Offshore Wind Power Limited

West of Orkney Windfarm Onshore EIA Report

Volume 1, Chapter 17 - Landscape and Visual

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West of Orkney Windfarm

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17 LANDSCAPE AND VISUAL

Chapter summary

This chapter of the Onshore Environmental Impact Assessment (EIA) Report assesses the potential effects from the onshore Project on landscape and visual receptors. This includes direct, indirect, whole-project assessment, cumulative, inter-related effects, inter-relationships and transboundary effects. The study area for the onshore LVIA was defined as 5 km from the onshore substation search area and 3 km from the onshore export cable area.

The desk-based study and site visits found that there are no designated landscapes within the study area. The baseline identified one NatureScot Landscape Character Type and three Scottish Natural Heritage (now NatureScot) Local Landscape Character Types likely to be affected by the onshore Project. Sensitive visual receptors likely to be affected by the onshore Project include residents within settlements, hamlets and scattered properties within the study area; recreational and tourist receptors using core paths, promoted trails and promoted tourism routes; and users of transport routes including road and rail.

The following impacts were identified as requiring assessment:

- Construction and decommissioning:
  - Landscape effects of the export cable landfall and onshore export cables on landscape character area;
  - Landscape effects of the onshore substation on landscape character areas;
  - Visual amenity effects of the export cable landfall and onshore export cables on visual receptors; and
  - Visual amenity effects of onshore substation on visual receptors.
- Operation and maintenance:
  - Landscape effects of the onshore substation on landscape character areas; and
  - Visual amenity effects of onshore substation on visual receptors.

The assessment has taken account of embedded mitigation measures for the assessment of potential effects. This includes landscape mitigation design principles for the onshore substation, which include the use of landscape bunds and planting to screen the onshore substation.

No significant landscape effects as a result of the onshore Project are likely to occur, either for the onshore Project or cumulatively with any other developments.

Significant visual effects of the onshore Project are anticipated for high sensitivity receptors in the immediate vicinity of the onshore substation due to the scale of infrastructure being introduced in the existing agricultural fields. Residential properties along the A9 (Trunk road (T)) to the immediate east of the onshore substation and residents along the road to Halkirk (C1014), between the A9(T) and Bridge Street are likely to experience a high-medium to medium magnitude of change, resulting in a major-moderate to moderate level of effect during the construction stage and at Year 1 of the operational stage, which is considered significant. At Year 15, once the proposed planting has established and matured, this is likely to reduce to a moderate to moderate-minor level of residual effect, which is still considered to be significant. The significant residual effect would persist due to the extent of change to the view, however the onshore substation itself would not be visible from the residential properties, being fully screened by the proposed bunds and planting.

Residents at Harpsdale with views of the onshore substation are likely to experience a medium magnitude of change, resulting in a moderate level of effect during the construction stage and at Year 1 of the operational stage, which is considered significant. At Year 15, this is likely to reduce to a moderate-minor level of residual effect, which is not significant.

Chapter summary continued

Residents at Crosskirk, Forss, Halkirk, Harpsdale and scattered properties within the onshore export cable study area are likely to experience temporary level of effects as a result of the construction of the offshore export cable landfall and onshore export cable corridor. Moderate-minor to major-moderate level of effects, which are considered significant, are anticipated during the construction stage for residents that are affected.

Users of a short section of North Coast (NC) 500 and National Cycle Route 1 are likely to experience a temporary moderate-minor to moderate level of effect during construction of the onshore export cable corridor, which is considered significant. The visual effects are partially contained by valley landform associated with the Forss Water and would be temporary, limited to the duration of construction in the vicinity of the A836.

Users of the core path at Crosskirk are likely to experience a temporary moderate-minor to moderate level of effect during construction, which is considered significant, based on the assumption that landfall would occur at Crosskirk option, and the proposed access track and onshore export cable corridor would be required in this area. Recommended mitigation measures include the careful siting of compounds and minimising disruption to the core path during construction.

Users of transport routes that run parallel to the onshore export cable corridor may experience significant effects during the construction stage, with moderate-minor level of effect likely to occur on users of the road south of Forss, Bridge Street (Halkirk) (C1018), the B874, B870 and A9(T), and the Network Rail Scotland railway line between Georgemas Junction and Thurso within the onshore export cable study area, where affected.

An assessment of cumulative effects found that the combined effect of the onshore Project and cumulative developments would not result in any significant effects on landscape character or visual amenity.

No inter-related effects have been identified, however there is potential for whole project effects on the coastal area as a result of the onshore and offshore Projects during the construction stage. However, any impact would be short-term, localised and temporary in nature.

Despite the impact assessment predicting significant impacts, Policy 11 (e) of NPF4 states that "*In addition, project design and mitigation will demonstrate how the following impacts are addressed: 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.*"

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17.1 Introduction

This chapter of the Onshore Environmental Impact Assessment (EIA) Report presents the landscape and visual receptors, of relevance to the onshore Project and assesses the potential impacts from the construction, operation and maintenance and decommissioning of the onshore Project on these receptors. The Landscape and Visual Impact Assessment (LVIA) specifically:

- Provides an overview of the existing landscape and visual baseline environment in which the proposed onshore Project will be set, including defining the study area;
- Identifies the landscape and visual receptors likely to be affected by the onshore Project and their sensitivity to the type of development proposed;
- Describes the key landscape and visual related aspects of the onshore Project and the nature of the anticipated change on the landscape and visual environments based on the worst case scenario for each impact;
- Assesses the magnitude and significance of the changes for the construction, operational and decommissioning stages; and
- Potential cumulative, inter-related and transboundary effects are also considered.

The assessment and fieldwork detailed in this chapter have been undertaken by chartered landscape architects at Williams Sale Partnership (WSP) in the United Kingdom (UK). The assessment has been undertaken with specific reference to the relevant legislation and guidance and draws on the established Guidelines for Landscape and Visual Impact Assessment, Third Edition (Landscape Institute and Institute of Environmental Management and Assessment (IEMA), 2013) and other best practice guidance (see section 17.2).

Table 17-1 below provides a list of all the supporting studies which relate to and should be read in conjunction with this chapter. All supporting studies are appended to this Onshore EIA Report and issued on the accompanying Universal Serial Bus (USB).

Table 17-1 Supporting studies

DETAILS OF STUDY	LOCATIONS OF SUPPORTING STUDY
Viewpoint assessment	Onshore EIA Report, Supporting Study (SS) 16: LVIA viewpoint assessment.
LVIA baseline figures: LVIA Site Location Plan; Zone of Theoretical Visibility (ZTV) and Visual Receptors: Landscape Character Types (LCT) - Substation; LCT - Onshore Project Area; Landscape Designations - Substation; Landscape Designations - Onshore Project Area	Onshore EIA Report, SS17: LVIA figure pack.
LVIA Viewpoints Visualisations including baseline photographs, wirelines and photomontages in accordance with NatureScot and The Highland Council (THC) standards: LVIA: Figures 17.VP1 - 17.VP6)	Onshore EIA Report, SS18: LVIA visualisation pack.

DETAILS OF STUDY	LOCATIONS OF SUPPORTING STUDY
Terrestrial archaeology onshore setting supporting visualisations (Viewpoints Visualisations including baseline photographs, wirelines and photomontages in accordance with NatureScot and The Highland Council (THC) standards: LVIA: Figures 17.VP7 - 17.VP8)	Onshore EIA Report, SS19: Terrestrial archaeology onshore setting supporting visualisations.

The impact assessment presented herein draws upon information presented within other impact assessments within this Onshore EIA Report. Equally, the LVIA also informs other impact assessments. This interaction between the impacts assessed within different topic-specific chapters on a receptor is defined as an 'inter-relationship'. The chapters and impacts related to the assessment of potential effects on landscape and visual receptors are provided in Table 17-2.

Table 17-2 LVIA inter-relationships

CHAPTER	IMPACT	DESCRIPTION
Terrestrial non-avian ecology (chapter 10, Onshore EIA Report)	Loss of agricultural fields and creation of new habitats.	The proposed landscape mitigation would replace agricultural fields with woodland, shrub and wildflower grassland habitats although there would be a loss of agricultural fields with the creation of a large area of hardstanding.
Land-use and other users, including forestry (chapter 12, Onshore EIA Report)	Loss of agricultural fields.	The creation of a large area of hardstanding will result in the loss of agricultural fields, with the remaining onshore substation area to be changed to landscaped areas comprising bunds, woodland, shrub and wildflower grassland.
Terrestrial archaeology and cultural heritage (chapter 13, Onshore EIA Report)	Impact on setting of Scheduled Monuments and Listed Buildings.	Views of the onshore substation from Scheduled Monuments and Listed Buildings could affect the setting of these heritage features.
Seascape Landscape and Visual Impact Assessment (SLVIA) (chapter 18, Offshore EIA Report)	Impact of the offshore and onshore Projects within the coastal zone.	The combination of the construction works for the offshore and onshore Projects may result in increased temporary effects on landscape and visual receptors within the coastal zone.

The following specialists have contributed to the assessment:

- WSP: stakeholder consultations, field surveys, baseline description, photography, mitigation recommendations, visualisations and LVIA chapter write-up.

17.2 Legislation, policy and guidance

Over and above the legislation presented in chapter 3: Planning policy and legislative context, the following legislation, policy and guidance are relevant to the assessment of impacts from the onshore Project on landscape and visual receptors:

- Legislation:
  - European Landscape Convention (ELC) (introduced in the UK in March 2007): at the highest level, the ELC seeks to 'promote landscape protection, management and planning, and to organise European co-operation on landscape issues' (Ch. 1 Art. 3) and encompasses 'the entire territory of the Parties and covers natural, rural, urban and peri-urban areas. It includes land, inland water and marine areas. It concerns landscapes that might be considered outstanding as well as every day or degraded landscapes' (Ch. 1 Art. 1), and therefore considers that all landscapes are important, not just the outstanding but also the everyday landscapes where most people live, work and spend much of their time. The Scottish Government is committed to implementing the principles of the ELC, which applies an 'all landscapes approach'.
- Policy:
  - National Planning Framework 4 (NPF4) (February 2023): sets out the long-term spatial strategy for Scotland. One of six national developments supporting the delivery of sustainable places includes 'strategic renewable electricity generation and transmission infrastructure', which supports electricity generation and associated grid infrastructure. The policies of relevance to LVIA include:
    - Policy 3: Biodiversity requires that biodiversity is enhanced and better connected including through strengthened nature networks and nature-based solutions;
    - Policy 4: Natural Places seeks to protect and enhance natural heritage;
    - Policy 6: Forestry, woodland and trees seeks to protect and expand forests, woodland and trees;
    - Policy 7: Historic assets and places seeks to protect and enhance historic environment assets and places, and to enable positive change;
    - Policy 10: Coastal Development requires that coastal areas develop sustainably and adapt to climate change; and
    - Policy 11: Energy supports all forms of renewable energy development and the expansion of low-carbon and zero emissions technologies, and sets out criteria for related development proposals, including that Project design and mitigation demonstrate how significant landscape and visual impacts are addressed. Policy 11 e) i. requires that Project design and mitigation demonstrate how 'impacts on communities and individual dwellings, including… visual impact' are addressed. Policy 11 e) ii. acknowledges that 'significant landscape and visual impacts… are to be expected for some forms of renewable energy', and states that '…where impacts are localised and/or appropriate design mitigation has been applied, they will generally be acceptable'.
  - Highland-wide Local Development Plan (HwLDP) (THC, 2012) sets out the vision and spatial strategy for Caithness and Sutherland, within which the onshore study area is located. It includes the potential for offshore renewable energy developments in the context of the following policies:

- Policy 28: Sustainable Design sets out the criteria against which they will be assessed, including that they 'demonstrate sensitive siting' and 'conserve and enhance the character of the Highland area';
- Policy 30: Physical Constraints identifies area of constraints which developments must demonstrate compatibility with or provide appropriate mitigation measures. With respect to the onshore Project, constraints of relevance include water bodies within 15 metre (m), flood risk areas, and woodland within 20 m;
- Policy 36: Development in the Wider Countryside sets out the criteria against which development proposals are assessed where they lie outwith settlements. These include that they are 'acceptable in terms of siting and design' and 'are compatible with landscape character and capacity'. Renewable energy development proposals are assessed against the renewable energy policies, and the non-statutory Highland Renewable Energy Strategy;
- Policy 49: Coastal Development states that 'proposals should not have an unacceptable impact on the natural, built or cultural heritage and amenity value of the area'. Essential infrastructure, which cannot be located elsewhere, may be acceptable, subject to mitigation as appropriate. Policy 49 states that potential landscape impact and effect on the setting of coastal communities are important factors to be considered;
- Policy 51: Trees and Development promotes the protection of existing hedges, trees and woodland on and around development sites;
- Policy 57: Natural, Built and Cultural Heritage requires that developments do not have an unacceptable impact on the natural environment, amenity and heritage resource, taking into account their level of importance;
- Policy 61: Landscape states that: 'New developments should be designed to reflect the landscape characteristics and special qualities identified in the Landscape Character Assessment of the area in which they are proposed. This will include consideration of the appropriate scale, form, pattern and construction materials, as well as the potential cumulative effect of developments where this may be an issue. The Council would wish to encourage those undertaking development to include measures to enhance the landscape characteristics of the area. This will apply particularly where the condition of the landscape characteristics has deteriorated to such an extent that there has been a loss of landscape quality or distinctive sense of place. In the assessment of new developments, the Council will take account of Landscape Character Assessments, Landscape Capacity Studies and its supplementary guidance on Siting and Design and Sustainable Design, together with any other relevant design guidance'. Note: The principles and justification underpinning the Council's approach to sustainable developments are contained in the supplementary guidance: "Sustainable Design". The key principles underlying this guidance are set out in Policy 28: Sustainable Design';
- Policy 77: Public Access requires that proposals that affect a route included in a Core Paths Plan or access points to water either retain the existing path or water access point or ensure suitable alternative access provision and requires the preparation of an Access Plan for Major Developments; and
- With respect to renewable energy development, the Highland-wide LDP acknowledges that 'additional electricity transmission and distribution infrastructure will need to be developed in Highland in order to realise the region's potential contribution to renewable electricity generation'. Policy 69: Electricity Transmission Infrastructure states that proposals for electricity transmission infrastructure will be considered having regard to their level of strategic significance, and proposals '*which are assessed as not having an unacceptable significant impact on the environment, including natural, built and cultural heritage features*' will be supported.

– The Caithness and Sutherland LDP (CaSPlan) (THC, 2018) joins the HwLDP as part of the Development Plan. The following CaSPlan policies are of relevance to the onshore Project:

    - CaSPlan includes supporting and enabling the High Voltage Energy Transmission Network as a main spatial element focussing on 'Employment';
    - With respect to the main spatial element focussing on 'Environment and Heritage', CaSPlan seeks to protect and enhance the unique natural environment. Paragraph 72 states that 'the natural and historic environment is rich, containing: internationally and nationally recognised sites, species and habitats; locally valued sites and landscapes; dramatic landforms, and a diverse cultural heritage'. The LDP refers to the HwLDP for policies that provide safeguards for these features; and
    - The onshore Project area falls within the 'East Coast Connectivity and Tourism Corridor' and 'Area for Energy Business Expansion' identified on the Strategy Map.
  - The Onshore Wind Energy Supplementary Guidance (OWESG) (THC, 2017) joins HwLDP as part of the Development Plan. Given the onshore Project relates to an offshore windfarm, the OWESG predominantly applies to the undergrounding of power lines connecting the West of Orkney Windfarm to the onshore substation and the construction of access tracks; however, consideration was given to the following Criterion as they applied to the onshore Project as a whole:
    - OWESG paragraph 4.14 requires that appropriate mitigation should be put in place, including with respect to the 'length, route, visibility and methods and materials used in the construction of access tracks';
    - Criterion 2: Key Gateway locations and routes are respected with consideration to the extent to which the proposal 'reduces or detracts from the transitional experience of key Gateway Locations and routes' with respect to wind turbines or other infrastructure;
    - Criterion 3: Valued natural and cultural landmarks are respected with consideration and assessment of the extent to which the proposal affects the fabric and setting of valued natural and cultural landmarks;
    - Criterion 4: The amenity of key recreational routes and ways is respected, including Core Paths and National Cycle Routes;
    - Criterion 5: The amenity of transport routes is respected and that wind turbines or other infrastructure 'do not overwhelm or otherwise significantly detract from the visual appeal of transport routes'; and
    - Criterion 8: The perception of landscape scale and distance is respected with consideration of and assessment of the 'extent to which the proposal maintains or affects receptors' existing perception of landscape scale and distance'.
- Guidance – the LVIA takes cognisance of the following best practice guidance documents:
  - Landscape:
    - Scotland's Landscape Character Assessment (NatureScot, 2019);
    - Landscape Sensitivity Assessment Guidance (NatureScot, 2022a); and
    - Landscape Character Assessment – Guidance for Scotland – Consultation Draft (NatureScot, 2022b).
  - Visualisations:
    - Visualisation Standards for Wind Energy Developments (THC, 2016);
    - Visual Representation of Wind Farms Version 2.2 (Scottish Natural Heritage (SNH), 2017);
    - Visual Representation of Development Proposals, Technical Information Note 06/19 (Landscape Institute (LI), 2019a); and
    - Visual Representation of Development Proposals: Earth Curvature, Technical Information Note 09/19 (LI, 2019b).

17.3 Scoping and consultation

Stakeholder consultation has been ongoing throughout the EIA and has played an important part in ensuring the scope of the baseline characterisation and impact assessment are appropriate with respect to the Project and the requirements of the regulators and their advisors.

The Scoping Report was submitted to Scottish Ministers (via Marine Scotland - Licensing Operations Team (MS-LOT[1])) and THC on 1st March 2022, who then circulated the report to relevant consultees[2]. A Scoping Opinion was received from THC on 9th May 2022. Relevant comments from the Scoping Opinion specific to LVIA are provided in Table 17-4, which provides a response on how these comments have been addressed within the Onshore EIA Report. The Scoping Opinion supersedes any pre-application advice provided by THC which was received on the 10th February 2021.

Further consultation has been undertaken throughout the pre-application stage. Table 17-3 summarises the consultation activities carried out relevant to landscape and visual.

Table 17-3 Consultation activities for landscape and visual

CONSULTEE AND TYPE OF CONSULTATION	DATE	SUMMARY
NatureScot, THC and OIC - meeting	14th June 2022	Present and discuss both the LVIA approach (including SLVIA) including study areas, visualisations, viewpoint locations, cumulative sites and assessment and timescales.
NatureScot, THC and OIC - meeting	14th September 2022	The primary focus of this meeting was to discuss the SLVIA field survey, including updated viewpoints list, however the key issues related to LVIA was touched on and a discussion was had around cumulative effects.
NatureScot – e-mail	16th March 2023	Liaison regarding the potential need for a viewpoint from Spittal Hill and agreement that the view could be excluded based on our professional judgement. The viewpoint was assessed in the field and was omitted from the onshore LVIA as views of the onshore Project are obscured by intervening landform.

[1] *MS-LOT have since been renamed Marine Directorate - Licensing Operations Team (MD-LOT).*

[2] *The Scoping Report was also submitted to Orkney Islands Council (OIC), as the scoping exercise included consideration of power export to the Flotta Hydrogen Hub, however, this scope is not covered in this Onshore EIA Report and will be subject to a separate Planning Application to OIC.*

CONSULTEE AND TYPE OF CONSULTATION	DATE	SUMMARY
THC case officers and landscape officer - meeting	17th May and 29th May 2023	The final list of viewpoints were presented and agreed, including an additional viewpoint from the road to Halkirk and two heritage views The mitigation strategy was presented and illustrated by draft visualisations for discussion. Concern was raised that the proposed landscape bunds are very large and that the proposed planting strategy emphasised the scale of the bunds. A softer approach was recommended to achieve a better landscape fit. Advice was provided from THC landscape officer that the onshore LVIA should include a description of how the design has evolved in response to the mitigation recommendations and include sections to illustrate the relationship between the proposed landscape bunds and the wider landscape setting and visual receptors. In addition, more detail was requested regarding the sequence of operations for construction of the onshore Project. It was discussed that the building elements of the onshore substation should be shown with a proposed recessive colour, such as brown or dark grey.

Table 17-4 Summary of Scoping Opinion consultation responses specific to landscape and visual

CONSULTEE	COMMENT	RESPONSE
Scottish Ministers (via MS-LOT) – on behalf of NatureScot	In Table 2-71 of the Scoping Report the Developer summarises the potential impacts on seascape, landscape and visual receptors to be scoped in or out of the EIA Report for each phase of the Proposed Development. The Scottish Ministers, in agreement with the representation from NatureScot and THC, advise that the effects on Wild Land Area's and NSAs must be scoped in for all phases of the Proposed Development. In line with the OIC representation, the impacts on the setting of historical environmental assets, and in particular The Heart of Neolithic Orkney World Heritage Site and coastal scheduled monuments, must be scoped into the assessment, and be clearly linked with the Marine Archaeology and Cultural Heritage chapter of the EIA Report. As highlighted in the NatureScot and THC representations, the Scottish Ministers advise that construction and decommissioning effects from the Proposed Development on the landscape and visual receptors, must be scoped into the EIA Report. Impacts from OSP and any temporary accommodation must be scoped in to the EIA Report as detailed in the THC representation. Additionally, in line with the representation from the THC, the Scottish Ministers advise that the Landscape and Visual Impact Assessment included within the EIA Report must include the impact on tourist and recreational routes including core paths including the national cycle network and long distance trails. A route assessment should also be included to consider the impact on road users as detailed in the THC representation.	This was the response received for the offshore scoping application. However, this is also relevant to the onshore application. There are no National Scenic Areas, or Wild Land Areas within the onshore study area. Assessment on OIC related comments and offshore infrastructure are not applicable for this Onshore EIA Report and are captured within chapter 18: Seascape, landscape and visual of the Offshore EIA Report. Potential construction, operations and maintenance and decommissioning impacts have been scoped into this assessment following THCs advice. The assessment has also considered impact on the tourist and recreational routes including core paths including the national cycle network and long-distance trails within section 17.6.1.2 and 17.6.2.2. Transport routes have been considered within section 17.6.1.2.3 and 17.6.2.2.3.

CONSULTEE	COMMENT	RESPONSE
THC	The Environmental Impact Assessment Report should recognise the existing land uses affected by the development having particular regard for THC's Development Plan inclusive of all statutorily adopted Supplementary Guidance (SG). Particular attention should be paid to the provisions of the Onshore Wind Energy SG (OWESG) inclusive of any Landscape Sensitivity Appraisal. This is not instead of but in addition to the expectation of receiving a Planning Statement in support of the application itself which, in addition to exploring compliance with the Development Plan, should look at Scottish Planning Policy and Planning Advice Notes which identify the issues that should be taken into account when considering significant development. The purpose of this chapter is to highlight relevant policies not to assess the compatibility of the proposal with policy.	This chapter recognises the existing land uses that could be potentially affected by the onshore Project and has taken into account THC's Development Plan. A summary of policies and guidance of relevance to the onshore LVIA have been included in this chapter. This includes OWESG and Planning Advice Notes, it does not include Scottish Planning Policy as this has now been superseded by NPF4. A separate Onshore Planning Statement has been submitted alongside the Planning Permission in Principle (PPP) Application, which sets out detailed assessment of the planning policy considered as part of this Project.
THC	The EIA / application Planning Statement should recognise the Spatial Framework component of the related Onshore Wind Energy Supplementary Guidance. Similarly, it should note progress with NPF4 and the Council's response to it. The Council responded to the draft NPF4 in 2022. The Applicant should respond to this through the Planning Statement or respond to any updated NPF4 position as it relates to the application depending on the timescale for submission of the application. Similarly, the Caithness and Sutherland Local Development Plan forms part of the approved development plan. This sets confirms the boundaries of the Special Landscape Areas and identifies settlements in the area. Other statutorily adopted supplementary guidance, as set out on the Council website, will also require to be considered.	The Onshore Wind Energy Supplementary Guidance has been considered with respect to the undergrounding of power lines connecting the West of Orkney Windfarm to the onshore substation and the construction of access tracks. Policies and guidance of relevance to the onshore LVIA have been included in this chapter, including NPF4 and the HwLDP and CaSPlan, as described in section 17.2, and there are no Special Landscape Areas within the onshore study areas. A separate Onshore Planning Statement has been submitted alongside the PPP Application, which sets out detailed assessment of the planning policy considered as part of this Project.

