior to construction works commencing.

15. To allow the Offshore Project to connect to the national electrical grid, new transformers will be required. These transformers will be located within the Proposed Substation Compound and due to their size and weight are classified as Abnormal Indivisible Loads. These will be delivered to the Proposed Substation Compound from the Port of Peterhead via the A982, A90 (T), A948, B9170, the unnamed road leading to Greens and the unnamed road between Maryhill and North Millbrex where the Proposed Substation access will be located.

16. The Study Area for this assessment includes the A90 (T), A981, A952, A950, A948, A947, B9030, B9170, unnamed road at Rora Dairy, unnamed road at National Grid New Deer Substation (NGNDSS) and other minor roads / tracks providing local access such as Woodside and Tortorston Road.

17. This Study Area, illustrated in **Figure 13.1** includes areas of material supply (quarries, etc), the Site access junctions, the trunk road network and the construction material and abnormal load delivery routes. It is also of sufficient size to include the main areas of workforce accommodation during the construction period.

18. Effects associated with construction traffic generated by the Proposed Development would be most pronounced in close proximity to the Site access junctions and on the final approaches to the Site. As vehicles travel away from the Proposed Development, they would disperse across the wider road network, thus diluting any potential effects. It is therefore expected that the effects relating to construction traffic are unlikely to be significant beyond the Study Area identified above.

13.4.2 Potential Effects Scoped In

19. The assessment has fully considered the transport and access issues arising from the construction phase of the Proposed Development. This Chapter considers effects on the following:

- Direct effects during construction on traffic flows in the surrounding Study Area;
- Direct effects upon local road users; and
- Effects upon local residents due to an increase in construction traffic.

20. Where the effects meet the criteria set out in the IEMA guidance, a review of the effects on severance, driver delay, pedestrian delay, pedestrian amenity, fear and intimidation and accidents / road safety has been undertaken.

21. The assessment is based on the Proposed Development as described in **Chapter 5 - Project Description**.

13.4.3 Potential Effects Scoped Out

22. The traffic effects during the operational phase of the Proposed Development are restricted to occasional maintenance operation which generate significantly lower volumes of traffic that are not considered to be in excess of daily traffic variation levels on the road network. As such, the effects during the operation phase are scoped out of the assessment.

23. The traffic effects during the decommissioning phase can only be fully assessed closer to that period, 50 years on from the completion of the Site. As elements of the Proposed Development are likely to remain in-situ (such as cables), the traffic flows associated with the decommissioning works will be lower than those associated with the construction phase. The construction phase therefore represents a worst case assessment and as such, no further assessment of the decommissioning phase has been considered at this point in time and has been scoped out of the assessment.

13.4.4 Desk Study

24. The desk study included reviews and identification of the following:

- Relevant transport planning policy;
- Accident data;
- Sensitive locations;
- Any other traffic sensitive receptors in the area (core paths, routes, communities, etc.);
- OS plans;
- Potential origin locations of construction staff and supply locations for construction materials to inform extent of local area roads network to be included in the assessment; and
- Constraints to the movement of Abnormal Indivisible Loads through a Route Survey Report including swept path assessments.

13.4.5 Site Visit

25. Site visits and field surveys were also undertaken and comprised:

- Site visit to review the potential access routes and potential constraints was undertaken; and
- Collection of traffic flow and speed data between the 7th and the 13th of June 2023.

13.4.6 Assessment of Potential Effect Significance

13.4.6.1 Criteria for Assessing the Sensitivity of Receptors

26. The Institution of Environmental Management and Assessment (IEMA) 'Guidelines for Environmental Impact Assessment' (2005) notes that the separate 'Guidelines for the Environmental Assessment of Road Traffic' (1993) document should be used to characterise the environmental traffic and transport effects (off-site effects) and the assessment of significance of major new developments. The guidelines intend to complement professional judgement and the experience of trained assessors.

27. In terms of traffic and transport impacts, the receptors are the users of the roads within the Study Area and the locations through which those roads pass.

28. The IEMA Guidelines includes guidance on how the sensitivity of receptors should be assessed. Using that as a base, professional judgement was used to develop a classification of sensitivity for users based on the characteristics of roads and locations. This is summarised in **Table 13.2.**

Table 13.2 – Classification of Receptor Sensitivity

Receptor	Sensitivity			
	High	Medium	Low	Negligible
Users of Roads	Where the road is a minor rural road, not constructed to accommodate frequent use by Heavy Goods Vehicles (HGV). Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.	Where the road is a local A or B class road capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic management measures.	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little affected by additional traffic and suitable for Abnormal Loads and new strategic trunk road junction capable of accommodating Abnormal Loads.
Users / Residents of Locations	Where a location is a large rural settlement containing a high number of community and public services and facilities.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.	Where a location is a small rural settlement, few community or public facilities or services.	Where a location includes individual dwellings or scattered settlements with no facilities.

29. Where a road passes through a location, users are considered subject to the highest level of sensitivity defined by either the road or location characteristics.

13.4.6.2 Criteria for Assessing the Magnitude of Change

30. The following rules, also taken from the IEMA Guidelines are used to determine which links within the Study Area should be considered for detailed assessment:

- Rule 1 – include highways links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles is predicted to increase by more than 30%); and
- Rule 2 – include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

31. The IEMA Guidelines identify the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development: the impacts and levels of magnitude are discussed below:

- Severance – the IEMA Guidance states that, "severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery." Further, "Changes in traffic of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' [or minor, moderate and major] changes in severance respectively". However, the Guidelines acknowledge that "the measurement and prediction of severance is extremely difficult";
- Driver delay – the IEMA Guidelines note that these delays are only likely to be "significant [or major] when the traffic on the network surrounding the development is already at, or close to, the capacity of the system.";
- Pedestrian delay – the delay to pedestrians, as with driver delay, is likely only to be major when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. An increase in total traffic of approximately 30% can double the delay experienced by pedestrians attempting to cross the road and would be considered major;

- Pedestrian amenity – the IEMA Guidelines suggests that a tentative threshold for judging the significance of changed in pedestrian enmity would be where the traffic flow (or its lorry component) is halved or doubled. Therefore, it is considered that a change in the traffic flow of -50% or +100% would produce a major change in pedestrian amenity;
- Fear and intimidation – there are no commonly agreed thresholds for estimating levels of fear and intimidation, from known traffic and physical conditions. However, as the impact is considered to be sensitive to traffic flow, changes in traffic flow of 30%, 60% and 90% are regarded as producing minor, moderate, and major changes respectively; and
- Accidents and safety – professional judgement would be used to assess the implication of local circumstances, or factors which may elevate or lessen risks of accidents.

32. While not specifically identified, as more vulnerable road users, cyclists are considered in similar terms to pedestrians.

13.4.6.3 Criteria for Assessing Significance

33. To determine the overall significance of effects, the results from the receptor sensitivity and magnitude of change assessments are correlated and classified using a scale set out in LA 104 Environmental Assessment and Monitoring (Revision 1) of the Design Manual for Roads and Bridges (DMRB) and summarised in **Table 13.3**.

Table 13.3 – Significance of Effects

Receptor Sensitivity	Magnitude of Impacts			
	Major	Moderate	Minor	Negligible
High	Major	Major / Moderate	Moderate / Minor	Minor
Medium	Major / Moderate	Moderate	Minor	Minor / Negligible
Low	Moderate / Minor	Minor	Minor	Minor / Negligible
Negligible	Minor	Minor	Minor / negligible	Negligible

34. In terms of the EIA Regulation, effects would be considered of significance where they are assessed to be Major or Moderate. Where an effect could be one of Major / Moderate or Moderate / Minor, professional judgement would be used to determine which option should be applicable.

13.4.6.4 Limitations to Assessment

35. The assessment is based upon average traffic flows in one-month periods. During the month, activities at the Site may fluctuate between one day and another and it is not possible to fully develop a day by day traffic flow estimate as no Balance of Plant (BoP) contractor has been appointed at this time and external factors can impact upon activities on a day by day basis (weather conditions, availability of materials, time of year, etc).

36. The assessment is based upon an assumed construction programme for the Proposed Development as provided in **Chapter 5 – Project Description**. Alterations in this programme, may increase or decrease traffic flows per month.

37. This assessment is based upon average traffic flows. There may be localised peaks with construction days where flows can be higher for a specific hour, such as a shift change on Site.

38. Assumptions on the origin points for materials have been made to provide a worst-case assessment scenario. Should these origin points change, the effects on surrounding areas may alter to those presented in the assessment.

39. Whilst some information gaps have been identified, it is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant environmental effects on access, traffic and transport.

13.5 Baseline

13.5.1 Baseline Traffic Surveys

40. Access to the Proposed Development will be taken from newly provided access junctions along the length of the Cable Route Corridor. Materials will be delivered to the Proposed Development via these access junctions. The locations of the newly provided temporary access junctions along the route of the Proposed Development are shown in **Appendix 13.1**.

41. The geographic scope was determined through a review of OS plans and an assessment of the potential origin locations of construction staff and supply locations for construction materials.

42. The Study Area for this assessment includes the A90 (T), A981, A952, A950, A948, A947, B9030, B9170, unnamed road at Rora Dairy, unnamed road at NGNDSS and other minor roads / tracks providing local access such as Woodside and Tortorston Road.

43. In order to assess the impact of construction traffic on the Study Area, Automatic Traffic Count (ATC) surveys were undertaken along the unnamed road, at NGNDSS, B9030 northeast of Auchnagatt, A952, Millbreck and A950, east of Mintlaw, between 07 and 13 June 2023.

44. The ATC surveys were complimented with existing traffic data obtained from the Department for Transport (DfT) database. Available traffic data from 2019 was used to estimate existing traffic flows, as this data was not affected by Covid 19 travel restrictions. National Road Traffic Forecasts (NRTF) low growth factors were applied to the 2019 data to estimate 2023 flows. The low growth factor for 2019 to 2023 is 1.027.

45. The DfT traffic data allow the traffic flows to be split in vehicle classes. The data was summarised into Cars / Light Goods Vehicles (LGV) and Heavy Goods Vehicles (HGVs) (buses and all goods vehicles >3.5tonnes gross maximum weight). The locations of the traffic count sites used in this assessment are illustrated in **Figure 13.1** and are described as follows:

    1. Unnamed road, at NGNDSS (ATC);
    2. B9170, south of New Deer (DfT 983081);
    3. A981, Fordyce Terrace, New Deer (DfT 21004);
    4. A948, south-east of New Deer (DfT 1180);
    5. A948, north of Nethermuir (DfT 50860);
    6. B9030, north-east of Auchnagatt (ATC);
    7. A952, Millbreck (ATC);
    8. A950, north-west of Old Deer (DfT 20990);
    9. A950, east of Mintlaw (ATC);
    10. Unnamed road, at Rora Dairy (DfT 931840);
    11. A90, St Fergus (DfT 50805);
    12. A90, north of Howe o'Buchan Roundabout (DfT 80573);
    13. A947, Birkenhills (DfT 30993); and
    14. A947, Tulloch (DfT 84078).

46. **Table 13.4** summarises the average daily traffic (ADT) traffic data collected and used in this assessment.

Table 13.4 – 24-hour Average Daily Traffic Data (2023)

Ref. No.	Survey Location	Car & LGV	HGV	Total
1	Unnamed road, at New Deer Substation	225	100	325
2	B9170, south of New Deer	1,562	161	1,723
3	A981, Fordyce Terrace, New Deer	2,738	194	2,932
4	A948, south-east of New Deer	853	92	946

Ref. No.	Survey Location	Car & LGV	HGV	Total
5	A948, north of Nethermuir	1,781	146	1,927
6	B9030, north-east of Auchnagatt	460	102	562
7	A952, Millbreck	5,108	1,245	6,353
8	A950, north-west of Old Deer	2,176	261	2,437
9	A950, east of Mintlaw	5,743	904	6,647
10	Unnamed road, at Rora Dairy	528	23	550
11	A90, St Fergus	4,546	267	4,813
12	A90, north of Howe o'Buchan Roundabout	3,740	413	4,153
13	A947, Birkenhills	5,852	534	6,386
14	A947, Tulloch	5,142	614	5,756

47. Please note minor variances due to rounding may occur.

48. The two-way seven-day average and 85th percentile speeds observed at the count sites are summarised below in **Table 13.5**. Note only those locations where ATCs were undertaken as part of this assessment have speed data available. Those locations making use of DfT data do not have speed data available.

Table 13.5 – Speed Summary (2023)

Ref. No.	Survey Location	Mean Speed (mph)	85th %ile Speed (mph)	Speed Limit (mph)
1	Unnamed road, at NGNDSS	46.5	57.8	60.0
2	B9170, south of New Deer	No Data Available		60.0
3	A981, Fordyce Terrace, New Deer			30.0
4	A948, south-east of New Deer			60.0
5	A948, north of Nethermuir			60.0
6	B9030, north-east of Auchnagatt	47.5	58.5	60.0
7	A952, Millbreck	57.8	65.9	60.0
8	A950, north-west of Old Deer	No Data Available		60.0
9	A950, east of Mintlaw	49.8	58.4	60.0
10	Unnamed road, at Rora Dairy	No Data Available		60.0
11	A90, St Fergus			40.0
12	A90, north of Howe o'Buchan Roundabout			60.0
13	A947, Birkenhills			50.0

Ref. No.	Survey Location	Mean Speed (mph)	85th %ile Speed (mph)	Speed Limit (mph)
14	A947, Tulloch			60.0

49. The speed information shown in **Table 13.5** indicates that there is compliance with the current speed limit at the ATC survey locations, with the exception of A952, Millbreck. This indicates that traffic management measures would be required at this location and that Police Scotland may wish to consider enforcement spot checks in this area.

13.5.2 Accident Review

50. Road traffic accident data for the five-year period commencing 01 January 2017 through to the 31 December 2021 was obtained from the online resource crashmap.co.uk which uses data collected by the police about road traffic crashes occurring on British roads.

51. Transport Assessment Guidance from Transport Scotland on behalf of the Scottish Government requires an analysis of the Personal Injury Accident (PIA) on the road network in the vicinity of any development to be undertaken for at least the most recent 3-year period, or preferably a 5-year period, particularly if the site has been identified as being within a high accident area.

52. The PIA statistics are categorised into three categories, namely “slight” for damage only incidents, “serious” for injury accidents and “fatal” for accidents that result in a death.

53. The locations of accidents and the recorded severity of the accidents are shown in **Figure 13.3**.

54. A summary analysis of the incidents indicates that:

- A total of 55 accidents were recorded within the Study Area during the study period, of which, 28 were classified as slight and 27 were classified as serious. No fatalities were recorded within the Study Area.
- A total of 52 accidents involved cars, five accidents involved motorcycles, seven accidents involved HGVs and two accidents involved pedestrians. A total of 18 accidents involved young drivers (16-20).
- Two separate incidents involved young pedestrians in Mintlaw, which were both recorded as slight. One incident was recorded at the A950 / Newlands Road priority junction and one incident was recorded on the western arm of the roundabout at The Square.
- A total of three separate incidents were recorded within a distance of 100m along the A90 (T), at the bridge over River Ugie. The road in the vicinity of the bridge is winding in nature. One of the incidents involved a motorcycle, one incident was recorded as a single-vehicle accident involving a car, and one incident involved two cars. The two separate incidents involving cars were classified as slight and the incident involving a motorcycle was classified as serious.
- Two separate accidents were recorded in the same location along the A947, approximately 600m to the south of Birkenhills. Both were classified as slight and were recorded as multivehicle collisions involving cars. There is a slight bend along the A947 in the vicinity of the area where the accidents were recorded.

55. In general, there are no clusters of PIAs at any location in the study area or high numbers of accidents involving HGVs for example. Based on the information available, it has been established that there are no specific road safety issues within the immediate vicinity of the Proposed Development that currently require to be addressed or would be exacerbated by the construction of the Proposed Development.

13.5.3 Active Travel Network

56. A review of the Core Paths Plan on the Aberdeenshire Council website indicates that the following Core Paths detailed in **Table 13.6** are located within the vicinity of the Proposed Development.

Table 13.6 – Core Paths in the vicinity of the Proposed Development

Path No.	Location	Path Type	Length (km)
7LD.03MP.05	The path crosses the Minor Routes at Glendaveny Cottages and Tortorston Road.	Existing Core Path	7.29
7LD.03MP.04	The Proposed Development crosses the path north of Crookedneuk	Existing Core Path	3.84
208.01	The path crosses Yokieshill Cottages within the Study Area.	Existing Core Path	1.47
7LD.03FM.10	The Proposed Development crosses the path at Capelstones	Existing Core Path	13.41

57. A review of Sustrans' National Cycle Network (NCN) map indicates that a section of NCN Route 1 is located along the Proposed Development's route. NCN Route 1 comprises a combination of on-road and traffic-free cycle route which runs from Dover to Tain and is approximately 2,034 km in length.

58. The section of NCN Route 1 which is located in the vicinity of the Proposed Development comprises a traffic free route and is located between Auchnagatt and Maud.

59. Within the Study Area, NCN Route 1 is required to cross the A981 on a section of the on-road route to the north-west of Maud.

13.5.3.1 Future Year Baseline

60. Construction of the Proposed Development could commence during 2025 if consent is granted and is anticipated to take up to 30 months depending on weather conditions and ecological considerations.

61. To assess the likely effects during the construction and typical operational phase, base year traffic flows were determined by applying a NRTF low growth factor to the surveyed traffic flows.

62. The NRTF low growth factor for 2023 to 2025 is 1.011. These factors were applied to the 2023 traffic flow data to estimate the 2025 future baseline traffic flows shown in **Table 13.7**. As outlined in **Appendix 13.1**, this will be used in the Construction Peak Traffic Impact Assessment.

Table 13.7 – 24-hour Average Daily Traffic Data (2025)

Ref. No.	Survey Location	Car & LGV	HGV	Total
1	Unnamed road, at NGNDSS	227	101	329
2	B9170, south of New Deer	1,579	163	1,742
3	A981, Fordyce Terrace, New Deer	2,768	196	2,964
4	A948, south-east of New Deer	863	93	956
5	A948, north of Nethermuir	1,800	147	1,948
6	B9030, north-east of Auchnagatt	465	103	568
7	A952, Millbreck	5,164	1,259	6,423
8	A950, north-west of Old Deer	2,200	264	2,464
9	A950, east of Mintlaw	5,806	914	6,720
10	Unnamed road, at Rora Dairy	534	23	557

Ref. No.	Survey Location	Car & LGV	HGV	Total
11	A90, St Fergus	4,596	270	4,865
12	A90, north of Howe o'Buchan Roundabout	3,781	417	4,199
13	A947, Birkenhills	5,916	540	6,456
14	A947, Tulloch	5,199	621	5,820

63. Please note minor variances due to rounding may occur.

13.5.3.2 Receptor Sensitivity

64. A review of sensitive receptors has been undertaken within the Study Area. **Table 13.8** details the receptors and their sensitivities for use within the following assessment. A justification for the sensitivity has been provided, based upon the details contained in **Table 13.2.**

Table 13.8 – Receptor Sensitivity Summary

Receptor	Sensitivity	Justification
A90 (T)	Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition.
A981	Medium	Where the road is a local A or B class road capable of regular use by HGV traffic.
A952	Medium	Where the road is a local A or B class road capable of regular use by HGV traffic.
A950	Medium	Where the road is a local A or B class road capable of regular use by HGV traffic.
A948	Medium	Where the road is a local A or B class road capable of regular use by HGV traffic.
A947	Medium	Where the road is a local A or B class road capable of regular use by HGV traffic.
B9030	Medium	Where the road is a local A or B class road capable of regular use by HGV traffic.
B9170	Medium	Where the road is a local A or B class road capable of regular use by HGV traffic.
Unclassified at Rora Dairy	High	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs.
Unclassified at NGNDSS	High	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs.
Other minor roads and tracks	High	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs.
Core Paths	High	Minor path used by walkers and cyclists, not constructed to accommodate HGV traffic flows.
Longside	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Mintlaw	High	Where a location is a large rural settlement containing a high number of community and public services and facilities.
Stuartfield	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Old Deer	Low	Where a location is a small rural settlement, few community or public facilities or services.

Receptor	Sensitivity	Justification
Auchnagatt	Low	Where a location is a small rural settlement, few community or public facilities or services.
New Deer	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Fyvie	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Oldmeldrum	High	Where a location is a large rural settlement containing a high number of community and public services and facilities.
Methlick	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.

65. Based on the indicators which are stated within the IEMA Guidelines, the following receptors are identified as sensitive receptors in this assessment. These locations will therefore be subject to 'Rule 2' of the IEMA Guidelines which requires a full assessment of effects if the traffic count locations are anticipated to be subject to an increase in 10% of total traffic:

- Longside;
- Mintlaw;
- Stuartfield;
- Old Deer;
- Auchnagatt;
- New Deer;
- Fyvie;
- Oldmeldrum; and
- Methlick.

66. All other receptors within the Study Area are subject to 'Rule 1' and are assessed if traffic flows (or HGV flows) on highway links are anticipated to increase by more than 30% as a result of the construction of the Proposed Development.

13.6 Potential Effects

13.6.1 Potential Construction Effects

67. The assessment of effects is based on the project description as outlined in **Chapter 5 - Project Description** and the assumptions noted above. Unless otherwise stated, potential effects identified are considered to be adverse.

68. The assessment is based upon the construction effects that may occur within the Study Area. In order to assess the effects, it is necessary to determine the likely traffic generation associated with the Proposed Development. During the assumed 30 month construction period, the following traffic would require access to the Site:

- Staff transport, either cars or staff minibuses;
- Construction equipment and materials, deliveries of machinery and supplies such as concrete materials, cables and aggregates;
- Abnormal Indivisible Loads consisting of transformers; and
- Escort vehicles for Abnormal Indivisible Loads deliveries.

69. Except for the transformers, most site traffic would be normal construction plant and would include grading tractors, excavators, high capacity cranes, forklifts and dumper trucks. Most would arrive at the Site on low loaders.

70. The resulting traffic generation profile is attached as **Appendix B** in **Appendix 13.1: Transport Assessment** for review. The peak of construction occurs in Month 5 with 396 HGV movements per day (198 inbound and 198 outbound) and 68 Car / LGV movements (34 inbound trips and 34 outbound trips).

71. The distribution of development traffic on the network would vary depending on the types of loads being transported. Materials for the construction of the access tracks will come from local quarries, the closest of which are located along the B9005, near Methlick, and is approximately 9 km to the south-east of the Proposed Substation. The closest concrete plants are located along the A950, to the south-east of Longside and is approximately 22.7 km northeast of the Proposed Substation .

72. The preparation of the construction supply contracts have not yet commenced and the Applicant will confirm exact sources of material with the Council prior to construction works commencing.

73. Equipment and materials to mobilise the Site will be transported to the Site via the A90 (T). Construction staff will be based locally to the Site.

74. The peak construction traffic flows have been distributed based on assumed origins of materials and staff, and as a worst case scenario, the trips associated with the construction of the Cable Route Corridor have been assigned to each of the count points located near the proposed 20 road crossing access points, as previously presented in **Figure 13.1**. This assumes that the construction of the Cable Route Corridor will occur along the route within the peak period. In reality, the construction of the cable will commence in the east and continue towards the west in line with the indicative construction programme, with only those material deliveries and staff trips required for those specific sections at any one time. By assigning all potential construction trips to each location, this ensures a suitably robust assessment has been undertaken.

75. To allow the Offshore Project to connect to the national electrical grid, new transformers will be required. These transformers will be located within the Proposed Substation Compound and due to their size and weight are classified as Abnormal Indivisible Loads. These will be delivered to the Substation Site from Port of Peterhead via the A982, A90 (T), A948, B9170, the unnamed road leading to Greens / Maryhill and the unnamed road between Maryhill and North Millbrex where the Substation Site access will be located.

76. To estimate the total trips through the Study Area during the peak of the construction phase, traffic was distributed through the network and combined with the 2025 Baseline traffic data. The resulting figures were compared with the 2025 Baseline traffic to provide a percentage in movements. The traffic impact summary is provided in **Table 13.9.**

Table 13.9 – Traffic Impact Summary

Ref. No.	Survey Location	Car & LGV	HGV	Total	Car & LGV % Increase	HGV % Increase	Total Traffic % Increase
1	Unnamed road, at NGNDSS	285	473	758	25.2%	368.2%	130.7%
2	B9170, south of New Deer	1,619	517	2,136	2.5%	217.3%	22.6%
3	A981, Fordyce Terrace, New Deer	2,807	507	3,314	1.4%	158.4%	11.8%
4	A948, south-east of New Deer	902	386	1,288	4.6%	313.4%	34.7%
5	A948, north of Nethermuir	1,840	440	2,280	2.2%	198.6%	17.1%
6	B9030, north-east of Auchnagatt	504	396	900	8.4%	284.0%	58.5%
7	A952, Millbreck	5,203	1,552	6,755	0.8%	23.3%	5.2%
8	A950, north-west of Old Deer	2,239	575	2,814	1.8%	117.9%	14.2%

Ref. No.	Survey Location	Car & LGV	HGV	Total	Car & LGV % Increase	HGV % Increase	Total Traffic % Increase
9	A950, east of Mintlaw	5,845	1,220	7,066	0.7%	33.5%	5.1%
10	Unnamed road, at Rora Dairy	573	320	893	7.4%	1301.1%	60.5%
11	A90, St Fergus	4,605	270	4,875	0.2%	0.0%	0.2%
12	A90, north of Howe o'Buchan Roundabout	3,802	739	4,541	0.5%	76.9%	8.1%
13	A947, Birkenhills	5,954	540	6,494	0.6%	0.0%	0.6%
14	A947, Tulloch	5,199	621	5,820	0.0%	0.0%	0.0%

Please note minor variances due to rounding may occur.

77. The total traffic movements are anticipated to increase by over 30% at the unnamed road, at NGNDSS, the B9090 (130.7% increase), A948, south-east of New Deer (34.7%), northeast of Auchnagatt (58.5% increase) and the unnamed road, at Rora Dairy (60.5%). The traffic flows are expected to increase by 429, 332, 332 and 336 daily two-way movements, respectively, which sees an hourly increase of approximately 36, 28,28 and 28 trips per hour, respectively or approximately two trips per minute on each of the road links, over a typical 12-hour shift.

78. HGV trips are expected to increase by over 30% on the following Links, described as follows:

- Count Point 1. Unnamed road, at NGNDSS (368.2% increase) which sees an increase in HGVs by 372 HGVs per day which equates to approximately 31 HGV trips per hour (16 inbound HGV trips and 15 outbound HGV trips);
- Count Point 2. B9170, south of New Deer (217.3% increase) which sees an increase in HGVs by 354 HGVs per day which equates to approximately 30 HGV trips per hour (approximately 15 inbound HGV trips and 15 outbound trips);
- Count Point 3. A981, Fordyce Terrace, New Deer (158.4% increase) which sees an increase in HGVs by 311 HGVs per day which equates to approximately 26 trips per hour (approximately 13 inbound HGV trips and 13 outbound HGV trips);
- Count Point 4. A948, south-east of New Deer (313.4% increase) which sees an increase in HGVs by 293 HGVs per day which equates to approximately 24 trips per hour (12 inbound HGV trips and 12 outbound HGV trips);
- Count Point 5. A948, north of Nethermuir (198.6% increase) which sees an increase in HGVs by 293 HGVs per day which equates to approximately 24 trips per hour (12 inbound HGV trips and 12 outbound HGV trips);
- Count Point 6. B9030, northeast of Auchnagatt (284.0% increase) which sees an increase in HGVs by 293 HGVs per day which equates to approximately 24 trips per hour (12 inbound HGV trips and 12 outbound HGV trips);
- Count Point 8. A950, northwest of Old Deer (117.9% increase) which sees an increase in HGVs by 311 HGVs per day which equates to approximately 26 trips per hour (approximately 13 inbound HGV trips and 13 outbound HGV trips);
- Count Point 9. A950, east of Mintlaw (33.5% increase) which sees an increase in HGVs by 306 HGVs per day which equates to approximately 26 trips per hour (approximately 13 inbound HGV trips and 13 outbound HGV trips);
- Count Point 10. Unnamed road, at Rora Dairy (1301.1% increase) which sees an increase in HGVs by 297 HGVs per day which equates to approximately 25 trips per hour (13 inbound HGV trips and 12 outbound HGV trips); and

- Count Point 12. A90, north of Howe o'Buchan Roundabout (76.9% increase) which sees an increase in HGVs by 321 HGVs per day which equates to approximately 27 trips per hour (14 inbound HGV trips and 13 outbound HGV trips).

79. While the increases could be considered statistically significant, it is generally caused by low total flows as well as low HGV flows on roads within the Study Area. The increases in total and HGV flows detailed above are not considered significant in terms of overall total flows. It should also be noted the construction phase is transitory in nature and the peak of construction activities is short- lived.

80. A review of existing road capacity has been undertaken using the Design Manual for Roads and Bridges, Volume 15, Part 5 "The NESA Manual". The theoretical road capacity has been estimated for each of the road links for a 12-hour period that makes up the Study Area. The results are summarised in **Table 13.10**.

Table 13.10 – 2025 Daily Traffic Data (12 hr)[2]

Ref. No.	Survey Location	2025 Baseline Flow	2025 Base + Development	Theoretical Flows	Spare Road Capacity %
1	Unnamed road, at NGNDSS	329	758	3,360	77%
2	B9170, south of New Deer	1,742	2,136	21,600	90%
3	A981, Fordyce Terrace, New Deer	2,964	3,314	19,200	83%
4	A948, south-east of New Deer	956	1,288	21,600	94%
5	A948, north of Nethermuir	1,948	2,280	21,600	89%
6	B9030, north-east of Auchnagatt	568	900	19,200	95%
7	A952, Millbreck	6,423	6,755	21,600	69%
8	A950, north-west of Old Deer	2,464	2,814	21,600	87%
9	A950, east of Mintlaw	6,720	7,066	21,600	67%
10	Unnamed road, at Rora Dairy	557	893	3,360	73%
11	A90, St Fergus	4,865	4,875	28,800	83%
12	A90, north of Howe o'Buchan Roundabout	4,199	4,541	28,800	84%
13	A947, Birkenhills	6,456	6,494	28,800	77%
14	A947, Tulloch	5,820	5,820	28,800	80%

Please note minor variances due to rounding may occur.

81. The results indicate there are no road capacity issues with the addition of construction traffic associated with the Proposed Development and significant spare capacity exists within the trunk and local road network to accommodate all construction phase traffic.

1. [2] It should be noted that a review of the existing traffic plus committed traffic flows is presented in **Appendix 13.1** (**Table 11**) which indicates that the ample spare capacity within the road network to accommodate the construction phase traffic along with committed development flows.

82. The significance of the potential effects has been determined using the rules and thresholds discussed previously. **Table 13.11** summarises the significance on the receptors for the construction phase.

Table 13.11 – Overall Construction Phase Effects

Receptors	Severance	Driver Delay	Pedestrian Delay	Amenity	Fear	Accidents & Safety
Unnamed road, at NGNDSS	Major	Major	Moderate / Minor	Major	Major	Major / Moderate
B9170, south of New Deer	Major / Moderate	Moderate	Minor	Major / Moderate	Major / Moderate	Moderate
A981, Fordyce Terrace, New Deer	Major / Moderate	Moderate	Moderate	Major / Moderate	Major / Moderate	Moderate
A948, south-east of New Deer	Major / Moderate	Moderate	Moderate	Major / Moderate	Major / Moderate	Moderate
A948, north of Nethermuir	Major / Moderate	Moderate	Minor	Major / Moderate	Major / Moderate	Moderate
B9030, northeast of Auchnagatt	Major / Moderate	Moderate	Moderate	Major / Moderate	Major / Moderate	Moderate
A950, northwest of Old Deer	Moderate	Minor	Moderate	Moderate	Moderate	Moderate
A950, east of Mintlaw	Minor	Minor	Minor	Minor	Minor	Minor
Unnamed road, at Rora Dairy	Major	Major	Moderate / Minor	Major	Major	Major / Moderate
A90, north of Howe o'Buchan Roundabout	Minor	Minor / Negligible	Minor / Negligible	Minor / Negligible	Minor	Minor
Other minor roads and tracks*	Major	Major	Moderate / Minor	Major	Major	Major / Moderate
Core Paths*	Major	Negligible	Major / Moderate	Major	Major	Major / Moderate
Mintlaw**	Major	Major / Moderate	Major / Moderate	Major	Major	Major / Moderate
Stuartfield**	Major / Moderate	Moderate	Moderate	Major / Moderate	Major / Moderate	Moderate
Old Deer	Moderate / Minor	Minor	Minor	Moderate / Minor	Moderate / Minor	Minor
Auchnagatt	Moderate / Minor	Minor	Minor	Moderate / Minor	Moderate / Minor	Minor
New Deer	Major / Moderate	Moderate	Moderate	Major / Moderate	Major / Moderate	Moderate
Methlick**	Major / Moderate	Moderate	Moderate	Major / Moderate	Major / Moderate	Moderate

* As there is no available traffic information, as a worst-case assessment it is assumed that percentage increase in total flows and HGV flows equate to 100%, and these locations have been assessed as such.

** As there are no count points located in the vicinity of these villages, as a worst-case assessment it is assumed that percentage increase in total flows and HGV flows equate to 100%, and these locations have been assessed as such.

13.7 Mitigation

13.7.1 Construction Mitigation

13.7.1.1 Construction Traffic Management Plan (CTMP)

83. A full CTMP is proposed to help reduce the negligible traffic impact of the construction phase on the Study Area. As part of this assessment however, a framework CTMP has been prepared and is included as **Appendix 13.2.**

84. Whilst this is not required under the assessment it is proposed to further reduce any transport and access issues on the network.

85. A summary of the measures included within the framework CTMP is provided below for information, while the full CTMP would be undertaken in consultation with Aberdeenshire Council prior to construction works commencing:

- Deliveries to Site shall be scheduled to the normal working times of the Site which are proposed to be 07:00 – 19:00 Monday – Friday and 07:00 – 13:00 on Saturdays and public holidays. Any deliveries to be made out with these working times will be reviewed on a case by case basis with Aberdeenshire Council, taking into account a number of factors including, time and impact on local community, noise and traffic disruption;
- Unless otherwise agreed with Aberdeenshire Council, construction activities would in general be undertaken during daytime periods only;
- Preparation of a Path Management Plan to minimise potential conflicts between path users and construction activities. This would include appropriate signage, diversions routes (if required), cross facilities and warning signs;
- Tool box talks to assist construction staff in how to avoid conflicts with walkers and equestrians, including instructions on how to pass horses in safety;
- Adoption of a voluntary speed limit of 20 mph for all construction vehicles through villages which include Longside, Mintlaw, Stuartfield, Old Deer, Auchnagatt, New Deer, Fyvie, Oldmeldrum and Methlick. It is not anticipated that traffic will not travel through Maud village;
- Specific training and disciplinary measures would be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- All reversing operations and the movement of plant/deliveries which will take place on-site will be supervised and controlled;
- Appropriate traffic management measures would be put in place in the vicinity of each of the access junctions to the Site in order to avoid conflict with general traffic, subject to the agreement of the roads authority. Typical measures would include HGV turning and crossing signs and / or banksmen at the Site access and warning signs;
- If road closures are required at any location as a result of the construction works, appropriate traffic management procedures including diversions will be introduced, in agreement with Aberdeenshire Council;
- The arrangements for Traffic Management will be communicated to the public and local community directly affected by construction traffic via the Applicants public liaison officer. Other methods of communication which may be implemented by the project team include letter drops to landowners in the immediate vicinity to planned Traffic Management works, online update notices communicated via the project website and local press releases;
- All visitors and new staff must undertake a Site induction. During the induction, personnel will be made aware of the Traffic Management Plan and Site rules;
- All drivers would be required to attend a site induction, which would include:
    - A tool box talk safety briefing;
    - The need for appropriate care and speed control;
    - A briefing on driver speed reduction agreements (to slow Site traffic at sensitive locations through the villages); and
    - Identification of the required access routes and the controls to ensure no departure from these routes.

86. With regards to potential damage to the Council infrastructure, Aberdeenshire Council may require an agreement to cover the cost of abnormal wear and tear on the local road network.

87. Video footage of the pre-construction phase condition of the road network within the Study Area would be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction stage of the Proposed Development. Any necessary repairs would be coordinated with the Roads Authority. Any damage caused by traffic associated with the Proposed Development, during the construction period that would be hazardous to public traffic, would be repaired immediately.

88. Any damage to road infrastructure caused directly by construction traffic would be made good, and street furniture that is removed on a temporary basis would be fully reinstated.

89. There would be a regular road edge review and any debris and mud would be removed from the public carriageway to keep the road clean and safe during the initial months of construction activity, until the construction junction and immediate access track works are complete.

13.7.1.2 Abnormal Load Transport Management Plan

90. An Abnormal Load Transport Management Plan will be prepared to cater for all movements to and from the Proposed Development. Upon confirmation of the Abnormal Indivisible Load component sizes, the finalised Transport Management Plan will include the following further details:

- Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles are not impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking.
- A diary of proposed delivery movements will be used to liaise with the communities in order to avoid key dates, such as popular local events.
- A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic.
- Proposals to establish a construction liaison committee to ensure the smooth management of the project and provide public interface with the Applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee will form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

13.7.1.3 Road Condition Survey

91. Aberdeenshire Council and Transport Scotland may require an agreement to cover the cost of abnormal wear and tear on roads within the Study Area. Video footage of the pre-construction phase condition of the construction vehicles route would be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction stage of the Proposed Development. Any necessary repairs would be coordinated with the Roads Authority. Any damage caused by traffic associated with the Proposed Development, during the construction period that would be hazardous to public traffic, would be repaired immediately.

92. Any damage to road infrastructure caused directly by construction traffic would be made good, and street furniture that is removed on a temporary basis would be fully reinstated.

93. There would be a regular road edge review and any debris and mud would be removed from the public carriageway to keep the road clean and safe during the initial months of construction activity, until the construction junction and immediate access track works are complete.

94. Overhead high voltage crossing points would be identified prior to the commencement of construction activities and appropriate actions would be undertaken to highlight these.

13.7.1.4 Access Improvements

95. All access junctions would be designed and constructed in accordance with Transport Scotland and Aberdeenshire Council design standards. An indicative layout of the access junctions along the local road network and the access junction along the trunk road are presented in **Appendix 13.1**.

13.7.1.5 Public Information

96. The Applicant would also ensure relevant information in relation to construction activities was distributed through its communication team via the project website, local newsletters and social media.

13.7.1.6 Onsite Measures delivered using a Path Management Plan

97. Consideration would be given to pedestrians and cyclists alike due to potential interactions between construction traffic and users of the core path network.

98. The Principal Contractor would ensure that speed limits are always adhered to by their drivers and associated subcontractors. This is particularly important within close proximity to the core path network and at crossing points. Advisory speed limit signage would also be installed on approaches to areas where core path users may interact with construction traffic.

99. Signage would be installed on the Site exits that makes drivers aware of local speed limits and reminding drivers of the potential presence of pedestrians and cyclists in the area. This would also be emphasised in weekly toolbox talks.

100. While no scoping response has been received from The British Horse Society, measures implemented on similar schemes will be given consideration as part of the Proposed Development. These measures are predominantly focused are the interactions between HGV traffic and horses. Horses are normally nervous of large vehicles, particularly when they do not often meet them. Horses are flighty animals and will run away in panic if really frightened. Riders will do all they can to prevent this but, should it happen, it could cause a serious accident for other road users, as well as for the horse and rider.

101. The main factors causing fear in horses in this situation are:

- Something approaching them, which is unfamiliar and intimidating;
- A large moving object, especially if it is noisy;
- Lack of space between the horse and the vehicle;
- The sound of air brakes; and
- Anxiety on the part of the rider.

102. The British Horse Society recommends the following actions that will be included in the Site training for all HGV staff:

- On seeing riders approaching, drivers must slow down and stop, minimising the sound of air brakes, if possible;
- If the horse still shows signs of nervousness while approaching the vehicle, the engine should be shut down (if it is safe to do so);
- The vehicle should not move off until the riders are well clear of the back of the HGV;
- If drivers are wishing to overtake riders, please approach slowly or even stop in order to give riders time to find a gateway or lay by where they can take refuge and create sufficient space between the horse and the vehicle. Because of the position of their eyes, horses are very aware of things coming up behind them; and
- All drivers delivering to the Site must be patient. Riders will be doing their best to reassure their horses while often feeling a high degree of anxiety themselves.

13.7.2 Staff Travel Plan

103. A Staff Travel Plan will be deployed where necessary, to manage the arrival and departure profile of staff and to encourage sustainable modes of transport, especially car-sharing. A package of measures could include:

- Appointment of a Travel Plan Coordinator (TPC);
- Provision of public transport information;
- Mini-bus service for transport of Site staff;
- Promotion of a car sharing scheme; and
- Car parking management.

13.7.3 Operation Mitigation

104. The permanent Site access junction to the Proposed Substation will be well maintained and monitored during the operational life of the development. Regular maintenance will be undertaken to keep the access junction drainage systems fully operation and to ensure there are no run-off issues onto the public road network.

13.8 Residual Effects

105. The assessment confirms that the effects will be Minor and non-significant. This is outlined in the summary of significant effects in **Table 13.12.**

106. The traffic effects associated with the construction phase are temporary in nature and are confined to the 30 month construction period only. No long-term significant transport or access effects associated with the Proposed Development.

Table 13.12 – Summary of Residual Effects

Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
	Sensitivity	Magnitude	Significance		
Construction					
Unnamed road, at NGNDSS	High	Major	Major	CTMP Proposals and Access Junction Design to Aberdeenshire Council standards.	Minor adverse – not significant
B9170, south of New Deer	Medium	Major	Major / Moderate	CTMP Proposals and Access Junction Design to Aberdeenshire Council standards.	Minor adverse – not significant
A981, Fordyce Terrace, New Deer	Medium	Major	Major / Moderate	CTMP Proposals.	Minor adverse – not significant
A948, south-east of New Deer	Medium	Major	Major / Moderate	CTMP Proposals and Access Junction Design to Aberdeenshire Council standards.	Minor adverse – not significant
A948, north of Nethermuir	Medium	Major	Major / Moderate	CTMP Proposals and Access Junction Design to Aberdeenshire Council standards.	Minor adverse – not significant
B9030, north-east of Auchnagatt	Medium	Major	Major / Moderate	CTMP Proposals and Access Junction Design to Aberdeenshire	Minor adverse – not significant

Potential Effect	Pre-mitigation Effect			Mitigation	Residual Effect
	Sensitivity	Magnitude	Significance		
				Council standards.	
A950, north-west of Old Deer	Medium	Moderate	Moderate	CTMP Proposals.	Minor adverse – not significant
Unnamed road, at Rora Dairy	High	Major	Major	CTMP Proposals and Access Junction Design to Aberdeenshire Council standards.	Minor adverse – not significant
A90, north of Howe o'Buchan Roundabout	Low	Minor	Minor	CTMP Proposals and Access Junction Design to Transport Scotland's standards.	Minor adverse – not significant
Other minor roads and tracks	High	Major	Major	CTMP Proposals and Access Junction Design to Aberdeenshire Council standards.	Minor adverse – not significant
Core Paths	High	Major	Major	Core Path Management Plan Proposals.	Minor adverse – not significant
Mintlaw	High	Major	Major	CTMP Proposals.	Minor adverse – not significant
Stuartfield	Medium	Major	Major / Moderate	CTMP Proposals.	Minor adverse – not significant
Old Deer	Low	Major	Moderate / Minor	CTMP Proposals.	Minor adverse – not significant
Auchnagatt	Low	Major	Moderate / Minor	CTMP Proposals.	Minor adverse – not significant
New Deer	Medium	Major	Major / Moderate	CTMP Proposals.	Minor adverse – not significant
Methlick	Medium	Major	Major / Moderate	CTMP Proposals.	Minor adverse – not significant
Operation					
None	None	None	None	None	None

13.9 Cumulative Assessment

107. A review of the consented developments which have been considered as cumulative developments are presented in **Appendix 13.1**.

108. A review of Aberdeenshire Council's planning portal and the Energy Consent Units website were undertaken to determine what cumulative developments should be considered with regards to the Proposed Development. This review was undertaken as part of **Appendix 13.1**.

109. As outlined in **Appendix 13.1**, a number of proposals which are considered as committed developments did not have information relating to vehicle trips submitted as part of their planning application, or available on the planning portal. As such, it was assumed that trips associated with these committed developments would be accounted for in the NTRF low growth factors.

110. Detailed trip information was however provided for the following committed developments:

- Erection of 73 Dwellinghouses and Associated Infrastructure (APP/2016/3352), Land at Aden Park Estate, Station Road, Mintlaw; and
- Mixed Use Development - Erection of 500 Dwellinghouse, Business, Community, Services for the Elderly, Retail and 5Ha of Employment Land (APP/2017/2547), Nether Aden, Mintlaw.

111. A review was undertaken to compare the impact of trips associated with the construction of the Proposed Development on the 2025 Baseline (without committed developments) and 2025 Baseline plus Committed Developments. It was found that the inclusion of committed developments identified above in the baseline flows diluted the impact of the Proposed Development on the surrounding road network. As such, in order to provide a robust assessment the potential impacts within the Traffic and Transport assessment have been based on the 2025 Baseline (without committed developments) only.

112. It should be noted that should a new development or associated development be consented following determination of the Proposed Development, any effects of all the sites being constructed at the same time would be mitigated through the use of an overarching Traffic Management and Monitoring Plan (oTMMP) for all of the sites and by introducing a phased delivery plan which would be agreed with the relevant roads department and relevant police authorities.

13.10 Summary

113. The Proposed Development would lead to a temporary increase in traffic volumes on the Study Area during the construction phase. Traffic volumes would fall off considerably outside the peak period of construction.

114. The peak of construction activity occurs in Month 5 of the programme and results in 464 daily movements (232 inbound and 232 outbound movements per day). Of these 464 daily movements, 396 movements are associated with HGV moving equipment to mobilise sections of the works as well as the import of track building materials from local quarries. The remaining 68 movements are associated with construction staff arriving at and departing from the Site.

115. The greatest impact would occur along the following roads: Unnamed road, at NGNDSS, B9170, A981, A948, B9030, A950, Unnamed road, at Rora Dairy, A90 and other minor roads and tracks, as well as the following settlements: Mintlaw, Stuartfield, Old Deer, Aughnagatt, New Deer and Methlick, as well as on the Core Path network.

116. With the implementation of appropriate mitigation, no significant residual effects are anticipated in respect of traffic and transport issues. The residual effects are all assessed to be minor or insignificant but as they will occur during the construction phase only, they are temporary and reversible.

13.11 References

- Scottish Government. (2014) National Planning Framework 4: Available at: https://www.transformingplanning.scot/national-planning-framework/
- Scottish Government. Planning Advice Note (PAN) 75. Available at: https://www.gov.scot/publications/planning-advice-note-pan-75-planning-transport/
- Transport Scotland. (2012) Transport Assessment Guidance. Available at: https://www.transport.gov.scot/media/4589/planning_reform_-_dpmtag_-_development_management__dpmtag_ref__17__-_transport_assessment_guidance_final_-_june_2012.pdf
- Aberdeenshire Council (2023) Aberdeenshire Local Development Plan. Available at: https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2023/
- Aberdeenshire Council (2005) Use of Energy in Aberdeenshire: Guidance for Developers Supplementary Planning Guidance. Available at: https://www.aberdeenshire.gov.uk/media/5945/wind_developers06.pdf
- The Institution of Environmental Management and Assessment (2005) Guidelines for Environmental Impact Assessment
- The Institution of Environmental Management and Assessment. (1993) Guidelines for the Environmental Assessment of Road Traffic
- Highways England, Transport Scotland, Welsh Government & Department for Infrastructure (2020), LA104, Environmental assessment and monitoring, the Design Manual for Roads and Bridges (DMRB)
- Transport Scotland. (2012) Transport Assessment Guidance. Available at: https://www.transport.gov.scot/media/4589/planning_reform_-_dpmtag_-_development_management__dpmtag_ref__17__-_transport_assessment_guidance_final_-_june_2012.pdf
- Table 2.2 of Volume 11, Section 2, Part 5 of the Design Manual for Roads and Bridges (DMRB) (2008); and
- Design Manual for Roads and Bridges, Volume 15, Part 5 “The NESA Manual” (2013).