CONSULTEE	COMMENT	RESPONSE
THC	The EIA Report must consider the landscape and visual impact of the development which require separate assessment.	Landscape character and visual amenity effects are clearly distinguished and discussed separately in this assessment (see section 17.6).
THC	The Council expects the EIAR to consider the landscape and visual impact of the development. The Council makes a distinction between the two. While not mutually exclusive, these elements require separate assessment and therefore presentation of visual material in different ways. It is the Council's position that it is not possible to use panoramic images for the purposes of visual impact assessment. The Council, while not precluding the use of panoramic images, require single frame images with different focal lengths taken with a 35mm format full frame sensor camera – not an 'equivalent.' The focal lengths required are 50mm and 75mm. The former gives an indication of field of view and the latter best represents the scale and distance in the landscape i.e. a more realistic impression of what we see from the viewpoint. These images should form part of the EIAR and not be separate from it. Photomontages should follow the Council's Visualisation Standards: https://www.highland.gov.uk/downloads/file/12880/visualisation_standards_for_wind_energy_developments The following are minimum requirements for the printed copies: • For hard copies - Visuals should be presented in their own bound version of the document. • The first image should clearly set out the location of the viewpoint and directions on how to get there (as per figure 2 of the Standards). • The second page should include a photomontage presented at A3 with a 50mm field of view for landscape assessment (as per figure 6 of the Standards).	Photography has been carried out with a 50 millimetre (mm) format full frame sensor camera and in accordance with THCs Visualisation Standards. It was agreed with THC to provide single frame photomontages in addition to visualisations to NatureScot standards. The requirements for printed copies are noted and have been met. THC requirements for visualisations have been discussed and agreed on 17th May 2023, taking into account NatureScot's requirements as well and THC's request that panoramic views be included due to the size of the onshore substation and associated bunds. The visualisation package for each viewpoint follows the below: • Page a – viewpoint location plans (NatureScot guidance); • Page b – 90-degree existing view and wireline (NatureScot guidance); • Page c – 53.5-degree wireline (NatureScot guidance); • Page d– 53.5-degree photomontage at Year 1 (NatureScot guidance); • Page e– 53.5-degree photomontage at Year 15 (NatureScot guidance); • Page f – 50mm THC existing viewpoint; • Page g – 50mm THC photomontage Year 1 (THC guidance); • Page h – 50mm THC photomontage Year 15 (THC guidance); • Page i – 75mm THC existing viewpoint; • Page j – 75mm THC photomontage Year 1 (THC guidance); and

CONSULTEE	COMMENT	RESPONSE
	• The third page should include a baseline photograph at 50mm field of view and wirelines at the same scale as per Figure 7 or Figure 8 of the Standards). • The fourth page should include a 50mm image photomontage (as per figure 10 of the Standards). • The fifth page should include a 75mm image photomontage for assessment of visual impacts (as per figure 12 of the Standards). • The document requires to be printed single sided with a high quality laser printer or equivalent on photo quality paper.	• Page k – 75mm THC photomontage Year 15 (THC guidance).
THC	The use of monochrome for specific viewpoints is useful where there are a number of different infrastructure (existing and proposed) in the view. We are happy to provide advice on this matter going forward. All existing and proposed turbines should be rerendered even if they appear to be facing the viewer in the photograph to ensure consistency and to ensure the cumulative assessment can be considered on the worst case scenario.	No requirement for the use of monochrome viewpoints was identified in discussions with THC regarding the production of viewpoint photography and visualisations due to the absence of Wind Turbine Generators (WTGs) in the views. Visualisations and assessment for the offshore Project (including existing turbines) is captured in chapter 18: Seascape, landscape and visual of the Offshore EIA Report.
THC	This assessment should include the expected impact of construction compounds and any temporary access roads, despite the fact that the permanent infrastructure will be of primary concern. All elements of a development are important to consider within any EIAR.	Construction effects are covered in the assessment, including construction compounds and temporary access roads.
THC	A study area of 3km has been proposed for the development. This is accepted for the line if it remains within the current design parameters. However, given the open nature of the landscape and anticipated scale of the substation, it is considered that the study area for this element be extended to 5km. The assessment of landscape and visual impact should be completed in full across the entire study area. For the avoidance of doubt, THC do not consider it to be acceptable to screen out viewpoints for a full assessment based upon distance.	The required study areas have been applied, with a 5 kilometre (km) study area for the onshore substation and a 3 km study area for the onshore export cables. A full assessment with these study areas has been undertaken.

CONSULTEE	COMMENT	RESPONSE
THC	In terms of cumulative impacts, we encourage you to review the wind energy map on our website which will provide an indication of other projects in the area which may require consideration: http://highland.gov.uk/windmap.	Cumulative developments have been included in the assessment as agreed with THC. This has included consideration of the wind energy map on the THC website.
THC	The finalised list of Viewpoints (VP) and wireframes for the assessment of effects of a proposed development must be agreed in advance of preparation of any visuals with THC.	Viewpoint selection has been agreed with THC, Historic Environment Scotland (HES) and NatureScot prior to the preparation of any visuals as described in section 17.4.4.4.
THC	We acknowledge that there will be some micrositing of the viewpoints to avoid intervening screening of vegetation boundary treatments etc. We would recommend that the photographer has in their mind whether the VP is representative or specific and also who the receptors are when they are taking the photos it would be helpful. We have also found that if the photographer has a 3D model on a laptop when they go out on site it helps the orientation of the photography.	The final list of viewpoints and wireframes has been agreed with consultees in May 2023 and was informed by extensive fieldwork and photography, the ZTV and the Project's Three-Dimensional (3D) model. A 3D model has been produced for the Project and has been used to understand the overall impact of the onshore Project.
THC	The detailed location of viewpoints will be informed by site survey, mapping and predicted ZTVs. It would be useful to include a comparative ZTV between the consented scheme and the proposed scheme. The visuals should also show any restoration work and removal of the existing estate track in this location. Failure to do this may result in abortive work, requests for additional visual material and delays in processing applications/consultation responses. Community Council's may request additional viewpoints and it would be recommended that any pre-application discussions with the local community, and associated reporting on consultation undertaken, take this into account.	THC confirmed that references to a consented scheme, restoration work and an estate track relate to a different project and have been included erroneously and therefore no response is required. The final list of viewpoints and wireframes has been agreed with consultees in May 2023 and was informed by extensive fieldwork and photography, the ZTV and the 3D model. Early in the EIA, the Project set up three Community Panels (involving Community Council representation from Sutherland, Caithness and Orkney) to inform our engagement approach and facilitate liaison with local communities. In tandem with the Community Panels, we used each round of consultation to inform the content of subsequent rounds. For example, we learned during the first and second rounds of consultation that local communities were particularly interested to see what the proposed windfarm and onshore infrastructure might

CONSULTEE	COMMENT	RESPONSE
		look like from different locations. Identifying which viewpoints to consider involved an iterative process of consultation with key regulatory, strategic and local stakeholders. The proposed list of viewpoints to be included in the EIA was presented at public consultation events during the third round of consultation in November 2022. Maps showing these locations as well as the 'ZTV' were displayed alongside a selection of photomontages from key viewpoints and feedback was invited from attendees. Given the importance of visual impact to local stakeholders, we also took the decision to bring the 3D computer generated visualisation model to all subsequent formal pre-application consultation events during rounds three, four and five of the consultation. The 3D model allowed visitors to request to view the windfarm from their own chosen viewpoint as well as those viewpoints identified for inclusion in the EIA.
THC	The purpose of the selected and agreed viewpoints shall be clearly identified and stated in the EIAR. For example, it should be clear that the VP has been chosen for landscape assessment, or visual impact assessment, or cumulative assessment, or sequential assessment, or to show a representative view or for assessment of impact on designated sites, communities or individual properties. Wirelines should also be provided at regular intervals along the B851 to demonstrate the sequential impact when travelling along the road.	Eight viewpoints have been included in the LVIA, with visualisations prepared from all of the viewpoints, as agreed with NatureScot and THC (see SS17: LVIA figure pack, SS18: LVIA visualisation pack and SS19: Terrestrial archaeology onshore setting supporting visualisations). All of the viewpoints illustrate the landscape and visual baseline for readers of the LVIA and the chapter states where specific viewpoints are also used to inform the assessment of visual impacts on specific visual receptors; with respect to cumulative assessments; and sequential assessments along routes including the A9(Trunk (T)), A836, B870, B874, C1018 and C1014 as described in section 17.4.4.4. The Scoping Opinion comment relating to the B851 is not applicable for this onshore Project, as it is a road in Inverness, located over 170 km away. Viewpoints 7 and 8 (see SS19: Terrestrial archaeology onshore setting supporting visualisations.) representing views from Scheduled Monuments and have informed the assessment of potential effects on the setting of these heritage assets in chapter 13: Terrestrial archaeology and cultural heritage.

CONSULTEE	COMMENT	RESPONSE
THC	Further the LVIA Chapter of the EIAR should clearly set out the methodology including: • Definitions of each point on the scale of magnitude of change which is used by the Applicant in reaching a conclusion on the magnitude of change; • Definitions of each point on the scale of sensitivity of receptor which is used by the Applicant in reaching a conclusion on the sensitivity of receptor; • The threshold to which the Applicant considers a significant effect is reached. For the avoidance of doubt the Council consider that Moderate impacts can be significant and it is recommended that the EIAR takes this approach as well; and • A clear matrix approach supported by descriptive text setting out how the Applicant reaches their conclusion of effect on landscape character, designated landscapes, visual receptors and residential amenity.	The LVIA provides clear methodology with tables identifying the criteria for determining the scale of magnitude tables for determining the sensitivity of landscape and visual receptors (see section 17.5.3) and the approach to consider significant effect (see section 17.5.3). The LVIA provides a clear methodology based on Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3). In line with THC's approach, the LVIA generally considers moderate effects and greater to be significant as set out in chapter 7: EIA methodology and section 17.5.3, although professional judgement has been applied. Whilst a matrix table has not been included in the LVIA as judgements of significance are not formulaic, a matrix approach to the correlation between sensitivity and magnitude of change underpins the judgements made. Descriptive text sets out how the conclusion of effect on landscape character and visual receptors and residential amenity have been determined. It should be noted that there are no landscape designations within the onshore Project study area). The LVIA has been prepared by a professionally registered landscape architect and reviewed by chartered landscape architects.
THC	When assessing the impact on tourist and recreational routes please ensure that all core paths, the national cycle network, long distance trails are assessed. It should be noted that these routes are used by a range of receptors. Further a route assessment should be included to consider the impact of the substation on users of the road network. This should be focussed on the A9, B870 and the road between Westerdale and Halkirk. This should be supported by wirelines, and viewpoint assessments should be provided from these routes in the main body of the LVIA.	Where scoped in, effects on tourist and recreational routes have been assessed in section 17.6. Viewpoint and Visualisations 1 illustrate a representative view, wireline and photomontage from the road between Westerdale and Halkirk (C1018) Viewpoints and Visualisations 3, 4 and 5 illustrate sequential views, with wirelines and photomontages, from the A9(T). The ZTV and field work demonstrate that landform screens views of the onshore substation from the B870 and this has therefore been scoped out of further assessment.

CONSULTEE	COMMENT	RESPONSE
THC	The development will further extend the number of proposals of this type in the surrounding area, necessitating appropriate cumulative impact. It is considered that cumulative impact will be a significant material consideration in the final determination of any future application.	Cumulative effects have been assessed for LVIA and are presented in section 17.7. The importance of this assessment is noted and agreed.
THC	Given the potential cumulative impact of the proposal it is expected that the Applicant should present images for presentation within the Panoramic Digital Viewer deployed by the Council – see visualisation standards document. To view current or determined schemes in the Council's Panoramic Viewer please see the link below: http://www.highland.gov.uk/panoramicviewer.	Images will be provided for the Panoramic Digital Viewer, as requested, once the Application has been submitted.
THC	We expect an assessment of the proposal against the criterion set out in the Council's OWESG to be included within the LVIA chapter of the EIAR.	Where relevant to the onshore Project, which does not include onshore Wind Turbine Generators (WTGs) but includes an onshore substation and underground cables, the criterion have been considered in the LVIA of the onshore EIA Report. Chapter 13: Terrestrial archaeology and cultural heritage assesses whether "valued natural and cultural landmarks are respected" (Criteria 3). The LVIA assesses the potential effects on users of core paths, National Cycle Route (NCR) and promoted tourism routes and transport routes within the onshore study area (Criteria 4 and 5) and the LVIA assesses the likely effects of the onshore Project on LCTs (Criteria 10). All guidance documents mentioned have been used to inform the assessment. The OWESG and the Caithness Landscape Sensitivity Appraisal have been reviewed and considered in the assessment process.
THC	The EIAR needs to identify all designated sites which may be affected by the development either directly or indirectly. This will require you to identify: • The architectural heritage (Conservation Areas, Listed Buildings); • The archaeological heritage (Scheduled Monuments, Historic Battlefields);	The landscape designations of both the onshore Project and onshore substation is provided in SS17: LVIA figure pack and they demonstrate that there are no National Scenic Areas, Special Landscape Areas, Gardens and Designed Landscapes or Wild Land Areas within the onshore study area. The LVIA mapping indicates the location of cultural heritage assets within the

CONSULTEE	COMMENT	RESPONSE
	• The landscape (including designations such as National Scenic Areas, Special Landscape Areas, Gardens and Designed Landscapes, and general setting of the Development; and • The inter-relationship between the above factors.	onshore study area, including Scheduled Monuments and Listed Buildings as well as core paths, NCRs and promoted tourism routes. The LVIA describes the general landscape and visual baseline of the setting of the onshore Project.
THC	While the Scoping Report and an eventual EIA may include impacts on elements of outdoor access assessed under other headings it is considered that all the impacts on outdoor access should all be brought together here in a comprehensive assessment of the proposals visual and physical impacts on outdoor access during the preparatory, construction, operational and post-operational phases. Those impacts, along with the mitigation measures, will inform an Outdoor or Access Management Plan which should be submitted with an application as per the requirements of Highland wide LDP Policy 77 Outdoor Access. If not, it the Council will ask for a suspensive condition requiring that one be submitted to and approved in writing by the Planning Authority prior to any work starting on site. The gate at the site entrance and any other access gates, must accommodate public access to the side with pass gates and with an internal width of 1.5m on a surfaced pass.	An Access Management Plan will be prepared once the detailed design has been completed and the construction effects on outdoor access as a result of the onshore Project has been determined. The Access Management Plan will be developed post-consent. A Design and Access Statement has been submitted alongside this PPP Application and outlines the known access points and mitigations that will be followed to ensure appropriate access is maintained throughout the construction, operations and maintenance and decommissioning works.
THC	Considering the potential for this proposal to have significant negative visual and physical impacts on many forms of outdoor access across all phases of the development it is recommend a similarly significant range of mitigation measures.	As noted above, the detailed design will establish the mitigation measures to address visual and physical impacts on outdoor access. Landscape mitigation principles to address the negative visual impacts of the onshore substation have been proposed to inform the detailed design of mitigation measures along with a bunding and planting strategy.
THC	We expect an assessment of the proposal against the criterion set out in the Council's OWESG to be included within the LVIA chapter of the EIAR.	This was the response received for the offshore scoping application. However, this is also relevant to the onshore application. All guidance documents mentioned have been used to inform the assessment. The OWESG and the Caithness Landscape Sensitivity Appraisal have been reviewed and considered in the assessment process.

CONSULTEE	COMMENT	RESPONSE
THC	In each of the viewpoints all infrastructure should be shown, both on and offshore, to ensure cumulative matters are assessed.	This was the response received for the offshore scoping application. However, this is also relevant to the onshore application. Offshore infrastructure has been assessed in chapter 18: Seascape, landscape and visual. For the onshore infrastructure all elements for the onshore substation have been included to ensure cumulative matters are assessed.
THC	When assessing the impact on tourist and recreational routes please ensure that all core paths, the national cycle network, long distance trails are assessed. It should be noted that these routes are used by a range of receptors. As outlined above a route assessment should be included to consider the impact of the development on users of the road network. This should be focussed on the A9, A99, B876, A836, A897, A838, and B870. This should be supported by wirelines, and viewpoint assessments should be provided from these routes in the main body of the LVIA.	This was the response received for the offshore scoping application. However, this is also relevant to the onshore application with respect to potential effects on users of core paths, the national cycle network, North Coast 500 (NC500), and from the roads within the study area. All routes which have potential effects upon tourist and recreational routes have been identified and assessed in section 17.4.4.3.3. The A836 and A9, which overlap with the North Coast 500 route and the Sustrans National Cycle Route 1: Inverness to John O' Groats, are considered further as detailed in section 17.4.4.3.3. The B870 and B874 runs generally parallel to the onshore export cable corridor and views may be experienced from road users during construction activities and these transport routes are therefore further considered, as detailed in section 17.4.4.3.3. The C1018 and C1014 roads run south of Halkirk, visibility to construction and ongoing operational and maintenance activities may be experienced. These transport routes are considered further as detailed in section 17.4.4.3.3. The final list of viewpoints has been agreed with THC in May 2023 and these have been used to support the assessment throughout. These viewpoints have been supported by wirelines and a viewpoint assessment as detailed in SS16: LVIA viewpoint assessment and SS18: LVIA visualisation pack.

CONSULTEE	COMMENT	RESPONSE
		Certain transport routes, the A99, A897, A838 and B876, are outwith the LVIA study area and have no visibility of the onshore Project area and are therefore not considered further in the assessment.
THC	We do not consider it appropriate to scope out the construction and decommissioning impacts completely and reference should be made to them in the EIAR. We consider it appropriate to scope in assessment of operational impact on users of recreational routes and core paths within the inland study area as some of these will have visibility of the development.	This was the response received for the offshore scoping application. However, this is also relevant to the onshore application. Potential construction, operations and maintenance and decommissioning impacts have been scoped into this assessment following THCs advice. For further detail on the impacts of recreational routes and core paths, see chapter 12: Land use and other users (including forestry).

17.4 Baseline characterisation

This section outlines the current baseline conditions for the landscape and visual amenity within the onshore study area. The baseline study establishes the scope of the assessment and the key landscape and visual receptors. The desk-based research identifies the existing Landscape Character Assessments (LCAs) within the onshore study area. A ZTV study and wirelines/block models of the onshore Project inform the identification of landscape and visual receptors likely to experience significant landscape and visual effects. Field work was undertaken to verify the desk-based research, identify representative viewpoints and capture photography.

Together the established baseline provides an understanding of the components of the landscape and visual resource that may be affected by the onshore Project, which includes the identification of key receptors and viewpoints which represent such receptors. The baseline is of sufficient detail to enable a well-informed assessment of the likely landscape and visual effects on the baseline conditions of the onshore Project.

17.4.1 Study area

The LVIA onshore study area is defined as a 3 km radius extending from the onshore export cable area (onshore export cable study area) and a 5 km radius from the onshore substation search area (onshore substation study area) due to the scale of the proposed substation and the open nature of the landscape. The extent of the study areas were agreed with THC and are illustrated in the site location plan provided in SS17: LVIA figure pack.

17.4.2 Data sources

Data has been gathered from official, reliable and the most up-to-date sources. This includes Ordnance Survey (OS) map-based data, as well as NatureScot data on landscape character, designations and THC cumulative data. The existing data sets and literature with relevant coverage to the onshore Project, which have been used to inform the baseline characterisation for LVIA are outlined in Table 17-5.

Table 17-5 Summary of key datasets and reports

TITLE	SOURCE	YEAR	AUTHOR
OS 1:50,000 mapping	Xodus, via emapsite: emapsite.com	2023	OS
OS 1:250,000 Raster maps from OS Open Data	OS OpenData	2023	OS
OS Terrain 5 Digital Terrain Model (DTM)	Emapsite: emapsite.com	2023	OS
NatureScot Landscape Character Assessment	https://www.nature.scot	2019	NatureScot

TITLE	SOURCE	YEAR	AUTHOR
SNH Review 103 Caithness and Sutherland Landscape Character Assessment	https://www.nature.scot	1998	Straton, C.
National Cycle Network	https://www.sustrans.org.uk/national-cyclenetwork/	2023	Sustrans
Core paths in Highland Council area	https://highland.maps.arcgis.com/apps/webappviewer/index.html?id=2fd3fc9c72d545f7bcf1b43bf5c8445f	2023	THC
Electricity Act 1989 - section 36 applications: guidance for applicants on using the design envelope	https://www.gov.scot/publications/guidance-applicants-using-design-envelope-applications-under-section-36-electricity-act-1989/	2022	MS and Energy Consents Unit (ECU)

17.4.3 Project site-specific surveys

The LVIA has been informed by desk-based studies and field survey work undertaken within the LVIA onshore study area. The landscape and visual baseline has been informed by desk-based review of LCAs, and the ZTV, to identify receptors that may be affected by the onshore Project and produce written descriptions of their key characteristics and value.

Desktop findings were verified and augmented by targeted field reconnaissance during which all key sensitive receptor locations were visited.

Viewpoints identified through consultation and during desk studies were ground-truthed through fieldwork and their positions fixed prior to photography being undertaken. Viewpoints focus on the onshore substation area due to the nature of the onshore Project. Site visits were undertaken in November 2022, February and March 2023 to assess the landscape and visual baseline for the Project within a study area of up to 5 km with respect to the onshore substation.

The site visits were informed by ZTV analysis that modelled the zone of theoretical visibility of the onshore substation based on an indicative layout. ZTV is the process of determining the extent of the non-visibility and the theoretical visibility of the onshore Project. It is a computer-generated analysis which evaluates visibility using the height and extent of the onshore substation against a digital terrain model. It is important to understand that the ZTV is not used to determine actual visibility, only theoretical visibility. Actual visibility can only be determined on site; site surveys are used to 'ground-truth' those areas shown on the ZTV as theoretically visible. In some instances, it has been useful to confirm the nature of visibility with wireframe views as part of the analysis of the visibility mapping.

ZTV studies were prepared using the ESRI ArcGIS Viewshed routine. This created a raster image that indicated the visibility (or not) of the onshore substation based on a worst case scenario of the development envelope associated with the proposed platform location, as illustrated in the ZTV provided in SS17: LVIA figure pack and using a development platform height of 70 m Above Ordnance Datum (AOD) and a development height of 13.5 m. The ZTV

was produced using a combination of 5 m and 50 m resolution Digital Terrain Model (DTM), with the 5 m DTM around the onshore substation. Curvature of the earth has been taken into consideration and an assumed observer height of 1.6 m above ground level.

The resulting ZTV map does not take account of visually significant structures and vegetation and settlements, which may screen or partially obscure views of the development, and therefore it represents the worse-case scenario visibility. It should be noted that in practice, there will be many locations within the 5 km ZTV where views of the onshore Project will not be possible.

In addition to the site-specific surveys, an interactive 3D model was developed for the Project by 3D Webtech. The 3D model was used within the EIA process, at public events and consultation meetings. The 3D model consisted of animated onshore and offshore elements including the onshore substation, onshore export cable corridor, WTGs and offshore substations. Additional planning constraint data layers were also available in the model and viewed as required (e.g. designated sites). Viewers were able to navigate to both the onshore LVIA and offshore SLVIA viewpoints, the locations of which were agreed as part of the EIA process. There was also postcode search option, to view the Project from locations relevant to the viewer. A fly-through video was available which took the viewer on an aerial tour of the onshore and offshore Project.

The 3D model allowed the Project team, stakeholders and members of the public to visualise the Project from different perspectives and understand how the Project fits into the wider environment. The ability to visualise the Project in this manner was used both in the development of the layout and design of certain aspects of the Project, such as the onshore substation, and in order to assist with the EIA assessment.

17.4.4 Existing baseline

This section describes the landscape and visual baseline of relevance to the type of development proposed and the landscape and visual receptors likely to experience significant effects. Reasoned justifications are provided where receptors are 'scoped out' from further assessment based on a judgement that effects are 'unlikely to occur or so insignificant that it is not essential to consider them further' (LI and IEMA, 2013). In order to be concise and proportionate, the LVIA focuses on the effects upon the most affected sensitive receptors.

The onshore study area is at the edge of the flow country, where the extensive peat moorlands meet the low rolling hills of North-east Caithness.

It is a very large scale and open landscape, in parts bleak. It is flat or slightly rolling to the east of the A9(T), gently rolling to the west. Levels vary from approximately 40 m AOD at Halkirk to 100 m at Mybster above AOD and with a high point at Spittal Hill of 176 m. Spittal Hill is sufficiently prominent in this landscape that the OS has used it for a trig point.

The higher ground and more peaty ground is moorland, whilst much of the more amenable land has been 'improved' to 'permanent pasture' (some of which is degraded with areas of rushes), with a few arable fields. There are a number of forestry plantations, varying from small shelter strips to large areas of commercial conifers. Areas of broadleaf and mixed woodland planting have been created under woodland grant schemes, including at Achanarras Farm (1999 to 2005), to the south of the onshore substation.

Flagstone quarries such as at Spittal are noticeable because of their spoil-heaps and processing buildings, although the quarries themselves cut into the flat land and are not readily visible.

Human habitation is sparse across the southern and western part of the area. There is a scatter of cottages and houses along the A9(T), small settlements at Mybster and Spittal, and the planned town (clearances settlement) of Halkirk on the banks of the River Thurso in the more fertile ground towards the south of the onshore study area.