GREEN VOLT

14 Chapter 14

Air Quality

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-REP-0009-14	
Version Number:	00	
Date:	*Issue Date 02/08/23*	
Prepared by:	Lucy Aylott	*Lucy Aylott*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First Review	03 July 2023
A2	Second Review	31/07/23
A3	Clean	02/08/23
00	Final	02/08/23

Contents

14 Air Quality

14.1 Introduction

1. This Air Quality Impact Assessment (AQIA) evaluates the impact of the Proposed Development on Air Quality (AQ) during the Construction phase.
2. Potential sources of airborne pollutants have been identified and the pathways for those pollutants to cause exposure to nearby receptors have been appraised.
3. The principal pollutants with potential to adversely impact nearby receptors addressed by this assessment are dust and particulate matter (primarily PM_{10}) resulting from Construction activities.
4. Particular attention has been given to the sensitivity of nearby receptors in order to assess the significance of any potential impacts identified. The principal receptors are nearby human residents. Nearby sensitive ecological receptors have also been appraised.

14.2 Legislation, Guidance and Policy

14.2.1 National Guidelines

5. The following UK national guidance documents have been referred to in compiling this assessment:
   - Institute of Air Quality Management (IAQM) (2014) – *Guidance on the assessment of dust from Demolition and Construction*

14.2.2 Legislation

6. Several limits and objectives are in place in Scotland to protect human health, vegetation, and ecosystems against harmful pollutants. European Union (EU) targets are set out in the European 2008 Ambient Air Quality Directive (2008/50/EC) and transposed into Scottish legislation by the Air Quality Standards (Scotland) Regulations 2010. The United Kingdom (UK) and Scottish Governments have set out additional standards and objectives under the Air Quality (Scotland) Regulations 2000, the Air Quality (Scotland) Amendment Regulations 2002 and the Air Quality (Scotland) Amendment Regulations 2016. The objectives relevant to this assessment are shown in **Table 14.1** (Air Quality in Scotland, 2021).

Table 14.1 – Relevant Scottish Air Quality Objectives

Pollutant	Concentration	Measured as
Particles (PM_{10})	50µg/m^3 not to be exceeded more than 7 times per year	24-hour mean
	18µg/m^3	Annual mean

14.3 Consultation

7. **Table 14.2** sets out the Air Quality (AQ) consultation undertaken during the Scoping process. No actions were required following consultation.

Table 14.2 – Scoping Consultation Responses

Consultee	Scoping Response	Action
Aberdeenshire Council – Environmental Health	Agree that AQIAs are not required for Construction traffic and Operational impacts. Agree that the	None

Consultee	Scoping Response	Action
	proposed methodology for Construction dust impacts is appropriate.	

14.4 Assessment Methodology

8. There are various AQ impacts that can arise due to emissions of dust during Construction activities and Construction traffic emissions. The impacts considered in this AQIA are:

- **Dust soiling** – dust deposition on surfaces can be an annoyance, most commonly affecting residences.
- **Human health** – ambient PM_{10} concentrations can increase due to dust generating activities. Exposure to PM_{10} over a period of time can negatively impact on human health, e.g. causing asthma in children.
- **Ecological** – dust deposition on vegetation can create ecological stress by blocking photosynthesis or leaching damaging chemicals into the surrounding soil.

9. PM_{10} refers to airborne particulate matter with a diameter of less than 10µm. The majority of dust emissions from Construction sites are in the coarse $PM_{2.5\text{-}10}$ fraction (85% to 90% by weight) rather than the finer $PM_{2.5}$ fraction (IAQM, 2014). Only objectives relevant to PM_{10} have therefore been considered in this assessment.

10. Dust impacts from Construction activities are temporary and will not last longer than the duration of Construction. Construction is anticipated to take place over a period of 21 months in total, with Landfall, Cable Route Corridor, and Substation Compound works taking place concurrently. Works along the Cable Route Corridor are expected to take 6 to 10 weeks for each route section. See **Chapter 5 – Project Description** for outline Construction Programme. Any impacts, particularly dust-soiling or ecological impacts, will therefore be short-lived.

11. The assessment considers activities in four categories:

- **Demolition**: any activity involved with the removal of existing structures.
- **Earthworks**: processes of soil stripping, ground levelling, excavation, and landscaping.
- **Construction**: any activity involved with the provision of new structures, or modifications/refurbishment of existing structures.
- **Trackout**: transport of dust and dirt from the site onto public roads via heavy duty vehicles leaving the site. The dust may be deposited on public roads and re-suspended by other vehicles using the road.

12. Following the *IAQM Guidance* on the assessment of dust from Demolition and Construction, the following approach has been used:

- The magnitude of emissions from each activity type have been assessed and categorised as small, medium or large.
- The sensitivity of the area to dust soiling, human health, or ecological harm has been determined. The sensitivity takes into account the individual receptor sensitivity, number of receptors, and distance from source.
- The risk of dust impacts for each activity type have been estimated based on the dust emission magnitude and area sensitivity, using **Table 14.3**, **Table 14.4**, and **Table 14.5**.
- Mitigation methods have been recommended for the site as a whole, and each activity based on the risk of impacts without mitigation.
- The residual effects and significance have been assessed with mitigation measures taken into account.

Table 14.3 – Risk of Dust Impacts for Demolition Activities

Risk of dust impacts for Demolition		Dust emission magnitude		
		Large	**Medium**	**Small**
Sensitivity of area	**High**	High risk	Medium risk	Medium risk
	Medium	High risk	Medium risk	Low risk

Risk of dust impacts for Demolition		Dust emission magnitude		
		Large	**Medium**	**Small**
	Low	Medium risk	Low risk	Negligible risk

Table 14.4 – Risk of Dust Impacts for Earthworks and Construction Activities

Risk of dust impacts for Earthworks and Construction		Dust emission magnitude		
		Large	**Medium**	**Small**
Sensitivity of area	**High**	High risk	Medium risk	Low risk
	Medium	Medium risk	Medium risk	Low risk
	Low	Low risk	Low risk	Negligible risk

Table 14.5 – Risk of Dust Impacts for Trackout Activities

Risk of dust impacts for Trackout		Dust emission magnitude		
		Large	**Medium**	**Small**
Sensitivity of area	**High**	High risk	Medium risk	Low risk
	Medium	Medium risk	Low risk	Negligible risk
	Low	Low risk	Low risk	Negligible risk

14.4.1 Receptors

13. The *IAQM Guidance* states that a Construction dust assessment should be carried out where there is a human receptor within 350m of the Application Site Boundary or an ecological receptor within 50m of the Application Site Boundary; or within 50m of the route used by Construction and up to 500m from the site entrance in the case of Trackout impacts. Human receptors within 350m of the Site, or within 50m of access roads within 500m of the Site, have been identified using planning address data, aerial imagery, and street view imagery.
14. The definitions used to categorise human receptors as high, medium or low sensitivity are given in **Table 14.6**.

Table 14.6 – Sensitivities of Humans to Dust Soiling and Human Health Effects

Sensitivity	Description – Dust Soiling Effects	Description – Human Health Effects
High	Areas where: ▪ Users expect enjoyment of a high level of amenity. ▪ Appearance, aesthetics, or value of their property would be diminished by soiling. ▪ People or property would be expected to be present continuously, or regularly for extended periods. Examples include dwellings, museums, medium/long-term car parks, car showrooms, etc.	Areas where: ▪ Members of the public are exposed over a time-period relevant to the air quality objective for PM_{10}. Examples include residential properties, hospitals, schools, and residential care homes.
Medium	Areas where: ▪ Users expect to enjoy a reasonable level of amenity, but not the same level of amenity as in their home. ▪ Appearance, aesthetics, or value of their property could be diminished by soiling. ▪ People or property would not be expected to be present continuously or regularly for extended periods. Examples include parks, places of work, etc.	Areas where: ▪ People exposed are workers, and exposure is over a time-period relevant to the AQ objective for PM_{10}. Examples include office and shop workers.
Low	Areas where: ▪ Enjoyment of amenity would not reasonably be expected. ▪ Appearance, aesthetics, or value of their property would not be diminished by soiling. ▪ Transient exposure, where people or property would be expected to be present only for limited periods of time. Examples include playing fields, farmland (unless commercially-sensitive horticultural land), footpaths, short-term car parks, roads, etc.	Areas where: ▪ Human exposure is transient. Examples include public footpaths, playing fields, parks, shopping streets, etc.

15. The sensitivity of the area to dust soiling and health effects of PM_{10} has been determined based on the sensitivity of each receptor, the number of these receptors, distance to source, the background concentration of PM_{10}, and site-specific factors where relevant, using **Table 14.7** and **Table 14.8**. The sensitivity has been determined separately for each activity.

Table 14.7 – Sensitivity of the Area to Dust Soiling Effects

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		< 20	< 50	< 100	< 350
High	**>100**	High	High	Medium	Low
	10–100	High	Medium	Low	Low
	1–10	Medium	Low	Low	Low
Medium	**>1**	Medium	Low	Low	Low
Low	**>1**	Low	Low	Low	Low

Table 14.8 – Sensitivity of the Area to Human Health Impacts (only values relevant to annual mean PM_{10} concentration of 11.3µg/m^3 shown)

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)				
		< 20	< 50	< 100	<200	< 350
High	**>100**	Medium	Low	Low	Low	Low
	10–100	Low	Low	Low	Low	Low
	1–10	Low	Low	Low	Low	Low
Medium	**≥1**	Low	Low	Low	Low	Low
Low	**≥1**	Low	Low	Low	Low	Low

16. Ecological receptors have been identified in conjunction with the Ecological Impact Assessment (EcIA), full details of which are given in **Chapter 6 – Ecology and Ornithology**. Potential ecological impacts have been considered within 50m of the Site, or within 50m of the access roads within 500m of the Site in the case of Trackout impacts.

17. The sensitivity of the area to ecological effects has been determined based on the number of sensitive receptors, distance to source, and site-specific factors where relevant, using **Table 14.9**. The sensitivity has been determined separately for each activity.

Table 14.9 – Sensitivity of the Area to Ecological Effects

Receptor Sensitivity	Distance from the Source (m)	
	< 20	< 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

14.4.2 Pathway

18. Dust dispersion and impacts are influenced by the local weather conditions. Dust impacts are more likely to occur during high wind speeds, in the direction of the wind, and during dry conditions as rainfall acts as a natural

dust suppressant. Receptors that are frequently downwind of the Site are therefore more likely to experience dust impacts.

19. The nearest Met Station to the Site is Aberdeen Airport (Dyce). The long-term wind rose, **Figure 14.1**, shows a prevailing wind direction of approximately southerly, therefore receptors to the north of the Site are more likely to experience dust impacts. However, Construction works and potential for dust impacts at each location along the Cable Route Corridor will be short-term (around 6–10 weeks per cable section) and wind direction is variable on this short-term basis, thus there is potential for impacts in all wind directions.

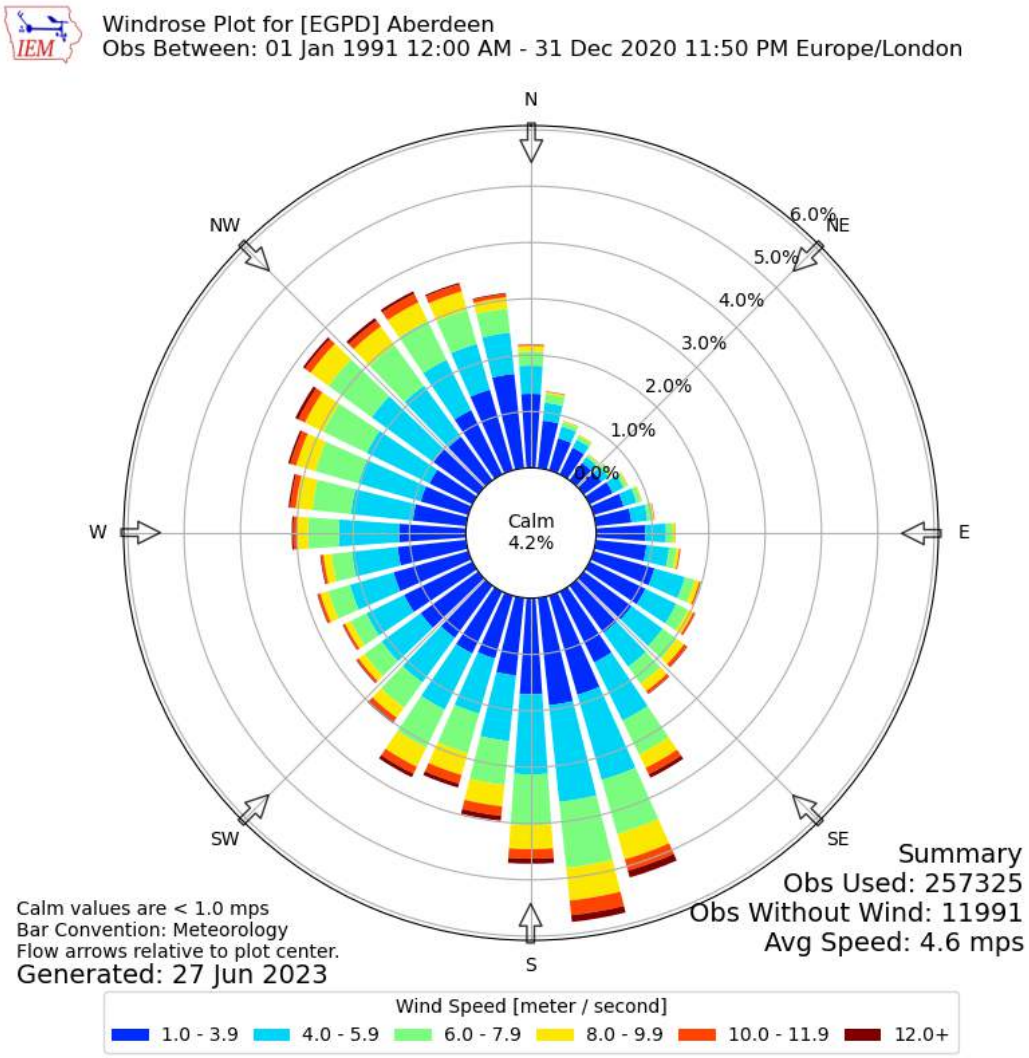

Figure 14.1 – Aberdeen Airport Wind Rose (Iowa Environmental Mesonet, 2023)

20. The region is slightly drier than the UK average. The average annual rainfall at Aberdeen Airport was 833mm from 1991–2020 inclusive, less than the UK average of 1163mm (Met Office, 2023). There was an average of 143 days per year with at least 1mm of rainfall over the same period.

14.5 Baseline

21. Air quality is generally good in Aberdeenshire; there are no exceedances of national objectives and no Air Quality Management Areas (Aberdeenshire Council, 2022).

22. No particulate matter (PM_{10}) monitoring is carried out in Aberdeenshire and no dust monitoring was proposed to be carried out for the Environmental Impact Assessment (EIA).

23. In the absence of monitoring data in the vicinity of the proposed development area, annual mean background PM_{10} data have been sourced from Air Quality in Scotland background maps for the year 2023 (Air Quality in

Scotland, 2018). The maximum annual mean background concentration over the development area is 11.3µg/m^3, comfortably below the annual mean objective of 18µg/m^3.

24. The land surrounding the Site is rural and is predominantly used as agricultural farmland with low potential for dust emissions. There are a small number of other sites close to the Proposed Development with a higher potential for dust emissions:

- The National Grid New Deer Substation is very dusty, therefore the baseline dust soiling in the vicinity of the Proposed Substation will be higher than along the majority of the Cable Route Corridor.
- Gordon Sawmills, located around 250m from the Cable Route Corridor and within 350m of two residences that are within the study area.
- Sand/gravel pit at Wester Rora Farm, adjacent to the Cable Route Corridor. The only receptor within 350m is the farm.
- Two sand/gravel pits neighbouring Derek Forsyth Cars, both marked as disused on Ordnance Survey (OS) Maps. There are two residential receptors within 350m that are within the study area.

25. The baseline dust soiling may be higher in the vicinity of these sites than around the majority of the Proposed Development, therefore the receptors close to these sites may be less sensitive to dust-soiling effects than other similar receptors. The baseline PM_{10} may also be slightly higher than the annual mean background concentration of PM_{10} in the vicinity of these sites, though as the annual mean background concentration is low, the sensitivity of the area to human health impacts is not expected to be affected.

14.6 Potential Effects

14.6.1 Dust Emission Magnitude

26. The potential dust emission magnitude for each category of works (Demolition, Earthworks, Construction, and Trackout) have been determined based on the scale of anticipated works. Works will not take place simultaneously across the entire Proposed Development area; instead the Cable Trench will be constructed in sections, therefore the receptors will not all be exposed to potential impacts at the same time.

14.6.1.1 Demolition

27. The scale of Demolition works will be determined following geological site investigations.

28. Where rock is encountered during trench excavation, it will be removed using excavators where possible, however it may be necessary to utilise peckers or a ripping tooth to enable excavators to access the rock strata. In cases where the rock is of sufficient strength and composition to make this method difficult, then a rock saw may be employed to cut a trench along the centreline to trench bottom depth. In areas of extremely high-strength rock, it may be necessary to employ a chemical rock breaker, whereby holes are drilled into the rock and a chemical compound is injected that expands rapidly causing the rock to fracture.

29. It is estimated that blasting will be required along 25%–50% of the Cable Route Corridor, with on-site crushing of blasted stone to be used for haul roads and drainage where possible. Blasting will take place at or below ground level. Subsoil and topsoil bunds on either side of the working corridor will help to mitigate dust dispersion from the Site. The cable trench will have a total length of approximately 35,000m and a maximum total width of 8m, if two trenches are used. In the worst case scenario, blasting will be required along 50% of the Cable Route Corridor. Assuming a trench depth of 1.5m and that assumed that any rock present will be at least 1m below ground level, equating to a total blasting volume of 70,000m^3.

30. Given the potential volume of blasting and the presence of on-site crushing, the dust emission magnitude associated with Demolition is anticipated to be **large** prior to mitigation. As all blasting will take place below ground level, dust dispersion and therefore impacts are much less likely than if blasting was above ground. The likelihood of impacts will further be reduced by prioritising other methods of rock removal over blasting.

14.6.1.2 Earthworks

31. Earthworks activities with the potential to lead to dust emissions are presented in **Table 14.10** below. The activity with the largest area with the potential of dust emissions is the excavation of the cable trenching.

Table 14.10 – Earthworks Activities

Infrastructure	Area	Earthworks
Landfall		
Trenchless Compound and Onshore Transition Jointing Pit	Approx. 220m^2 combined	▪ Topsoil stripping ▪ Drainage ▪ Subsoil excavation ▪ Creation of topsoil and subsoil bunds ▪ Material and equipment storage ▪ Trenchless Compound at Landfall point ▪ Backfill ▪ Reinstatement of subsoil and topsoil
Mobilisation Area 4 (Main Site Yard 2)	Approx. 55,000m^2	▪ Topsoil stripping ▪ Drainage ▪ Creation of topsoil bunds ▪ Reinstatement of topsoil
Cable Route Corridor		
Cable Route Corridor	Approx. 1,750,000m^2	
Cable Trench	Up to two trenches, each approx. 4m width, within Working Corridor	▪ Topsoil stripping ▪ Drainage ▪ Cable trench excavation (majority open-cut trenching, Trenchless Compound for road/watercourse crossings) ▪ Creation of topsoil and subsoil bunds ▪ Backfill with cement bound sand, imported sand, and excavated soil ▪ Reinstatement of topsoil
Cable Joint Pits and Link Boxes	Approx. 20m^2, every 600–1000m within Working Corridor	▪ Topsoil stripping ▪ Reinstatement of topsoil
Haul Road	Approx. 5m width, within Working Corridor	▪ Topsoil stripping ▪ Reinstatement of topsoil
Mobilisation Area 1 (Main Site Yard 1), 2, and 3	Approx. 92,500m^2 combined	▪ Topsoil stripping ▪ Drainage ▪ Creation of topsoil bunds ▪ Reinstatement of topsoil
Substation Compound		
Construction Compound	Approx. 91,000m^2	▪ Topsoil stripping ▪ Drainage (Sustainable Urban Drainage Systems (SUDS) pond) ▪ Creation of topsoil bunds ▪ Reinstatement of topsoil

32. Given the large area of cable trenching to be excavated, the dust emission magnitude associated with Earthworks is anticipated to be **large** prior to mitigation.

14.6.1.3 Construction

33. Construction at the Landfall is limited to fencing installation and haul road installation and removal. The haul road will consist of a stone apron on a geotextile membrane, with low potential for dust emissions. Potential for dust emissions during fence installation is also low.

34. Construction along the Cable Route Corridor will consist of haul road installation and removal, fencing installation, Construction of concrete joint pits/link boxes, and High Density Polyethylene (HDPE) duct installation. The potential for dust emissions during haul road installation and removal, fencing installation, and duct installation is low.

35. As concrete is a potentially dusty Construction material, there is a higher potential for dust emissions from Construction of the concrete Joint Pits/Link Boxes. Each Joint Pit will have an area of up to 20m^2 and consist of a concrete plinth and may include concrete walls. Link Boxes will be smaller at around 1m^2 and consist of a manhole set in a concrete plinth. Joint Pits/Link Boxes will be spaced 600–1000m apart along the route. The total Construction volume for joint pits and link boxes will therefore be approximately 1000m^3, assuming a concrete height of no more than 1m.

36. The largest source of potential dust emissions from Construction will be related to the Substation Compound. The exact specifications for the Substation buildings will be determined during the Detailed Design Phase. The combined volume of the Control Building, Dynamic Compensation Building, and Filter Building is estimated to be up to 50,000m^3. This is comfortably within the 25,000m^3–100,000m^3 range for medium emissions magnitude. Additional works, such as fence and access road installation, will be negligible in comparison to the Substation buildings.

37. Overall, the dust emission magnitude associated with Construction is anticipated to be **medium** – prior to mitigation.

14.6.1.4 Trackout

38. Haul roads will be constructed along the Cable Route Corridor to allow access for Construction vehicles. Haul roads and any off-easement accesses will use a stone apron on a geotextile membrane layer, which will reduce the potential for dust emissions via Trackout. Parts of the Site along the Cable Route Corridor will be accessed directly from the public roads.

39. Details of traffic and vehicle movements are given in **Chapter 13 – Traffic and Transport**. The peak number of vehicle movements in a single day is estimated to occur in Month 5 of the Construction programme, with 396 Heavy Goods Vehicle (HGV) movements (198 inbound and 198 outbound) and 68 car/Light Goods Vehicle (LGV) movements (34 inbound and 34 outbound) in one day. These movements will be spread along the entire Cable Route Corridor, with a total of 79 HGV movements at the Substation, 24 at Landfall, and 293 along the Cable Route Corridor. The Trackout magnitude at the Substation and Landfall is estimated to be medium, based on the total outbound HGV movements and haul road surfacing, while the Trackout magnitude along the Cable Route Corridor is estimated to be large.

40. Given the estimated maximum number of outbound HGV movements in a single day is estimated to be 198, the total Trackout magnitude is anticipated to be **large** prior to mitigation.

14.6.1.5 Summary

41. The overall dust emission magnitude for each activity is set out in **Table 14.11** below.

Table 14.11 – Summary of Dust Emission Magnitudes

Activity	Dust Emission Magnitude
Demolition	Large
Earthworks	Large
Construction	Medium
Trackout	Large

14.6.2 Sensitivity of Area

14.6.2.1 Dust Soiling and Human Health Effects

42. The sensitivity of the area to dust soiling and health effects of PM_{10} has been determined based on the receptors set out in **Table 14.12** and **Table 14.13**, the number of these receptors, distance to source, the background concentration of PM_{10} given in **Section 14.5**, and site-specific factors where relevant. The sensitivity has been determined separately for each activity.

43. The main receptors are human residential properties that are categorised as high sensitivity: to dust soiling and human health impacts.

44. Along the Cable Route Corridor the duration of works in each section will be short (approx. 6–10 weeks) thus limiting the potential for impacts at receptors along the Cable Route Corridor. Landfall works will take place over approximately 7 months and the Substation Compound works will take place over approximately 21 months.

Table 14.12 – Human Receptors within 350m of the Site (relevant to Demolition, Earthworks, and Construction)

Receptor	Sensitivity to Dust Soiling Effects	Sensitivity to Human Health Impacts	Distance from Site
Residences	High	High	8 within 20m 18 within 50m 48 within 100m 206 within 350m
Ravenscraig Castle	High	Medium	350m
Other Places of Work	Medium	Medium	1 within 20m 3 within 350m
Craigewan Links Golf Course	Medium	Low	Adjacent to Site at Landfall
Agricultural Land	Low	Low	Adjacent to Site along entire route
Roads	Low	Low	Cross Site in multiple places along route
Core Paths	Low	Low	Cross Site in two places

Table 14.13 – Human Receptors within 50m of Access Routes up to 500m from the Site Access Points (relevant to Trackout)

Receptor	Sensitivity to Dust Soiling Effects	Sensitivity to Human Health Impacts	Distance Along Road from Site
Residences	High	High	3 Within 20m 6 within 50m 13 within 100m 64 within 500m
Agricultural Land	Low	Low	Adjacent to access roads along entire route
Roads	Low	Low	All access route sections
Core Paths	Low	Low	Within 50m of access road in two locations

14.6.2.1.1 Demolition, Earthworks, and Construction

45. In terms of dust soiling, there are 8 high-sensitivity residential receptors within 20m of the Site and 18 residential receptors within 50m of the Site, both of which give an area sensitivity to dust soiling of medium according to **Table 14.7**.

46. There are 206 residential receptors within 350m of the site, plus an additional high-sensitivity receptor at Ravenscraig Castle, resulting in a low area sensitivity. The remaining medium and low-sensitivity receptors would also result in a low area sensitivity. The highest level of area sensitivity is taken, therefore the sensitivity of the area to dust soiling from Demolition, Earthworks, and Construction is **medium**.

47. As the background annual mean PM_{10} concentration is low, the sensitivity of the area to human health impacts of PM_{10} from Demolition, Earthworks, and Construction is **low**.

14.6.2.1.2 Trackout

48. As Trackout magnitude was determined to be large, receptors within 50m of access routes up to 500m from Site access points have been considered.

49. There are 3 high-sensitivity residential receptors within 20m of Site access points and 6 within 50m of Site access points, giving an area sensitivity to dust soiling of medium following **Table 14.7**. The total number of high-sensitivity receptors within 500m is less than 100 and the remaining receptors are considered to be low sensitivity, thus do not cause the area sensitivity to increase above medium.

50. The highest level of area sensitivity is taken, therefore the sensitivity of the area to dust soiling from Trackout is **medium**.

51. As the background annual mean PM_{10} concentration is low, the sensitivity of the area to human health impacts of PM_{10} from Demolition, Earthworks, and Construction is **low**.

14.6.2.2 Ecological Effects

52. Ecological effects can be physical or chemical. Physical effects occur due to dust deposition smothering vegetation and reducing photosynthesis, respiration, and transpiration, while chemical changes to soil or watercourses, such as those resulting from highly alkaline concrete dust, can prevent some plants from growing.

53. The Site is situated in an area of mostly agricultural land with localised areas of woodland and stretches from beach and dune systems through coastal agricultural plains and onto farmland with woodland areas. There are areas of agricultural fields (crop and modified grassland), marshy grassland, scrub, woodland with a mix of commercial conifer plantations, ancient and native woodlands, individual trees, lines of trees and hedges.

54. The agricultural land that encompasses most of the Site area is not ecologically sensitive to dust. No International or National designated sites (SPA, SAC, SSSI) are within the Construction footprint or buffer zones, and there are no plant species from the habitats recorded on Site that are critically endangered, endangered or vulnerable on

the International Union of Conservation Nature (IUCN) Red list, therefore none of the ecological receptors are considered high or medium sensitivity following the recommendations in the *IAQM Guidance*. However, there are some locally important habitats and species in the area that could be sensitive to dust.

55. The following potential ecological receptors have been identified:

- **Ancient Woodland Inventory (AWI)**: There are two sensitive AWI woodlands within 50m of the Application Site Boundary/access roads (see **Figure 4 – Woodland Sites within 2km of the Proposed Development** in **Appendix 6.1**). Crichie Wood (AWI: LEPO 2b) is located around 67m north of the Application Site Boundary and is adjacent to an access road. The Cable Route Corridor also passes through an AWI consisting of a narrow belt of broadleaved trees listed as AWI: LEPO 2b. The woodland undergrowth could be sensitive to dust soiling, therefore these are considered low-sensitivity receptors.
- **Native Woodland Survey Scotland (NWSS)**: There are two NWSS listed woodlands that are in close proximity to the working corridor (one adjacent to Application Site Boundary and one within 30m of the Application Site Boundary, see **Figure 4 – Woodland Sites within 2km of the Proposed Development** in **Appendix 6.1**). These are listed as wet and native woodlands and correspond with the National Vegetation Classification (NVC) categories of W4 and W7. Both have been categorised as Class 1 highly Ground Water Dependent Terrestrial Ecosystems (GWDTE) and are considered to be low sensitivity receptors.
- **Badger**: Baseline surveys for badgers recorded multiple setts consisting of a large 20+ hole sett to single outliers, including paths and well-worn tracks, diggings and latrines. Badgers are not considered sensitive to dust impacts, however the habitats that they rely on for feeding and foraging may have low sensitivity to dust soiling.
- **Ornithology**: Breeding birds recorded in the predominantly agricultural fields in the survey area were very limited. Species recorded included skylark, meadow pipit and corn bunting. The skylark has a UK population of 1,785,000 breeding territories and the meadow pipit is 2.5 million breeding territories and both these species are relatively common throughout Aberdeenshire. The corn bunting is a much rarer species with 11,000 breeding territories present in the UK with as few as 800 pairs in Scotland. Breeding birds are considered to be low sensitivity receptors.
- **Rattray Head to Peterhead Local Nature Conservation Site (LNCS)**: This runs through the Application Site Boundary at the Landfall (see **Figure 6.XX** in **Appendix 6.1**) and is noted for its variety of coastal habitats including; sand dunes, a good diversity of plant species including several species that are rare in north-east Scotland, adjacent fields important for roosting and feeding geese, waders and wildfowl. This habitat is not likely to be sensitive to dust soiling as it is primarily located in sand dunes. In addition, the Trenchless Compound methodology is expected to produce less dust than the open-cut trenching used along much of the Cable Route Corridor, and very little concrete will be used at the Landfall. The LNCS is therefore not considered to be sensitive to dust soiling.
- **GWDTE**: A number of Class 2 and Class 3 GWDTE habitats were identified within or close to the Application Site Boundary (see **Figure 8: Maps 1 - 4** in **Appendix 6.1**). All of these habitats are considered to be low sensitivity receptors to dust soiling.
- **Other Habitats**: In total, 26 National Vegetation Classification (NVC) communities were recorded within the respective study area. The most common vegetation types within the study area included arable crop land and modified grassland. Arable crop land is not considered to be a sensitive receptor. Much of the vegetation communities on Site have been impacted by farm practices and include grassland modification, drainage and grazing. These can form transitional zones to other plant communities, especially where land has been unmanaged, or is adjacent to main watercourses. Many of these areas of grassland have high ecological value locally, therefore are considered to be low sensitivity receptors. In addition, the locally important plant species small-flowered crane's-bill (*Geranium pusillum*) and three incidences of marsh yellow-cress (*Rorippa palustris*) were identified on/near the Site, which could be sensitive to dust.

56. No chemical effects are expected from Demolition or Earthworks activities. Any chemical effects would be limited to Construction and Trackout around the Substation, as there will be very little concrete at Landfall and along the Cable Route Corridor. The majority of land at the Substation is currently classed as arable land, though there are small areas of neutral semi-improved grassland within the Application Site Boundary and areas of neutral semi-improved and improved grassland adjacent to the Application Site Boundary which could be sensitive to chemical changes to the soil.

57. All other effects would be physical, i.e. dust soiling/smothering of habitats.

58. Overall, there are no high or medium sensitivity ecological receptors, however there are a number of locally important low sensitivity receptors. The overall sensitivity of the area to ecological effects is considered to be **low** for all activities.

14.6.2.3 Summary

59. The overall sensitivity of the area for each activity and each dust impact is set out in **Table 14.14** below.

Table 14.14 – Summary of Sensitivity of Area to Each Dust Impact

Sensitivity of Area		Activity			
		Demolition	**Earthworks**	**Construction**	**Trackout**
Potential Impact	**Dust Soiling**	Medium	Medium	Medium	Medium
	Human Health	Low	Low	Low	Low
	Ecological	Low	Low	Low	Low

14.6.3 Risk of Impacts

60. Using **Table 14.3**, **Table 14.4**, and **Table 14.5**, the risk of dust impacts for each activity have been estimated and are set out in **Table 14.15** below.

Table 14.15 – Summary of Estimated Risk of Dust Impacts

Risk of Dust Impact		Activity			
		Demolition	**Earthworks**	**Construction**	**Trackout**
Potential Impact	**Dust Soiling**	High Risk	Medium Risk	Medium Risk	Medium Risk
	Human Health	Medium Risk	Low Risk	Low Risk	Low Risk
	Ecological	Medium Risk	Low Risk	Low Risk	Low Risk

14.7 Mitigation

61. The *IAQM Guidance* provides a list of mitigation measures that are highly recommended (H), desirable (D), or not required (N) depending on the level of risk. The highest risk levels were found to be: **high** for Demolition, **medium** for Earthworks, **medium** for Construction, and **medium** for Trackout. The mitigation measures listed below are suitable for the highest-risk level identified for each activity. It is recommended that these be included in the Construction Environmental Management Plan (CEMP).

Table 14.16 – Recommended Mitigation Measures for Dust Emissions

Mitigation Measures	Low Risk	Medium Risk	High Risk
All Activities: Communications			
Develop and implement a Stakeholder Communications Plan that includes community engagement before work commences on site.	N	H	H
Display the name and contact details of person(s) accountable for AQ and Dust emissions on the site boundary. This may be the environment manager/engineer or the site manager.	H	H	H

Mitigation Measures	Low Risk	Medium Risk	High Risk
Display the head or regional office contact information.	H	H	H
Develop and implement a Dust Management Plan (DMP). This should include as a minimum the highly recommended measures in this document that may include measures to control other emissions – approved by the Local Authority. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of: dust deposition; dust flux; real time PM_{10} continuous monitoring; and/or visual inspections.	D	H	H
All Activities: Site Management			
Record all dust and AQ complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	H	H	H
Make the complaints log available to the Local Authority when asked.	H	H	H
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the Incident Logbook.	H	H	H
Hold regular liaison meetings with other high risk Construction sites within 500m of the Site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.	N	N	H
All Activities: Monitoring			
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the Logbook available to the Local Authority staff when asked. This should include regular dust-soiling checks of surfaces such as street furniture, cars, and windowsills within 100m of site boundary, with cleaning to be provided if necessary.	D	D	H
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an Inspection Log available to the Local Authority when asked.	H	H	H
Increase the frequency of site inspections by the person accountable for AQ & Dust issues on site – when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	H	H	H
Agree dust deposition; dust flux; or real-time PM_{10} continuous monitoring locations; with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on Phase commences.	N	H	H
All Activities: Preparing and Maintaining the Site			
Plan site layout so that machinery and dust-causing activities are located away from receptors, as far as is possible.	H	H	H
Erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles on Site.	H	H	H
Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	D	H	H

Mitigation Measures	Low Risk	Medium Risk	High Risk
Avoid site runoff of water or mud.	H	H	H
Keep site fencing, barriers and scaffolding clean using wet methods.	D	H	H
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover, as described below.	D	H	H
Cover, seed or fence stockpiles to prevent wind whipping.	D	H	H
All Activities: Operating Vehicle/Machinery and Sustainable Travel			
Ensure all vehicles switch-off engines when stationary – no idling vehicles.	H	H	H
Avoid the use of diesel or petrol-powered generators and use mains electricity or battery-powered equipment where practicable.	H	H	H
Impose and signpost a maximum-speed-limit of 15mph on surfaced haul roads and 10mph on unsurfaced work areas.	D	D	H
Comply with the Construction Traffic Management Plan (CTMP) to manage the Sustainable delivery of goods and materials.	N	H	H
Implement a Travel Plan that supports and encourages Sustainable travel (public transport, cycling, walking, and car-sharing).	N	D	H
All Activities: Operations			
Only use cutting, grinding or sawing equipment fitted, or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	H	H	H
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H	H	H
Use enclosed chutes and conveyors and covered skips.	H	H	H
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H	H	H
Ensure equipment is readily available onsite to clean any dry spillages, and clean-up spillages as soon as reasonably practicable after the event using wet cleaning methods.	D	H	H
All Activities: Waste Management			
Avoid bonfires and burning of waste materials (to be included in the Waste Management Plan).	H	H	H
Demolition			
Ensure effective water suppression is used during Demolition operations. Hand-held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	H	H	H
Avoid explosive blasting, using appropriate manual or mechanical alternatives.	H	H	H
Bag and remove any biological debris or damp-down such material before Demolition.	H	H	H

Mitigation Measures	Low Risk	Medium Risk	High Risk
Earthworks			
Re-vegetate Earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as is practicable.	N	D	H
Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	N	D	H
Only remove the cover in small areas during work and not all at once.	N	D	H
Construction			
Avoid scabbling (roughening of concrete surfaces) if possible.	D	D	H
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	D	H	H
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems: to prevent escape of material and overfilling during delivery.	N	D	H
For smaller supplies of fine power materials ensure bags are sealed post-use and stored appropriately to prevent dust.	N	D	D
Trackout			
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked-out of the Site. This may require the sweeper being continuously in use.	D	H	H
Avoid dry sweeping of large areas.	D	H	H
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	D	H	H
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as is reasonably practicable.	N	H	H
Record all inspections of haul routes and any subsequent action in a Site Logbook.	D	H	H
Install hard surfaced haul routes that are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers, and regularly cleaned.	N	H	H
Implement a wheel-washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	D	H	H
Ensure there is an adequate area of hard-surfaced road between the wheel-wash facility and the Site exit (wherever Site size and layout permits).	N	H	H
Access gates to be located at least 10m from receptors where possible.	N	H	H

14.8 Residual Effects

62. The IAQM recommend that the significance of dust effects is only considered with mitigation measures in place. The aim of the recommended mitigation measures is to prevent any significant effects. With the above mitigation measures included in the CEMP, the risk of dust impacts is predicted to be negligible for each activity, and the predicted effects are considered to be **not significant**. Occasional, short-term effects may still occur, for

example, during particularly dry and windy weather conditions where high-sensitivity receptors are downwind of the Site, however these are not expected to be frequent enough to be significant.

14.9 Cumulative Assessment

63. EIA or major developments that have the potential to have cumulative Construction dust effects have also been considered. Cumulative projects considered are shown in **Figure 3.1**. The North-East 400 kV Overhead Line Reinforcement Works (ECU00000677) is consented, however is currently under Construction and it is assumed that Construction will be complete well before Construction begins on the Proposed Development. This project has therefore been scoped out of the cumulative assessment.

64. For Demolition, Earthworks, and Construction, the risk of other impacts is only considered within 350m of the Site Boundary for the Proposed Development and the cumulative projects. The Trackout magnitude has not been estimated for the cumulative projects; the worst-case scenario has been considered of potential impacts within 50m of public access roads within 500m of the Site Boundary.

Table 14.17: Cumulative Dust Assessment

Cumulative Project	Distance from Site (m)	Comments
ECU00003226 – Kirkton Solar PV Farm and Energy Storage Facility	766	If the solar farm is operational during Construction of the Proposed Development, there will be a negligible risk of impacts on the solar farm as it is greater than 350m from the Application Site Boundary. If Construction of the two projects is concurrent: ▪ There is no overlap of the 350m boundary from the two projects, therefore the risk of cumulative impacts from Demolition, Earthworks, and Construction is negligible. ▪ Assuming access to the solar site will be via the A90, the Proposed Development Trackout buffer is greater than 500m from the closest likely solar site access point, therefore the risk of cumulative impacts from Trackout is negligible.
APP/2022/0369 – Residential Mixed Use Development (800 houses)	495	If the Construction of the application is complete during Construction of the Proposed Development, there will be a negligible risk of impacts on the residential development as it is greater than 350m from the Application Site Boundary. If Construction of the two projects is concurrent: ▪ There are four high-sensitivity residential receptors greater than 100m and within 350m of the boundaries for both projects. The bank of trees along the River Ugie in between the application project area and the receptors would likely provide some screening. The sensitivity of the area to cumulative impacts from Demolition, Earthworks, and Construction would therefore be low, resulting in a medium risk of cumulative impacts from Demolition and low risk of cumulative impacts from Earthworks and Construction. ▪ The only receptors at risk of Trackout impacts from both developments are the surrounding low-sensitivity farmland and the A90 road, and small areas of habitats particularly along the River Ugie that are considered low-sensitivity ecological receptors, therefore the sensitivity

Cumulative Project	Distance from Site (m)	Comments
		of the area to cumulative Trackout impacts is low and the risk of cumulative impacts is low.
APP/2019/0421 – Formation of Footpath	0	The footpath is considered to be a low-sensitivity receptor. If Construction of the footpath is complete during Construction of the Proposed Development, there would be a medium risk of impacts from Demolition, low risk of impacts from Earthworks and Construction, and negligible risk of impacts from Trackout on the footpath. If Construction of the two projects is concurrent: ▪ There are no medium- or high-sensitivity receptors within 350m of both projects. The habitats along the River Ugie, adjacent to the footpath area, are considered low-sensitivity ecological receptors. The overall sensitivity of the area to cumulative impacts from Demolition, Earthworks, and Construction would therefore be low, resulting in a medium risk of cumulative impacts from Demolition and low risk of cumulative impacts from Earthworks and Construction. ▪ The Proposed Development Trackout buffer is greater than 500m from the footpath application boundary, therefore the risk of cumulative impacts from Trackout is negligible.
ECU00000649 – New pair of terminal towers to connect into New Deer Substation	0	If Construction of the two projects is concurrent: ▪ There is one high-sensitivity receptor within 350m of both projects. This receptor is 350m from the application boundary and over 200m from the Proposed Development. The sensitivity of the area to cumulative impacts from Demolition, Earthworks, and Construction would therefore be low, resulting in a medium risk of cumulative impacts from Demolition and low risk of cumulative impacts from Earthworks and Construction. ▪ It is assumed that access to the terminal towers site would be via New Deer Substation. There are no medium- or high-sensitivity receptors within 500m of the terminal towers application boundary and within 50m of the public road. The sensitivity of the area to cumulative Trackout impacts would therefore be low, resulting in a low risk of cumulative impacts from Trackout.
ECU00003242 – Overhead Line	2750	Distance from the Application Site Boundary is much greater than 350m therefore there is no risk of cumulative impacts.
ENQ/2019/0563 – Residential Development	2981	Distance from the Application Site Boundary is much greater than 350m therefore there is no risk of cumulative impacts.

65. A summary of the risks cumulative impacts for each of the projects considered is given in **Table 14.18**.

Table 14.18 – Risk of Cumulative Dust Impacts

Cumulative Project	Activity	Sensitivity of Area	Risk of Dust Impacts
ECU00003226 – Kirkton Solar PV Farm and Energy Storage Facility	All activities	Negligible	Negligible
APP/2022/0369 – Residential Mixed Use Development (800 houses)	Demolition	Low	Medium
	Earthworks	Low	Low
	Construction	Low	Low
	Trackout	Low	Low
APP/2019/0421 – Formation of Footpath	Demolition	Low	Medium
	Earthworks	Low	Low
	Construction	Low	Low
	Trackout	Negligible	Negligible
ECU00000649 – New pair of terminal towers to connect into New Deer Substation	Demolition	Low	Medium
	Earthworks	Low	Low
	Construction	Low	Low
	Trackout	Low	Low
ECU00003242 – Overhead Line	All activities	N/A	None
ENQ/2019/0563 – Residential Development	All activities	N/A	None

66. Overall, the cumulative projects would not result in an increase in the risk of dust impacts for any of the categories considered. With the mitigation proposed in **Section 14.7**, the risk of cumulative dust impacts is predicted to be negligible for each activity and the residual effects are considered to be **not significant**.

14.10 References

Aberdeenshire Council (2022). Annual Progress Report (APR). Available online at: https://www.scottishairquality.scot/sites/default/files/publications/2022-11/APR2022-1.pdf

Air Quality in Scotland (2018). Data for Local Authority Review and Assessment purposes. Available online at: https://www.scottishairquality.scot/data/mapping/data

Air Quality in Scotland (2021). Air Quality Standards and Objectives. Available online at: https://www.scottishairquality.scot/air-quality/standards

Iowa Environmental Mesonet, Iowa State University (2023). Wind Roses. Available online at: https://mesonet.agron.iastate.edu/sites/windrose.phtml?station=EGPD&network=GB__ASOS

Met Office (2023). UK Climate Averages – Aberdeen Airport. Available online at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gfnmmyh91

GREEN VOLT

15

Chapter 15

Agricultural Land

Onshore EIA Report: Volume 1

Document Code:	FLO-GRE-REP-0009-15	
Version Number:	00	
Date:	*Issue Date 03/08/23*	
Prepared by:	Maria Morrison	*Maria Morrison*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First draft for review	30/07/23
A2	Second draft for review	02/08/23
A3	Third draft for review & Final version	02/08/23
00	Final	03/08/23

Contents

15 Agricultural Land

15.1 Introduction

1. This chapter will assess the potential changes and impacts to agricultural land resulting from the Proposed Development. Land within Scotland has been classified in order to better understand the capabilities of the land and its potential uses, particularly in reference to agriculture. The Macaulay Institute developed the Land Use Capability (LUC) system to assess land capability and rank it based on potential productivity and flexibility. This became the Macaulay Land Capability for Agriculture (LCA) classfication which is widely used across Scotland. The Macaulay Land Use Research Institute has since merged with the Scottish Crop Research Institute (SCRI) to form the James Hutton Institute.
2. The different classifications can be simplified into four broader categories that give an indication of the agricultural capabilites of land[i]:
   - Arable Agriculture (Classes 1 - 3.1)
   - Mixed Agriculture (Classes 3.2 - 4.2)
   - Improved Grassland (Classes 5.1 - 5.3)
   - Rough Grazing (Classes 6.1 - 7)
3. The study area for this chapter is the Application Site Boundary which is primarily within arable land, extending from Peterhead (Landfall) through to New Deer (Substation Compound location). The purpose of this desk study is to classify this land under the Land Capability for Agricultural production (LCA) within the Application Site Boundary in order to identify any area of Prime Agricultural Land (PAL) and to determine any temporary or permanent loss of agricultural land.