There is a windfarm with 21 turbines on the edge of the flow country east of the A9(T) at the south end of the study area (Causeymire Wind Farm). These are large scale structures in a large scale open landscape which attract the eye, and change the character from appearing wild to one of a landscape affected by man.

17.4.4.1 Landscape character

The main sources for the landscape character baseline, to inform judgements within the onshore study area, are the Caithness and Sutherland LCA (1998) reports and NatureScot digital map-based national LCT (NatureScot, 2019). These regional scale characterisations generally also consider changes to landscape and forces for landscape change (i.e. what the drivers of these changes are).

As illustrated in the landscape character of the onshore Project and onshore substation in SS17: LVIA figure pack, the majority of the onshore study area falls within the Farmed Lowland Plain LCT (LCT 143) as defined by the NatureScot National LCA (NatureScot, 2019). To the south, the fairly flat, fertile landscape of the Farmed Lowland Plain gives way to the sweeping moorland of the Sweeping Moorland and Flows LCT (LCT 134).

Whilst quite open and sparsely populated, this is a landscape that is actively used and altered by man. It is not a landscape that can be considered particularly sensitive to change. However, the open nature of the landscape has some sensitivity to the large scale of the type of development proposed.

17.4.4.1.1 NatureScot LCT: Farmed Lowland Plain (LCT 143)

The key characteristics of the Farmed Lowland Plain LCT that are of particular relevance to the onshore Project are identified below:

- A generally open, low-lying plain, gently undulating to form shallow broad valleys, which are often filled with lochs and mosses, and subtle low ridges;
- Occasional smooth hills rise above the more low-lying plain forming local landmarks;
- Agriculture the predominant land cover;
- Distinctive Caithness flagstone fences in some parts, creating low, sharp edges to fields;
- Sparse woodland, mainly comprising small angular coniferous plantations planted for shelter on farms;
- Larger conifer woodlands located at the transition with the Sweeping Moorland and Flows standing out where they are planted on poorer wetter ground on low ridges;
- Farm buildings and houses forming focal points within the landscape;
- A number of historic environment features, including conspicuous castles, Baronial mansions and tall 'Lairds' houses, usually with broadleaf shelter woods planted around them;
- Roads reinforce the settlement pattern, often following the field and property boundaries, running straight and then swinging around sharp corners;

- Many historic features, including brochs and cairns, dotted across farmland and situated on hills within, or adjacent to, this area;
- Small groups of large wind turbines sited on some of the low ridges and hills and prominent visibility of larger windfarms in adjacent LCTs;
- Extensive views due to the openness of the landscape, and the clarity of northern air and light; and
- Dramatic views from the northern part of this landscape to Dunnet Head and the distant Orkney islands, and views from the A9(T) on the western edge of this landscape of the Lone Mountains of Movern and Scaraben seen across the low-lying Sweeping Moorland and Flows.

Farmland Lowland Plain (LCT 143) is broadly described as vast, exposed and open, generally dominated by a horizontal emphasis. This, as well as the clarity of the air and light, allows for extensive views both within the lowland plain and to the landscapes and seascapes beyond. The undulating landform forms a series of broad, shallow valleys running south-east/north-west across the plain. Although this landscape is predominantly farmed, areas of wetter rough pasture and moss, and occasional lochs, also occur within valley floors and shallow basins. Woodland is sparse, limited to small coniferous shelterbelts and clumps of broadleaf trees sheltering farms.

17.4.4.1.2 SNH local landscape character types (LLCTs)

Whilst the Caithness and Sutherland LCA (Stanton, 1998) has been updated and largely superseded by the updated NatureScot LCA (NatureScot, 2019), Stanton (1998) assesses at a more local level and identifies four Local LCTs (LLCT) within the onshore study area:

- Mixed agriculture and settlement (LLCT 14);
- Sweeping moorland (LLCT 1), including flat peatland, a sub-type of the sweeping moorland LLCT;
- Lone mountains (LLCT 4); and
- Open, intensive farmland (LLCT 13).

Stanton (1998) also shows extensive areas of forestry and woodland as distinct character types. For the purposes of this assessment, commercial forest plantations were not considered as a LCT as it is possible that large areas of forestry in the onshore study area may be cleared. The extent of current forestry is visible from the OS map background.

Mixed agriculture and settlement (LLCT 14)

The mixed agriculture and settlement LLCT broadly corresponds with the Farmed Lowland Plain LCT and is described as ‘a wide open landscape generally dominated by a horizontal emphasis, with the occasional location of a hill or woodland defining spaces at a more local level.’

The assessment goes on to note that this landscape is generally gently sloping and that in some places the slopes rise to form low hills or dip to create shallow glens. Achanarras Hill is one such low hill, with the valley of the Achanarras Burn between it and Spittal Hill a ‘space defined at a more local level’. The landscape is described as having a simple landform that is covered by ‘a confusion of characteristics – physical, cultural and experiential’.

Sweeping moorland (LLCT 1)

The sweeping moorland LLCT broadly corresponds with the Sweeping Moorland and Flows LCT and is described as 'it appears stunning on account of its simple composition of landscape elements and vast scale. Transitions between different areas and neighbouring LCTs tend to be extremely subtle.'

Stanton (1998) notes that this landscape possesses a simple visual composition and that there is generally no visual focus (although these are sometimes provided by lone lochans, trees or other landscape elements).

The flat peatland LLCT subtype has a slightly different nature predominantly as a result of the difference of landform. Most parts of the flat peatland LLCT subtype are very remote, with little human access or activity. A very small part of the flat peatland LLCT extends into the southern edge of the onshore study area.

Lone mountains (LLCT 4)

Spittal Hill is classed as 'lone mountains' LLCT, which is described as comprising 'individual mountains which lie isolated within an open 'sea' of moorland'.

Stanton (1998) notes that the focal dominance of mountains means that their influence extends far into other LCTs. This emphasises the point that Spittal Hill is a local focal point, even though it is at the lower and less dramatic end of the range of lone mountains in Caithness.

Open, intensive farmland (LLCT 13)

Open, intensive farmland only occurs in a few areas of Caithness. Within the onshore study area, this LLCT occurs on the coast around Crosskirk.

The LLCT comprises a wide plain of rich agricultural land, with the character type dominated by 'openness and flat or gently sloping landform' and the appearance of the landscape is strongly influenced by the characteristics of the northern, coastal light in Caithness and comprises a simple composition of elements.

17.4.4.1.3 LLCT guidance

Stanton (1998) sets out key forces for change and design guidance for each LLCT and the points that are most relevant to the onshore Project are abstracted in the following paragraphs.

Mixed agriculture and settlement (LLCT 14)

Composition and balance of the complex mix of characteristics that make up this LLCT have changed over the years and continue to do so. This is in some respects a 'landscape of change' – one that is continually evolving. This means that many areas can accommodate new changes without marring their intrinsic qualities. However, it is difficult to locate new elements into this landscape where there is no distinct pattern or organisation to which to relate them.

Whilst it is difficult to introduce any new elements into this landscape without adding to the visual complexity, the impact of this may be limited where new elements directly relate to the specific characteristics of a site or create an identifiable order and pattern of their own.

New vertical elements will be particularly noticeable, with the degree of visibility tending to relate to the mass of the elements; that bulky objects can obstruct apparent visual movement along a skyline and become a dominant focus, such as the existing Scottish Hydro Electric Transmission plc (SHET-L) Spittal substation.

Relative to this, it is important to consider the most appropriate design and location of a new element, particularly in respect of its scale and form and in relation to the skyline. In respect of locating new built structures, it may be appropriate to integrate new features into the existing arrangement of landscape components or to concentrate them as a distinct group in their own right.

Sweeping moorland (LLCT 1)

New elements in this landscape tend to become focal features and that it is important to consider how they may affect the sense of remoteness that exists in this landscape. The introduction of numerous elements into this landscape will have a cumulative effect – an important point given the presence of the existing Causeymire and Halsary Wind Farms.

Lone mountains (LLCT 4)

The design guidance for this character area notes the importance of considering the impact of any development on the skyline in this LLCT. Perhaps more importantly in the context of siting and design of the onshore substation it makes the point that 'new elements can compete with the existing focal dominance of the mountain.'

Open, intensive farmland (LLCT 13)

The design guidance for this character area notes the importance of its openness, simple composition and landscape pattern, within which change or development tends to be clearly visible. The Forss Wind Farm is a distinctive vertical feature within this flat, simple landscape type.

17.4.4.2 Designated and protected landscapes

As illustrated in the landscape designations of the onshore Project and onshore substation in SS17: LVIA figure pack, there are no designated landscapes within the LVIA onshore study area.

17.4.4.3 Visual amenity

The extent of visibility of the onshore substation, and the area from which there may be visible effects, can be seen in the ZTV (see SS17: LVIA figure pack). The ZTV is based on bare ground mapping and does not take account of the screening effects of woodland, forestry and built form, and therefore represents a worst case scenario.

As described above, the landscape within the LVIA onshore study area is vast, exposed and open, generally dominated by a horizontal emphasis. This, as well as the clarity of the air and light, allows for extensive views both within the lowland plain and to the landscapes and seascapes beyond. The undulating landform forms a series of broad, shallow valleys running south-east/north-west across the plain, which provides some visual enclosure. Woodland is sparse, limited to small coniferous shelterbelts and clumps of broadleaf trees sheltering farms, but where present, screens and encloses views. Built form and infrastructure introduce a sense of scale into the landscape.

The onshore substation is located within a relatively accessible part of Caithness, sited to the immediate west of the A9(T), and to the south of the A9(T)/A882 junction. The village of Halkirk is located approximately 2.8 km to the north of the onshore substation, on the B784 and River Thurso. Georgemas Junction Station is located to the east of Halkirk, at the junction between the Inverness to Wick/Thurso Network Rail Scotland railway lines. The small hamlet of Spittal is located on the A9(T), approximately 2 km to the south of the onshore substation. There are scattered homes and farmsteads within the onshore substation study area. There is an existing SHET-L Spittal substation immediately to the south of the onshore substation. Achanarras Quarry (Geological Site of Special Scientific Interest (SSSI)) with visitor interpretation) lies approximately 1 km to the south of the onshore substation.

Visual receptors are 'the different groups of people who may experience views of the development' (LI and IEMA, 2013). ZTV studies, baseline desk study, field-based observations and consultations with stakeholders have been used to identify those receptors who may be significantly affected by the onshore Project.

The key visual receptors of the onshore Project can be classified according to their reasons for being there, as:

- Residential receptors: residents within settlements and scattered individual properties;
- Recreational and tourist receptors: people using the countryside for outdoor recreation and visiting the area as tourists; and
- Transport receptors: people travelling through the area on major and minor roads.

17.4.4.3.1 Settlements

The largest settlement of Thurso lies outside the LVIA onshore study area. Table 17-6 lists the villages and hamlets within the LVIA onshore study area having potential to experience visibility of the onshore Project. It is recognised that temporary construction effects will arise as a result of the construction and decommissioning stages. However, almost all of the permanent visual effects will arise as a result of the onshore substation.

Should visibility of the onshore Project be possible from any of the other settlements listed below, then it is judged that the visual effects would be of no greater than negligible scale and are therefore not included in the assessment.

Table 17-6 Settlements within LVIA onshore study area

SETTLEMENT	DISTANCE / DIRECTION	DESCRIPTION
Halkirk	2.6 km / NW (onshore substation)	Halkirk is a small village by the River Thurso in Caithness. The B874 connects Halkirk to Thurso to the North, and to the smaller settlements of Roadside and Georgemas, as well as the A9(T), to the east. To the south, a minor road links Halkirk to Harspdale (C1018), along which there are several residential properties and businesses.
Harspdale	1.7 km / W (onshore substation)	Harpsdale is a small hamlet including a few residential properties, farms and businesses along the minor road (C1018), approximately 2 km to the south of Halkirk.
Crosskirk	0 m (onshore export cable)	Crosskirk is a remote coastal hamlet overlooking Crosskirk Bay. The Hill of Lybster Technology Park lies to the west of the settlement. Crosskirk lies within the onshore Project area, adjacent to the Crosskirk landfall option.
Forss	0 m (onshore export cable)	Forss is a small hamlet, approximately 6.4 km to the west of Thurso. Forss lies within the onshore Project area, in the vicinity of the two cable landfall options.

17.4.4.3.2 Recreational routes

As illustrated in the landscape designations of the onshore Project (see SS17: LVIA figure pack), the NC500 is regarded as one of the world's most scenic road trips, 516-mile (830 km) route around the North coast of Scotland, which starts and ends in Inverness. Within the LVIA onshore study area, the route comprises coastal sections of the A838 and A836. The route is also on a road cycle route. The route takes in areas of stunning coastal scenery, with white sandy beaches, rugged mountains and remote fishing villages. Approximately 12 km of the NC500 route falls within the onshore export cable study area. As the NC500 route lies 12 km to the north of the onshore substation it will therefore not be considered further in this assessment with respect to operation stage effects.

Sustrans NCR 1: Inverness to John O' Groats[3], when emerging from the Loch Loyal valley at Tongue it follows the scenic road of the A836 / The NC500 up to Reay and thereafter follows local roads to the south of the A836, its destination being in the village of John O' Groats. Approximately 10 km of the NCR route fall within the onshore export cable study area. The NCR lies approximately 12 km to the north of the onshore substation and therefore will not be considered further in this assessment with respect to operation stage effects.

[3] *As illustrated on the OS mapping available online at: https://explore.osmaps.com/route/5512954/sustrans-inverness-to-john-o-groats?lat=58.164578&lon=-4.344162&zoom=8.0657&style=Standard&type=2d&overlays=os-ncn-layer&placesCategory.*

Core paths and recreational paths within Caithness are generally concentrated around settlements and along the coast. Core paths within the LVIA onshore study area includes:

- Core path to Achanarras Quarry;
- Core path on the western edge of Spittal;
- Core paths around Halkirk; and
- Core paths at Crosskirk.

As illustrated by the ZTV (see SS17: LVIA figure pack), the landform prevents intervisibility between the core path on the western edge of Spittal and the onshore Project, and therefore this is not considered further in this assessment.

17.4.4.3.3 Transport routes

There are a number of transport routes in the onshore Project area that may experience visibility to construction and ongoing operation and maintenance activities. Transport routes may include road and railway users. In terms of road users, those road links that are of relevance to the onshore Project area and route assessment for visual amenity are provided in Table 17-7.

The Wick to Inverness Network Rail Scotland railway route runs on a general east to west direction to the north of the substation onshore study area. People travelling on this route might have partial views of the onshore substation, however these would be for a short section, at a distance and partially screened by existing buildings and vegetation. Overall, no significant effects on railway users are anticipated and therefore railway users will not be considered further in this assessment.

Table 17-7 Roads of relevance to the route assessment

ROAD	DESCRIPTION	RELEVANT TO CONSTRUCTION IMPACT ASSESSMENT	RELEVANT TO ONSHORE SUBSTATION IMPACT ASSESSMENT
A9	The A9(T) is a single-carriageway trunk road and is the main transport route in the LVIA onshore study area. The A9(T) runs north from Inverness to Mybster in the south of the study area, passes to the east of Halkirk, runs through the town of Thurso, and terminates at Scrabster. As a trunk road, the A9 is designed to carry higher volumes of traffic.	The A9(T) generally runs parallel to the onshore export cable route and users of this road are likely to experience transient views of construction activities. The A9(T) is therefore taken into consideration in the construction impact assessment (see section 17.6.2.2.3).	Views of the onshore substation would be available to the west of the A9(T) road. Landform and vegetation, in particular woodland blocks and coniferous plantations at Sibster Forest and Banniskirk Mains, limit the section of the road in which the onshore substation would be visible. An assessment has been undertaken of the impacts from this transport route (see section 17.6.1.2.3).

ROAD	DESCRIPTION	RELEVANT TO CONSTRUCTION IMPACT ASSESSMENT	RELEVANT TO ONSHORE SUBSTATION IMPACT ASSESSMENT
A836	The A836 is a single-carriageway road, suitable for two-way traffic, that runs in a westerly direction from the A9(T) to the north of Thurso. The route heads west and generally follows the north coast passing through Forss, Lybster, Reay and Tongue. The A836 forms part of the NC500 and 12 km of the NC500 route in the north of the area, falls within the onshore export cable study area.	The A836 runs perpendicular to the onshore export cable corridor, and although this route is likely to be fleeting to users, it will be taken into consideration during the construction impact assessment (see section 17.6.2.2.3).	The onshore substation is not visible from the A836 and has therefore not been considered in the impact assessment.
B870	The B870 is a single-track road, with regular passing places, that runs in a south-westerly direction from the B874, to meet the U1871 to the west of Halkirk. It passes through a rural area, providing access to isolated farms and steadings.	The B870 runs generally parallel to the onshore export cable corridor and users of this road are likely to experience transient views of construction activities. This transport route is taken into consideration in the construction impact assessment (see section 17.6.2.2.3).	The onshore substation is not visible from the B870 and has therefore not been considered further in the impact assessment.
B874	The B874 is a single carriageway road, suitable for two-way traffic, which runs north-south, parallel with, and to the west of the A9(T). It commences in Thurso and runs south, passing through the small settlement of Halkirk before re-joining the A9(T) to the east of the village.	The B874 runs generally parallel to the onshore export cable corridor and users of this road are likely to experience transient views of construction activities. This transport route is taken into consideration in the construction impact assessment (see section 17.6.2.2.3).	The B874 lies to the north of the substation onshore study area, extending east of Halkirk. Partial views of the onshore substation may be possible from this road, however this would be for limited sections of the road, distant, and no significant effects on road users are likely to occur and therefore users of the B874 will not be considered further in this impact assessment.
C1018	This road runs south from the centre of Halkirk onto Bridge Street and for part it is a single-carriageway road that is suitable for two-way traffic. However, to the south of the C1014 junction, this road becomes a single-track road with passing places.	This road runs generally parallel to the onshore export cable corridor and users of this road are likely to experience transient views of construction activities. This transport route is taken into consideration in the construction impact assessment (see section 17.6.2.2.3).	This road lies to the north of the onshore substation study area and users of approximately 3.4 km of Bridge Street (south of Halkirk) will have views of the onshore substation, albeit occasionally interrupted by built form and vegetation. An assessment has been undertaken of the impacts from this transport route (see section 17.6.1.2.3).

ROAD	DESCRIPTION	RELEVANT TO CONSTRUCTION IMPACT ASSESSMENT	RELEVANT TO ONSHORE SUBSTATION IMPACT ASSESSMENT
C1014	This road links the C1018 to the A9(T) to the east. It is a single-track road, with occasional passing places.	This road runs generally perpendicular to the onshore export cable corridor and although this route is likely to be fleeting to users, it will be taken into consideration during the construction impact assessment (see section 17.6.2.2.3).	This road lies to the north of the onshore substation and views are potentially apparent along the entire road, although interrupted at times due to vegetation and built form. An assessment has been undertaken of the impacts from this transport route (see section 17.6.1.2.3).

17.4.4.4 Representative viewpoints

In line with guidance (LI and IEMA, 2013) representative viewpoints have been identified to illustrate the nature of the existing baseline on which the assessment is based. The representative viewpoints illustrate a range of visual receptors from publicly accessible locations. It should be noted that in general, the representative viewpoints have been selected in locations where visual effects would be anticipated (i.e., the onshore substation area is visible); though some may be selected outside of the ZTV – either to demonstrate the reduction of effects with distance; the nature of sequential views; or to specifically ensure the representation of a particularly sensitive receptor, such as a scheduled monument. Most of the viewpoints represent multiple receptors. All of the viewpoints illustrate the landscape and visual baseline for readers of the LVIA. Table 17-8 below identifies which visual receptors are represented by the viewpoints, however it should be noted that the assessment of visual effects is based on field work and supported by the illustrative material, including visualisations, and is not based on the viewpoints themselves.

The viewpoints have also been discussed and coordinated with the terrestrial archaeological and cultural heritage consultants of Orkney Research Centre for Archaeology (ORCA), and therefore include proposed viewpoints for both LVIA and the cultural heritage. setting assessment.

Advice set out by THC in their Scoping Opinion (9th May 2022) and stakeholder consultations with HES, NatureScot and THC provided feedback on the viewpoint locations and highlighted additional locations for consideration. Field work was undertaken to consider whether any of the more distant viewpoints used for the existing SHET-L Spittal substation should be included, however these were not included predominantly due to the lower-lying nature of the onshore substation area relative to the existing SHET-L Spittal Substation.

The assessment is illustrated from eight representative viewpoints, as described in Table 17-8, and the location of the viewpoints and the visual receptors are illustrated in the ZTV (see SS17: LVIA figure pack) and the viewpoint photographs are illustrated on Figure VP1-VP8a-k (see SS18: LVIA visualisation pack and SS19: Terrestrial archaeology onshore setting supporting visualisations).

Table 17-8 Assessment viewpoints and identified visual receptors

VIEWPOINT REF	VIEWPOINT LOCATION	IDENTIFIED RECEPTORS
VP1	Harpsdale, Bridge Street	Residents at Harpsdale Road users of Bridge Street (C1018)
VP2	Achanarras Quarry, Caithness	Recreational visitors to Achanarras Quarry Users of core path to Achanarras Quarry
VP3	A9(T), Spittal, at entrance to Spittal Mains Farm	Residents at Spittal Road users of A9(T)
VP4	A9(T), Spittal, at Road to Quarry	Residents at Spittal Road users of A9(T)
VP5	Junction of A9, Spittal	Residents of Houstry Road users of A9(T) Road users of C1014 (A9 to Halkirk / Bridge Street)
VP6	Road to Halkirk at entrance to Hayfold Cottage	Residents of Houstry Road users of C1014 (A9 to Halkirk / Bridge Street)
VP7	Cairn 800 m north-west of Achanarras	Scheduled Monument
VP8	St Magnus' Church	Residents of Spittal Mains Farmstead Scheduled Monument

Viewpoint 1 is taken from Bridge Street adjacent to residential properties at Harpsdale, approximately 1.45 km to the west of the onshore substation area. The viewpoint represents residents at Harpsdale and road users of Bridge Street. The view faces east towards the onshore substation from a rural road corridor that runs parallel to the A9(T). The view is principally characterised by open farmland. Agricultural built form is visible to the right of the view, including Benachie Farm, beyond which the views are contained by the subtle form of the hill of Achanarras which is reinforced by areas of forestry on its southern slopes (Achlachan Moss). Within the relatively flat and open landscape, the elevated topography associated with Spittal Hill introduces a distinctive feature into the view and creates a backcloth to the onshore substation and existing SHET-L Spittal substation. There are open views west towards Ben Dorrery and Beinn Freiceadain.

Viewpoint 2 is taken from elevated land at Achanarras Quarry and faces north towards the onshore substation area. The viewpoint represents tourists and recreational visitors to Achanarras Quarry, including visitors hunting for fossils. The view is principally characterised by open grass fields and woodland, that lie within this part of the shallow valley landscape. There is a framed view of the existing SHET-L Spittal substation, beyond blocks and belts of commercial forest, and an open view of Achanarras Farm. The onshore substation area is visible from this location, albeit partially screened by existing woodland and seen beyond Achanarras Farm. The onshore substation area is visible against the backdrop of the distant hills. The existing SHET-L Spittal substation and overhead lines introduce industrial features to the landscape.

Viewpoint 3 faces north-west towards the onshore substation area from the A9(T) on the northernmost edge of Spittal village, opposite the access to Spittal Mains farmstead which has a coniferous tree belt running along the farm access. The viewpoint represents road users of the A9(T), and residents of Spittal. The view is principally characterised by open farmland, falling to the north-west towards a shallow valley although the elevated field and structure in the foreground partially obscure views down into the valley to the West of the view. The existing SHET-L Spittal substation is located within the shallow valley and is partially screened by landscaped bunds. However, the recently felled coniferous tree belt has opened up views of the existing SHET-L Spittal substation. Long distance views to the north are available from this location towards the wider landscape to the north, within which Halkirk is located, and which form a backdrop to the existing SHET-L Spittal substation and the onshore substation area beyond. Occasional blocks of dense plantation woodland contrast with the largely flat and open landscape. To the east (right of the view) the elevated land associated with Spittal Hill, along with the woodland belts that lie to the East of the A9(T), contain views of the wider landscape to the east.

Viewpoint 4 faces west and is taken from the A9(T) which lies directly to the east of the onshore substation area, at the track to the former quarry. The view is principally characterised by rough open grass/scrubland, interspersed with occasional farmsteads and agricultural built form. Long distance views to the west are available across the shallow valley landscape, albeit obscured to a degree by the existing plantation woodland that lies over Achanarras Hill. To the left of the view, there are open views of the existing SHET-L Spittal substation due to the recent felling of a belt of coniferous trees. Young native broadleaf woodland provides low-level screening, but the large massing of the main existing SHET-L Spittal substation building is visible against the low skyline. High voltage overhead lines extend north and south from the existing SHET-L Spittal substation. There are open views into the onshore substation area from this viewpoint, beyond a low wall and existing grassland.