15.2 Legislation, Guidance and Policy

4. The following guidance and legislation were consulted during this assessment:
   - Aberdeenshire Local Development Plan (LDP) January 2023[ii]
   - National Planning Framework 4 (NPF4[iii])
   - The James Hutton Institute: Land Capability for Agriculture in Scotland (Macaulay System)

15.3 Consultation

5. The following table details the scoping response from Aberdeenshire Council in relation to Agricultural Land Use and the action following from the response.

Table 15.1 – Scoping Consultation Responses

Consultee	Scoping Response	Action
Aberdeenshire Council	*…identifying land within the cable corridors include 'Prime Agricultural Land' (PAL) and areas of forestry, also identifying potential effects including direct loss of agricultural land and woodland, along with indirect effects upon soil quality as a result of the proposed development…. Direct and indirect effects have been identified which should be considered fully within the EIAR, along with any mitigation required to reduce/remove theses effects.*	Assessment of Agricultural Land in relation to Proposed Development using Hutton LCA Soil Map 250k dataset. This dataset is based on the Macaulay LCA.

15.4 Assessment Methodology

6. This assessment is specific to agricultural land classifications in relation to the Proposed Development. It is not specific to soil type or soil quality. As such, it was determined that a desk study was appropriate, as there are existing datasets that appropriately detail the agricultural land classifications.
7. A desktop study was conducted utilising the Hutton LCA 250k Soil Map dataset. The dataset is a digitised version of the Macaulay LCA map, which was produced by the former Macaulay Institute and provided by the James Hutton Institute. The map outlines and defines the agricultural classifications for all land in Scotland and was selected for the methodology.
8. The map was used to accurately identify the land classifications within the study area. This was achieved through a GIS Software exercise, allowing for the land to be categorised into the set classifications and identifying areas of PAL and 'Non-Prime Agricultural Land'.
9. PAL is land that is of high quality in terms of agricultural production. It can support a variety of crop types, is flexible for other uses such as woodland, and has a favourable climate. Non-Prime Agricultural land varies from land with moderate crop range and less favourable climate — to land with severe limitations such as steepness and poor drainage. This is further outlined in **Table 5.2**.
10. Identifying areas of PAL within the Application Site Boundary further informed whether these sections of land had potential to be impacted temporarily or permanently resulting from the Proposed Development.
11. Once each area was identified, further calculations were carried out to ascertain the following:
    - Area of each Class within the Application Site Boundary (Hectares)
    - Percentage of land that would be permanently and temporarily impacted
12. In accordance with the appropriate legislation and guidance outlined in **15.2: Legislation, Guidance and Policy**, the potential effects were assessed and determined whether they were within acceptable levels. As a result, the assessment methodology differs from that presented in **Chapter 3 – EIA Methodology**.

15.5 Baseline

13. The Application Site Boundary extends approximately 35km from Peterhead to New Deer. The Peterhead Golf Course characterises the land encompassing the proposed Landfall area to the east, and the existing National Grid New Deer Substation (NGNDSS) is situated on the northern border of the Substation Compound location in

the western portion of the study area. The land situated between these two points is primarily characterised by the extensive farmland both within the Application Site Boundary and in the surrounding area, which is known for both cattle and crop farming. By categorizing the Hutton LCA specifically to the Application Site Boundary using GIS Softwear, it was identified that there are three agricultural land classifications ranging from Class 3.1–4.2. The James Hutton Institute: Land Capability for Agriculture defines these classifications, as detailed in **Table 15.2** below. This is shown in **Figures 15.1a – 15.1e**.

Table 15.2: Agricultural Land Classifications (James Hutton Institute)

Agricultural Capability Category	Classification Number	Definition
Arable Agriculture: Prime Land	1 - 3.1	Capable of producing wide range of crops. Favourable climate and is highly flexible for other uses e.g. woodland and biofuel crops[iv].
Mixed Agriculture: Non-Prime	3.2 - 4.2	Capable of growing moderate range of crops including cereals, forage crops and grass. Less favourable climate than on prime land, and drainage limitations within soil may exist[v].
Improved Grassland: Non-Prime	5.1 - 5.3	Potential for use as grassland. Ranging limitations within these classes such as climate, slope and wetness[vi].
Rough Grazing: Non-Prime	6.1 - 7	Severe limitations such as steepness, poor drainage, acidic and shallow soils that can mechanical improvements. Ground may still have high value in terms of carbon storage and supporting rare species[vii].

14. The eastern portion of the study area, inclusive of the proposed Landfall area shown in **Figure 15.1a**, is classified as 4.2 Mixed Agriculture. According to the LCA shown in **Table 15.2**, this area is considered to be 'non-prime agricultural land' and is less favourable due to limitations such as poor drainage.

15. The western portion of the study area, inclusive of the Substation Compound location (**Figure 15.1e**), has been classified as 3.1 agricultural land, which has been described as PAL. This is defined as having a favourable climate and is capable of producing a wide range of crops. As shown in the **Image 15.1** below, this land is primarily used for farming crops, with the existing NGNDSS notable north of the Proposed Substation.

16. The remainder of the study area (**Figures 15.1b-d**) has interchanging classifications ranging from 3.1-4.2. The classified land is primarily split into small sections along the route, and is predominantly characterised as Class 3.1 land, Arable Agriculture (See **Table 15.2**).

Image 15.1 – Proposed Substation Location

15.6 Potential Effects

17. The primary effect would be the potential for PAL, as well as non-prime agricultural land, to be lost or damaged during operation and maintenance. With consideration to the size of the Application Site Boundary, potential impacts such as damage to PAL soil, contamination and impact on future crop yields would extend across a large area, and include a number of agricultural land classifications where soil quality could be reduced and limitations placed on the land.

18. **Table 15.3** below details the total area (ha) of each classification within the Application Site Boundary and the approximate temporary and permanent footprint (%) anticipated resulting construction and operation. The temporary footprint includes for those components of the Proposed Development that will be required for the construction phase, but which will be reinstated during operation. Those components include the area of land required for the following:

    - Landfall
    - Cable Trench
    - Cable Route Corridor
    - Access tracks
    - Proposed Temporary Construction Compound
    - Substation Compound
    - Proposed SuDS Pond

19. The permanent footprint includes:

    - Substation Compound
    - Access Tracks
    - Proposed SuDS Pond

20. The following calculations were reached by measuring the total amount of each classification within the Application Site Boundary. By identifying the total area of each and measuring how much would be affected by temporary and permanent infrastructure, a percentage was drawn.

Table 15.3 – Total Area Impacted within Agricultural Classifications

Classification Number	Total Area (Hectares)	Permanent Footprint (~%)	Temporary Footprint (~%)
3.1	215.9	6.6	53.3
3.2	137.4	0	38.1
4.2	7.2	0	2.0

15.6.1 Construction

21. The trenchless methodology was chosen to minimise the impact of the Proposed Development. By choosing this method, it minimises any agricultural land disrupted through construction as the alternative is to create an open trench across the whole of the Cable Route Corridor. Any land that is disrupted during construction would be reinstated and allowed to naturally recover over time, minimising permanent damage and land take. Following this, and as demonstrated in **Table 15.3**, the majority of the impact is anticipated to occur during construction and is considered to be temporary (approximately 93.4%). These impacts are considered temporary, as they will only be affected for the duration of construction and reinstatement measures will be carried out. Further information on the Proposed Development can be found in **Chapter 5 - Project Description**.

15.6.2 Operation

22. The Substation Compound location, access track and Sustainable Drainage System (SuDS) Pond will be the only permanent feature resulting from the Proposed Development, as it will be required for long-term operation. The infrastructure will be sited on ~23.6ha (6.6%) of Class 3.1 land within the western Application Site Boundary, which is defined as PAL, and will not be reinstated following the completion of construction works.

23. As noted in both the Aberdeenshire LDP, and NPF4 Policy 5, certain developments such as digital communications and electricity grid connections are considered 'essential infrastructure' and are permitted. The Substation Compound would fall into this category and align with an acceptable change in land use. The operation impacts would be restricted to the footprint required for the substation and associated infrastructure such as the SuDS pond and access tracks.

24. The maximum footprint of the Substation Compound, when compared to the availability of PAL throughout Aberdeenshire, accounts for a small percentage of PAL. It is considered that the operation of the Proposed Development will not result in adverse impacts on land use, and as such those impacts are considered negligible.

15.6.3 Decommissioning

25. The permanent structures associated with the Substation Compound will be removed upon decommissioning, allowing the land to naturally recover over time.

15.7 Mitigation

15.7.1 Construction Mitigation

26. During the construction phase, the affected topsoil and sub-soil will be treated and stored appropriately as not to cause damage and indirectly affect the soil quality. Care will be taken where possible throughout construction, and upon completion, any disturbed land will be reinstated as soon as possible. As previously stated, the majority of the construction phase is temporary, so any prime and non-prime agricultural land will only be impacted for the duration of the construction phase. Examples of mitigation measures to be implemented relevant to land are the Pollution Prevention Plan and the Emergency Environmental Response Procedure.

15.7.2 Operation Mitigation

27. As discussed in **Section 15.6.2**, no adverse impacts resulting from the operation stage of the development are anticipated. Additionally, the project lies within the criteria for essential infrastructure as outlined in NPF4 and the Aberdeenshire LDP. As such, there is no mitigation suggested for the operation of the substation.

15.7.3 Decommissioning Mitigation

28. Where possible, existing access tracks and other infrastructure will be reutilised in the decommissioning of the Substation Compound. It is anticipated that no additional agricultural land (outwith what is outlined in **Table 15.3**) will be further impacted following decommissioning. Further considerations will be outlined in the Decommissioning Plan, which will be produced prior to commencement of decommissioning.

15.8 Residual Effects

29. Although there will be a permanent loss of Class 3.1 land as a result of the Proposed Development it is a small amount of land loss in relation to the overall size of the Proposed Development and it is considered to be an acceptable change in land use as the Proposed Development is considered to be essential infrastructure.

15.9 Cumulative Assessment

30. The cumulative assessment considers the potential additional effects of other projects within a set area in relation to the Proposed Development. Within the cumulative search area there are seven developments that are In Construction, Consented and In-Planning within wider Aberdeenshire. The search area was selected based on the standard Landscape and Visual Impact Assessment (LVIA) study area. As this assessment considers cumulative more frequently, a study area was decided based on double the standard LVIA study area. As such, the measurements for the study area were 2km from the route and 10km from the Substation Compound.

31. The cumulative projects are further detailed in **Figure 3.1**:

- ECU00003226 - Kirkton Solar PV Farm and Energy Storage Facility
- APP/2022/0369 - Residential Mixed-Use Development (800 Houses)
- APP/2019/0421 - Formation of Footpath
- ECU00000649 - New Pair of terminal towers to connect into New Deer Substation
- ECU00000677 - North East 400 kV Overhead Line Reinforcement Works
- ECU00003242 - Overhead Line
- ENQ/2019/0563 - Residential Development

32. Of these seven developments, four are situated on Class 3.1 agricultural land which will be permanently affected in some cases. In conjunction with the Proposed Development this could result in larger-scale removal of PAL throughout Aberdeenshire. However, the percentage of PAL removed resulting from the cumulative projects and Proposed Development in comparison to PAL in the wider Aberdeenshire area is anticipated to be small.

33. Additionally, the Proposed Development will have a significantly smaller percentage of PAL permanently impacted when considered alongside the cumulative projects.

34. Additionally, the listed developments fall within ‘essential infrastructure’ category and therefore are considered acceptable changes in land use: as outlined in the Aberdeenshire LDP and NPF4.

35. It should be noted that the North-East 400 kV Overhead Line and the Proposed Development overlap on the western portion of the development. The overhead line is currently in the construction phase. Allowing for the Proposed Development application to go through the planning process, and for works to start, it is anticipated that there will be no overlap in construction phases for the Proposed Development and the overhead line.

15.10 References

[i] The James Hutton Institute (2023). Available online at: https://www.hutton.ac.uk/learning/exploringscotland/land-capability-agriculture-scotland

[ii] Aberdeenshire Council (2023). Available online at:: https://online.aberdeenshire.gov.uk/ldpmedia/LDP2021/AberdeenshireLocalDevelopmentPlan2023IntroductionAndPolicies.pdf

[iii] The Scottish Government (2023). Available online at: https://www.gov.scot/publications/national-planning-framework-4/pages/3/

[iv] The James Hutton Institute (2023). Available online at: https://www.hutton.ac.uk/learning/exploringscotland/land-capability-agriculture-scotland/arable-agriculture

[v] The James Hutton Institute (2023). Available online at: https://www.hutton.ac.uk/learning/exploringscotland/land-capability-agriculture-scotland/mixed-agriculture

[vi] The James Hutton Institute (2023). Available online at: https://www.hutton.ac.uk/learning/exploringscotland/land-capability-agriculture-scotland/improved-grassland

[vii] The James Hutton Institute (2023). Available online at: https://www.hutton.ac.uk/learning/exploringscotland/land-capability-agriculture-scotland/rough-grazing

GREEN VOLT

16

Chapter 16

Greenhouse Gas Assessment

Onshore EIA Report: Volume 1

Document Code: FLO-GRE-REP-0009-16		
Version Number:	00	
Date:	*Issue Date 03/08/23*	
Prepared by:	PBO	*PBO*
Checked by:	JP	*JP*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
00	Final Issue	03/08/23

Contents

Table of Tables

Appendices

Acronyms

Acronym	Description
BEIS	Department for Business, Energy, and Industrial Strategy
CCC	Climate Change Committee
CCPu	Climate Change Plan 2018-2032
CCRA	Climate Change Risk Assessment
CH_4	Methane
CO_2	Carbon Dioxide
COP	Conference of Parties
COP21	21st Climate Change Conference of the Parties
COP22	22nd Climate Change Conference of the Parties
DESNZ	Department of Energy Security and Net Zero
DRLX	Dismantled Rail Crossing
EIA	Environmental Impact Assessment
GHG	Greenhouse Gas
GWh	Gigawatt Hours
GWP	Global Warming Potential
HDD	Horizontal Directional Drilling
HFC	Hydrofluorocarbons
HPS	Hydrogen Policy Statement
ICE	Institution of Civil Engineers
IEMA	Institute of Environmental Management and Assessment
INTOG	Innovation and Targeted Oil and Gas
LCA	Life Cycle Analysis
LEPS	Local Energy Policy Statement
MW	Megawatt
N_2O	Nitrous Oxide
NF3	Nitrogen Trifluoride

NPF3	Third National Planning Framework
NPF4	Fourth National Planning Framework
NSTA	North Sea Transition Authority
OGA	Oil and Gas Authority
PFC	Perfluorocarbons
RVX	River Crossing
SCCAP1	First Scottish Climate Change Adaptation Programme
SCCAP2	Second Scottish Climate Change Adaptation Programme
SF_6	Sulphur Hexafluoride
UK	United Kingdom
UNFCCC	United Nations Framework Convention on Climate Change

16 Greenhouse Gas Assessment

16.1 Introduction

1. This chapter comprises a Greenhouse Gas (GHG) assessment for the Proposed Development. The GHG assessment quantifies the contribution of the Project to the national and regional GHG emissions in Scotland and the United Kingdom (UK), and it's 'net effect' compared to a baseline of 'do nothing'.
2. The GHG assessment for the Offshore Project is included in the Offshore Environmental Impact Assessment (EIA) report. The GHG assessment presented in this chapter for the Proposed Development follows a similar approach to the one adopted for the GHG assessment for the Offshore Project.
3. This chapter was prepared by Royal HaskoningDHV. The assessment was undertaken in accordance with the Institute of Environmental Management and Assessment (IEMA) guidance 'Guide: Assessing GHG Emissions and Evaluating their Significance' (IEMA, 2022). This guidance document provides a topic-specific methodology for the assessment of GHGs and determining the significance of GHG emissions generated by a single development or project, and therefore the assessment methodology differs from that presented in **Chapter 6 - EIA methodology**. The *IEMA Guidance* is considered to be best practice for undertaking GHG assessments in EIA, and therefore was selected as the most appropriate approach to adopt for the purposes of this assessment. The GHG assessment methodology used in this chapter is described in **Section 16.4**.

16.2 Legislation, Guidance and Policy

16.2.1 International Agreements

16.2.1.1 United Nations Framework Convention on Climate Change

4. The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty addressing climate change which entered into force on 21 March 1994. Its main objective is 'to stabilise GHG concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system'. In its early years it facilitated intergovernmental climate change negotiations and now provides technical expertise. Its supreme decision-making body, the Conference of Parties (COP) meets annually to discuss and assess progress in addressing climate change.
5. The first agreement was the Kyoto Protocol which was signed in 1997 and entered into force in 2005 and committed industrialised countries to limit and reduce GHG emissions in accordance with individual targets to reduce the rate and extent of global warming. It applies to seven GHGs: carbon dioxide (CO_2) methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3) which was incorporated into the second Kyoto Protocol compliance period in 2012. The Kyoto Protocol recognises that the economic development of a country is an important determinant in the country's ability to combat, and adapt to, climate change. Therefore, developed countries have an obligation to reduce their current emissions particularly due to their historic responsibility for the current concentrations of atmospheric GHGs.
6. Subsequently, the meetings of COP have resulted in several important and binding agreements, including the Copenhagen Accord (2009), the Doha Amendment (2012) and the Paris Agreement (2015).
7. The Copenhagen Accord raised climate change policy to the highest political level and expressed a clear political intent to constrain carbon and respond to climate change in the short and long term. It introduced the potential commitment to limiting global average temperature increase to no more than 2°C above pre-industrial levels.
8. The Doha Amendment to the Kyoto Protocol in 2012 included a commitment by parties to reduce GHG emissions by at least 18% below 1990 levels in the eight-year period from 2013 to 2020. The UK Climate Change Act 2008 has an interim 34% reduction target for 2020, which would allow the UK to meet and exceed its Kyoto agreement target.
9. The United Nations Climate Change Conference in Paris in 2015 (known as 'COP21') led to the following key

areas of agreement (the Paris Agreement):

- Limit global temperature increases to below 2°C, while pursuing efforts to limit the increase to 1.5°C above the pre-industrial average temperature;
- Parties to aim to reach a global peak of GHG emissions as soon as possible alongside making commitments to prepare, communicate and maintain a Nationally Determined Contribution;
- Contribute to the mitigation of GHG emissions and support sustainable development whilst enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change;
- Commitment to transparent reporting of information on mitigation, adaptation and support which undergoes international review; and
- In 2023 and every five years thereafter, a global stocktake will assess collective progress toward meeting the purpose of the Agreement.

10. At the 22nd Climate Change Conference of the Parties (COP22) in November 2016, the UK ratified the Paris Agreement to enable the UK to "help to accelerate global action on climate change and deliver on our commitments to create a safer, more prosperous future" (Department for Business, Energy and Industrial Strategy (BEIS), 2016). At the COP24 meeting, held in Katowice, Poland in December 2018, a set of rules for the Paris climate process were agreed.

11. COP26 was held in 2021 in Glasgow. The four specific objectives that were aimed to be achieved for COP26 were (UK Parliament, 2022):
    1. Securing global net zero by mid-century and keep 1.5°C within reach by:
        - Accelerating the phase-out of coal;
        - Curtailing deforestation;
        - Speeding up the switch to electric vehicles; and
        - **Encouraging investment in renewables**.
    2. Adapt to protect communities and natural habitats;
    3. Mobilise at least $100 billion in climate finance per year; and
    4. Work together to deliver the requirements to finalise the Paris Rulebook and accelerate action to tackle the climate crisis.

12. For the first time, nations have been called upon to 'phase down' unabated coal power and inefficient subsidies for fossil fuels (UNFCCC, 2022). The two main headlines of COP26 were the (1) signing of the Glasgow Climate Pact, which is a series of decisions and resolutions that build on the Paris Agreement setting out what needs to be done to tackle climate change but does not specify what each country must do and is not legally binding, and (2) agreeing the Paris Rulebook, which gives the guidelines on how the Paris Agreement is delivered. Agreements in the finalised Rulebook include enhanced transparency framework for the reporting of emissions, common timeframes for emissions reduction targets and mechanisms and standards for international carbon markets (UK Parliament, 2022).

13. The most recent COP, was held in Egypt in November 2022 (COP27). Conclusions of COP27 include the decision to establish a fund for responding to loss and damage, and the *inability* to reach agreement on the phasing out of coal and other fossil fuels or setting emission peaking records. COP28 will be held in Dubai, United Arab Emirates towards the end of 2023.

16.2.2 Legislation

16.2.2.1 The Climate Change Act 2008 and Climate Change (Scotland) Act 2009

14. The Climate Change Act 2008 (the "2008 Act") provides a framework for the UK to meet its long-term goals of reducing GHG emissions to 'net-zero' (i.e. at least a 100% reduction) by 2050 ("climate mitigation"). This target was introduced by the Climate Change Act 2008 (2050 Target Amendment) Order 2019, which amended the previous 2050 GHG target of an 80% reduction compared to 1990 levels. The t 2008 Act also established a system of carbon budgets were introduced in order to drive progress towards this target.

15. The 2008 Act required the UK Government to set legally binding 'carbon budgets' to provide a constraint of GHG emissions in a given time period. The carbon budgets are set by the Climate Change Committee (CCC) and provide a legally binding five-year limit for GHG emissions in the UK. The six carbon budgets that have been placed into legislation and will run up to 2037, and are identified in **Table 16-1**.

Table 16-1 - The Six UK Carbon Budgets

Budget	Carbon Budget Level ($MtCO_2e$)	Reduction Below 1990 Levels (UK targets)	Reduction Below 1990 Levels (achieved by the UK)
1st Carbon Budget (2008 to 2012)	3,018	25%	30%
2nd Carbon Budget (2013 to 2017)	2,782	31%	38%
3rd Carbon Budget (2018 to 2022)	2,544	37% by 2020	47%
4th Carbon Budget (2023 to 2027)	1,950	51% by 2025	-
5th Carbon Budget (2028 to 2032)	1,725	68% by 2050	-
6th Carbon Budget (2033 to 2037)	965	78% by 2035	-

16. The UK outperformed its emission reduction targets set by the first and second Carbon Budgets, achieving a 30% and 38% reduction compared to 1990 levels in 2011 and 2015 respectively. The UK is set to out-perform the targets set by the third Carbon Budget; the latest CCC Progress Report to Parliament (CCC, 2023) notes that there was a 46% reduction from 1990 levels achieved in 2022. This represented a decrease in 9% from 2019 levels.

17. The Sixth Carbon Budget was published by the CCC in December 2020, which is the first Carbon Budget to be set following the adoption of Net Zero carbon emissions target.

18. While falling under the umbrella of the 2008 Act, Scotland has its own distinct climate change legislation, the Climate Change (Scotland) Act 2009 (the "2009 Act"). The Climate Change (Scotland) Act 2009 Act provides a framework for Scotland to meet its long-term goals of reducing GHG emissions to 'Net Zero' (i.e. a minimum 100% reduction) by 2045. Doing so would allow Scotland to achieve Net Zero five years ahead of the rest of the UK. This target was introduced by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, which amended the previous 2050 GHG target of an 80% reduction compared to 1990 levels. The amended Climate Change (Scotland) Act also set in law a number of interim targets between 2020 and 2045, which includes a 75% reduction in GHG emissions by 2030 compared to 1990 baseline levels. This ambitious target went beyond the 2019 Climate Change Committee's recommendation for a target set at a 70% reduction (CCC, 2020).

19. The Climate Change Act 2008 and subsequent Climate Change (Scotland) Act 2009 were enacted as part of Scotland's responsibility and obligations as a signatory of the Kyoto Protocol 1997 (which did not become binding until 2005). The Scotland target covers the seven main GHGs referenced in the Kyoto Protocol. The interim targets are also in line with what is required to meet Scotland's commitments under 2015 Paris Agreement.