Viewpoint 5 is taken from the junction off the A9(T) and faces south towards the onshore substation area. The landscape at this point is principally characterised by open grass fields bound to the east by the A9(T) road corridor and intersected by intermittent farmsteads, woodland belts and plantation woodland. The landscape is relatively open in nature, long distance views towards the wider landscape to the south and west (right of the view) are therefore available albeit obscured to some degree by the existing woodland blocks and the rising land to the south. Vegetation and the rising land on the eastern edge of the A9(T) serves to contain views towards the wider landscape to the east (left of the view). There are open views across the onshore substation, which is seen in the foreground of the existing SHET-L Spittal substation.

Viewpoint 6 is taken from the road to Halkirk opposite the entrance to Hayfold Cottage, looking south towards the onshore substation. There are open views towards the onshore substation area, which is bound by a heavily managed hedgerow. Beyond the onshore substation area, the existing SHET-L Spittal substation is seen against the skyline, which is more visible since a coniferous shelterbelt between the onshore substation area and existing SHET-L Spittal

substation was felled. Overhead lines extend north and south of the existing SHET-L Spittal substation, running along the Achanarras Burn to the west of the onshore substation area (right of the view). To the east (left of the view), Spittal Hill rises up beyond the A9(T), fringed by coniferous forestry. To the west (right of the view), the rolling landform, reinforced by mixed woodland and coniferous forestry encloses views further south. There is a view towards Achanarras Quarry through the break in the trees.

Viewpoint 7 is taken from a Cairn, 800 m north-west of Achanarras, looking east towards the onshore substation area. The viewpoint represents views from the Scheduled Monument as requested by HES and is not a view that is likely to be widely experienced by visual receptors, being located within a field away from any footpaths. The onshore substation area is partially screened by intervening landform as the land drops down towards the Achanarras Burn, and the existing SHET-L Spittal substation is entirely screened by landform and vegetation. Achalone Cottage, Achcomhairle Farmstead and houses on the A9(T) beyond the onshore substation area can be seen on the horizon, dwarfed by the overhead lines in the foreground.

Viewpoint 8 is taken from St Magnus' Church, looking north towards the onshore substation area, which lies beyond the existing SHET-L Spittal substation. The existing SHET-L Spittal substation and surrounding screening bunds curtail views of the onshore substation area but enable long-distance views across the distant fields and hills. The viewpoint was included at the request of HES to illustrate the nature of views from the Scheduled Monument.

17.4.5 Future baseline

Across the lifetime of the onshore Project, the existing landscape and visual baseline is envisaged to be relatively stable. Predominant changes and forces for change that may be expected to occur include:

- A range of policies that impact on the management of the landscape, ranging from national policy and regulation, through to Local Development Plans (LDPs). The LVIA onshore study area falls within a Highland Native Woodland Target Area, which may lead to more native woodland planting in the area, which in turn may reduce the visibility of the onshore Project in the longer term, such as the mixed woodland at Sibster around Georgmas Junction;
- Commercial forestry activities are also likely to influence the landscape and visual baseline due to the associated felling and restocking, as set out in the Forestry and Land Scotland (FLS) (2023) Caithness Land Management Plan. For example, an existing coniferous tree belt that provided screening to the south of the onshore substation was felled in the course of the LVIA field surveys, opening up views of the existing SHET-L Spittal substation and altering the composition of the immediate landscape;
- Potential changes to the landscape as a result of climate change have been considered. However, neither the changes currently anticipated (milder, wetter winters, warmer drier summers) nor those that might arise if tipping points are reached (such as collapse of the gulf stream and thus colder weather) would change the impacts assessed in this chapter or change the effect of the mitigation proposed; and
- Development or decommissioning of infrastructure, particularly relating to onshore wind developments, nuclear test establishments and the associated electrical infrastructure such as the new SHET-L Spittal 2 substation and HVDC converter station. The new SHET-L Spittal 2 substation and HVDC converter station is a proposed 400 kilovolt (kV) substation that is part of wider upgrades and reinforcement for new future onshore and offshore renewables generation and is part of the associated upgrades from Spittal to Loch Buidhe, Beauly reinforcement project. In addition, the ESB asset development compensator and the high voltage underground cable that would link the existing SHET-L Spittal substation are proposed as new transmission infrastructure developments.

It is considered that there would be no significant changes to the tourism and recreation resource.

It is important to note that the future baseline is a projection, with a range of possible future conditions, and it is subject to uncertainty associated with the available projections and how they may influence landscape character and visual amenity.

17.4.6 Summary and key issues

Table 17-9 summarises the key sensitive receptors identified from the baseline study that are the focus of the impact assessment.

Table 17-9 Summary and key issues for onshore LVIA

	ONSHORE SUBSTATION STUDY AREA	ONSHORE EXPORT CABLE STUDY AREA
SUMMARY AND KEY ISSUES	The onshore substation study area includes sensitive landscape and visual receptors. The main permanent effects of the onshore Project are expected to arise as a result of the onshore substation, which will introduce new infrastructure into the local landscape and the affected views. Landscape receptors: • NatureScot LCT 143: Farmed Lowland Plain; • SNH LLCT 14: Mixed agricultural and settlement; and • SNH LLCT 4: Lone Mountains LLCT. Visual receptors: • Residential receptors; • Recreational and tourist receptors; and • Transport receptors.	The onshore export cable study area including the landfall options includes sensitive landscape and visual receptors. The main landscape and visual effects likely to arise as a result of the onshore export cable corridor are temporary construction effects. Landscape receptors: • NatureScot LCT 143: Farmed Lowland Plain; • SNH LLCT 14: Mixed agricultural and settlement; • SNH LLCT 4: Lone Mountains; and • SNH LLCT 13: Open, intensive farmland LLCT. Visual receptors: • Residential receptors; • Recreational and tourist receptors; and • Transport receptors.

17.4.7 Data limitations and uncertainties

The assessment of the onshore Project does not include detailed design information and therefore there are uncertainties relating to the exact location and design of the onshore export cable corridor and onshore substation. The LVIA therefore clearly sets out the assumptions on which judgements are made and if the design proposals differ substantially this may affect the nature and extent of significant landscape and visual effects that are likely to occur.

Site visits were undertaken in November 2022, February and March 2023 and whilst survey time was limited by the short winter days, there was sufficient daylight to give proper consideration to all publicly accessible areas with the potential to be significantly affected.

17.5 Impact assessment methodology

17.5.1 Impacts requiring assessment

The impacts identified as requiring consideration for landscape and visual receptors are listed in Table 17-10. Information on the nature of impact (i.e. direct or indirect) is also described.

Table 17-10 Impacts requiring assessment for landscape and visual receptors

POTENTIAL IMPACT	NATURE OF IMPACT
Construction and decommissioning*	
Potential landscape character effects from landfall activities and onshore export cables installation	Direct / Temporary
Potential visual amenity effects from landfall activities and onshore export cables installation - residential receptors	Direct / Temporary
Potential visual amenity effects from landfall activities and onshore export cables installation - recreational and tourist receptors	Direct / Temporary
Potential visual amenity effects from landfall activities and onshore export cables installation - users of transport routes	Direct / Temporary
Operation and maintenance stage	
Potential landscape character effects from the onshore substation	Direct / Permanent
Potential visual amenity effects from the onshore substation - residential receptors	Direct / Permanent
Potential visual amenity effects from the onshore substation - recreational receptors	Direct / Permanent
Potential visual amenity effects from the onshore substation - users of transport routes	Direct / Permanent

**** In the absence of detailed information regarding decommissioning works, and unless otherwise stated, the impacts during the decommissioning of the onshore Project are considered analogous with, or likely less than, those of the construction stage. Any changes in the future would be subject to the necessary assessment which would be deemed appropriate at the time.***

17.5.2 Impacts scoped out of the assessment

The impacts scoped out of the assessment during EIA scoping, and the justification for this, are listed in Table 17-11.

Table 17-11 Impacts scoped out for LVIA

IMPACT SCOPED OUT	JUSTIFICATION
Construction	
Landscape effects upon Sweeping Moorland and Flows LCT and Sweeping Moorland LLCT	The indicative onshore substation location is entirely outwith the LCT and LLCT, with only a small part of the LCT extending into the 5 km study area. There is almost no intervisibility between the LCT and LLCT and the indicative onshore substation location. The onshore Project area is almost entirely outwith the LCT and LLCT, and therefore there are unlikely to be any direct effects on the LCT and LLCT themselves and no significant effects are likely to occur.
Visual amenity effects from onshore substation construction	Construction activities are likely to be more noticeable than the operational onshore substation due to the noise and movement and change associated with construction works, however they are temporary and short term and are therefore likely to result in the same magnitude of change as the operational stage effects. Therefore, the effects attributable to the construction stage of the onshore substation are not assessed further.
Operation and maintenance stage	
Landscape effects of the landfall of offshore cable corridors and onshore export cable corridor	The existing habitats and features affected by the construction of the onshore export cable corridor will be reinstated following completion with no significant landscape effects likely to persist post-construction.
Visual amenity effects from landfall activities and onshore export cables installation	The onshore export cable corridor is underground, and the existing habitats and features will be reinstated once construction is complete, with no significant changes in visual amenity likely to persist post-construction.

17.5.3 Assessment methodology

17.5.3.1 Introduction

The purpose of the LVIA is to identify, predict and evaluate potential impacts associated with the onshore Project. Landscape and visual assessments are separate although linked processes, describing closely related but distinct sets of effects.

- LCA focuses on effects on the physical landscape elements which may give rise to changes in its distinctive character and how this is experienced, including consideration of aesthetic and perceptual aspects.
- Visual amenity assessment considers the response of the people who experience visual effects caused by changes that arise in the composition of available views as a result of the onshore Project.

17.5.3.2 Assessment criteria

The assessment methodology has been derived from the LI with the IEMA (2013) GLVIA3. The involvement of IEMA in developing the GLVIA3 ensured that LVIAs undertaken within the EIA process can be effectively integrated with the rest of the topic-specific chapters in an Environmental Statement[4]. The guidance ensures that the most relevant assessment principles and approaches are being utilised and offers guidance on setting out the context of the development and the receiving environment. The LVIA methodology approach, principles and processes aim to support compliance with EIA Regulations and to follow the principles set out in chapter 7: EIA methodology. The LVIA methodology also contains certain discipline-specific terminology which the LVIA uses, and is, provided in the Glossary in section 17.14.

As identified in the GLVIA3 the effects are identified by establishing and describing the changes resulting from the different components of the development and the resulting effects on individual landscape or visual receptors. Assessment of the significance of effects takes account of the nature of the effects ('magnitude'), as well as the nature of the receptors ('sensitivity') and differentiates between them according to the stages (construction, operation and maintenance and demolition) of the development in which they would occur (LI and IEMA (2013), Box 3.1). Wherever possible, identified effects are quantified, however the nature of LVIA requires interpretation by professional judgement. In order to provide a level of consistency to the assessment, the prediction of magnitude and assessment of significance of the residual landscape and visual impacts have been based on pre-defined criteria. The flow diagram of this process is presented in Figure 17-1.

17.5.3.3 Sensitivity to change

The sensitivity of landscape and visual receptors is arrived at by separately considering the receptor value and the susceptibility of the receptor to change as a result of the type of development proposed.

17.5.3.3.1 Landscape sensitivity

The sensitivity of landscape receptors to change arising from the type of development proposed is defined as high, medium, low or negligible based on professional interpretation, combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape.

17.5.3.3.2 Landscape value

Landscape value is "the relative value that is attached to different landscapes by society" (LI and IEMA, 2013).

The value attached to landscape receptors reflects landscape designations and the level of importance which they indicate at the community, local, national or international levels. However, landscape designations are not the sole indicator of landscape value (LI and IEMA (2013), Box 5.1).

[4] *https://www.iema.net/articles/iema-publishes-revised-lvia-guidance.*

The following range of factors are considered in order to identify valued landscape:

1 Landscape quality;
2 Scenic quality;
3 Rarity;
4 Representativeness;
5 Conservation interest;
6 Recreation value;
7 Perceptual aspects; and
8 Cultural associations.

Value can apply to areas of landscape as a whole, or to the individual elements, features and aesthetic or perceptual dimensions which contribute to the character of the landscape. Table 17-12 below sets out the criteria against which landscape value is assessed.

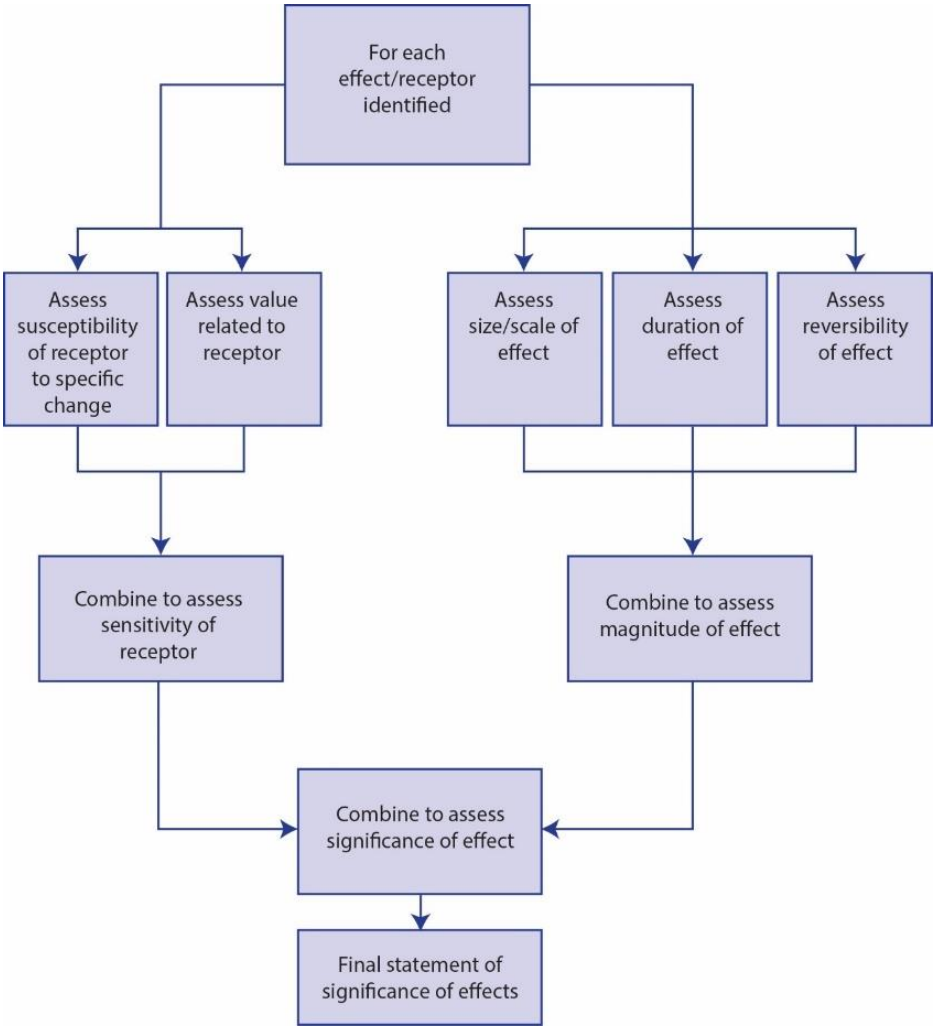

Figure 17-1 Flow diagram from GLVIA3 Page 39 (LI and IEMA, 2013)

Table 17-12 Landscape character value

VALUE	RECOGNITION	FEATURES	QUALITY / CONDITION
High	Typically, a landscape or feature of international or national recognition: National Scenic Areas, National Parks, World Heritage Sites (where designated for landscape reasons), designed landscapes on the HES Register[5].	Typically, a strong sense of place with landscape/ features worthy of conservation; no or few detracting features.	A very high-quality landscape/ feature; attractive landscape/ feature; exceptional/ distinctive.
Medium	Regional recognition or undesignated, but locally valued landscape/ features: Local Landscape Areas, locally listed designed landscapes and Regional Parks.	Typically, contains distinguishing features worthy of conservation; evidence of some degradation and/or some detracting elements.	Ordinary to good quality landscape/ feature with some potential for substitution; a reasonably attractive landscape/ feature; fairly typical and commonplace.
Low	Typically, an undesignated landscape/ feature.	Few landscape features worthy of conservation, evidence of degradation with many detracting features.	Ordinary landscape/ feature with high potential for substitution; quality that is typically commonplace and unremarkable; limited variety or distinctiveness.
Negligible	Typically, an undesignated landscape/ feature.	No landscape features worthy of conservation; evidence of degradation with many detracting features.	Low quality landscape/ feature with very high potential for substitution; limited variety or distinctiveness; commonplace.

It should be noted that the landscape sensitivity assessed at each of the representative viewpoints is not necessarily the same as that identified as the overall sensitivity for the LCA within which the viewpoint is located. Thus, if the key characteristics of the landscape at, and seen from, a viewpoint location is different from the key characteristics of the overall LCA, it may be assessed as being of a different sensitivity at the particular viewpoint location.

17.5.3.3.3 Landscape susceptibility

Susceptibility indicates the ability of a landscape to accommodate the onshore Project '*without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies*' (LI and IEMA, 2013). Some landscape receptors are better able to accommodate development than others due to certain characteristics that are indicative of capacity to accommodate change. These characteristics may or may not also be Special Landscape Qualities (SLQ) that underpin designated landscapes.

[5] https://www.historicenvironment.scot/advice-and-support/listing-scheduling-and-designations/gardens-and-designed-landscapes/.

Susceptibility of a landscape to any type of change, is dependent on (NatureScot, 2022a):

- Sense of scale and pattern of the landscape and its elements/features;
- Enclosure/ openness or exposure;
- Coastal and hinterland form;
- Land/sea use;
- Settlement pattern;
- Seascape pattern and foci /the nature of skylines;
- Movement;
- Lighting;
- Simplicity / complexity of the landscape; and
- Tranquillity/ remoteness/ wilderness.

Table 17-13 below sets out the criteria against which landscape susceptibility is assessed and Table 17-14 shows how landscape value and landscape susceptibility are combined to make judgements regarding landscape sensitivity.

Table 17-13 Landscape character susceptibility

SUSCEPTIBILITY OF RECEPTOR	DEFINITION
High	Low ability to accommodate the specific proposed change; undue consequences for the maintenance of the baseline situation (receptor value) and/or achievement of relevant planning policies/ strategies.
Medium	Moderate ability to accommodate the specific proposed change; some undue consequences for the maintenance of the baseline situation (receptor value) and/or achievement of relevant planning policies/ strategies.
Low	High ability to accommodate the specific proposed change; little or no undue consequences for the maintenance of the baseline situation (receptor value) and/or achievement of relevant planning policies / strategies.
Negligible	Very high ability to accommodate the specific proposed change; no undue consequences for the maintenance of the baseline situation (receptor value) and/or achievement of relevant planning policies/ strategies.

Table 17-14 Level of landscape sensitivity

SENSITIVITY OF RECEPTOR	DEFINITION
High	• Areas of landscape character that are highly valued for their scenic quality (including most statutorily designated landscapes); • Elements/ features that could be described as unique or are nationally scarce; • Mature vegetation with provenance such as ancient woodland or mature parkland trees; and/or • Mature landscape features which are characteristic of and contribute to a sense of place and illustrates time-depth in a landscape and if replaceable, could not be replaced other than in the long term. No or limited scope for substitution or positive enhancement.

SENSITIVITY OF RECEPTOR	DEFINITION
Medium	• Areas that have a positive landscape character but include some areas of alteration/degradation/or erosion of features; • Perceptual/ aesthetic aspects has some vulnerability to unsympathetic development; and/or • Features/ elements that are locally commonplace; unusual locally but in moderate/ poor condition; or mature vegetation that is in moderate/ poor condition or readily replicated. Some scope for substitution or positive enhancement.
Low	• Damaged or substantially modified landscapes with few characteristic features of value; • Capable of absorbing major change; and/or • Landscape elements/ features that might be considered to detract from landscape character such as obtrusive man-made artefacts (e.g. power lines, large scale developments, etc.). Scope for substitution or positive enhancement.
Negligible	• Areas that are relatively bland or neutral in character with few/ no notable features; • A landscape that includes areas of alteration/ degradation or erosion of features; and/or • Landscape elements/ features that are common place or make little contribution to local distinctiveness. Opportunities for the restoration of landscape through mitigation measures associated with the proposal.

17.5.3.3.4 Sensitivity of visual receptor

Visual receptors are all people, as stated in guidance (LI and IEMA, 2013) although the assessment may describe and map visual receptors based on the places they occupy.

Visual receptor sensitivity assessment is based on two factors:

- Value of view: the value attached to a particular view; through designation, visitor attraction or local importance; and
- Susceptibility of visual receptors: the occupation or activity of the people at the affected location and the extent to which their attention or interest may be focused on the view/ visual amenity.

The sensitivity of a visual receptor reflects their susceptibility to change and any values which may be associated with the specific view. It varies depending on a number of factors such as the activity of the viewer, their reasons for being there and their expectations and the duration of view.

Certain views are highly valued for either their cultural or historical associations, which can increase the sensitivity of the viewer. However, whilst a valued view may serve to increase the overall visual receptor sensitivity, a low value will not necessarily reduce sensitivity.

Table 17-15 and Table 17-16 below sets out the criteria against which visual susceptibility and values associated with views are assessed. Table 17-17 describes how they can be combined to form a judgement of visual sensitivity.

Table 17-15 Susceptibility of the visual receptor to change

SUSCEPTIBILITY OF RECEPTOR	DEFINITION
High	Residents at home. Walkers on long distance trails and mountain access routes. Users of footpaths where the attractive nature of the countryside is a significant factor in the enjoyment of the walk. Cyclists on national and local cycle routes designed to provide an attractive experience. Road users on recognised tourist routes. Visitors to landscape and heritage resources and other attractions where views of the surroundings are an important contributor to appreciation, experience and/or enjoyment.
Medium	General road users. Passengers on rail lines where the trains run at low or moderate speeds. Users of public open space and footpaths where the nature of the surroundings is not a significant factor in the enjoyment of the activity. Visitors to landscape and heritage resources and other attractions where views of the surroundings are a minor contributor to appreciation, experience and/or enjoyment.
Low	People at their place of work or shopping. Users of high speed roads and passengers in trains running at high speed. People engaged in recreational activities where the view of the surroundings is secondary to the enjoyment of the activity (such as playing or spectating at outdoor sports facilities). Users of public open space and footpaths where the nature of the surroundings is irrelevant to the enjoyment of the activity.
Negligible	Users of indoor facilities where the view is irrelevant to their activity.

Table 17-16 Values associated with views (which may raise the receptor sensitivity)

VALUE OF RECEPTOR	RECOGNITION	INDICATORS OF VALUE
High	Recognised views from nationally or internationally important landscape or heritage resources, such as Wild Land Areas, National Scenic Areas, Scheduled Monuments; may be identified in planning policies or statutory documents.	High value / celebrated view; referred to in national or international guide books, tourist guides etc.; literary and art references; presence of interpretive facilities (e.g. visitor centre).
Medium	Recognised views from local or regionally important landscape or heritage resource, such as Local Special Landscape Areas or Conservation Areas; may be identified in local planning policies or supplementary planning documents.	Moderately valued view; referred to in local or regional guide books, tourist maps etc.; local literary and art references; presence of some interpretive facilities (e.g. parking places or sign boards).

Table 17-17 Level of visual sensitivity

VISUAL SENSITIVITY	DEFINITION
High	A view or overall visual amenity which is an important reason for receptors being there (and therefore most views or overall visual amenity for highly susceptible receptors). A well balanced view containing attractive features and notable for its scenic quality. A view which is experienced by a large number of people and/or recognised for its scenic qualities.
Medium	A view or overall visual amenity which plays a relatively small part in the reason why a receptor would be there (and therefore most views or overall visual amenity for receptors of medium susceptibility). An otherwise attractive view that includes noticeable discordant features or overall visual amenity where there are noticeable visual detractors.
Low	A view or overall visual amenity which is unlikely to be part of the receptor's experience or reasons for being there (and therefore most views or overall visual amenity for receptors of low susceptibility). An unattractive view or overall visual amenity where there are many visual detractors.
Negligible	A view or overall visual amenity which is irrelevant to the receptor's experience or reasons for being there.

17.5.3.4 Assessing magnitude of change

The magnitude of landscape or visual effect is stated as combining consideration of the scale or size of effect with the extent of the area affected and duration/reversibility of that effect (LI and IEMA, 2013). The relative weighting of the three main factors are not specifically discussed in the guidance. There are some practitioners who give them equal or almost equal weight. This means that there is potential for the overall magnitude of effect to be less than the scale of effect alone. However, others give most weight to the scale of effect and extent (in terms of distance). As onshore substations are long-term, the overall magnitude of effect is therefore often at the same level as the scale of effect. For a study of this nature, it is therefore considered sensible to take a precautionary approach and consider that the scale of effect is likely to be at a similar level to the magnitude of effect.