20. The CCC report, The Sixth Carbon Budget – The UK's path to Net Zero, issued in 2020 (CCC, 2020), states that Scotland is on track to achieve Net Zero well before 2050, however, this pathway does not go through by the 2030 interim target of 75%. Instead, current projections suggest this interim target will be reached by 2035 (CCC, 2020).

21. The CCC report, 2023 Progress Report to Parliament (CCC, 2023), states that Scotland emissions in 2021 has reduced by 49.9% below 1990 levels but did not meet its 2021 annual target of a 51.1% reduction (CCC, 2023). However, unlike the rest of the UK, emissions from industry and electricity supply decreased in Scotland in 2021 (CCC, 2023).

16.2.2.2 National Planning Framework

22. Scotland's fourth National Planning Framework (NPF4) sets out its long term plan up to 2045, which provides guidance on spatial development, outline national planning policies and forms part of the statutory development plan. The framework supports developments that meet GHG emission targets. The key policies with respect to planning for climate change and GHG emissions reduction are detailed below

(Scottish Government, 2023):

- Policy 1 – Tackling the climate change and nature crises.

"When considering all development proposals significant weight will be given to the global climate and nature crises".

- Policy 2 – Climate mitigation and adaptation

"a) Development proposals will be sited and designed to minimise lifecycle greenhouse gas emissions as far as possible.

b) Development proposals will be site and designed to adapt to current and future risks from climate change"

- Policy 11 – Energy

"a) Development proposals for all forms of renewable, low-carbon and zero emission technologies will be supported. These includes:

i. Wind farms including repowering, extending, expanding and extending the life of existing wind farms;

ii. Enabling works, such as grid transmission and distribution infrastructure."

23. **Table 16-2** summarizes the total amount of renewable energy generated and consumed by Scotland between 2012 and 2021, and the contribution of renewable sources to total proportion of energy and electricity consumed in Scotland by renewable sources between 2012 and 2021.

Table 16-2 - Renewable Energy Generation and Consumption by Scotland and % Contribution of renewable energy to Scotland's Total Energy Consumption (Scottish Government, 2023)

Year	Renewable Energy Generation in Scotland (GWh)	Renewable Electricity Generation in Scotland (GWh)	Proportion of Energy Consumption in Scotland from Renewables (%)	Proportion of Electricity Consumption in Scotland from Renewables (%)
2012	17,480	14,667	11%	9%
2013	20,168	16,990	13%	11%
2014	22,756	19,045	14%	12%
2015	26,496	21,743	17%	14%
2016	23,953	19,476	15%	12%
2017	30,630	25,301	19%	16%
2018	32,780	26,597	21%	17%
2019	37,002	30,204	24%	20%
2020	38,673	32,002	26%	22%
2021	34,621	27,467	24%	19%

24. The latest figures for 2021, shown in **Table 16-2**, indicate that renewable electricity sources in Scotland produced 27,467 Gigawatt Hours (GWh), a decrease of 4,535 GWh compared to 2020. The data from **Table 16-2** highlights that there has been a gradual increase in renewable energy and electricity generation in Scotland from 2012 to 2020, with a decrease from 2020 to 2021. Renewable energy and electricity generation in Scotland has increased by 13% from 2012 to 2021 and it is anticipated that these figures will

continue to rise, which will support Scotland's NPF4 and contribute to achieving the 2045 Net Zero target.

16.2.2.3 Climate Change Plan

25. In 2018, Scotland published the update to the Climate Change Plan 2018-2032 (CCPu), which lays out the pathways to achieving its world-leading 2032 targets. The CCPu outlines a number of policies and proposals that will contribute towards reducing Scotland's GHG emissions and achieving Net Zero by 2045.
26. The delivery of the CCPu is supported by a number of other policies, including the Offshore Wind Policy Statement (OWPS), the Local Energy Policy Statement (LEPS) and the Hydrogen Policy Statement (HPS), discussed in further detail below.

16.2.2.4 The Innovation and Targeted Oil and Gas Decarbonisation Sectoral Marine Plan

27. In October 2020, the Scottish Government published a new Sectoral Marine Plan for Offshore Wind Energy in Scottish inshore and offshore waters out to the Exclusive Economic Zone limit. This Plan provides opportunities for development within deeper waters, a consideration not factored into the earlier Blue Seas Green Energy 2011 Plan. It identifies 15 Plan Options, split across 4 regions and recognises the pivotal role Offshore wind energy has in Scotland's energy system.
28. The Scottish Government is now developing a Sectoral Marine Plan for Offshore Wind Energy for Innovation and Targeted Oil and Gas (INTOG) Decarbonisation, which provides the strategic framework for offshore wind projects in sustainable and suitable locations that will help deliver Net Zero commitments. In August 2021, Crown Estate Scotland announced the INTOG leasing round, which will support the emissions reduction targets from the offshore oil and gas sector agreed as part of the North Sea Transition Deal (BEIS, 2021a). The INTOG process is designed to allow developers to apply for the rights to build offshore wind farms specifically for the purpose of providing low carbon electricity to power oil and gas installations and help decarbonise the sector. INTOG expects to support the delivery of smaller (<100 Megawatt (MW)) innovation projects and specifically targets (>100 MW) projects that seek to support the decarbonisation of the oil and gas sector, such as the Project.
29. The Sectoral Marine Plan and INTOG process are relevant to the Proposed Development as it will facilitate the provision of renewable energy to the grid, and therefore will contribute to Scotland and the UK's decarbonisation ambitions.

16.3 Consultation

30. Consultation is a key feature of the EIA process andcontinues throughout the lifecycle of the Proposed Development from the initial stages through to consent and post-consent.
31. The Onshore Scoping Report, which was submitted to Aberdeenshire Council in May 2022 did not include consideration for a GHG assessment. The Scoping Report was only considering the Proposed Development in isolation and not as part of the larger overall Project, and it was not considered that the Proposed Development would have likely significant effects relating to Climate Change. The Aberdeenshire Council Scoping Opinion highlighted the need to consider Climate Change: as presented in **Table 16-3**.

Table 16-3 – Scoping Consultation Responses

Consultee	Date/Document	Scoping Response	Action
Aberdeenshire Council	March 2022, Aberdeenshire Council - Green Volt Offshore Windfarm – Onshore Infrastructure EIA Scoping Report	In order to make an assessment of the above information there are specific criteria and guidance set out in Schedule 4 of the Regulations. In particular these include characteristics of the development, an outline of any alternative options/sites and the main reasons for the options/sites chosen. Environmental issues are of obvious key importance such as those aspects of the environment that would be likely to be significantly affected. Detailed survey work would be required to inform the EIA Report. Following analysis of the aspects of the environment which would be likely to be significantly affected, a detailed assessment of the effects themselves would be required along with mitigation measures proposed. Examples of the types of issues that should be addressed include: • Climate change	This chapter provides a GHG assessment for the Proposed Development, including activities during the construction, operation and maintenance, and decommissioning phases. This chapter also provides consideration for In-combination GHG assessment with the Offshore Project.

16.4 Assessment Methodology

16.4.1 Context

32. The construction, operation, maintenance and decommissioning stages of wind farm projects entail the generation of GHG emissions, both from the standpoint of:

    - Embedded carbon and GHGs, which are the emissions caused by the extraction and refinement of raw materials and their manufacture into the commodities and products that make up the Proposed Development such as landfall, onshore cables, and onshore substation, etc.; and
    - Carbon and other GHG emissions arising from the combustion of fuels and energy used in constructing, operating and maintaining the Proposed Development over its lifetime and in decommissioning. These are associated with road transport vehicles and onshore plant equipment.

33. The release of emissions from these sources are small in comparison to emissions from fossil fuel generation of energy, therefore the emissions saved during the generation of electricity from wind (when compared to fossil fuel sources) outweigh those released from construction, operation and maintenance, and decommissioning activities.

34. There are inherent uncertainties associated with carrying out GHG assessment for offshore wind power projects including the onshore components, although the approach to determine emissions from individual sources groups is well defined and are adopted in the GHG assessment.

35. A report titled *Life Cycle Costs and Carbon Emissions of Offshore Wind Power* published by the University of Edinburgh in 2015 (Thomson & Harrison, 2015) examined the life cycle costs and GHG emissions associated with offshore wind energy projects, comparing data gleaned from the analysis of some 18 studies carried out over the period 2009 to 2013 (Thomson & Harrison, 2015). This report provided useful context for the GHG assessment for the Proposed Development , and benchmark figures which were used to verify the

outcomes of the assessment. It is acknowledged that advancements and efficiencies have been gained in the offshore wind sector since this study was undertaken, however the figures and details within this study are considered to be applicable and provides useful context for the GHG assesssment.

36. **Table 16-4** provides a summary of the percentage of the total GHG emissions associated with the different phases of a wind farm development as provided within the report (Thomson & Harrison, 2015). It is worth noting that the figures are relevant to both the offshore and onshore components of an offshore wind farm, however the main focus of this assessment is for the onshore elements only.

Table 16-4 - Summary of Offshore Wind Farm GHG Emissions (Thomson & Harrison, 2015)

Phase	% of Total GHG Emissions
Manufacture and Installation	78.4
Operation and Maintenance	20.4
Decommissioning	1.2

37. The report highlighted that the greatest proportion of emissions are associated with the manufacture and installation of wind farm components. Decommissioning accounted for the smallest proportion, only 1.2%, of total life cycle GHG emissions. A more detailed breakdown of emissions is given in Thomson & Harrison (2015), which highlights that most emissions are associated with the offshore components of an offshore windfarm.

38. In the University of Edinburgh report titled '*Life Cycle Costs and Carbon Emissions of Offshore Wind Power*' (Thomas & Harrison, 2015), additional analysis of the data extracted from the 18 technical studies expressed the GHG emissions as grammes (g) of CO_2e per kilowatt-hour (kWh) of electricity generated. These were found to vary quite widely, between approximately 5 and 33 g CO_2e/kWh^1. There was not a clear relationship between the metrics for either turbine rating (in MW) or capacity factor.

39. A further study in 2012 titled '*Life Cycle Greenhouse Gas Emissions of Utility-Scale Wind Power*' (Dolan & Heath, 2012), amassed the results of over 200 studies of carbon emissions from onshore and offshore wind power and attempted to "harmonise" the results to use only the most robust and reliable data and to align methodological inconsistencies. The harmonised results of this study revealed that the range in GHG emissions per kWh of electricity generated varied between approximately 7 and 23 g CO_2e/kWh^1, with a mean value of 12 g CO_2e/kWh^1.

40. It is noted that these studies were undertaken in 2012 and 2015, and there have been significant advances in the technology, infrastructure and components used for offshore wind farms. Therefore, other available published sources were reviewed to evaluate average GHG intensity of energy produced offshore wind farms, and these are presented in **Table 16-5**. As shown, the range of energy intensities for offshore wind farms across the range of studies is 6 to 32 gCO_2e/kWh.

Table 16-5 - Review of Average Carbon Emission per kWh

Wind farm size	Energy intensity (gCO_2e/kWh)	Source
15x 5 MW	32	Chen et al. (2011), referenced in Bhandari et al. (2020)
N/A	6	IEA World Energy Outlook (2012), referenced in Siemens Gamesa (no date) and Orsted (2021)
100x 2.5 MW	13.7	Arvesen & Hertwich (2012), referenced in Bhandari et al. (2020)
80x 4 MW	10.9*	Bonou et al. (2016), referenced in Bhandari et al. (2020)
100x 6 MW	7.8	Bonou et al. (2016), referenced in Bhandari et al. (2020)
28x 3.6 MW	25.5*	Yang et al. (2018), referenced in Bhandari et al. (2020)
*offshore wind farm studies published from 2016 onwards		

41. To place these metrics into context, comparable values for electricity generation by gas are around 372 g CO_2e/kW[1] (31 times that of offshore wind) and, for coal, approximately 1,002 g CO_2e/kWh[1] (84 times that of offshore wind) (BEIS, 2022).

42. Although robust and fit for purpose, this assessment should not be taken to be a comprehensive, detailed Life Cycle Analysis (LCA) of the Proposed Development, as it is not possible to fully define the supply chain and undertake the relevant detailed assessments at this stage in the design. Therefore, assumptions and simplifications to the methodology were made in certain area and a precautionary approach was adopted for the assessment to allow for this. These assumptions and simplifications are referred to in **Section 16.5.3** and the worst-case scenario is set out in **Section 16.7.2**.

16.4.2 Assessment Approach

43. In this assessment the term 'GHG' or 'carbon' encompasses CO_2 and the six other gases as referenced in the Kyoto Protocol (CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3). The results in the assessment are expressed in carbon dioxide equivalent (CO_2e), which recognises that different gases have notably different global warming potentials (GWP[1]).

44. GHG emissions arising from the construction, operational and maintenance, and decomissioning phases of the Proposed Development were predicted within a defined 'project boundary', in accordance with the GHG Protocol (World Resources Institute and World Business Council on Sustainable Development, 2015), explained in futher detail in **Section 16.5**. This chapter provides a GHG assessment for the Proposed Development, in addition to the Project as a whole using the assessment outputs for the Offshore Project as presented in the Offshore EIA report. This is to fully contextualise the outputs of the assessment to account for the electricity generated by the Project, and the avoidance of emissions through fossil fuel generated sources.

45. To assist with the determination of the significance of the Proposed Development in relation to GHG emissions (as discussed in **Section 16.5.1**), three parameters were calculated to contextualise the GHGs emitted during the life cycle of the Project as a whole in relation to the benefits of providing renewable energy. These include:

- The GHG intensity of the Project:
    - This takes into account the amount of energy generated by the Project over its lifetime in relation to its GHG emissions.
- The GHG savings resulting from the Project:

[1] *Global Warming Potential (GWP) of a GHG is a measure of how much heat is trapped by a certain amount of gas in the atmosphere relative to carbon dioxide.*

- This will provide the net reduction in GHGs as a result of the Project.

- GHG 'payback' period:
  - The time it would for electricity generated by the Project to displace an equivalent amount of electricity generated by fossil fuels[2]. This calculation takes into account the use of energy generated by the Project to power the oil and gas installations in the Outer Moray Firth area.

16.4.3 Emission Calculations

46. GHG emissions sources arising from the Proposed Development were categorised into three main source groups as detailed in **Table 16-6**.

Table 16-6 Emission Source Groups Considered in GHG Assessment

Source Name	Definition	Onshore Project Sources
Embodied carbon in materials	Embodied emissions within materials comprise GHGs released throughout the supply chain, and includes the extraction of materials from the ground, transport, manufacturing, assembly, and its end-of-life profile.	Embodied emissions were quantified for the main construction materials to be used for the Proposed Development. The components that were considered include the landfall, onshore export cables and onshore substations. The requirement for spare (or replacement) parts during operation is not known at this stage. Therefore, we have relied on existing literature to estimate the likely emissions contribution from these components to the overall footprint of the Proposed Development.
Road Traffic	Emissions associated with the movement of road vehicles.	Emissions associated with the movement of heavy goods vehicles (HGVs) and staff travel during construction and operation were calculated.
Plant and equipment	Emissions are released from fuel combustion by non-road mobile machinery (NRMM).	Emissions from the use of NRMM during the construction of the Proposed Development were calculated.

47. Details on the activities that will take place during the construction, operation and maintenance and decommissioning phases are not fully known at this stage, therefore some assumptions have been made in order to quantify GHG emissions, as detailed in **Section 16.5.3**. These assumptions are based on indicative data from similar projects provided by the Applicant's design team or professional judgement. Emissions from the decommissioning phase were therefore derived from previous studies (Thomson & Harrison, 2015) which quantified them to be approximately 1.2% of the carbon footprint.

48. The approach to quantifying GHG emissions for each of the source groups detailed in **Table 16-6** are provided in the sections below. Further details with respect to the origin of the values used within the GHG assessmnent is provided in **Appendix 16.1**. The total operational life of the Project is 50 years, although there is a potential to extend this with maintenance. However, the operational life of the Offshore Project is 35 years, and therefore for the purpose of this assessment, the temporal scope is assumed to be 35 years.

16.4.3.1 Embodied Emissions in Materials

49. Emissions of 'cradle to (factory) gate' a term which includes the extraction manufacture and production of materials to the point at which they leave the factory gate of the final processing location, were calculated for the Proposed Development. GHG emissions were derived from quantities or volumes of known materials

[2] *Assumed to be a from a combination of Combined-Cycle Gas Turbine (CCGT) for electricity supplied to the national grid from gas combustion as this is the most common form of new plant in terms of fossil fuel combustion (BEIS, 2020), and from Open Cycle Gas Turbine (OCGT) for offshore oil and gas installations.*

(at this stage of the application) that will be used in construction. The key elements of the Proposed Development are:

- Trenchless compound;
- Joint bays (underground);
- Electrical cables; and
- Proposed Onshore Substation

The approach to determining embodied emissions from materials used for the Proposed Development is detailed in **Appendix 16.1.**

16.4.3.2 Road Vehicles

50. Road vehicle movements associated with the construction and operation, and maintenance phases of the Proposed Development will result in the release of GHG emissions. GHG emissions were calculated from the total kilometres travelled by HGVs and staff transport to and from the onshore construction sites, and also during the operation and maintenance phase. The total distance travelled during the construction phase was calculated based on the assumed average trip length (two-way movement) of 10km for cars and 50km for HGVs for each vehicle movement, which were considered to be reasonable assumptions for the study area. Emission factors for each vehicle type considered in the Assessment were obtained from DESNZ (formerly BEIS) (2023), in units of kg CO_2e per km travelled, assuming a forecasted fleet compostition (i.e. proportion of diesel, petrol and electric cars) for 2025. Full details of the methodology are provided in **Appendix 16.1**.

16.4.3.3 Plant and Equipment

51. Fuel consumption associated with the use of NRMMduring construction of the Proposed Development was calculated based on the estimated use of each item of plant and equipment, based upon assumptions obtained from projects of a similar nature. The approach to determine emissions from construction plant and equipment is detailed in **Appendix 16.1**.

16.4.3.4 Decommissioning

52. As stated in paragraph 47, activities associated with decommissioning were not known at the time of assessment. Therefore, emissions from the decommissioning phases were therefore derived from previous studies (Thomson & Harrison, 2015), which quantified them to be approximately 1.2% of the carbon footprint.

16.4.4 Impact Assessment Criteria

53. This assessment was undertaken in accordance with a topic-specific assessment methodology and approach to determining effect significance for the GHG assessment is provided within *IEMA Guidance* (IEMA, 2022), as set out in the following sections.

16.4.4.1 Sensitivity

54. The receptor for the GHG assessment is the global atmosphere. As such, it is affected by all global sources of GHGs, and is therefore considered to be of 'high' sensitivity to additional emissions.

16.4.4.2 Significance Criteria

55. Guidance on the assessment of GHG emissions was first released by IEMA in 2017 (IEMA, 2017), which stated that "*…in the absence of any significance criteria or defined threshold, it might be considered that all GHG emissions are significant…".* However, the recently updated IEMA guidance (IEMA, 2022) recognises "*when evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible*".

56. Significance can be evaluated in a number of ways depending on the context of the assessment, i.e. sector-based, locally, nationally, policy goals or against performance standards. The IEMA guidance recommends that significance criteria align with Paris Agreement, the UK's Carbon Budget up to 2037 and Net Zero

commitments: *"The crux of significance is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050"* (IEMA, 2022).

57. The updated IEMA guidance provides relative significance descriptions to assist assessments, specifically in the EIA context. Section VI of the updated IEMA guidance (IEMA, 2022) describes five distinct levels of significance which are not solely based on whether project emits the GHG emissions alone, but how the project makes a relative contribution towards achieving a science-based 1.5°C aligned transition towards Net Zero. These are presented below in **Table 16-7**.

Table 16-7 Assessment Significance Criteria, as obtained from the IEMA Guidance

Source	Summary
Major adverse	A project's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards Net Zero.
Moderate adverse	A project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards Net Zero.
Minor adverse	A project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards Net Zero.
Negligible	A project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or Net Zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards Net Zero and has minimal residual emissions.
Beneficial	A project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds Net Zero requirements with a positive climate impact.

58. To determine the significance of effects, GHG emissions arising from activities associated with the Proposed Development and Project as a whole were contextualised by consideration of emissions saved from the replacement of fossil fuel generated electricity by renewable generation, as described in **Section 16.4.2**. For the purposes of the EIA, major adverse and moderate adverse effects are deemed to be significant.

16.4.5 Cumulative Impact Assessment

59. The Global atmosphere is the receptor for the GHG assessment, therefore there are no common receptors between this assessment and other disciplines considered in the EIA. GHG emissions have the potential to contribute to climate change, and therefore the impacts are global and cumulative in nature. This is taken into account in defining the receptor (i.e. the global atmosphere) as high sensitivity. The IEMA guidance (IEMA, 2022) states that impacts of GHG emissions from specific cumulative projects should therefore not be individually assessed, as there is no basis for selecting which projects to assess cumulatively over any other. The GHG assessment is therefore considered to be inherently cumulative, and no additional consideration of cumulative impacts are required.

16.4.6 Transboundary Impact Assessment

60. As noted above for cumulative impacts, the receptor for the GHG assesment is the global atmosphere and therefore GHG emissions have an indirect transboundary impact. As the GHG emissions are assessed in

context of the UK Carbon Budgets and the aspirations to reduce GHG emissions in line with climate agreements, the cumulative transboundary impacts of GHGs emitted by the Proposed Development are not considered to require specific consideration.

16.5 Scope

16.5.1 Study Area

61. The system boundary of the GHG assessment includes activities during material extraction and manufacturing, transport and installation, operation and maintenance, and end of life and decommissioning. The study area is therefore not geographically defined but encompasses emission sources from a defined list of activities provided in **Section 16.4.3.**

16.5.2 Data Sources

62. The assessment was undertaken using data from the sources detailed in **Table 16-8** which are considered to be represenative for quantifying GHG emissions from activities associated the Proposed Development.

Table 16-8 Data Sources Used to Inform the GHG Assessment

Data	Year	Coverage	Confidence	Notes
Department of Energy Security and Net Zero (DESNZ) – Greenhouse gas reporting conversion factors 2023	2023	N/A	High	These conversion factors are provided by the UK Government for use by UK and international organisations to report GHG emissions associated with a range of activities, including transportation and fuel use.
Inventory of Carbon and Energy (ICE) Database v3.0	2019	N/A	High	These emission factors are provided for embodied GHG's in construction materials
BEIS CO_2e intensity of gas generation	2022	N/A	High	This data provided the GHG intensity of gas generation in the UK
North Sea Transition Authority (NSTA), formerly the Oil and Gas Authority (OGA), CO_2e intensity of electricity	2022	N/A	High	This data provided the GHG intensity for OCGT of offshore oil and gas installations
BEIS Treasury Green Book supplementary appraisal guidance on valuing energy use and GHG emission supporting data tables	2023	N/A	High	This data provides the grid-average emission factor for the UK Grid
Life Cycle Greenhouse Gas Emissions of Utility Scale Wind Power (Dolan and Heath, 2012)	2012	N/A	High	This data provides the benchmarking of results from the GHG assessment
Life Cycle Cost and Carbon Emission of Offshore Wind Power (Thomson & Harrison, 2015)	2015	N/A	High	This data provides the benchmarking of results from the GHG assessment and likely contribution activities to the overall Proposed Development Footprint.