The size or scale of effect includes consideration of the:

- Scale of change in the view including the proportion of the view occupied by the onshore Project;
- Degree of contrast or integration; and
- Nature of the view in terms of the relative amount of time over which it will be experienced or whether views will be full, partial or glimpses.

The geographical extent of the visual effect is likely to reflect the:

- Angle of view in relation to the main activity receptor;
- Distance of the viewpoint from the onshore Project; and
- Extent of the area over which the change would be visible (combining a number of viewpoints such as on a footpath or road).

The duration of landscape effects is described as short, medium or long term. Short term is defined as zero to up to five years, medium term as over five to ten years and long term as over 10 years. Temporary effects are effects that last for a limited time and where effects cease once the associated activity ceases. Reversibility is based on a judgement about the prospects and the practicality of the particular effect being reversed within an appropriate timescale. Table 17-18 sets out the criteria against which judgements of magnitude of change are made.

Table 17-18 Magnitude of change

MAGNITUDE	SIZE, SCALE & NATURE	GEOGRAPHICAL EXTENT	DURATION & REVERSIBILITY
High	• Occupies much of the view; • Obstructs a significant portion of the view; • Forms a large or very noticeable or discordant element in the view; • Considerable change to key features or many existing elements of the landscape; • Introduces elements considered totally uncharacteristic to the existing landscape; and/or	Ranging from notable change over extensive area to intensive change over a more limited area.	Long term; permanent / non-reversible or partially reversible.

MAGNITUDE	SIZE, SCALE & NATURE	GEOGRAPHICAL EXTENT	DURATION & REVERSIBILITY
	• A very noticeable change to the character of the landscape.		
Medium	• Occupies a noticeable portion of the view; • Obstructs a significant portion of the view; • Forms a large or very noticeable or discordant element in the view; • Some considerable change to existing landscape elements and/or landscape character; discernibly changes the surroundings of a receptor, such that its baseline is partly altered; and/or • Readily noticeable.	Moderate changes in a localised area.	Medium term; semi-permanent or partially reversible.
Low	• Occupies a small portion of the view; • Small change to existing landscape elements and/or landscape character; • Slight, but detectable impacts that do not alter the baseline of the receptor materially; and/or • Not readily noticeable.	Minor changes in a localised area.	Short term / temporary; partially reversible or reversible.
Negligible	• Occupies little or no portion of the view; • Hardly noticeable; • Limited or no change in existing landscape elements and/or landscape character; and/or • Barely distinguishable change from baseline conditions.	No change discernible.	Short term / temporary reversible.

17.5.3.5 Cumulative effects

Cumulative assessment relates to the assessment of the effects of more than one development. GLVIA3 emphasises that cumulative impact assessment should be reasonable and proportionate to the nature of the proposed development and local environment, focussing on likely significant effects that result from 'additional changes to the landscape or visual amenity'.

The cumulative assessment considers the different types of cumulative landscape and visual effect that may need to be considered with respect to the cumulative developments and the onshore Project and can include:

- The extent to which they extend or intensify the landscape and/or visual effects of each scheme;
- The extent to which the landscape resource and/or views or visual amenity are altered by the extent of development;
- The interactions between different types of development, where the total may be greater than the sum of its parts;
- The potential for significant combined landscape and visual effects to arise where individual effects are not significant through incremental change as a result of successive schemes;

- Temporal effects arising due to simultaneous or successive effects on communities and localities over an extended period of time;
- Indirect effects such as enabling or disabling other types of development with the associated landscape and/or visual effects; and
- Landscape and/or visual effects resulting from the future removal of features within the existing landscape and changes to the future baseline.

The cumulative developments that are included in this assessment are described in section 17.7. The cumulative effects have been assessed as the 'additional' effect over and above the effects of the onshore Project on the existing baseline and considers the 'combined' cumulative effect of the cumulative developments and the onshore Project. Cumulative effects arising from the onshore Project when considered in conjunction with other schemes is determined taking account of the above magnitude criteria as well as the following:

- The number of existing, consented and proposed developments visible;
- The distance to each of the visible developments from the receptor location;
- The direction of each development in relation to the viewpoint;
- The extent of the view occupied by each development;
- The cumulative effect of development upon the fabric or key landscape components; and
- In the case of LCTs, residential areas and transportation/recreational routes: the proportion of the area or route subject to cumulative views.

Table 17-19 below describes the criteria used to determine the magnitude of cumulative effect.

Table 17-19 Cumulative magnitude of change

MAGNITUDE	CRITERIA
High	The onshore Project would represent a considerable increase in the proportion of the landscape or view affected by similar development.
Medium	The onshore Project would represent a notable increase in the proportion of the landscape or view affected by similar development.
Low	The onshore Project would represent a minor addition to the proportion of the landscape or view affected by similar development.
Negligible	The onshore Project would represent a barely perceptible addition to the proportion of the landscape or view affected by similar developments.

Developments which have been refused at appeal or withdrawn are not included in the assessment.

Cumulative effects are described as:

- Simultaneous or combined: where two or more developments may be viewed from a single fixed viewpoint simultaneously, within the viewer's field of view and without requiring them to turn their head;

- Successive or repetitive: where two or more developments may be viewed from a single viewpoint successively as the viewer turns their head or swivels through 360°; and
- Sequential: where a number of developments may be viewed sequentially or repeatedly at increased frequency, from a range of locations when travelling along a route within the LVIA onshore study area.

The way in which the assessment is described and presented is varied depending on the number and nature of scenarios which may arise.

- The cumulative assessment considers scenarios within which developments of the same status (operational and consented) may be "grouped", for instance two or more nearby cumulative windfarm proposals may be considered in one scenario if it is considered that the cumulative effects arising if one or more are developed are likely to be similar;
- Receptors judged to receive a negligible magnitude of effect from the onshore Project on its own are not considered for cumulative assessment on the basis that any significant effects arising would primarily be caused by the cumulative developments and unlikely to be contributed to by the onshore Project; and
- Only those receptors judged likely to experience effects from the cumulative development(s) being considered within a given scenario are included in the assessment.

17.5.3.6 Significance of effects

The effect of any identified landscape or visual impact is assessed as major, moderate, minor or negligible. These categories are based on combining landscape or visual sensitivity and the predicted magnitude of change. The determination of levels of significance requires the application of professional judgement and experience to gauge the balance of variables which, in every instance, are given different weight according to the site and its surroundings in terms of specific considerations.

The gradations of magnitude of change and level of effect used in the assessment represent a continuum. Where appropriate, this assessment uses intermediate descriptors, such as minor to negligible, minor to moderate or moderate to major, where the assessor considers that the effect falls between levels.

Where the landscape or visual impact has been classified as Major and Major / moderate this is considered to be equivalent to a significant effect. Moderate level of effect may be significant or not significant, depending on the particular circumstances arising and professional judgement.

Each impact is evaluated on a case by case basis using the matrix in Table 17-20 below, showing general guidance on the relationship between magnitude of change and sensitivity of receptor.

Table 17-20 Significance of impact

LANDSCAPE AND VISUAL SENSITIVITY	MAGNITUDE OF CHANGE			
	HIGH	MEDIUM	LOW	NEGLIGIBLE
HIGH	Major	Major / moderate	Moderate	Minor
MEDIUM	Major / moderate	Moderate	Moderate / minor	Minor / negligible
LOW	Moderate	Moderate / minor	Minor	Negligible

In line with the GLVIA3 (LI and IEMA, 2013), the matrix is not used as a prescriptive tool and the methodology and analysis of potential effects at any particular location must allow for the exercise of professional judgement. Thus, in some instances a particular parameter may be considered as having a determining effect on the analysis. Table 17-21 describes the considerations that inform the judgement of the level of landscape and visual effects.

Where intermediate ratings are given, e.g. "moderate / minor", this indicates an effect that is less than moderate but more than minor, rather than one which varies across the range. In such cases, the higher rating will always be given first; this does not mean that the impact is closer to that higher rating but is done to facilitate the identification of the more significant impacts within tables. Intermediate judgements may also be used for judgements of magnitude.

It should also be noted that whilst an effect may be significant, that does not necessarily mean that such an impact would be unacceptable or should necessarily be regarded as an "undue consequence" (GLVIA3 (LI and IEMA (2013), para 5.40).

Table 17-21 Level of landscape and visual effect

LEVEL OF EFFECT	LANDSCAPE EFFECT	VISUAL EFFECT
Major	Considerable change over an extensive area of a highly sensitive landscape, fundamentally affecting the key characteristics and the overall impression of its character.	The development would be a prominent feature or a noticeably discordant or enhancing feature substantially affecting overall visual amenity or would result in a clearly noticeable change to a highly sensitive and well composed existing view. A clearly noticeable or substantial improvement or deterioration of the existing view.
Moderate	Small or noticeable change to a highly sensitive landscape or more intensive change to a landscape of medium or low sensitivity, affecting some key characteristics and the overall impression of its character.	The development would be a noticeable feature or a somewhat discordant or enhancing feature affecting overall visual amenity or would result in a noticeable change to a highly sensitive and well composed existing view, or would be prominent within a less well composed and less sensitive view.

LEVEL OF EFFECT	LANDSCAPE EFFECT	VISUAL EFFECT
		A noticeable improvement or deterioration of the existing view.
Minor	Small change to a limited area of landscape of high or medium sensitivity or a more widespread area of a less sensitive landscape, affecting few characteristics without altering the overall impression of its character.	The development would be a visible but not particularly noticeable feature or a slightly discordant or enhancing feature affecting overall visual amenity or would result in a small change to a highly sensitive and well composed existing view, or would be noticeable within a less well composed and less sensitivity view. A small improvement or deterioration of the existing view.
Negligible	No discernible improvement or deterioration to the existing landscape character.	No discernible improvement or deterioration in the existing view.

17.5.3.7 Nature of effects

Effects can be either beneficial or adverse and, in some cases, neutral (neither beneficial nor adverse). As the general planning policy presumption is that distinctive character should not be altered, then large industrial structures being added to the landscape, is unlikely to constitute a beneficial nature of impact in landscape and visual terms, but neutral effects could occur where it is considered the onshore Project does not change the defining characteristics of the landscape.

17.5.4 Embedded mitigation

As described in chapter 7: EIA methodology, certain measures have been adopted as part of the Project development process in order to reduce the potential for impacts to the environment, as presented in Table 17-22. These have been accounted for in the assessment presented below. The requirement for additional mitigation measures (secondary mitigation) is dependent on the significance of the effects on landscape and visual receptors.

In accordance with the onshore PPP Application, the embedded mitigations listed below have been attributed to particular Development Zones within the onshore Project area. These are detailed in Table 17-22 and the Development Zones are shown in Figure 17-2.

Whilst the onshore substation layout is indicative only, certain parameters have been set out in order to embed primary mitigation into the onshore Project and reduce the likely landscape and visual effects of the onshore Project, as summarised in Table 17-22. The embedded mitigation measures have been developed in consultation with THC and other stakeholders and have been amended in response to comments received at consultation events, as described in detail in the design evolution of the onshore substation (section 17.5.5.2). The embedded mitigation measures have been tested through 3D modelling and the preparation of visualisations.

The final design, including onshore substation location and layout will be developed via an iterative design process in consultation with interested stakeholders, post-consent.

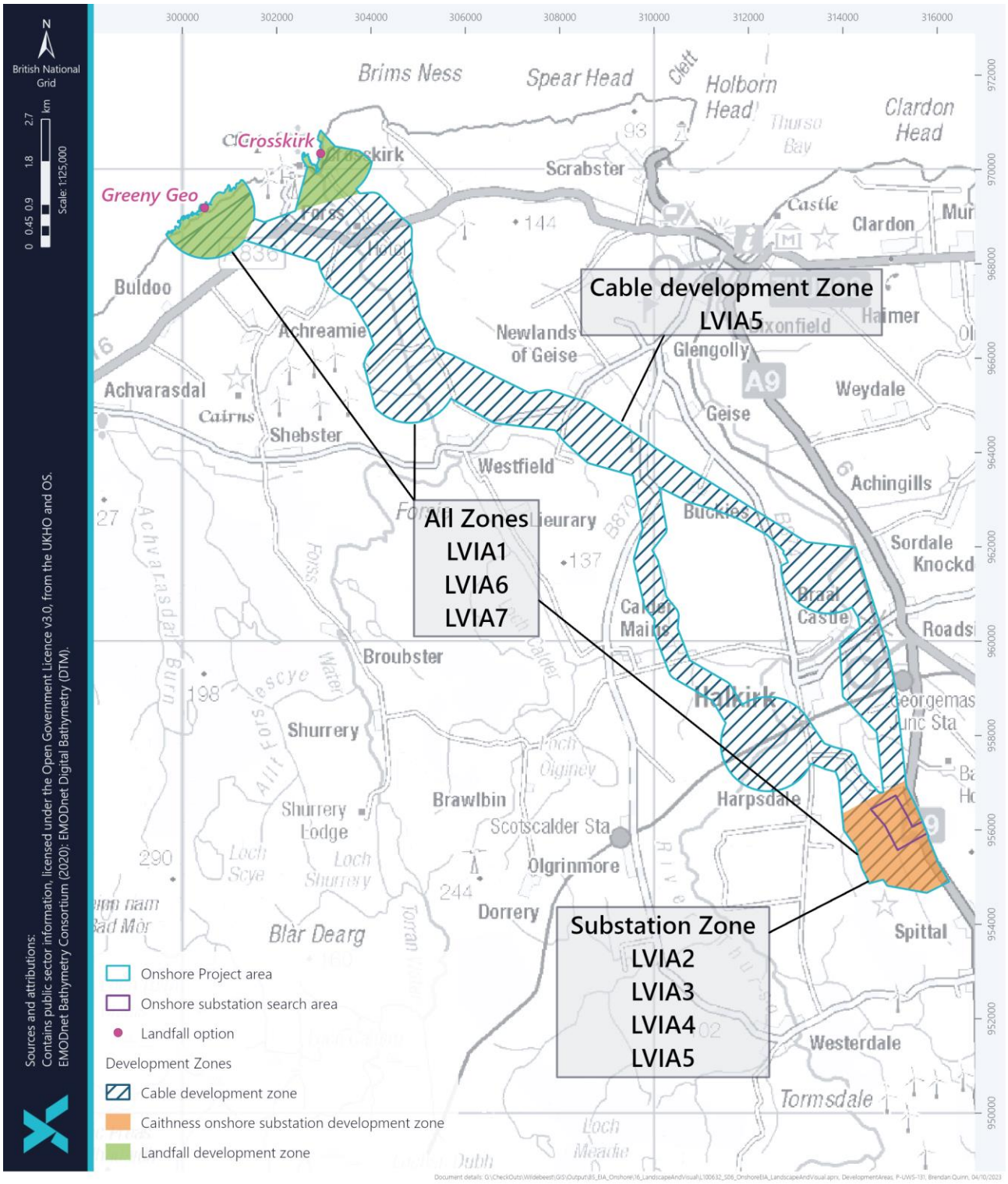

Figure 17-2 Development Zones for the onshore PPP Application

Table 17-22 Embedded mitigation measures relevant to landscape and visual receptors

ID	MITIGATION MEASURE	TYPE	DESCRIPTION	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE
LVIA1	Onshore construction	Primary	Siting of construction compounds and set down areas to respond to sensitive receptors. Suitable temporary route to be provided during construction stage and duration of diversion of Core Path to be minimised.	Established within the design principles post-consent (secured through Construction Method Statements (CMSs)).	All zones.
LVIA2	Onshore substation site location and design	Primary	The site selection and iterative design of the onshore substation location and layout has been a key process which has considered the potential impacts to landscape and visual receptors. The location of the onshore substation will be immediately west of the preferred SHET-L Spittal 2 substation where this area has a strong influence of this type of infrastructure. Additionally, a linear arrangement is proposed to enable the onshore substation to be set back from the A9 and to respond to the existing terrain. The colour of the onshore substation and structures will be a recessive colour such as dark brown or grey to further reduce visual impact.	Established within the design principles post-consent (secured through CMSs). Detailed design will be post-consent and must be approved by THC prior to development commencing.	Substation zone.

ID	MITIGATION MEASURE	TYPE	DESCRIPTION	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE
LVIA3	Landscape screening	Primary	Landscape bunding is a fixed development parameter with specific design principles including: • Slopes will be varied, with an average slope of 1:6, and a recommended maximum slope of 1:4 to the outer faces; • 'Internal' slopes adjacent to the development platform can be steeper and/or make use of retention; • The bunds will have rounded and varied tops and toes, and their shape should respond to the existing landforms within the surrounding context where possible; • The maximum height of the landscape bunds will be determined by the requirement to screen the onshore substation from the surrounding visual receptors and for noise mitigation; • No level changes are possible within the flood plain; and • No bunding is possible over the cable corridors around the development platform. The detailed design will take place post-consent.	Established within the design principles post-consent (secured through Construction Method Statements (CMSs)). Detailed design will be post-consent and must be approved by THC prior to development commencing.	Substation zone.
LVIA4	Landscape planting	Primary	Proposed native tree / shrub planting will be used to soften views of the proposed bunds and to integrate the bunds into the wider landscape. The planting will be designed to enhance biodiversity within the onshore substation area, including a mix of wildflower meadow, shrub planting and mixed native woodland.	Established within the design principles post-consent (secured through Construction Method Statements (CMSs)). Detailed design will be post-consent and must be approved by THC prior to development commencing.	Substation zone.

ID	MITIGATION MEASURE	TYPE	DESCRIPTION	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE
LVIA5	Reinstatement of terrain and ground cover	Primary	Reinstatement of terrain and ground cover, where possible, to avoid any impacts on the visual and landscape amenity by the underground onshore export cables.	Established within the design principles post-consent (secured through Construction Method Statements (CMSs)). Detailed design will be post-consent and must be approved by THC prior to development commencing.	Cable development zone and substation zone.
LVIA6	Engagement with affected landowners, asset owners and members of the public	Tertiary	Close liaison with affected landowners, asset owners and members of the public will be maintained during planning, and construction stages to ensure they are fully aware of proposals and sequence of construction activities and how these may interact with planned land use activities.	External communication with the community, landowners and asset owners will be undertaken by the Community Liaison Officer (CLO). The requirement for a CLO will be secured through a condition attached to the PPP.	All zones.
LVIA7	Decommissioning, Restoration and Aftercare Plan	Tertiary	A Decommissioning, Restoration and Aftercare Plan will be prepared for the onshore Project and agreed with THC prior to decommissioning works being undertaken. The plan will include any measures required for landscape and visual receptors during decommissioning which are likely to be similar to those proposed within the Construction Environmental Management Plan (CEMP).	Established within the design principles (secured through the CMSs) and the Decommissioning, Restoration and Aftercare Plan which will be secured through conditions attached to the PPP.	All zones.

17.5.4.1 Design evolution of onshore substation

The onshore substation will introduce a substantial scale of new energy infrastructure into the landscape. Although the onshore substation provides an indicative layout only, with detail design to be undertaken at a later stage, there has been a process of landscape-led design evolution in order to address the likely landscape and visual effects as a result of this type of infrastructure and established landscape mitigation principles that can form the embedded mitigation for the onshore Project. This was developed through landscape mitigation memoranda and design workshops to ensure the mitigation measures are technically feasible.

Figure 17-3 illustrates the initial substation area identified in an early version of the Project Design Envelope (PDE) which had dimensions of 520 x 460 m.

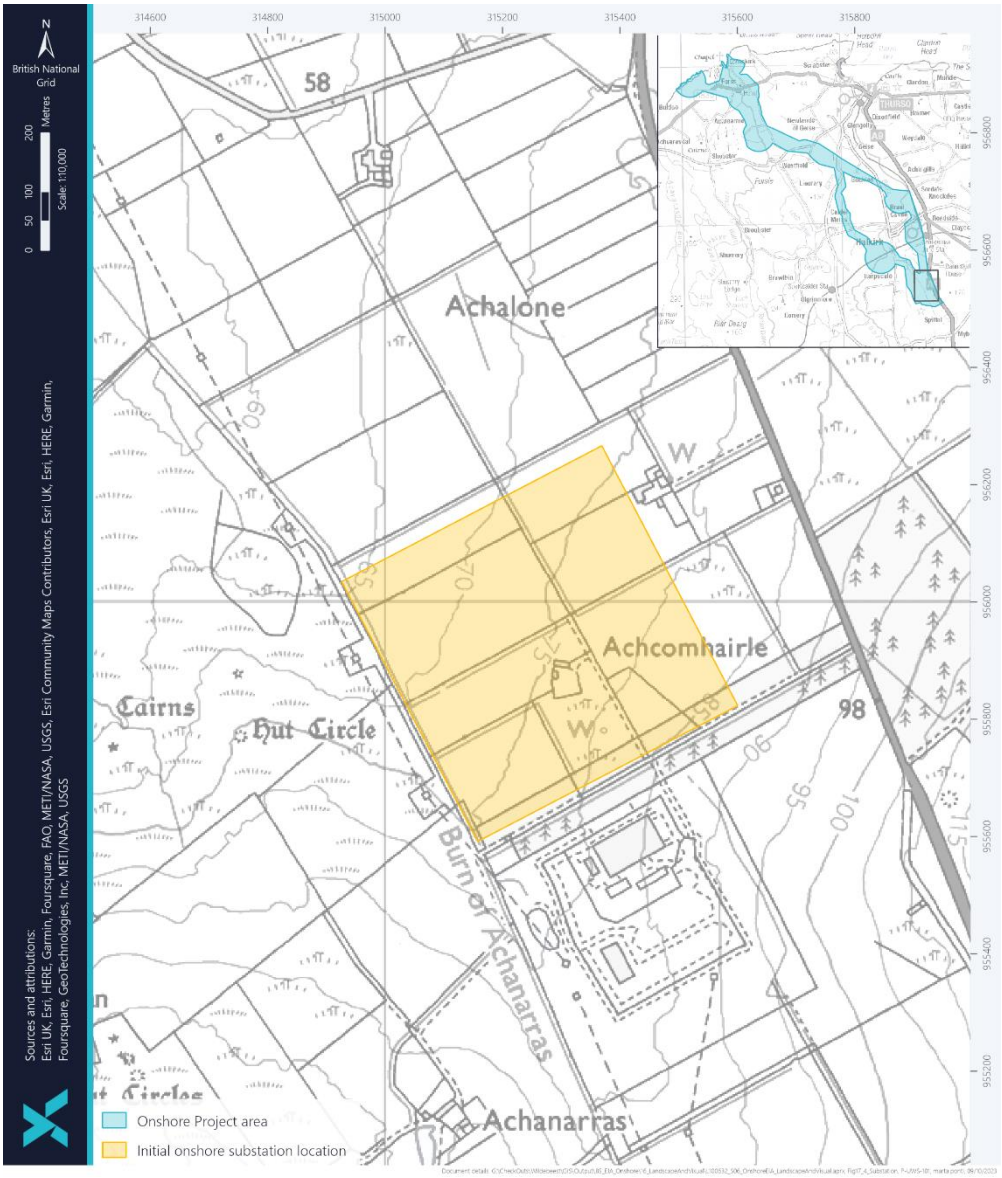

Figure 17-3 Initial indicative substation development platform

In order to maximise the natural screening of the onshore substation, the indicative development platform was amended to address the following recommendations:

- Locate the development as low as possible in the landscape;
- Undertake land forming to screen the site from key sensitive views as far as reasonably possible; and
- Introduce planting to reinforce the screening.

Taking into consideration the above recommendations, the design of the indicative onshore substation was amended to a long thin arrangement that could be located on the lower part of the onshore substation search area and further away from the A9(T), as illustrated on Figure 17-4.