16.5.3 Assumptions and Limitations

63. A number of assumptions were made in the GHG assessment, as set out in **Table 16-9**. Further details on the methodology adopted to quantify GHG emissions arising from the Proposed Development are presented in **Appendix 16.1.**

Table 16-9 Assumptions and Limitations of the GHG Assessment

ID	Assumption/Limitation	Discussion
1	Quantities for all materials to be used during construction were not available at the time of the assessment	Where information specific to the onshore components were not available, indicative quantities from other offshore windfarm projects have been used. Furthermore, precautionary assumptions were adopted when determining quantities of known materials (i.e., using the maximum quantity).
2	The recycled content of construction materials is unknown – albeit sustainability is one of the core values of procurement function.	As an example, it has been assumed that all steel used on the Proposed Development is virgin steel to provide a conservative assessment. It is likely that materials that will be used in construction such as steel will have a high recycled content, and thus a lower embodied carbon content than has been assumed in this assessment.
3	Lack of emission factors for future year activities, such as fuel consumption and material extraction.	The most recent available emissions factors were used in the assessment to provide a precautionary assessment.
4	The specific nature and composition of some materials, such as the type of concrete or steel to be used, was unknown which may affect the carbon intensity of the material.	If there was variation across different compositions of the same material, the 'General' option within the ICE database was chosen, if available, or the median value if not.
5	Operation and maintenance emissions	Many sectors are anticipated to decarbonise over the next 35 years, and during operation and maintenance, it is likely that the emissions intensity of producing materials and the movement of road transport/plant and equipment will be less than the present day. Therefore, emissions associated with the operation and maintenance phase of the Proposed Development are likely to be a significant overestimation.
6	Emissions from spare parts	The requirement for spare (or replacement) parts during the operation and maintenance phase is not known at this stage, therefore the likely composition of emissions in terms of the overall footprint of the Proposed Development was obtained from existing literature (Thomson & Harrison, 2015). This was assumed to be 3.7% of the total from the remaining sources during the construction and operational and maintenance phases.
7	Emissions quantified in the 'do nothing' scenario	The emission factor for electricity supplied by gas is in units of CO_2, whereas emissions quantified from the Proposed Development and Project as a whole are in units of CO_2e. However CO_2 is likely to be the main GHG released from the generation of electricity from gas, and the factor would be higher if other GHGs were to be included, therefore this approach presents a conservative scenario.

16.6 Existing Environment

64. To help determine the significance and contextualise the outcomes of the assessment, consideration of a baseline or 'without development' scenario is required. The UK electricity grid is made up from a number of different energy sources, including gas, nuclear, onshore and offshore wind, coal, bioenergy, solar and hydroelectric.

65. The growth of renewable energy is key to both Scotland's and the UK's Energy Strategy and Net Zero targets, and a transition away from electricity generated by fossil fuels. Therefore, to evaluate the impact of the Proposed Development, it was assumed that electricity produced by fossil fuels is displaced, including that used on offshore oil and gas installations. For the purposes of the assessment, it was assumed that emissions per GWh of electricity generated by natural gas for the national grid, 372 tonnes CO_2/GWh as Combined Cycle Gas Turbine (CCGT), is the most common form of new plant in terms of fossil fuel combustion (BEIS, 2020). Emissions associated with electricity generated by offshore oil and gas installations from OCGT is 460 tonnes CO2/GWh) (OGA, 2020).

16.6.1 Energy Produced by the Offshore Project

66. The approximate amount of energy produced by the Offshore Project, both annually and over the anticipated 35-year lifetime of the wind farm was quantified from the approach advocated by RenewableUK (2022). Under this approach, the installed capacity (assumed to be 560 MW) was multiplied by the hours in the year (8,760) and by the appropriate average load or capacity factor for the Project. For new build floating offshore wind farms, BEIS advises that the load factor is 63.1% (BEIS, 2021a).

67. The anticipated energy produced by the Project is:

- Approximately: 3,095,434 MWh/year
- Approximately: 108,340,176 MWh over the 35-year lifetime of the Project

16.6.2 GHG Emissions from the 'do nothing' scenario

68. In the 'do nothing' scenario, where the Project is not constructed, it was assumed that the energy would otherwise be produced using gas, as this is the fuel currently used by the oil and gas industry in the Outer Moray Firth and is also the most common choice for new plant construction in terms of fossil fuel combustion. An alternative approach would be to use the future electricity emission factors of the UK Grid, for which projections are available from BEIS (2021b). However, these projections account for renewable energy projects such as the Project becoming operational and decarbonising the UK electricity grid. Therefore, using the future projections of the UK grid to determine a 'do nothing' or 'without Project' baseline is not considered to be reasonable approach.

69. The Project is anticipated to provide up to 31.7% of its generated electricity to oil and gas installations in the Outer Moray Firth, which would replace electricity from OCGT power generation units operating on fossil fuels. Consequently, it is assumed that the remaining 68.3% of the electricity generated by the Project will displace electricity generated from gas for the national grid.

70. The GHG emissions resulting from the production of the anticipated energy from the Project by gas combustion in the 'do nothing' scenario if the Proposed Development is not built is presented in **Table 16-10**. This has been quantified by multiplying the proportion of anticipated electricity generated by the Project by the relevant emission factors for the OCGT turbines at oil and gas installations, 460 tonnes CO_2/GWh (OGA, 2020), and from gas supplied electricity for the National Grid (372 tonnes CO_2/GWh) (BEIS, 2021b).

71. The emission factors for electricity supplied by gas is in units of CO_2, whereas emissions quantified from the Proposed Development and Project as a whole are in units of CO_2e. However CO_2 is likely to be the main GHG released from the generation of electricity from gas, and the factor would be higher if other GHGs were to be included, therefore this approach presents a conservative scenario.

Table 16-10 Do Nothing Scenario Baseline GHG Emissions

Timeframe	Anticipated energy produced by the Project	Emission Factor (tonnes CO_2/ GWh)	GHG emissions from electricity generation from gas (tonnes CO_2)
Per year	3,095 GWh	372 tonnes CO_2/GWh for 68.7% of the electricity produced	1,237,852
Duration of the Project (35 years)	108,340 GWh	420 tonnes CO_2/GWh for 31.7% of the electricity produced	43,324,803

16.7 Potential Impacts

72. A summary of the potential impacts assessed in this Chapter is provided in **Table 16-11**. Unlike other chapters in the EIA, the GHG assessment considers emissions released and saved across the life cycle of the Proposed Development, and wider Project as a whole, rather than distinct phases.

Table 16-11 Potential impact pathways on climate change receptors

Green Volt Project Phase	Potential Impact Pathways	Receptor
Construction, Operation and Maintenance, and Decommissioning	GHG emissions (released and saved) to the atmosphere during construction, operation, and decommissioning	Global atmosphere

16.7.1 Embedded Mitigation

73. The IEMA GHG guidance (IEMA, 2022) notes the importance of embedded mitigation in minimising GHG emissions from a development. The IEMA GHG Management Hierarchy sets out a structure to eliminate, reduce, substitute and compensate (IEMA, 2022).

74. In response to these principles, the need for the Project in relation to achieving Net Zero targets for the UK and Scotland, and decarbonisation of the energy sector is well established and set out within **Chapter 2: Need for the Project** of the **Offshore EIA Report** as well as the Planning Statement related to the Onshore EIA Report. Furthermore, project level GHG mitigation is being incorporated into the design development process for the Proposed Development wherever it is practicable to do so. Considering that the primary purpose of the Proposed Development is to connect to the generating station and allow for the provision of low carbon renewable energy to the grid, the process of reducing GHG emissions is guided by the hierarchy summarised in **Table 16-12.**

Table 16-12 IEMA GHG Guidance (IEMA, 2022) - Mitigation Hierarchy Specific to the Project

	Hierarchy	Principle	Project Response
	Do not build (Eliminate)	Evaluate the basic need for the proposed project and explore alternative approaches to achieve the desired outcome(s).	The purpose and rationale for the Project is to tackle climate change by replacing existing high carbon energy generation. So, in this case of 'do not build' could have the effect of perpetuating and exacerbating climate change.
	Build less (Reduce)	Realise potential for re-using and/or refurbishing existing assets to reduce the extent of new construction required.	Offshore windfarms and their onshore elements by their design are efficient in their use of materials. Minimising the use of steel is a key design feature of the approach to project design and procurement.
	Build clever (Substitute)	Apply low carbon solutions (including technologies, materials, and products) to minimise resource consumption and embodied carbon during the construction, operation, user's use of the project, and at end-of-life.	The Project will use the latest, most efficient, and effective turbines, offshore substation platforms, and onshore substation.
	Construction efficiently (compensate)	Use techniques (e.g. during construction and operation) that reduce resource consumption and associated GHG emissions over the life cycle of the Project.	Offshore windfarm and its onshore elements construction is by its nature expensive and relies on the use of highly specialised, efficient vessels and equipment with a dedicated and highly trained workforce.

75. Measures to reduce GHG emissions associated with the construction, operational and maintenance and decomissioning phases of the Proposed Development will be considered throughout the design process. Measures to reduce emissions during construction associated with the use of NRMM will be included within a Construction Environmental Management Plan (CEMP), and the use of lower carbon intensive materials will be considered where practicable.

16.7.2 Worst Case

76. The worst-case scenario with regard to GHG emissions are presented in **Table 16-13**. Where a range of parameters are presented in **Chapter 5: Project Description** and there is an effect on the quantity of materials required, the higher values were used to provide a conservative assessment.

Table 16-13 Worst Case Assumptions

Impact	Parameter	Notes
Construction		
GHG emission during construction	Indicative construction programme: ▪ 2025 to 2027 – ○ Cable Installation – onshore – 361 days ○ Trenchless Landfall (900m) – 124 days ○ Trenchless – River Crossing (RVX) 14/1 (535m) – 94 days ○ Trenchless – Dismantled rail crossing (DRLX) 7/1 (435 m) – 114 days ○ Substation – 546 days	Maximum duration of construction
	Infrastructure: ▪ Landfall: ○ Trenchless compound ○ Onshore transition jointing pit ▪ Installation of onshore cable: ○ Technology: open-cut trenching ○ Onshore export cable length: 35 km ○ Number of jointing bays: 137 ○ Number of link boxes: 245 ▪ Onshore substation: ◦ Substation compound: 45,000 m^2	Maximum lengths and/or configuration of infrastructure
Operation		
GHG emission during operations	▪ Operational life – 35 years ▪ Total maximum capacity of 560 MW	n/a
Decommissioning		
The contribution from decommissioning was scaled based on the total GHG contribution and assumed as 1.2% of the total carbon footprint for the construction and operation of the Proposed Development *as per* **Table 16-4**		

16.7.3 Potential Impacts During Construction, Operation and Maintenance, and Decommissioning

16.7.3.1 GHG Quantification

77. **Table 16-14** presents the GHG emissions associated with the Project.

Table 16-14 GHG emissions associated with the Proposed Development

Phase	Source	GHG Emissions (tonnes CO_2e)*	Percentage of GHG footprint per phase	Total GHG Emissions per phase (tonnes CO_2e)	Percentage of Overall GHG footprint**
Construction	Embodied Carbon in materials	63,623	90.6%	70,192	95.0%
	Plant and equipment	2,448	3.5%		
	Road traffic	4,121	5.9%		
Operation and Maintenance (35 years)	Road Vehicles	212	7.5%	2,817	3.8%
	Spare Parts	2,605	92.5%		
Decommissioning**		855	100%	855	1.2%
Total		**73,865**			
*Figure presented in this table have been rounded to the nearest whole number, where possible **Refer to **Table 16-4**					

78. The results of the GHG assessment are shown in **Table 16-14**, and include emissions associated with the lifetime of the Proposed Development, including construction, an operational lifetime of 35 years, and decommissioning.

79. The results highlight that the construction phase is anticipated to have the highest emission contribution of the Proposed Development. Embodied carbon in construction materials is expected to be the largest source of emissions, contributing approximately 90.6% of the overall construction phase footprint.

80. Emissions during operation and maintenance associated with the Proposed Development are predicted to be 2,817 tonnes CO_2e per year, with the majority of GHGs released from the the provision and installation of spare parts.

16.7.3.2 Assessment of significance

81. As noted in **Section 16.4.4.2** the significance of the Proposed Development in relation to GHG emissions is derived from comparisons to the 'Do Nothing' baseline scenarios and how the Project would align with the Scotland's Net Zero by 2045 aspirations (and the UK's by 2050). The significance of effect for the GHG assessment therefore considered both the Proposed Development and the Offshore Project and is provided in **Section 16.7.3.2.1**.

16.7.3.2.1 Further mitigation

82. No further mitigation is recommended for the Proposed Development.

16.7.3.3 In-combination with Offshore Project

16.7.3.3.1 Quantification of the Project's GHG Emissions

83. To determine the total GHG savings or carbon offset from the Project as a whole, and the GHG intensity of electricity production, the GHG contribution from the Offshore Project is required to provide a total GHG

footprint. Emissions from the Offshore Project were obtained from the GHG Assessment presented in the Offshore Project EIA Report, as detailed in **Section 16.1.**

84. **Table 16-15** presents the GHG emissions associated with the Project, using the contribution from the Proposed Development presented in this GHG Assessment, and emissions from the Offshore Project combined.

Table 16-15 GHG Emissions for the Project (Proposed Development and Offshore Project)

Phase	Offshore or Onshore	Source	GHG Emissions (tonnes CO_2e)*	Percentage of GHG footprint per phase	Total GHG Emissions per phase (tonnes CO_2e)	Percentage of Overall GHG footprint
Construction	Offshore	Embodied Carbon in materials	1,128,852	91.9%	1,228,443	71.2%
	Onshore	Embodied Carbon in materials	63,623	5.2%		
	Offshore	Marine vessels	29,398	2.4%		
	Onshore	Plant and equipment	2,448	0.2%		
	Onshore	Construction road traffic	4,121	0.34%		
Operation and Maintenance	Offshore	Vessels	457,938	95.8%	477,796	27.7%
	Onshore	Road Vehicles	212	0.04%		
	Offshore/onshore	Spare Parts	19,646	4.1%		
Decommissioning	Onshore/offshore	1.2% of total **	20,731	100%	20,731	1.2%
Total			**1,726,970**			
*Figure presented in this table have been rounded to the nearest whole number **Refer to **Table 16-4**						

85. The results in **Table 16-5** show that the construction phase of the Project is anticipated to have the highest emissions contribution. Embodied carbon in construction materials is expected to be the largest source of emissions to the overall offshore GHG footprint, contributing approximately 97.1% of emissions during the construction phase, and 69.1% of the overall footprint for the Project.

86. As stated in **Appendix 16.1** there is likely to be an overestimation of embodied carbon in materials. In addition, the emission factors used in the assessment such as for manufacturing of materials and the transportation are representative of present-day conditions. It is highly likely that the emission factors would reduce as sectors within the UK decarbonise over the temporal scope of approximately 35 years considered in the assessment. The results from the assessment are therefore considered to be conservative.

87. GHG emissions from the sources for the Project are predicted to be approximately 1,726,970 tonnes. Contextualisation of the results are presented in the following sub-sections.

16.7.3.3.2 GHG intensity of the electricity produced for the Project

88. The GHG intensity per unit electricity (kWh)produced by the Project was determined using the approach described in **Section 16.6.** The anticipated levels and associated GHG intensity of electricity generated by the Project is presented in **Table 16-16.**

Table 16-16 Electricity generation and GHG intensity for the Project

Annual electricity generation (MWh p.a.)	Electricity generated by Project over 35 years (MWh)	GHG Emissions Released from the Project (tonnes CO_2e)	GHG intensity of electricity produced by project (g CO_2e/kWh)
3,095,434	108,340,176	1,726,970	15.9

89. The GHG intensity of the electricity produced by the Project is therefore 15.9 g CO_2e/kWh . As noted in **Section 16.5.3** and **Appendix 16.1**, a number of very conservative assumptions were adopted in the assessment, therefore the GHG footprint of the Project, particularly during the operation and maintenance phase, is likely to be an overestimation.

16.7.3.3.3 GHG Emission Savings or Carbon Offset for the Project

90. In the 'do nothing' scenario, it was assumed that the electricity generated by the Project would otherwise be produced using gas in power generation units supplying the National Grid and providing electricity onboard offshore oil and gas installations as detailed in **Section 16.6.2**. The quantity of GHG emissions produced from the generation of electricity from gas (National Grid and oil and gas installations) is presented in **Table 16-10**, along with the GHG footprint of the Project as presented in **Section 16.7.3.3.1.** These values are used to derive the total carbon offset by the Project as shown in **Table 16-17**. It is noted that the emission factor for electricity supplied by gas is in units of CO_2 rather than CO_2e, however, CO_2 is likely to form the main contribution to the generation of electricity.

Table 16-17 GHG savings from the Project

Anticipated energy produced by the Offshore Project (GWh)	GHG emissions from electricity generated from gas (tonnes CO_2)	Project GHG emissions (tonnes CO_2e)	GHG emissions saved (tonnes CO_2e)
108,340	43,324,803	1,726,970	41,597,833

91. The data presented in **Table 16-17** shows that the estimated levels of GHG savings over the lifespan of the Project would be approximately 41.6 million tonnes CO_2e.

16.7.3.3.4 GHG 'payback' period for offshore and onshore aspects of the Project

92. Emissions calculated for the ''do nothing' scenario (**Section 16.6.2**) were also used to estimate the 'GHG payback' of the Project.

93. The GHG payback of the Project, assuming that electricity produced by natural gas combustion is displaced (on both UK Grid and the electrification of oil and gas installations) is 1.4 years from the time of when the Project becomes fully operational (expected to be 2027) as set out in **Table 16-18.**

Table 16-18 GHG 'payback' period for the Project

Parameter	Value	Unit
Energy produced by Project	3,095	GWh/year
CO_2e intensity of electricity generated by natural gas supplied to the National Grid (68.7% of electricity generated by the Project)	372	tonnes CO_2e/GWh
CO_2e intensity of electricity generated by natural gas on offshore oil and gas installations (31.3% of electricity generated by the Project)	460	tonnes CO_2e/GWh
Annual CO_2e from gas-generated electricity (i.e. saved per year)	1,237,852	tonnes per year
Total CO_2e released by the Project (total: construction/35-year operation and maintenance/ decommissioning)	1,726,970	tonnes
Time taken for Project-generated CO_2e to be paid back	1.40	years

16.7.3.3.5 Comparison to the UK Carbon Budget

94. The provision of renewable energy will play an important role in meeting the UK Carbon Budgets and contributing to Scotland's Net Zero aspirations.

95. During construction, total GHG emissions from the Project (1,228,443 tonnes CO_2e) were predicted to contribute approximately 0.06% of the 4th UK Carbon Budget (between 2023 and 2027) over the five-year period. This assumes that all of the construction activities take place within the period 2023 – 2027, which is likely to be an overestimation as some emissions generating activities will take place beyond 2027. GHG emissions during construction are temporary and form a relatively small component of the 4th UK Carbon Budget.

96. The total GHG savings associated with the Proposed Development are estimated to be 41.6 million tonnes CO_2e. For context, these GHG savings (over a five-year period equates to approximately 68,257 tonnes CO_2e) as a result of the Project equates to a saving of 0.01% of the 6th UK Carbon Budget (2033-2037).

16.7.3.4 Assessment of Significance of effect

97. As noted in **Section 16.4.4.2,** the significance of a project in relation to GHG emissions is derived from comparisons to the 'Do Nothing' baseline scenarios and how the Project would align with Scotland's and the UK's Net Zero aspirations.

98. As noted in **Section 16.7.3.3.1**, the Proposed Development would result in a reduction in the release of GHG's to the atmosphere by approximately 41.6 million tonnes CO_2e, compared to the 'do nothing' baseline (i.e. electricity produced by gas). The Project will provide a renewable source of electricityand will beneficially contribute towards Scotland's Net Zero by 2045 aspirations (and the UK's by 2050), including providing electricity to oil and gas installations, which is also aligned with the UK North Sea Transition Deal. It was therefore considered that the effects of the Project would be of **beneficial significance** in relation to reducing GHG emissions, which is considered to be significant in EIA terms.

16.8 Cumulative Impacts

99. As noted in **Section 16.4.5**, the global atmosphere is the receptor for the GHG assessment (which is of high sensitivity) and IEMA guidance (2022) states that effects of GHG emissions from specific cumulative projects should therefore not be considered individually, as there is no basis for selecting which projects to assess cumulatively over any other. The impact of GHG assessment is therefore inherently cumulative, and no specific cumulative assessment of other projects is required to be undertaken.

16.9 Potential Transboundary Impact

100. As noted in **Section 16.4.6** emissions of GHGs have an indirect transboundary impact. As noted, the receptor for the GHG assessment is the global atmosphere, and therefore emissions of GHGs have an indirect transboundary effect. As the GHG emissions arising from the Proposed Development and Project were considered in the context of the UK Carbon Budgets and the aspiration to national emissions, the cumulative transboundary effects of GHGs emitted by the Proposed Development and Project are not considered to require specific consideration.

16.10 Inter-Relationships

101. The receptor for the GHG assessment is the global atmosphere. There are no other topics which have direct impacts on this receptor, and therefore there are no inter-relationships with this topic.

16.11 Summary

102. This chapter has investigated the potential effects on GHG emissions arising from the Proposed Development, and the Project as a whole.

103. **Table 16-19** presents a summary of the impacts assessed within this chapter, any commitments made, and mitigation required and the residual effects. The Proposed Development and Project as a whole were predicted to have beneficial effect in terms of GHG emissions and would contribute towards Scotland's and the UK's Net Zero targets. This was significant in EIA terms, in accordance with *IEMA Guidance* (2002).

Table 16-19 Summary of Potential Impacts Identified for Climate Change

Potential impact	Receptor	Sensitivity	Magnitude	Significance	Potential mitigation measure	Residual impact
Construction, Operation and Maintenance, and Decommissioning						
GHG emissions during construction, operation and maintenance and decommissioning	Global atmosphere	High	N/A*	Beneficial (significant)	N/A	Beneficial (significant)
Cumulative						
Cumulative impacts in relation to GHGs do not require assessment						
Transboundary						
Transboundary impacts were not explicitly considered within the assessment						
*not defined as part of the assessment methodology						

16.12 References

Arvesen, A., Hertwich, E. G. (2012). Corrigendum: environmental implications of large-scale adoption of wind power: a scenario-based life cycle assessment. Environ. Res. Lett. 7, 39501.

Bhandari, R., Kumar, B., Mayer, F. (2020). Life cycle greenhouse gas emission from wind farms in reference to turbine sizes and capacity factors. Journal of Cleaner Production, Volume 277.

Bonou, A., Laurent, A., Olsen, S. I. (2016). Life cycle assessment of onshore and offshore wind energy-from theory to application. Applied Energy, Volume 180, pp. 327-337.

Cableizer (2021), Embodied energy and carbon [Online] Available at: https://www.cableizer.com/documentation/EEC/

Climate Change Committee (2020). The Sixth Carbon Budget The UKs path to Net Zero Chapter 4 Scotland, Wales and Northern Ireland's contribution to Net Zero. 1st ed [pdf] London: Climate Change Committee, p. 228. [Online] Available at: https://www.theccc.org.uk/publication/sixth-carbon-budget/?msclkid=553aaa35ae7511ec8e7fcfabb0201b38

Climate Change Committee (CCC) (2023) 2023. Progress Report to Parliament. Available: 2023 Progress Report to Parliament - Climate Change Committee (theccc.org.uk)

Department for Business, Energy & Industrial Strategy (BEIS) (2020), Digest of United Kingdom Energy Statistics, 2020. [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/924591/DUKES_2020_MASTER.pdf

Chen, G. Q., Yang, Q., Zhai, Y. H. (2011). Renewability of wind power in China: A case study of nonrenewable energy cost and greenhouse gas emission by a plant in Guangxi. Renewable and Sustainable Energy Review, Volume 15, Issue 5, pp. 2322-2329.

Department for Business, Energy & Industrial Strategy (BEIS) (2020), Digest of United Kingdom Energy Statistics, 2020. [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/924591/DUKES_2020_MASTER.pdf

Department for Business, Energy & Industrial Strategy (BEIS) (2021a) North Sea Transition Deal

Department for Business, Energy & Industrial Strategy (BEIS) (2021b). Contracts for Difference Scheme for renewable electricity generation Allocation Round 4: Allocation Framework, 2021. [Online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1035899/cfd-allocation-round-4-allocation-framework.pdf

Department for Business, Energy & Industrial Strategy (BEIS) (2023). BEIS Valuation of energy use and greenhouse gas (GHG) emissions, supplementary guidance to the HM Treasury Green Book on Appraisal and Evaluation in Central Government. [Online] Available at: data-tables-1-19.xlsx (live.com)

Department for Business, Energy & Industrial Strategy (BEIS) (2016. UK ratifies the Paris Agreement UK ratifies the Paris Agreement - GOV.UK (www.gov.uk)

Department for Business, Energy & Industrial Strategy (BEIS) (2022). Estimated Carbon Dioxide Emissions from Electricity Supplied [Online] Available at: https://assets.publishing.service.