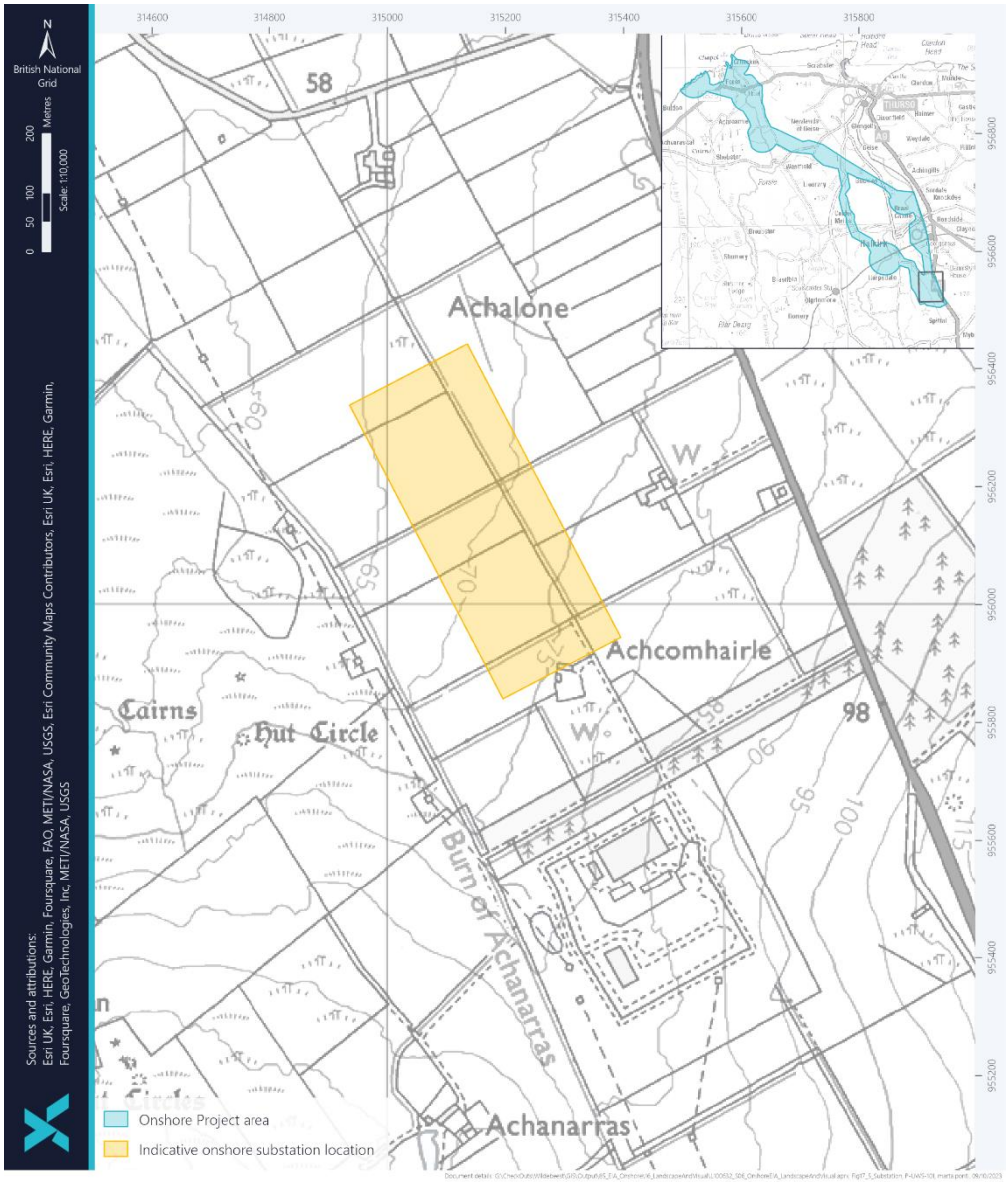

Figure 17-4 Recommended indicative onshore substation

The cross sections shown in Figure 17-5 illustrate the difference between a square substation layout and a linear layout within the onshore substation area in terms of the associated cut and fill as well as the potential set back from the A9(T).

The indicative onshore substation layout was developed through a series of design workshops with the Project development and technical teams, alongside other EIA specialists (specifically archaeological and noise specialists). This ensured the indicative layout is technically feasible, including the gradient of access into the onshore substation, balancing cut and fill, implementing noise mitigation measures, and avoiding earthworks within the flood risk area along the Achanarras Burn and also took account of other mitigation requirements with respect to archaeological setting.

Figure 17-6 illustrates the proposed landscape mitigation based on the current indicative layout. The Project design can only be finalised once detailed design has been carried out and therefore the landscape mitigation proposals can only be fixed once the detailed design has been fixed. Landscape mitigation design principles have been established for the onshore substation based on the indicative layout. Should there be a significant change in the proposed design, the design principles should be amended as appropriate.

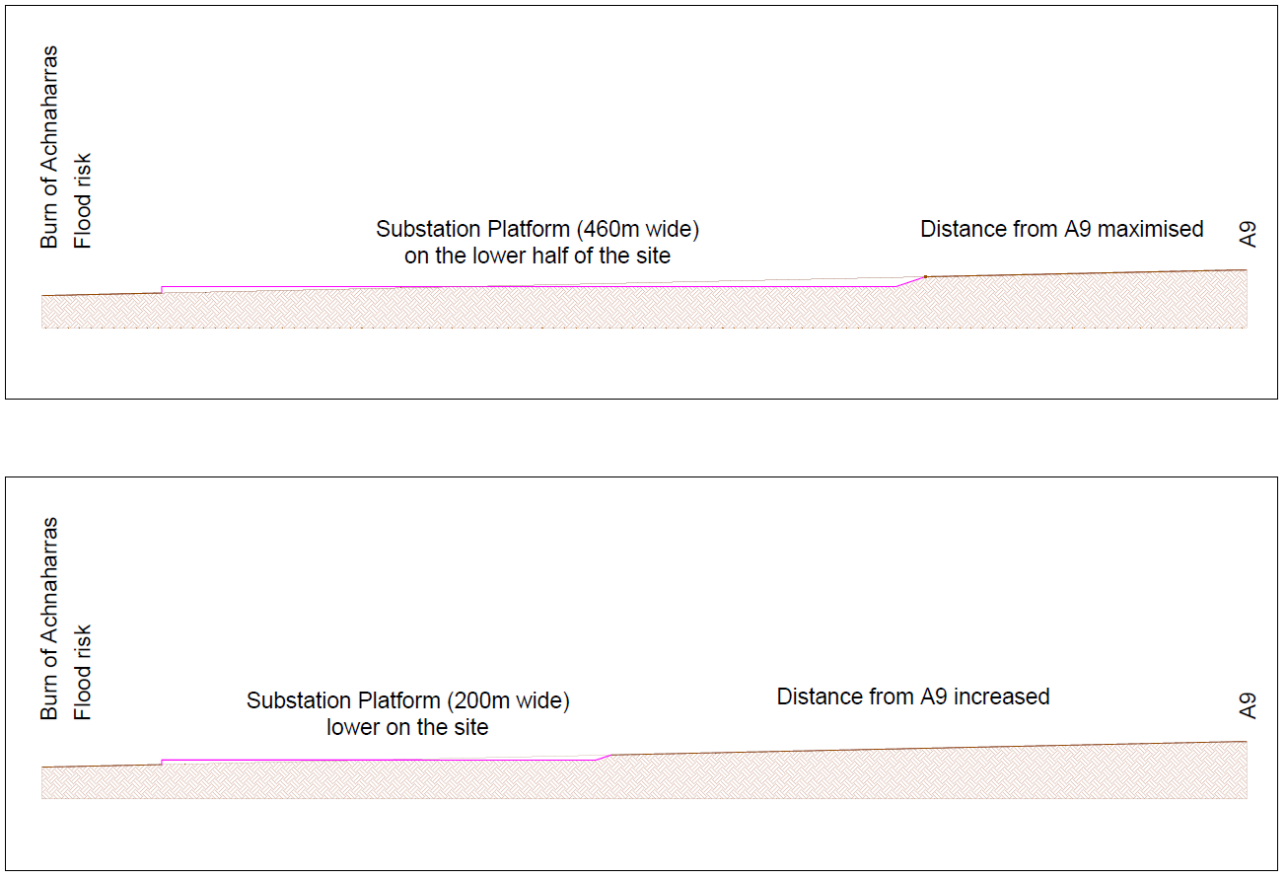

Figure 17-5 Cross sections comparing initial layout (square) with recommended layout (linear)

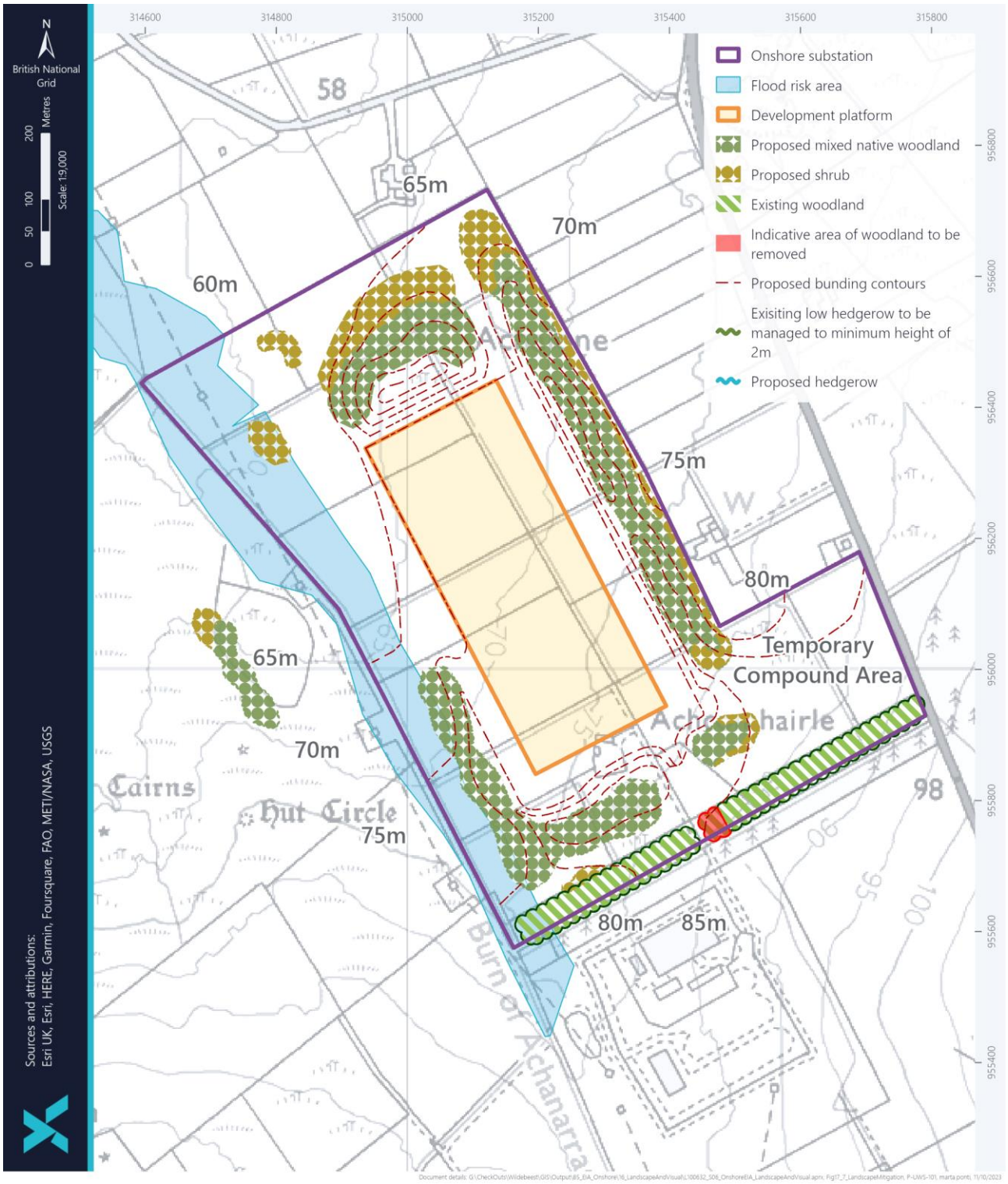

Figure 17-6 Landscape mitigation plan

Based on design development and consultation with THC and other stakeholders, the following presents the design principles as illustrated on Figure 17-6:

- Site location: The preferred location for the development platform location has been identified within the substation area of search, located to the north-west where it would make use of the natural enclosure provided by the Achanarras Burn and Achanarras and Spittal Hills. The preferred location for the development platform is located north of the access track to reduce the extent of cut and fill required and enable the development platform to be relatively low-lying in the landscape and set back from the A9(T);
- Site design: A linear arrangement is the preferred arrangement to enable the onshore substation to be set back from the A9(T) and respond to the existing terrain to reduce the extent of cut and fill required and ensure a better 'landscape fit';
- Development platform height and levels: The preferred level for the development platform level is set at 70 m AOD to balance cut and fill and achieve the best 'landscape fit' for a large, linear platform, with a maximum development height of 13.5 m (83.5 m AOD);
- Colours: Buildings and structures will be coloured in a recessive colour such as dark brown or dark grey;
- Landscape screening: Landscape bunds will be the principal means of screening the onshore substation. Whilst Figure 17-6 shows an indicative bunding layout, the following principles for the bunding design have been agreed:
  - Slopes will be varied, with an average slope of 1:6, and a recommended maximum slope of 1:4 to the outer faces;
  - 'Internal' slopes adjacent to the development platform can be steeper and/or make use of retention;
  - The bunds will have rounded and varied tops and toes, and their shape will respond to the existing landforms within the surrounding context where possible;
  - The maximum height of the landscape bunds will be determined by the requirement to screen the onshore substation from the surrounding visual receptors and for noise mitigation;
  - No level changes are possible within the flood plain; and
  - No bunding is possible over the cable corridors around the development platform.
- Landscape planting: Proposed native planting will be used to soften views of the proposed bunds and to integrate the bunds into the wider landscape. The planting will be designed to enhance biodiversity within the onshore substation area, including a mix of wildflower meadow, shrub planting and mixed native woodland; and
- Landscape restoration: Areas temporarily disturbed during construction will be restored to their previous condition.

Indicative sections were prepared to illustrate the height, position and profile of the proposed landscape bunds that are primary form of screening. Figure 17-7 shows the location of the sections and the indicative sections on Figure 17-8 illustrates the relationship between the indicative onshore substation and the surrounding landscape and visual receptors.

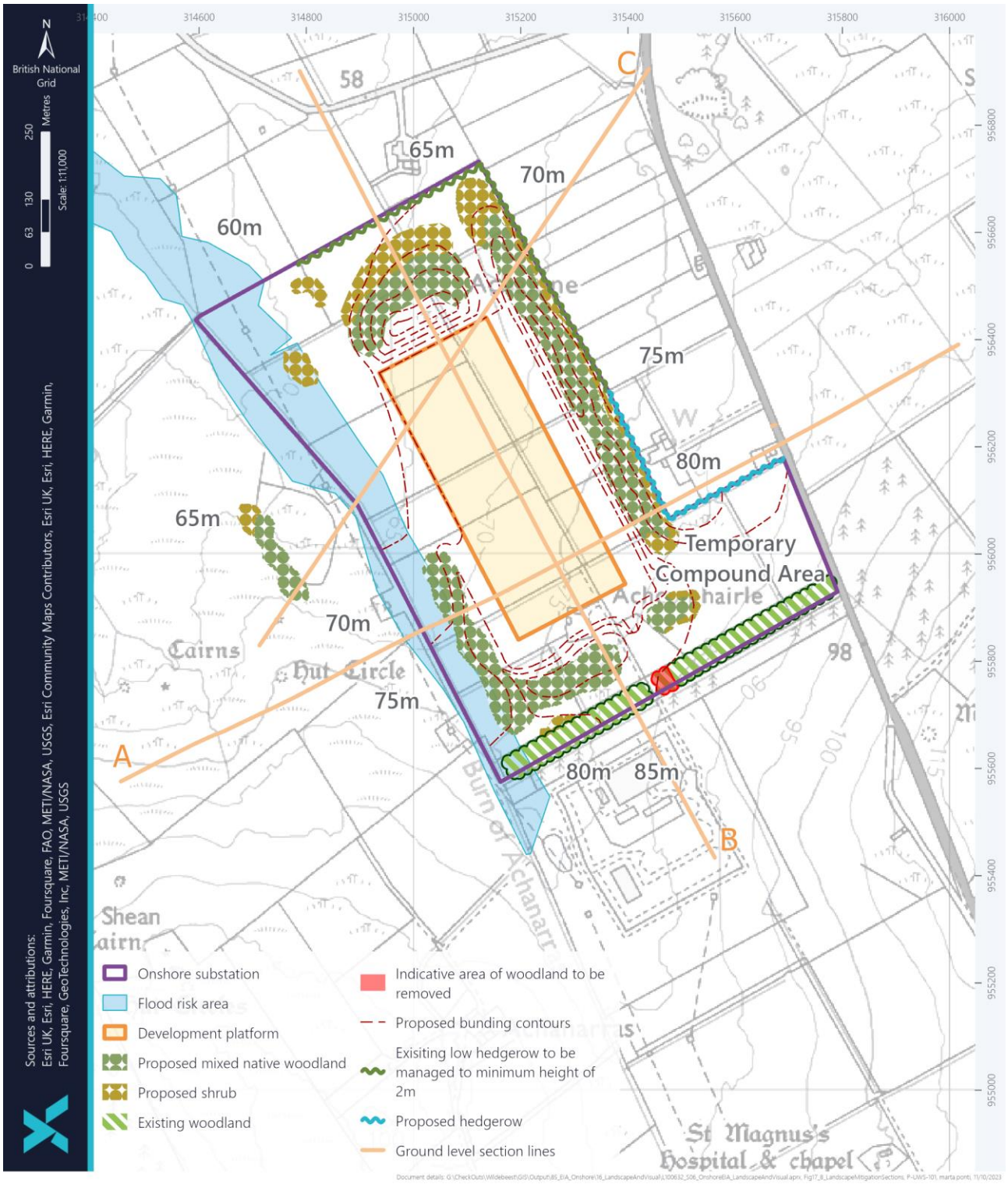

Figure 17-7 Landscape mitigation plan with section lines

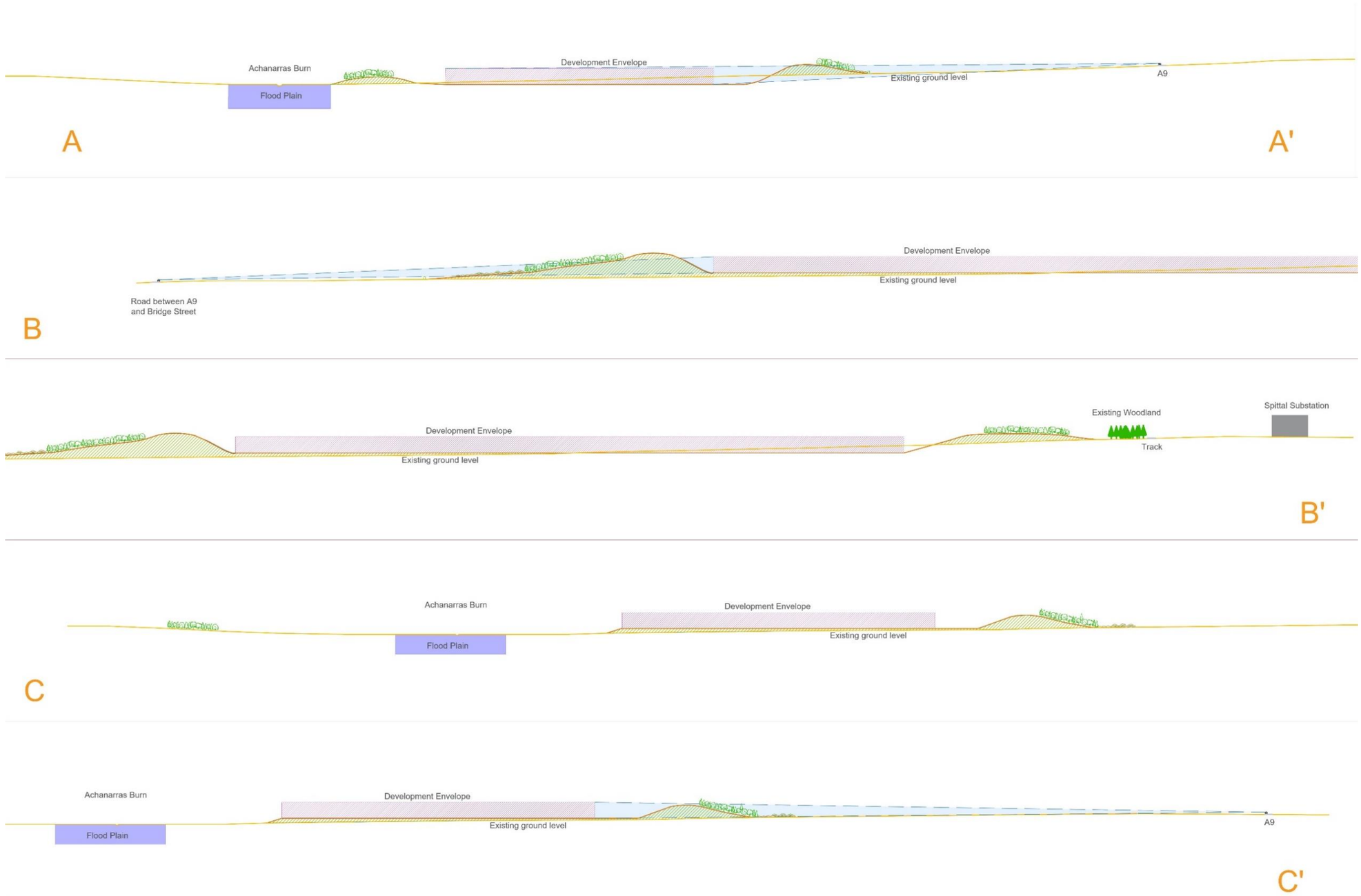

Figure 17-8 Landscape mitigation indicative cross sections

Note: the PDE represents the maximum height and spatial coverage of the onshore substation. In reality, it will not be a solid structure but a mix of buildings and electrical infrastructure.

17.5.5 Worst case scenario

As detailed in chapter 7: EIA methodology, this assessment considers the worst case scenario for the onshore Project parameters which are predicted to result in the greatest environmental impact, known as the 'worst case scenario'. The worst case scenario represents, for any given receptor and potential impact, the design option (or combination of options) that would result in the greatest potential for change.

Chapter 5: Project description describes the different elements of the onshore Project, and the worst case scenario with respect to landscape and visual receptors is summarised below.

17.5.5.1 Landfall of offshore cables and onshore export cable corridors

Up to five offshore export cables will make landfall, with two possible location options: one at Crosskirk and one at Greeny Geo, with the potential for landfall split between both sites. The landfall is the interface between the offshore and onshore aspects of the Project and construction work involves both offshore and onshore elements. Horizontal Directional Drilling (HDD), a trenchless installation, will be used for the landfall installation and permanent access roads are required at the HDD landfall site(s). A new track of approximately 770 m may be installed at Crosskirk and a combination of approximately 650 m of new track installed and 690 m of existing track to be improved at Borrowston Mains, as illustrated on Figure 17-9. At the landfall, concrete transition joint bays (TJB) will be required, with one per export cable.

From the TJB, up to five onshore export cables will be routed inland towards the onshore substation as underground cables buried in separate trenches.

17.5.5.2 Onshore substation

The onshore substation includes the electrical equipment required to connect the onshore Project to the grid, including switchgear, busbars, transformers, harmonic filters, reactive compensation devices, power electronics, protection equipment, batteries and other auxiliary equipment and control systems. The onshore substation will be above ground and secured by perimeter fencing, with some equipment located outdoors. The preferred location of the onshore substation is within the onshore substation search area as detailed in Table 17-23.

The assessment of the onshore substation is based on an indicative layout representing the 'worst case scenario' of an Air Insulated Structure (AIS) which comprises a larger development footprint, although the buildings are slightly shorter (half a metre) than for a Gas Insulated Structure (GIS). The assessment is based on an indicative development platform position as illustrated on Figure 17-6 and a development platform height of 70 m AOD and a development height 'envelope' of 13.5 m based on the busbar height, which is the tallest element. Internal access roads will be included within the footprint of the onshore substation.

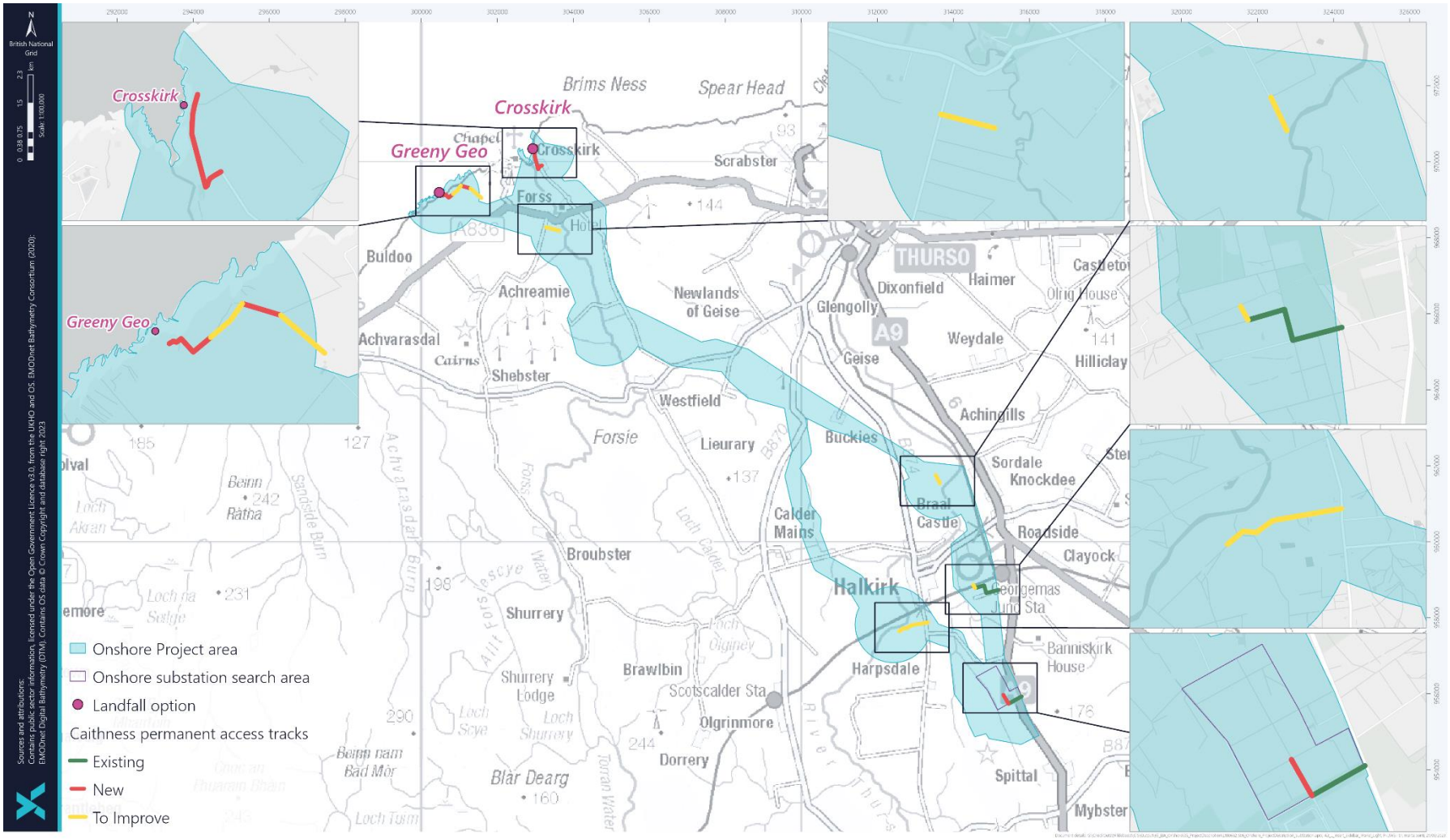

Figure 17-9 Permanent and temporary access tracks in the onshore Project area

The assessment considers the mitigation provided by proposed bunds and planting, as illustrated on Figure 17-6, with the following assumptions:

- Woodland planting mix comprises 70% broadleaf and 30% coniferous trees;
- Woodland planting at 60-70 centimetre (cm) at Year 1 and allowing for 5 m growth at Year 15 (based on an average of 1 m growth every 3 years); and
- Shrub planting at 40 cm at Year 1 and established at an average height of 2 m at Year 15.

The assessment of construction effects associated with the onshore Project is based on general assumptions, including:

- No overhead lines are being proposed;
- Micro-routing of the onshore export cable will where possible avoid woodland removal;
- Once installed, the onshore export cable corridor will be reinstated to its original habitat wherever possible;
- Temporary fencing to protect reinstalled areas, such as reinstated hedgerows, may be required during establishment; and
- Two construction 150 m x 150 m compounds will be required: one at landfall and one at the onshore substation, with 100 m x 100 m laydown compounds every 2 km along the cable route.

Given that the worst case scenario is based on the design option (or combination of options) that represents the greatest potential for change, confidence can be held that development of any alternative options within the design parameters will give rise to no worse effects than assessed in this impact assessment. Table 17-23 presents the worst case scenario for potential impacts on onshore LVIA during construction, operation and maintenance, and decommissioning.

Table 17-23 Worst case scenario specific to LVIA receptor impact assessment

POTENTIAL IMPACT	WORST CASE SCENARIO	JUSTIFICATION
Construction and decommissioning		
Temporary impacts of construction work of the landfall activities and onshore export cables on landscape effects and visual amenity	• A temporary HDD compound of up to 7,500 m^2; • A maximum of five onshore export cables buried to a depth of approximately 1 to 1.8 m and laid in a maximum of five trenches each up to 8 m wide at the top and 2 m wide at the bottom, with a working corridor of up to 100 m (total for all 5 cables), from landfall to the onshore substation, a maximum of 33 km. The working corridor will be temporary and reinstated following completion of the cable lay; • Creation of two 150 m x 150 m construction compounds (at landfall and substation) and 100 m x 100 m laydown compounds every 2 km along the cable route plus 200 m x 200 m site office and car park at the onshore substation; • Up to 288 Cable Joint Bays (CJBs) which will be covered by a tent or container during construction and following reinstatement, a manhole cover will be the only surface level structure visible of the cable corridor; • Trenchless methodologies will be used for crossing major roads, railway lines and main rivers, with working areas of up to 100 m x 30 m; • Potential requirement to fell some woodland at Hill of Howe and Sibster Forest depending on the final route of the onshore export cable; • Temporary access tracks for the landfall and along the onshore export cable route and seven permanent access tracks (indicative at this stage) across the onshore Project area; • Temporary access tracks (not including haul roads) up to 3,300 m in length at the landfall, the entry and exit points of the HDD points and the onshore substation. Lengths are indicative only; • Where possible, local infrastructure including road networks, farmer tracks and utility access roads will be utilised to minimise the construction of new infrastructure. Temporary bridges/spanning structure will be considered for appropriate locations for haul roads; and • Construction period of approximately 4 years.	Assessment of greatest size and number of areas affected by construction activity allows for assessment of the greatest effect on landscape and visual amenity. Assuming the loss of woodland within the cable corridor allows for the worst case scenario with respect to the loss of existing landscape features although the final route of the onshore export cable is still to be determined. Longest duration of construction is assessed to be the worst case.

POTENTIAL IMPACT	WORST CASE SCENARIO	JUSTIFICATION
Temporary impacts of construction work of the onshore substation on landscape effects and visual amenity	• Area of approximately 23.9 hectares (ha) for the substation, including earthworks to create level development platform and create landscape bunds; • Period of 24-hour working may be required for electrical equipment installation and initial set-up; and • Construction period of approximately 4 years.	Assessment of greatest footprint size of onshore substation allows for assessment of the greatest effect on landscape and visual amenity. Longest duration of construction is assessed to be the worst case.
Operation and maintenance		
Permanent impacts of operational stage of the onshore substation on landscape effects and visual amenity	• The full size of development area (including substation screening and bunding) is approximately 239,200 m^2 (23.9 ha); • Size of onshore substation platform (250 m x 520 m) based on AIS substation design for 'worst case scenario' of largest footprint necessary; • Maximum of 12 substation buildings to allow flexibility; • Maximum height of 13.5 m based on busbar height for the AIS scenario as this is considered to represent the 'worst case scenario', although a Gas Insulated Structure (GIS) design would require a building height of 14 m (but a smaller footprint); and • Lighting level ranging between 2.2 lux and 150 lux to illuminate the building and external area.	Maximum developed area would occupy the greatest extent of view and result in greatest landscape change.

17.6 Assessment of potential effects[6]

The assessment of potential landscape and visual effects considers the likely effects during the four year construction stage, and during operation and maintenance stage, assessing the effects on completion, at Year 1, and the residual effects at Year 15 when proposed planting will be established and starting to mature and the new infrastructure has weathered and 'dulled' over time. No residual Year 1 affects are assessed as the mitigation is embedded, and the mitigation planting takes time to establish.

Due to the underground nature of the onshore export cable corridor, no significant permanent effects are likely to occur, as described in section 17.5.2. Therefore, the assessment describes the likely construction effects associated with the onshore export cable corridor but the effects attributable to the operational and maintenance stages of the onshore export cable are not assessed further in detail upon landscape and visual receptors.

With respect to the onshore substation, the construction activities are likely to be more noticeable than the operational onshore substation due to the noise and movement and change associated with construction works, however they are temporary and short term and are therefore likely to result in the same magnitude of change as the operational stage effects. Therefore, the effects attributable to the construction stage of the onshore substation are not assessed in further detail in the following section.

17.6.1 Potential effects during operation and maintenance

17.6.1.1 Potential landscape character effects from the onshore substation

Permanent landscape effects as a result of the onshore Project are likely to occur as a result of the onshore substation, which will introduce large scale energy infrastructure into a relatively flat and open landscape. (see SS17: LVIA figure pack) illustrate the regional and LLCTs within the onshore substation study area. The assessment was undertaken based on the likely effects on the LCTs as a whole, not just the portions that fall within the onshore substation study area, as detailed below.

17.6.1.1.1 Farmed Lowland Plain LCT

The Farmed Lowland Plain LCT is generally characterised by an open, low-lying plain, gently undulating to form shallow broad valleys and with occasional smooth hills forming local landmarks. Land cover is predominantly agricultural with sparse woodland, which includes angular coniferous plantations and large conifer woodlands at the transition with the Sweeping Moorland and Flows LCT. Farm buildings and houses form focal points within the landscape and roads reinforce the settlement pattern. A number of historic features, including castles, mansions and 'Lairds' houses, usually with broadleaf shelter woods planted around them as well as brochs and cairns dotted across farmland. Small groups of large wind turbines sited on some of the low ridges and hills and prominent visibility of

[6] *Construction impacts are assessed in section 17.6.2.*

larger windfarms in adjacent LCTs. There are extensive views due to the openness of the landscape, and the clarity of northern air and light.

The Farmed Lowland Plain LCT is generally not subject to landscape designations, although there are some areas locally designated as Special Landscape Areas (SLAs). The Farmed Lowland Plain LCT is generally exposed and open, with a simple landform, although the landscape is a managed and modified landscape. To the north, the Farmed Lowland Plain LCT is defined by the sea and coastal edge, which is regarded as having higher susceptibility to the type of development proposed. The sensitivity of the LCT is therefore assessed as medium-low.

The onshore substation will introduce large scale energy infrastructure into the Farmed Lowland Plain LCT, replacing agricultural fields. The proposed landscape bunds will physically and visually contain the onshore substation, although the bunds will alter the character of the landscape within the area of search. Spittal and Achanarras Hills and the associated vegetation provide further containment of the onshore substation and bunds. The onshore substation is located immediately adjacent to the existing SHET-L Spittal substation and overhead lines, where the existing landscape is influenced by existing large scale energy infrastructure.

The onshore substation will have a very localised effect on the Farmed Lowland Plain LCT, within a part of the LCT that has relatively lower sensitivity to the type of development proposed. Therefore, a low magnitude of change is likely to occur at Year 1.

Evaluation of significance

Taking account of the medium-low sensitivity and low magnitude, the level of effect is therefore assessed as minor and not significant in EIA terms.

SENSITIVITY	MAGNITUDE OF CHANGE	LEVEL OF EFFECT
Medium-low	Low	Minor

Significance of effect - NOT SIGNIFICANT

17.6.1.1.2 Mixed agriculture and settlement LLCT

The mixed agricultural and settlement LLCT is generally characterised by a wide open landscape dominated by a horizontal emphasis. The occasional hill or woodland defines spaces at a more local level. The LLCT has a simple landform that is covered by a confusion of physical, cultural and experiential characteristics.

The mixed agricultural and settlement LLCT is generally not subject to landscape designations. The LLCT is generally exposed and open, with a simple landform, although the landscape is a managed and modified landscape. The sensitivity of the LCT is therefore assessed as low.

The onshore substation will introduce large scale energy infrastructure into the mixed agricultural and settlement LLCT, replacing agricultural fields. The proposed landscape bunds will physically and visually contain the onshore substation, although the bunds will alter the character of the landscape within the area of search. Spittal and Achanarras Hills and the associated vegetation provide further containment of the onshore substation and bunds.

The onshore substation is located immediately adjacent to the existing SHET-L Spittal substation and overhead lines, where the existing landscape is influenced by existing large scale energy infrastructure.

The onshore substation will have a very localised effect on the mixed agricultural and settlement LLCT, within a part of the LCT that has relatively lower sensitivity to the type of development proposed. Therefore, a low magnitude of change is likely to occur at Year 1.

Evaluation of significance

Taking account of the low sensitivity and low magnitude, the level of effect is therefore assessed as minor and not significant in EIA terms.

SENSITIVITY	MAGNITUDE OF CHANGE	LEVEL OF EFFECT
Low	Low	Minor

Significance of effect - NOT SIGNIFICANT

17.6.1.1.3 Lone mountains LLCT

The lone mountains LLCT is generally characterised by individual mountains that lie within an open 'sea' of moorland. The focal dominance of the mountains means that their influence typically extends far into other LCTs. Spittal Hill LLCT is a local focal point although it is described as being at the lower and less dramatic end of the range of lone mountains in Caithness.

The Spittal Hill LLCT is less characteristic of the lone mountains LLCT generally due to its closer relationship with the more varied and settled mixed agriculture and settlement LLCT and its relatively lower and less dramatic height and scale. The LLCT is not subject to any landscape designations and there are no core paths or public viewpoints from the Spittal Hill LLCT itself. Existing large scale energy infrastructure is present within the immediate setting of the LLCT, including the existing SHET-L Spittal substation and Causeymire Windfarm. The sensitivity of the LCT is therefore assessed as low.

The onshore substation will introduce additional large scale energy infrastructure into the LLCT to the immediate West of the LLCT, replacing agricultural fields. The onshore substation is located within the lower-lying land along the Achanarras Burn and proposed landscape bunds will physically and visually contain the onshore substation. Therefore, the onshore substation is unlikely to detract from Spittal Hill as a focal point within the local landscape. A low magnitude of change is likely to occur at Year 1.

Evaluation of significance

Taking account of the low sensitivity and low magnitude, the level of effect is therefore assessed as minor and not significant in EIA terms.

SENSITIVITY	MAGNITUDE OF CHANGE	LEVEL OF EFFECT
Low	Low	Minor
Significance of effect - NOT SIGNIFICANT		

17.6.1.2 Potential visual amenity effects from the onshore substation

The assessment of effects on visual amenity during operation and maintenance is based on the onshore substation on completion, at Year 1, and Year 15, once the proposed planting has established and is starting to mature. The viewpoint photography and visualisations have informed the judgements made, and the detailed descriptions and assessments of each of the eight viewpoints are set out in in SS16: LVIA viewpoint assessment and should be read alongside the visualisations (the photographs, wirelines and photomontages) supporting this LVIA (VP1-VP8a-k (SS18: LVIA visualisation pack and SS19: Terrestrial archaeology onshore setting supporting visualisations). The locations of each viewpoint are shown on the ZTV (SS17: LVIA figure pack).

17.6.1.2.1 Settlements and residents

Visual receptors such as settlements, townships and hamlets, and residents of individual properties outwith settlements are regarded as having high sensitivity to the type of onshore Project proposed.

The following Table 17-24 identifies effects attributable to the onshore Project.

Table 17-24 Settlements and residents

SETTLEMENTS & RESIDENTS	DISTANCE / DIRECTION	DESCRIPTION	MAGNITUDE OF CHANGE	LEVEL OF EFFECT YEAR 1	LEVEL OF RESIDUAL EFFECT YEAR 15
Halkirk (Viewpoint & Visualisation 6)	2.6 km / NW	Halkirk is located approximately 2.6 km to the north-west of the onshore substation and due to the relatively flat nature of the landscape, potential views of the onshore substation are limited to the properties along the southern edge of Halkirk which have open views across the landscape. The energy infrastructure within the onshore substation would not be visible from Halkirk, however the proposed landscape bund would be visible, as illustrated by Viewpoint and Visualisation 6 in the immediate vicinity of the onshore substation, seen to the West of Spittal Hill. The onshore Project would therefore introduce a new landscape feature into the view as well as reduce the extent in which energy infrastructure is visible within the view. Over time, the establishment of the proposed planting, and change to maintenance of the existing hedgerow as a fuller, taller hedge, will soften the form of the landscape bund and help to integrate it into the wider landscape setting.	Low	Moderate-Minor (not significant)	Minor (not significant)
Harspdale (Viewpoint & Visualisation 1)	1.7 km / W	Harpsdale is located approximately 1.7 km to the west of the onshore substation area, along Bridge Street to the south of Halkirk. There are relatively open views towards the onshore substation, although occasional woodland blocks filter or enclose views, including trees within the curtilage of residential properties. Viewpoint and Visualisation 1 illustrates an open view from Harpsdale towards the onshore substation. The onshore substation will introduce new industrial infrastructure into the view, replacing views of open fields and existing houses. The onshore substation is backclothed by the proposed landscape bunds and the rising landscape beyond.	Medium	Moderate (significant)	Moderate-Minor (not significant)

SETTLEMENTS & RESIDENTS	DISTANCE / DIRECTION	DESCRIPTION	MAGNITUDE OF CHANGE	LEVEL OF EFFECT YEAR 1	LEVEL OF RESIDUAL EFFECT YEAR 15
Residential properties along the A9(T) **(Viewpoints & visualisations 4 and 5)**	From 15 m / E to 260 m / E	The onshore substation itself will not be visible from the residential properties along the A9(T) due to the proposed landscape bunds, and therefore the views will not be affected by the industrial nature of the large-scale substation. However, there will be a loss of open views of the valley floor and a change from low-lying, open agricultural fields to one of vegetated landscape bunds. The landscape bunds will be set back from the road, beyond existing fields that separate the residential properties and the onshore substation, as illustrated by Viewpoints and Visualisations 4 and 5. A high-medium to medium magnitude of effect to residents on the A9(T) is therefore anticipated, depending on the proximity of the residents to the onshore substation. Over time, the proposed planting will soften the form of the landscape bunds and reflect the wooded character of the landscape around Achanarras Burn within the residential views.	High-Medium to Medium	Major-Moderate to Moderate (significant)	Moderate to Moderate-Minor (significant to not significant)
Residential properties along the road to Halkirk, between A9(T) and Bridge Street **(Viewpoints & Visualisations 5 and 6)**	From 78 m / N to 222 m / NE	There are scattered residential properties to the south of Halkirk, including along the road between the A9(T) and Bridge Street, as illustrated by Viewpoints and Visualisations 5 and 6. The onshore substation itself will not be visible within the view as it will be screened by the proposed landscape bunds in views from residential properties along the unclassified road. Therefore, views will not be affected by the industrial nature of the large-scale substation. However, there will be a loss of open views along the valley floor and a change from low, open agricultural fields to enclosing, vegetated landscape bunds in views towards the onshore substation area. The existing view is contained by the large built form of the existing SHET-L Spittal Substation, and by Spittal Hill and the vegetated higher ground of Achanarras Hill to the east (left of the view) and west (right of the view), respectively.	High-Medium to Medium	Major-Moderate (significant)	Moderate (significant)

SETTLEMENTS & RESIDENTS	DISTANCE / DIRECTION	DESCRIPTION	MAGNITUDE OF CHANGE	LEVEL OF EFFECT YEAR 1	LEVEL OF RESIDUAL EFFECT YEAR 15
		The landscape bund would be set back from the road, beyond Achalone Farmstead and the associated fields. Whilst the landscape bund will introduce a new feature into the view, it will also screen the existing SHET-L Spittal substation and part of the existing overhead lines, reducing the prominence of infrastructure within the view. Views from residential properties along the local road are fixed, with some direct views towards the onshore substation and some oblique views, depending on the orientation of the properties. Overall, a high-medium to medium magnitude of effect is anticipated for residents along the unclassified road, depending on their orientation and proximity to the onshore substation area. Over time, the proposed planting and changes to the management of the existing hedgerow into a fuller hedge.			

17.6.1.2.2 Recreational receptors

Although core paths provide views that are transient in nature, the recreational users of core paths are considered to be sensitive to changes in visual amenity and are therefore considered as having high sensitivity to the type of onshore Project proposed. Table 17-25 describes the likely effects on users of core paths.

Table 17-25 Recreational receptors

CORE PATH	DISTANCE / DIRECTION	DESCRIPTION	MAGNITUDE OF CHANGE	LEVEL OF EFFECT YEAR 1	LEVEL OF RESIDUAL EFFECT YEAR 15
Achanarras Core Path (Viewpoint & Visualisation 2)	From within 1.3 km / S	As illustrated by the ZTV (SS17: LVIA figure pack), views of the onshore substation are limited to the arrival point at Achanarras Quarry, with landform screening views to the south. Viewpoint and Visualisation 2 illustrate the nature of the existing and proposed views of the onshore substation. Whilst a medium-low magnitude of change is anticipated at this location, there would be no views of the onshore substation for users of the rest of the core path, and the onshore substation is peripheral to the main focus of the core path, which is the quarry. At Year 15, Torran Wood will have become even more mature and will screen more of the onshore substation, reducing the extent of open views of the electrical infrastructure from the core path.	Medium-Low to Negligible	Moderate-Minor to Negligible (not significant)	Minor to Negligible (not significant)
Core paths around Halkirk	From within 2.6 km / NW	Due to the flat nature of the landscape, views towards the onshore substation are screened and filtered by intervening built form, infrastructure and vegetation.	Negligible	Negligible (not significant)	Negligible (not significant)

17.6.1.2.3 Transport routes

The onshore substation is not visible from promoted tourist routes such as the NC500 or NCR1, including the A836. Views of the onshore substation are transient and from routes through landscapes that are not designated. However, users of the routes include tourists and recreational visitors to the area, and therefore the receptors are considered to have medium sensitivity to changes to visual amenity. It is noted however that these routes would also be used by road users of lower sensitivity who may be commuting or working. Those road links that are of relevance to the onshore substation are detailed in section 17.4.4.3.3. Table 17-26 describes the likely effects of the onshore substation on users of transport routes which includes those road links and railway users.

Table 17-26 Transport routes

ROUTES	DISTANCE / DIRECTION	DESCRIPTION	MAGNITUDE OF CHANGE	LEVEL OF EFFECT YEAR 1	LEVEL OF RESIDUAL EFFECT YEAR 15
Users of A9(T) between Spittal and Georgemas Junction **(Viewpoints & Visualisations 3, 4 & 5)**	Between 0 m / E and 2.6 km N	As illustrated by the ZTV, approximately 7 km of the A9(T) has views of the onshore substation area, although vegetation and built form limit views of the onshore substation beyond Banniskirk to the North. Viewpoints and Visualisations 3, 4 and 5, illustrate sequential views from the A9(T) looking west towards the onshore substation. There would be extremely limited glimpsed views of the energy infrastructure itself within the onshore substation area from the A9(T) due to the proposed landscape bunding. Therefore, the onshore substation would result in a change in visual amenity, but it would ultimately be as a result of the introduction of landscape bunds into the view and not of additional energy infrastructure, with open views retained over the top of the onshore substation and landscape bunds. The landscape bunds will also slightly reduce the extent of energy infrastructure visible from the A9(T) although they will also screen views	Medium-Low to Negligible	Moderate-Minor to Negligible (not significant)	Minor to Negligible (not significant)

ROUTES	DISTANCE / DIRECTION	DESCRIPTION	MAGNITUDE OF CHANGE	LEVEL OF EFFECT YEAR 1	LEVEL OF RESIDUAL EFFECT YEAR 15
		down into the valley floor around Achanarras Burn and towards Achanarras Hill and the associated woodland. Road users of the A9(T) travelling southbound are likely to experience a medium magnitude of change along approximately 1.7 km of the route (approximately 1 minute for a car and 5 minutes for a bike), in the immediate vicinity of the onshore substation. Northbound road users of the A9(T) are likely to experience a medium-low magnitude of effect due to the peripheral nature of views of the onshore substation over a distance of approximately 1 km (approximately half a minute for a car and 2 and a half minutes for a bike). Overall, road users of the A9(T) between Spittal and the Georgemas Junction are likely to experience a medium-low to negligible magnitude of effect.			
Users of Bridge Street South of Halkirk (C1018) **(Viewpoint & Visualisation 1)**	From within 1.3 km / W	Approximately 3.4 km of Bridge Street, south of Halkirk, has views of the onshore substation area, although open views are occasionally interrupted by built form and vegetation. Viewpoint and Visualisation 1 illustrate a view from Bridge Street in Halkirk, looking east towards the onshore substation. Road users of Bridge Street have peripheral views of the onshore substation travelling north, with more open and prominent views of the onshore substation when travelling south and immediately west of the onshore substation. The electrical infrastructure within the onshore substation will be visible from Bridge Street, albeit backclothed by the landform beyond and contained by the proposed landscape bunds to the north.	Medium-Low	Moderate-Minor (not significant)	Minor (not significant)

ROUTES	DISTANCE / DIRECTION	DESCRIPTION	MAGNITUDE OF CHANGE	LEVEL OF EFFECT YEAR 1	LEVEL OF RESIDUAL EFFECT YEAR 15
Users of C1014 (extending between A9(T) and Bridge Street **(Viewpoints & Visualisations 5 and 6)**	From within 185 m / N	There are potential views of the onshore substation from the entire 2.5 km road, although views are interrupted by vegetation and built form occasionally. Viewpoints and Visualisations 5 and 6 illustrate sequential views from the road south of Halkirk, between the A9(T) and Bridge Street, looking south towards the onshore substation from the immediate vicinity of the onshore substation area. There would be fleeting glimpsed views of the energy infrastructure within the onshore substation along the onshore cable corridor, with the main change in views arising as a result of the proposed landscape bunds. The bunds would create foreshortened views towards Achanarras Hill and the associated woodland but would also partially screen existing energy infrastructure. The magnitude of change will vary along the route but will range between high-medium and medium-low.	High-Medium to Medium-Low	Moderate to Minor (significant)	Moderate-Minor to Negligible (not significant)
Users of Wick to Inverness Railway Route between Scotscalder and Georgemas Junction	From within 2.2 km / N	There are potential views of the onshore substation along approximately 7.4 km of the railway route. Views from the railway line are likely to be similar to those experienced from the unclassified road to Halkirk, described above, but seen from a greater distance and with increased built form between the railway line and the onshore substation. Therefore, the magnitude of change will range between medium and low.	Medium to Low	Moderate-Minor to Negligible (not significant)	Minor to Negligible (not significant)

17.6.2 Potential effects during construction

Construction activities are temporary in nature, however, people notice movement and active change more than they notice fixed objects. Construction activities include the presence of site machinery, often with hazard lights, and the general noise and activity associated with construction works are likely to attract attention and add disturbance and change to areas that are currently relatively tranquil and more static. The construction stage also requires a larger area than the operational Project due to the need for additional area for construction compounds, welfare, temporary construction access and areas for storage and parking.