Department for Energy Security and Net Zero (2023). Greenhouse gas reporting: conversion factors 2023. [Online] Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023

Dolan, S. L., Heath, G. A. (2012). Life Cycle Greenhouse Gas Emissions of Utility-Scale Wind Power.

Oil & Gas Authority, (2020), UKCS Energy Integration, Final Report, Annex 1. Offshore electrification. [Online] Available at: UKCS Energy Integration Final report Annex 1. Offshore electrification (nstauthority.co.uk)

Orsted (2021). What is the carbon footprint of offshore wind? [Online] Available at: https://us.orsted.com/wind-projects/seven-facts-about-offshore-wind/carbon-footprint

Renewable UK (2022). Wind Energy Statistics Explained. [Online] Available at: Statistics Explained - RenewableUK

Scottish Government (2023). Scotland's Fourth National Planning Framework. [Online] Available at: https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf

Scottish Government (2019). Climate Ready Scotland: climate change adaptation programme 2019-2024. [Online] Available at: https://www.gov.scot/publications/climate-ready-scotland-second-scottish-climate-change-adaptation-programme-2019-2024/documents/

Scottish Government (2020). The Climate Change (Duties of Public Bodies: Reporting Requirements) (Scotland) Amendment Order 2020. [Online] Available at: https://www.legislation.gov.uk/ssi/2020/281/made

Scottish Government (2023a). Share of renewable energy in gross final consumption. [Online] Available at: https://scotland.shinyapps.io/sg-energy/?Section=WholeSystem&Chart=RenEnTgt

Siemens Gamesa (no date). Environmental Product Declaration SG 8.0-167 DD.

Inventory of Carbon and Energy (ICE) (2019) Database https://www.circularecology.com/embodied-carbon-footprint-database.html

Institute of Environmental Management & Assessment EMA (2022). Institute of Environmental Management & Assessment (IEMA) Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance. https://www.iema.net/

Institute of Environmental Management & Assessment (IEMA) (2017). Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance.

Thomson, R. C., Harrison, G. P. (2015). Life Cycle Costs and Carbon Emissions of Offshore Wind Power.

UK Parliament (2022). What were the outcomes of COP26?
United Nations Framework Convention on Climate Change (UNFCCC) (2022). The Glasgow Climate Pact – Key Outcomes from COP26.

World Resource Institute, World Business Council for Sustainable Development (2015) A Corporate Accounting and Reporting Standard, Revised Edition.

Yang, J., Chang, Y., Zhang, L., Hao, Y., Yan, Q., Wang, C. (2018). The life-cycle energy and environmental emissions of a typical offshore wind farm in China. Journal of Cleaner Production, Volume 180, pp. 316-324

GREEN VOLT

17 Chapter 17

Schedule of Mitigation

Onshore EIA Report: Volume 1

Document Code: FLO-GRE-REP-0009-17		
Version Number:	00	
Date:	*Issue Date 03/08/23*	
Prepared by:	Olivia Selby	*Olivia Selby*
Checked by:	Corey Simpson	*Corey Simpson*
Approved by Client:	Tracey Clarkson-Donnelly	*Tracey Clarkson-Donnelly*

Version Number	Reason for Issue / Major Changes	Date of Change
A1	First draft for review	28/07/23
A2	Second draft for review	02/08/23
00	Final	03/08/23

17 Schedule of Mitigation

1. The Applicant has made a number of commitments as part of the **EIA** process to avoid, reduce or offset adverse effects on the environment during the construction, operation and decommissioning of the Proposed Development. This chapter provides a summary of the mitigation measures and commitments presented within the **Onshore EIA Report**.

2. Key documents related to how mitigation and commitments include:

   - The Outline Construction Environmental Management Plan (CEMP) which includes within it the following environmental management plans:
     - Species Protection Plans;
     - Noise Management Plan;
     - Pollution Prevention Plan;
     - Emergency Environmental Response Procedure;
     - Dust Management Plan;
     - Light Pollution Prevention Plan;
   - Framework Traffic Management Plan; and
   - Private Water Supply Risk Assessment.

3. **Table 17.1** summarises the mitigation measures and commitments for the Proposed Development and at which phase of the Proposed Development they would apply. For more details, please refer to the corresponding chapter.

Table 17.1 - Schedule of Mitigation Commitments made in the Green Volt Onshore EIA Report

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
Chapter 6 - Ecology and Ornithology						
During Construction	Protect Ancient Woodland Inventory (AWI)	AWI areas throughout Cable Route Corridor	Trenchless methodologies will be the specified within the design process to ensure the mitigation is embedded. Tree Root Protection Zones (BS 5837: 2012 – Trees in Relation to Design, Demolition and Construction) are also to be included as part of the mitigation in this section to protect the sensitive habitat of the AWI and wider buffer zones, they will be	Yes	Yes	Secured by specification in the design, with the Construction Environmental Management Plan (CEMP) and ECoW remit to ensure implementation

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
			implemented according to the UK Gov recommendations (UK Gov, 2022).			
During Construction	Protect Native Woodland Survey Scotland (NWSS)	NWSS woodland area near Cable Route Corridor	Of the three NWSS woodlands noted only one is in proximity to the Cable Route corridor. Therefore, mitigation: Tree Root Protection Zones (BS 5837: 2012) and pollution prevention and control measures will be implemented as appropriate.	-	Yes	Secured through implementation of the Pollution Prevention Plan which will be part of the CEMP and ECoW remit
During Construction	Reduce ecological potential impacts	Throughout the Cable Route Corridor	Micrositing informed by the ECoW will help to further reduce impacts by avoiding any sensitive receptors (habitats or species).	-	Yes	Secured through the CEMP, ECoW, Species Protection Plan and Biodiversity Enhancement and Habitat Management Plan
During Construction	Reduce ecological potential Impacts	Rattray Head to Peterhead Local Nature Conservation Sites (LNCS)	Avoidance of habitats of local conservation value, as far as practicable. The location of the Onshore Transition Jointing Pit and associated infrastructure have been placed away from the edge of the LNCS and the sensitive sand dune communities, with no habitat loss to the LNCS.	Yes	-	Secured through the specification in the design process to avoid the LNCS and sand dune communities,
During Construction	Protect Badgers and their habitats	Throughout Cable Route Corridor	Consideration of areas with the potential to support badgers in relation to the location of the Cable Route Corridor and associated infrastructure, as far as practicable. The design was altered to avoid setts, outliers and areas of high activity. Implementation of a Species Protection Plan to be agreed with NatureScot.	Yes	-	Secured through specification in the design process to avoid known badger locations and SPP.
During Construction	Protect Badgers and their habitats	Throughout Cable Route Corridor	To avoid blocking potential routes, and as part of embedded mitigation, any fencing during construction, operation will be permeable and mammal friendly. They will be mammal friendly in-so-far as they will have regular small gaps for	Yes	-	The ECoW remit will ensure appropriate and effective measures are in place

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
			badgers to move through. The spacing will be agreed with NatureScot.			
During Construction	Protect Badgers and their habitats	Throughout Cable Route Corridor	During construction the existing inbuilt design measures will be followed and an ECoW will ensure implementation of pipes etc. are stored correctly (reducing likelihood of badgers from using them and being present in potentially 'high risk' areas) and low vehicle speed limits (15 mph) are enforced to greatly reduce the likelihood of badger injury or death from happening during construction.	Yes	-	The ECoW remit will ensure the planned appropriate and effective measures are in place
During Construction	Protect Breeding Birds and their habitats	Throughout Cable Route Corridor	Areas with the potential to support breeding bird species in relations to the location of the Cable Route Corridor and associated infrastructure have been considered, as far as practicable. The design was altered to avoid important habitats, such as, woodland. The key mitigation measure to avoid and minimise impacts to breeding birds is: ▪ Pre-construction surveys between April to September.	Yes	-	ECoW will undertake pre-construction surveys
Chapter 7 - Geology, Hydrology, Hydrogeology and Soils						
During Construction	Water Quality and Soils Management	Throughout the Cable Route Corridor	Prior to excavations, an end-use will be identified for the excavated material and an appropriate storage solution determined accordingly. Stored materials will be kept away from surface water bodies to minimise the possibility for sediments entering the aquatic environment. Where excavation works are proposed in pasture fields, the original turves will be carefully lifted and stored so that they can be reinstated once the works are complete.	Yes	-	This commitment will be secured in the CEMP

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
During Construction	Water quality and flood risk management	Throughout the Cable Route Corridor	Drainage will be planned prior to the construction of any cable joint bays, mobilisation areas, and site yards. Temporary drains will also be installed along the length of the proposed Cable Route Corridor during construction. Where appropriate, temporary silt fences will be installed downslope of construction works to filter runoff that is potentially carrying silt from excavations or stockpiles.	Yes	-	This commitment will be secured with drainage plans in the CEMP and the ECoW will also oversee silt runoff prevention measures as part of their remit
During Construction	To maintain Private Water Supplies (PWS)	Throughout the Cable Route Corridor	The Principal Contractor will ensure that the drainage measures installed during the construction phase are properly maintained and monitored to ensure the drainage management remains fully effective in safeguarding the surrounding water supplies. Additionally, no fuel or potentially contaminative materials will be stored uphill of any nearby PWS sources. Works carried out in proximity to any identified PWS shall include: ▪ Adherence to PWS monitoring programme to ensure that any change from the baseline water quality and quantity is identified and appropriate protection measures put in place. ▪ Provide and follow and private water supply emergency response plan (PWSERP) ▪ An alternative potable source of water will be provided in case of emergency ▪ Repair damage to existing PWS and provide adequate alternative as soon as possible ▪ Replace and upgrade existing treatment system for PWS ▪ Provide an alternative PWS	Yes	-	This commitment will be secured in the CEMP and PWSERP.

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
During Construction	Reinstatement of soils	Throughout the Cable Route Corridor	As far as is reasonably practical and achievable, excavated soil material horizons will be replaced in sequence and depths similar to those recorded prior to excavation, or similar to the surrounding undisturbed ground at the point of reinstatement.	Yes	-	This commitment will be secured in the CEMP
During Construction	Protection of Sensitive Habitat	Throughout the Cable Route Corridor	Dewatering shall be avoided where possible to minimise impacts on sensitive habitat. Where dewatering is required, it shall comply with the Abstraction Regime of CAR General Binding Rule (GBR) 2 and GBR 15. Details of how dewatering will be managed shall be provided within a final Construction Method Statement (CMS) prior to construction of the proposed project. Mitigating measures will include: using an irrigation sprinkler head to maintain moisture in the upper soil horizons of nearby GWDTE and peatland habitat; and, keeping the excavation duration as short as possible. This will maintain a continuous water supply to sensitive habitats and minimise the overall impact of dewatering.	Yes	-	This commitment will be secured in the CMS and CEMP
During Construction	General Site Pollution Prevention and Control	Throughout the Cable Route Corridor	Prior to construction, the outline CEMP will be finalised by the Principal Contractor, and a Pollution Prevention Plan (PPP) will be put in place, adhering to the standards set out by SEPA and Aberdeenshire Council.	Yes	-	This will be secured through the CEMP and the PPP
During Operation	Safeguarding the surrounding water environment	Throughout the Cable Route Corridor	The surface water from the Proposed Substation and associated infrastructure will be managed by the implementation of a surface water drainage system. This will consist of various SuDS methods to safeguard the surrounding water environment.	Yes	-	Secured via final drainage design at detailed design.
Chapter 8 - Contaminated Land						

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
Prior to Construction	Understanding potential for contaminated land	Section 19 of Cable route corridor at Stonemills	Investigation of soils in the undulating ground. Testing for metals, pH, petroleum hydrocarbons, polyaromatic hydrocarbons, asbestos, and organic matter content.	Yes	-	This will be secured via Planning Condition
Prior to Construction	Understanding potential for contaminated land	Section 16 of the Cable route corridor at Wester Rora Sandpit	Investigation of soils in tipped areas where the route will cross. Testing for metals, pH, petroleum hydrocarbons, polyaromatic hydrocarbons, asbestos and organic matter content.	Yes	-	This will be secured via Planning Condition
Prior to Construction	Understanding potential for contaminated land	Section 15 of the Cable route corridor at Sandyknapps	Investigation of ground where there appears to be a restored sand pit. Testing for metals, pH, petroleum hydrocarbons, polyaromatic hydrocarbons and organic matter content.	Yes	-	This will be secured via Planning Condition
Prior to Construction	Understanding potential for contaminated land	Section 6/7 of the Cable route corridor at the former railway line	Very localised investigation on the former railway line. Testing for metals and pH.	Yes	-	This will be secured via Planning Condition
Prior to Construction	Understanding potential for contaminated land	Section 5 of Cable route at Moss at Clockhill	Localised investigation, primarily for petroleum hydrocarbons and polyaromatic hydrocarbons.	Yes	-	This will be secured via Planning Condition
During or at an early stage of construction	Understanding potential for contaminated land	Section 19 of Cable route corridor at Stonemills	Hand-picking removal of Asbestos Containing Material (ACM) and appropriate disposal by licenced contractor	Yes	-	This will be secured via Planning Condition
During or at an early stage of construction	Understanding potential for contaminated land	Section 19 of the Cable route corridor at Bridge of Rora	Increased monitoring for hazardous gases in excavations above routine monitoring.	Yes	-	This will be secured via Planning Condition
During or at an early stage of construction	Understanding potential for contaminated land	Section 15 of the Cable route corridor at the sand pit at Gordon Sawmills	Increased monitoring for hazardous gases in excavations above routine monitoring.	Yes	-	This will be secured via Planning Condition

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
During or at an early stage of construction	Understanding potential for contaminated land	Section 1 of the Cable route corridor at the former rifle range	Increased awareness of the possibility of "lost" small arms ammunition which could be found. Procedure to address this if it occurs.	Yes	-	This will be secured via Planning Condition
During or at an early stage of construction	Understanding potential for contaminated land	Proposed Substation compound	Locate and make safe the well on the site shown on current OS maps.	Yes	-	This will be secured via Planning Condition
Chapter 9 - Noise						
During Construction	To minimise impact of construction noise to noise sensitive receptors (NSR)	Throughout the Cable Route Corridor	The contractor will employ best practicable means to reduce noise impacts via maintaining equipment and limiting activities to daytime hours where possible.	Yes	-	It is expected that this will be secured through planning conditions
During Construction	To minimise impact of construction noise	Throughout the Cable Route Corridor	The working width employs earth bunds at each extent with a height of approximately 6m. These bunds have not been accounted for in the construction noise assessment but may reduce the impact of some activities that occur close to ground level between the bunds e.g. trenching activities. Where the bunds are not effective, straw bale barriers can be deployed close to louder plant to reduce NSR levels. HERAS mounted noise barriers may also be effective in some locations.	Yes	-	This will be secured through the CEMP
During Construction	To minimise impact of construction noise to receptors (NSR)	Throughout the Cable Route Corridor	The Outline CEMP includes a 'Noise Management Plan' which will include: ▪ Undertake a noise and vibration assessment ▪ Implement construction schedule and working hours to minimise disruption to surrounding area ▪ Undertake regular equipment maintenance ▪ Communication with stakeholders and	Yes	-	This will be secured through the CEMP

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
			▪ Undertake monitoring to assess the effectiveness of noise and vibration measures			
During Operation	To minimise operational noise to receptors (NSR)	Proposed Substation	If the Proposed Substation design specification is amended at a later stage, mitigation may be required. To achieve operational noise compliance, positioning of equipment and positioning of barriers close to external plant equipment (SGT1 and SGT2, Shunt Reactors and Cooling Equipment) may be considered.	-	Yes	It expected that this will be secured through planning conditions
Chapter 10 - Landscape and Visual						
During Construction	To effectively reinstate soils	Throughout the Cable Route Corridor	The topsoil will be pulled back from the fence line using excavators to allow dozers to push it evenly back across the easement and leaving it generally level. During the reinstatement, hedge mounds will be replaced using an excavator and the topsoil will be given a final trim to leave it ready for reseeding by the landowner.	Yes	-	This will be secured through the CEMP
During Construction	To reinstate grass landcover quicker and more effectively	Throughout the Cable Route Corridor	Original turves from rough grassland will be saved and stored to help reinstatement work more effectively. Turves will be stored the right way up and kept separate from the topsoil and subsoil piles.		Yes	This will be secured by the ECoW and the CEMP
During operation	To screen visual effects of the Proposed Substation	Proposed Substation	Planting is suggested along the western, eastern and southern edges of the Proposed Substation. Once vegetation reaches maturity, it will provide screening to these views. While it will not completely remove the visibility of the Substation, it will reduce it to a non-significant level.	-	Yes	It is expected that this will be secured by planning conditions and overseen by the ECoW
Chapter 11 - Cultural Heritage and Archaeology						

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
During Construction	To protect unknown archaeological remains	HER10 – Nethermuir House HER14 - Mill Complex and Farmstead DS11 – Building DS12 -	For those features that are within the area of groundbreaking and construction activity a programme of archaeological works would be implemented to the satisfaction of the Council's archaeologist	Yes	-	It is expected that this will be secured by planning condition and an Archaeological Clerk (ACoW) of works if required.
During Construction	To protect unknown archaeological remains	CAN04 - Lunderton CAN11 - Woodside CAN15 - Skipleton HER01 – Ugie Canal HER12 – Mitchellhill Cottage HER14 – Mill Complex and Farmstead WS01 – Cut Earth Over Field Drain WS02	It is possible that remains may survive in close proximity to known features or that subsurface remains associated with the features may survive within the Application Site Boundary and an archaeological watching brief may be appropriate for some features where groundbreaking works are required within approximately 10m of known features and this would inform further understanding of the features. It is possible that unknown archaeology may exist in the Application Site Boundary. Given the identified physical impacts and potential for unknown remains to survive in the Application Site Boundary, a programme of works may be required to be undertaken. This programme of archaeological works would be implemented to the satisfaction of Aberdeenshire Council's Archaeologist and an Archaeological Clerk of Works may be used if appropriate.	Yes	-	It is expected that this will be secured by planning conditions
During Operation	To avoid third-party inter-visibility	LB07 – Millbrex Church	Mitigation planting on the western side of the substation may be appropriate. This planting would be appropriate for the vegetation in the surrounding area.	-	Yes	It is expected that this will be secured by planning conditions and overseen by the ECoW
Chapter 12 - Socio-economics, Tourism and Recreation						
During Construction	Minimise impacts on fishing locations	River Ugie of Port Sunken, Grilse	The use of trenchless methodologies to reduce plant and installation time.	Yes	-	This will be secured through the CEMP

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
		Pool and Whin Pool				
During Construction	Minimise impacts on Core Path	Throughout Cable Route Corridor near core paths	The use of trenchless methodologies to reduce plant and installation time will be key mitigation for the core paths. The implementation of these measures will be within the Core Path Management Plan and Construction Traffic Management plan (CTMP) that will be developed and agreed prior to construction.	Yes	-	This will be secured through the Core Path Management Plan and the CTMP
Chapter 13 - Traffic and Transport						
During Construction	Reduce any transport and access issues on the road network	Throughout Study Area.	A Construction Traffic Management Plan (CTMP) is proposed to help reduce the negligible traffic impact of the construction phase on the Study Area. This is not required under the assessment but is proposed to further reduce any transport and access issues on the road network.	Yes	-	This will be secured by the CTMP
During Construction	Reduce any transport and access issues on the road network	Throughout Study Area.	An Abnormal Load Transport Management Plan will be prepared upon confirmation of the Abnormal Indivisible Load sizes. This will cater for all movements to and from the Proposed Development.	Yes	-	This will be secured by the Abnormal Load Transport Management Plan
During Construction	Maintaining Road Condition	Throughout Study Area.	Video footage of the pre-construction phase condition of the construction vehicles route will be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline would inform any change in the road condition during the construction stage of the Proposed Development. Any necessary repairs would be coordinated with the Roads Authority. Any damage caused by traffic associated with the Proposed Development, during the construction period that would be hazardous to public traffic, would be repaired immediately.	Yes	-	It is expected that this will be secured by planning conditions

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
During Construction	Ensuring safe site access	Throughout Study Area.	All access junctions would be designed and constructed in accordance with Transport Scotland and Aberdeenshire Council design standards. An indicative layout of the access junctions along the local road network and the access junction along the trunk road are presented in **Appendix 13.1.**	Yes	-	It is expected that this will be secured by planning conditions
During Construction	Keeping the Public Informed of any disruption to traffic and transport	Throughout Study Area	The Applicant would ensure information was distributed through its communication team via the project website, local newsletters and social media.	Yes	-	A project stakeholder engagement plan will be compiled and implemented
During Construction	Protecting local road and path users	Throughout Study Area	The Principal Contractor would ensure that speed limits are always adhered to by their drivers and associated subcontractors. Signage would be installed on the Site exits that make drivers aware of local speed limits and remind drivers of the potential presence of pedestrians and cyclists in the area. While no scoping response has been received from The British Horse Society, measures implemented on similar schemes will be given consideration as part of the Proposed Development.	Yes	-	This will be secured by the Path Management Plan
During Construction	Supporting sustainable travel for staff	Throughout Study Area	A Staff Travel Plan will be deployed where necessary, to manage the arrival and departure profile of staff and to encourage sustainable modes of transport, especially car-sharing	Yes	-	This will be secured by the Staff Travel Plan and site induction
During Operation	Ensuring safe access to the substation compound	Proposed Substation	The permanent Site access junction to the Proposed Substation will be well-maintained and monitored during the operational life of the development. Regular maintenance will be undertaken to keep the access junction drainage systems fully operational and to ensure there are no run-off issues onto the public road network.	-	Yes	It is expected that this will be secured by planning condition
Chapter 14 - Air Quality						

Phase	Reason	Project Area/ Infrastructure	Proposed Commitment Measure	Embedded Mitigation	Additional Mitigation	How is this Commitment Secured
All Phases	Mitigate dust emissions	Multiple areas throughout the Proposed Development	Develop and implement a Dust Management Plan (DMP). This should include as a minimum the highly recommended measures in this document that may include measures to control other emissions – approved by the Local Authority. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of: dust deposition; dust flux; real-time PM_{10} continuous monitoring; and/or visual inspections.	Yes	Yes	This will be secured through the CEMP – Dust Management Plan
Chapter 15 - Agricultural Land						
Construction	Minimising impact to agricultural land and soil	Multiple areas throughout the Proposed Development	The affected topsoil and sub-soil will be treated and stored appropriately as not to cause damage and indirectly affect the soil quality. Care will be taken where possible throughout construction, and upon completion, any disturbed land will be reinstated as soon as possible. As previously stated, the majority of the construction phase is temporary, so any prime and non-prime agricultural land will only be impacted for the duration of the construction phase.	Yes	-	This will be secured through the CEMP.
Chapter 16 - Greenhouse Gas Assessment						
All Phases	Contribute to reducing global greenhouse gas emissions	Offshore Project	Renewable energy produced by the Offshore Project contributes to an overall saving of GHG emissions across the lifecycle of the Project as a whole (the Proposed Development and the Offshore Project). Renewable energy produced by the Offshore Project contributes to an overall saving of GHG emissions across the lifecycle of the Project as a whole (the Proposed Development and the Offshore Project)	Yes	-	Implementation of the Green Volt Offshore Windfarm Project as a whole

GREEN VOLT

Flotation Energy Plc | 12 Alva Street | Edinburgh EH2 4QG | Scotland

Tel: +44 7712 864013 | enquiries@flotationenergy.com | www.flotationenergy.com