As discussed above, the effects attributable to the construction stage of the onshore substation are not assessed in further detail as they are likely to be the same as the operational stage effects at Year 1 due to their more intensive but temporary nature. Whilst the layout and construction sequence is indicative only at this stage, it is considered reasonable to assume that initial onshore substation works will comprise the creation of the access and construction compound and that the bunds will be largely in place prior to fitting out the onshore substation, due to the need for access and the commissioning works of the onshore substation taking place towards the end of the construction programme.

With respect to the landfall(s) and the onshore export cable corridor, construction activities would involve the creation of construction compounds, stripping and stockpiling material, digging trenches and installing underground cables, and reinstating the disturbed areas on completion. Some tree and woodland removal may be required, which would result in a longer-term, but localised effect on landscape character.

Construction access tracks predominantly make use of existing tracks and temporary access tracks, with approximately seven permanent access tracks proposed across the onshore Project area as illustrated on Figure 17-9.

A construction programme of four years has been assumed, with the onshore substation works taking place over three years and a year after the onshore export cable works have commenced, as detailed in chapter 5: Project description.

17.6.2.1 Potential landscape character effects from landfall activities and onshore export cables installation

17.6.2.1.1 Farmed Lowland Plain LCT

The onshore Project area is located almost entirely within the Farmed Lowland Plain LCT. Construction of the landfall(s) and onshore export cable corridor will introduce construction activities into the LCT over a corridor of up to a maximum of 100 m wide and 33 km long from the coast at Crosskirk and/or Greeny Geo to the north-west to the onshore substation area to the south-west. Whilst structures, stockpiles and machinery associated with the construction works will be visible, much of the construction activity comprises trenching and piling rather than the creation of permanent above-ground structures and infrastructure. Vegetation affected by the onshore cable corridor route will be removed, which is predominantly agricultural fields and hedgerow boundaries, but may include some woodland. Overall, there will be a small change to existing landscape elements and character, albeit over an extensive area, with fields returned to agricultural use and field boundaries and vegetation reinstated wherever possible.

Overall, a low magnitude of change is likely to occur. The Farmed Lowland Plain LCT is considered to be of medium-low sensitivity to the type of development proposed (the installation of underground cables).

Evaluation of significance

Taking this medium-low sensitivity and low magnitude into account, the level of effect is therefore assessed as minor and not significant in EIA terms.

SENSITIVITY	MAGNITUDE OF CHANGE	LEVEL OF EFFECT
Medium-low	Low	Minor

Significance of effect - NOT SIGNIFICANT

17.6.2.1.2 Mixed agriculture and settlement LLCT

The mixed agriculture and settlement LLCT reflects the characteristics of the Farmed Lowland Plain LCT and broadly covers a similar area. Therefore, it is considered to have low sensitivity to the type of development proposed (the installation of underground cables). As assessed with respect to the Farmed Lowland Plain LCT, there will be a small and temporary change to the existing landscape elements and character, albeit over an extensive area, with fields returned to agricultural use and field boundaries and vegetation reinstated wherever possible. Overall, a low magnitude of change is likely to occur.

Evaluation of significance

Taking this low sensitivity and low magnitude into account, the level of effect is therefore assessed as minor and not significant in EIA terms.

SENSITIVITY	MAGNITUDE OF CHANGE	LEVEL OF EFFECT
Low	Low	Minor

Significance of effect - NOT SIGNIFICANT

17.6.2.1.3 Open, intensive farmland LLCT

The open, intensive farmland LLCT covers a small area at the coast at the Greeny Geo landfall option and comprises an area of more intensive farmland with a larger field pattern and a simple composition of elements. The LLCT is considered to have low sensitivity to the type of development proposed (the installation of underground cables) as it has a larger field system with less sensitive field boundary features to be affected by the type of development proposed but is more visually open. If landfall occurs at Crosskirk, a high-medium magnitude of effect is likely to occur on the LLCT due to the extensive area over which construction would occur.

Evaluation of significance

Taking this low sensitivity and high-medium magnitude into account, the level of effect is therefore assessed as **minor and not significant** in EIA terms.

SENSITIVITY	MAGNITUDE OF CHANGE	LEVEL OF EFFECT
Low	High-medium	Minor

Significance of effect - NOT SIGNIFICANT

17.6.2.2 Potential visual amenity effects from landfall activities and onshore export cables installation

17.6.2.2.1 Residential receptors

The nature of effects on residents of the settlements, hamlets and scattered properties within the LVIA onshore study area will vary depending on the final alignment of the landfall(s) and the onshore export cable corridor, however there is potential for significant effects on the visual amenity of residents during the construction stages due to their **high** sensitivity. Where there are views of the construction activities associated with the onshore export cable corridor, it will be of a discordant element within the view to which the eye is drawn due to the noise and movement associated with construction, and the structures and stockpiles associated with the construction compounds.

Affected residents within the onshore export cable study area are likely to experience effects that range between a **medium-low to high** magnitude of change.

Evaluation of significance

Taking this magnitude and high sensitivity of the residents into account, the level of effect is therefore assessed as **moderate-minor** to **major-moderate** and **significant** in EIA terms. This includes residents of Crosskirk, Forss, Halkirk, Harpsdale and scattered residents within the onshore export cable study area that lie outwith settlements and hamlets.

SENSITIVITY	MAGNITUDE OF CHANGE	LEVEL OF EFFECT
High	Medium-Low to High	Moderate-Minor to Major-Moderate

Significance of effect - SIGNIFICANT

17.6.2.2.2 Recreational and tourist receptors

Users of recreational and promoted tourist routes include user of the NC500, NCR1 and core paths within the onshore export cable study area. The attractive nature of the countryside and views of the surroundings are considered to be

an important contributor to the appreciation, experience and enjoyment of the users of recreational and tourist routes and destinations and therefore users are considered to have high-medium sensitivity to the type of development proposed (the installation of underground cables). Achanarras Quarry is a tourist destination promoted in guide books and on tourist maps, accessed by a core path, and of interest to fossil collectors, with medium value associated with views as the surroundings are considered to be a minor contributor to appreciation, experience and/or enjoyment of the quarry. Overall, visitors to Achanarras Quarry are considered to be of medium sensitivity.

Users of the NC500 and NCR1, which follows the A836 through the onshore export cable study area, will experience potential views of the construction works, with the onshore Project area encompassing approximately 3.5 km of the route, although the detail design of the onshore export cable corridor will refine the location and extent of the actual construction works area. Views of the construction works are slightly contained by the landform which falls gently towards the Forss Water, and by the screening effect of landform and vegetation. However, where views are possible, the construction works will introduce a discordant element into the view, with movement drawing the eye, and a transient medium to high-medium magnitude of change is anticipated in the immediate vicinity of the construction works. Taking into account the high-medium sensitivity of the NC500 / NCR1 users and a high-medium magnitude, the level of effect is therefore assessed moderate-Minor to moderate and significant in EIA terms. This is attributed to approximately 3.5 km of the route.

There is one core path within the onshore Project area, at Crosskirk, which lies within the landfall area and is crossed by a proposed permanent access track. The core path leads to St Mary's Chapel, located on the coastline to the west of the Forss Water. Users of the core path are likely to experience a medium to high-medium magnitude of change along the core path.

Evaluation of significance

Taking into account the high-medium sensitivity of the NC500 / NCR1 and Crosskirk core path users and a medium to high-medium magnitude, the level of effect is therefore assessed moderate-minor to moderate and significant in EIA terms.

SENSITIVITY	MAGNITUDE OF CHANGE	LEVEL OF EFFECT
High-medium	Medium to high-medium	Moderate-Minor to Moderate

Significance of effect - SIGNIFICANT

Views of the onshore export cable corridor are predominantly screened from the core path to Achanarras Quarry, with views across the onshore export cable study area limited to the northern extent of the core path, where there are slightly elevated 360-degree views across the surrounding landscape. The construction of the southern portion of the onshore export cable corridor and the onshore substation will be visible from this short section of the core path.

Evaluation of significance

Taking into account the medium sensitivity of the core path users at Achanarras Quarry and medium-low magnitude, the level of effect is therefore assessed **minor** and **not significant** in EIA terms.

SENSITIVITY	MAGNITUDE OF CHANGE	LEVEL OF EFFECT
Medium	Medium-low	Minor
Significance of effect – NOT SIGNIFICANT		

Users of core paths around Halkirk may experience visual effects as a result of the onshore export cable corridor construction, however the magnitude of effect will vary depending on the final design and will be partially screened by and seen in the context of the settlement and associated built form and mature vegetation. Significant effects on users of the core paths are therefore unlikely to occur during the construction stage.

17.6.2.2.3 Transport routes

Those road links that are of relevance to the construction stage are detailed in section 17.4.4.3.3. Construction effects where the onshore export cable route runs perpendicular to transport routes are likely to be more fleeting, affecting users of the transport routes within a much more localised section of the route for users of transport routes that run parallel to the onshore export cable corridor. Road users are considered to have **medium-low** sensitivity to changes in visual amenity as a result of the type of development proposed (the installation of underground cables) and given the localised nature of effects on transport routes that run perpendicular (i.e. A836 and C1014) to the onshore export cable corridor, no significant effects are likely to occur.

Users of transport routes that run broadly parallel to the onshore export cable corridor are likely to experience transient views of construction over a longer period of time and greater extent of the view, such as users of the C1018, B874, B870, A9(T) and railway line between Georgemas Junction and Thurso. Where the construction is visible, a **medium** magnitude of change is likely to occur reducing to negligible as views of the works are obscured, which despite being temporary will be a discordant element in the view.

Evaluation of significance

Taking into account the low sensitivity of transport receptors and medium-negligible magnitude, the level of effect is therefore assessed **moderate-minor** and **not significant** in EIA terms.

SENSITIVITY	MAGNITUDE OF CHANGE	LEVEL OF EFFECT
Medium-Low	Medium-negligible	Moderate-Minor
Significance of effect – NOT SIGNIFICANT		

17.6.3 Potential effects during decommissioning

In the absence of detailed information regarding decommissioning works, the impacts during the decommissioning of the onshore Project are considered analogous with, or likely less than, those of the construction stage.

Decommissioning operations will be based on strategies that minimise the environmental impact and maximise efforts to recycle materials where possible and will be developed in consultation with THC.

The preference will be to remove infrastructure where possible, however the impact of removal will be assessed against environmental impacts. Whilst the detail of the decommissioning strategy is yet to be established, this assessment is based on the decommissioning strategy proposed in Table 5-7 of chapter 5: Project description, which is as close to full removal as possible, whilst recognising that this is subject to assessments and consultation closer to the time of decommissioning. It is expected that decommissioning follows a reverse order of the installation activities with some infrastructure potentially left in situ, therefore lessening the impact on the land as there is no requirement for intrusive works. As the landscape bunds and proposed planting will be mature at the time of decommissioning, it is expected these will be retained.

It is therefore worth noting that decommissioning would result in the removal of the electrical infrastructure of the onshore substation; however, it is not anticipated that there would be a return to the baseline conditions due to the retention of the large landscape bunds and the proposed planting. In the absence of detailed information regarding decommissioning works, the impacts during the decommissioning of the onshore Project are considered to be likely less than, or at least analogous with, those of the construction stage.

A Decommissioning Restoration and Aftercare Plan will be prepared prior to decommissioning which will include a financial guarantee to secure decommissioning and site restoration. Decommissioning will be undertaken in accordance with applicable guidance at the relevant time. As per the embedded mitigation measures the Project will seek to maximise recycling where possible of components which are recovered to ensure sustainable decommissioning. As such, it would be expected that any potential impact would not be significant.

The overall impact on landscape and visual receptors during decommissioning is therefore considered to be, at worst, minor and not significant, in line with the impacts assessed for the construction stage.

17.6.4 Summary of potential effects

A summary of the outcomes of the assessment of potential effects from construction and decommissioning is provided in Table 17-27 and from operation and maintenance is provided in Table 17-28.

Table 17-27 Summary of potential effects for construction and decommissioning

POTENTIAL EFFECT	RECEPTOR	SENSITIVITY OF RECEPTOR	MAGNITUDE OF IMPACT	CONSEQUENCE (SIGNIFICANCE OF EFFECT)	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT)
Potential landscape character effects from landfall activities and onshore export cables installation	Farmed Lowland Plain LCT	Medium-Low	Low	Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)
	Mixed agriculture and settlement LLCT	Low	Low	Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)
	Open, intensive farmland LLCT	Low	High-medium	Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)
Potential visual amenity effects from landfall activities and onshore export cables installation - residential receptors	Residents at Crosskirk, Forss, Halkirk, Harpsdale and scattered properties within the onshore export cable study area	High	Medium-Low to High	Moderate-Minor to Major-Moderate (significant)	None required above existing embedded mitigation measures.	Moderate to Moderate-Minor (significant)
Potential visual amenity effects from landfall activities and onshore export cables	North Coast 500 & NCR 1	High-Medium	Medium to Medium-High	Moderate-Minor to Moderate (significant)	None required above existing embedded mitigation measures.	Moderate-Minor to Moderate (significant)

POTENTIAL EFFECT	RECEPTOR	SENSITIVITY OF RECEPTOR	MAGNITUDE OF IMPACT	CONSEQUENCE (SIGNIFICANCE OF EFFECT)	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT)
installation - recreational and tourist receptors	Core path at Crosskirk	High-Medium	Medium to Medium-High	Moderate-Minor to Moderate (significant)	None required above existing embedded mitigation measures.	Moderate-Minor to Moderate (significant)
	Core path at Achanarras Quarry	Medium	Medium-Low	Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)
Potential visual amenity effects from landfall activities and onshore export cables installation - users of transport routes	Users of road south of Forss, Bridge Street, B874, B870, A9(T) and Network Rail Scotland railway line between Georgemas Junction and Thurso within onshore export cable study area	Medium-Low	Medium-Negligible	Moderate-Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)

Table 17-28 Summary of potential effects for operation and maintenance

POTENTIAL EFFECT	RECEPTOR	SENSITIVITY OF RECEPTOR	MAGNITUDE OF IMPACT	CONSEQUENCE (SIGNIFICANCE OF EFFECT) – YEAR 1	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT) – YEAR 15
Potential landscape character effects from the onshore substation	Farmed Lowland Plain LCT	Medium-Low	Low	Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)
	Mixed agriculture and settlement LLCT	Low	Low	Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)
	Spittal Hill LLCT Lone Mountains LLCT	Low	Low	Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)
Potential visual amenity effects from the onshore substation - residential receptors	Halkirk	High	Low	Moderate-Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)
	Harpsdale	High	Medium	Moderate (significant)	None required above existing embedded mitigation measures.	Moderate-Minor (not significant)

POTENTIAL EFFECT	RECEPTOR	SENSITIVITY OF RECEPTOR	MAGNITUDE OF IMPACT	CONSEQUENCE (SIGNIFICANCE OF EFFECT) – YEAR 1	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT) – YEAR 15
	Residential properties along the A9(T)	High	High-Medium to Medium	Major-Moderate to Moderate (significant)	None required above existing embedded mitigation measures.	Moderate to Moderate-Minor (significant to not significant)
	Residential properties along the road to Halkirk, between A9(T) and Bridge Street	High	High-Medium to Medium	Major-Moderate (significant)	None required above existing embedded mitigation measures.	Moderate (significant)
Potential visual amenity effects from the onshore substation - recreational receptors	Achanarras Core Path	High	Medium-Low to Negligible	Moderate-Minor to Negligible (not significant)	None required above existing embedded mitigation measures.	Minor to Negligible (not significant)
	Core paths around Halkirk	High	Negligible	Negligible (not significant)	None required above existing embedded mitigation measures.	Negligible (not significant)
Potential visual amenity effects from the onshore substation - users of transport routes	A9(T), between Spittal and Georgemas Junction	Medium	Medium-Low to Negligible	Moderate-Minor to Negligible (not significant)	None required above existing embedded mitigation measures.	Minor-Negligible (not significant)

POTENTIAL EFFECT	RECEPTOR	SENSITIVITY OF RECEPTOR	MAGNITUDE OF IMPACT	CONSEQUENCE (SIGNIFICANCE OF EFFECT) – YEAR 1	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT) – YEAR 15
	Bridge Street, between Halkirk and Achies (C1018)	Medium	Medium-Low	Moderate-Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)
	Road to Halkirk, between A9(T) and Bridge Street (C1014)	Medium	High-Medium to Medium-Low	Moderate to Minor (significant)	None required above existing embedded mitigation measures.	Moderate-Minor to Negligible (not significant)
	Wick to Inverness Railway Route between Scotscalder and East of Georgemas Junction	Medium	Medium to Low	Moderate-Minor to Negligible (not significant)	None required above existing embedded mitigation measures.	Minor to Negligible (not significant)

**** In the absence of detailed information regarding decommissioning works, and unless otherwise stated, the impacts during the decommissioning of the onshore project are considered comparable with, or likely less than, those of the construction stage.***

17.7 Assessment of cumulative effects

17.7.1 Introduction

Potential impacts from the onshore Project have the potential to interact with those from other developments, plans and activities, resulting in cumulative impacts on landscape and visual receptors. The approach to the cumulative effects assessment is described in chapter 7: EIA methodology (see Figure 7-4), detailing the developments considered in relation to the onshore Project area. A summary of the approach is provided below.

The list of relevant developments for inclusion within the cumulative effects assessment is outlined in Table 17-29. This has been informed by a screening exercise, undertaken to identify relevant developments for consideration within the cumulative effects assessments for each EIA topic, based on defined Zones of Influence (ZoI).

With respect to cumulative construction effects, these are likely to be the same as or less than cumulative operation and maintenance effects due to the temporary and short term nature of construction activities.

The following ZoIs have been derived for the LVIA cumulative assessment:

- Direct impacts on landscape character:
  - Onshore windfarms within 10 km of the onshore substation search area; and
  - Large scale developments excluding windfarms, e.g. transmission infrastructure sites within 5 km of the onshore substation search area.
- Direct impacts on visual amenity:
  - Onshore windfarms within 10 km of the onshore substation search area; and
  - Large scale developments excluding windfarms, e.g. transmission infrastructure sites within 5 km of the onshore substation search area.

Table 17-29 Cumulative developments within the LVIA onshore cumulative effects study area

LOCATION	DEVELOPMENT TYPE	DEVELOPMENT NAME	DISTANCE FROM ONSHORE PROJECT AREA (KM)	DISTANCE FROM ONSHORE SUBSTATION SEARCH AREA (KM)	STATUS	CONFIDENCE[7]
Corsback, Caithness	Onshore windfarm	Corsback Hill windfarm (22/00790/SCO)	6.2	7.6	Pre-application (scoping)	Low

[7] *Confidence ratings have been applied to each cumulative development where: 'Low' = pre-application or application, 'Medium' = consented and 'High' = under construction or operational.*

LOCATION	DEVELOPMENT TYPE	DEVELOPMENT NAME	DISTANCE FROM ONSHORE PROJECT AREA (KM)	DISTANCE FROM ONSHORE SUBSTATION SEARCH AREA (KM)	STATUS	CONFIDENCE[7]
Mybster, Caithness	Onshore windfarm	Loch Toftinghall windfarm (19/02384/SCOP)	3.28	4.37	Pre-application (scoping)	Low
Westerdale, Caithness	Onshore windfarm	Tormsdale windfarm (19/03045/SCOP)	4.75	5.54	Pre-application (scoping)	Low
West Watten, Caithness	Onshore windfarm	Watten windfarm (22/02644/SCOP)	5	6.1	Pre-application (scoping)	Low
Spittal, Caithness	Transmission infrastructure – substation plant	Electricity Supply Board (ESB) asset development synchronous compensator (20/05118/FUL)	0	0	Consented	Medium
Spittal, Caithness	Transmission infrastructure - cables	High Voltage underground Spittal compensator grid connection (22/00016/FUL)	0	0.24	Consented	Medium

Corsback Wind Farm is located 7.6 km to the north-east of the onshore substation and 6.2 km north-east of the onshore Project area and comprises up to four wind turbines on Corsback Hill. The ZTVs submitted with the Scoping Report indicate very limited views of the cumulative development from the A9(T), with some potential intervisibility between the cumulative development and the onshore substation area, Halkirk and Harpsdale based on bare-earth modelling over a distance of more than 5 km. However, Spittal Hill and Sordale Hill to the east of the A9(T) provide some separation between the cumulative development and the onshore Project area and no cumulative effects are likely to occur as a result of Corsback Wind Farm in combination with the onshore Project and it has been scoped out of further assessment.

17.7.2 Cumulative operation and maintenance effects

17.7.2.1 Potential effects on landscape character

The ESB asset development synchronous compensator and the high voltage underground cable that would link the synchronous compensator and the existing SHET-L Spittal substation are located within the onshore Project area, immediately south of the onshore substation search area and of Torran Wood. Once implemented, the cumulative developments will extend the existing energy infrastructure to the south of the onshore substation area further west, with access off the existing farm track to Achanarras Farm. Proposed planting around the synchronous substation will wrap woodland planting around the western and southern edges of the scheme. The cumulative schemes and the onshore Project are located within the Lowland Plain LCT, however additional changes to landscape character are not anticipated as a result of the cumulative schemes.

The cumulative developments at Tormsdale Wind Farm, Loch Tuftinhall and Watten windfarms would extend the existing cluster of wind turbines at Halsary, Achlachan I & II, Causeymire and Bad a Cheo windfarms by up to 13 wind turbines to the north-east and up to twelve wind turbines to the west. The existing windfarms and cumulative developments are located on the north-eastern edge of the Sweeping Moorland and Flows LCT, south of the Farmed Lowland Plain LCT within which the onshore Project area is located. The cumulative developments are unlikely to result in any cumulative effects on the Farmed Lowland Plain LCT and therefore no cumulative effects on landscape character are anticipated.

17.7.2.2 Potential effects on visual amenity

Views of the ESB asset development synchronous compensator are likely to be very limited due to the screening provided by existing vegetation and infrastructure. Views from Achanarras Quarry, as illustrated by Viewpoint 2, are screened by the existing farmstead and associated tree belts, and the cumulative scheme is unlikely to be noticeable in views from the quarry and core path. Whilst the cumulative scheme would be visible from Achanarras Farm, Torran Wood screens views of the onshore substation and therefore no cumulative visual effects are anticipated.

To the south of Spittal and the onshore Project area there are a cluster of existing windfarms which are perceived as one large windfarm, including Causeymire, Achlachan I & II and Bad a Cheo Wind Farms to the West of the A9(T) and Halsary Wind Farm to the East of the A9(T). The cluster of windfarms are located at the transition between the open peatlands to the south and the more settled agricultural valley to the north of the B870.

The cumulative development at Tormsdale windfarm lies to the immediate west of Causeymire windfarm. The cumulative developments at Loch Toftinhall and Watten windfarms surround Loch Toftinhall to the east and west, and are located immediately north of Halsary windfarm, and to the East of Achlachan windfarm I & II. Therefore, the three proposed windfarms are likely to be experienced as extensions of the existing windfarm cluster.

Potential cumulative effects that are likely to arise as a result of Loch Toftinhall, Watten and Tormsdale windfarms in combination with the onshore Project are on users of the A9(T) and users of the core path to Achanarras Quarry.

Users of the A9(T) would experience successive views energy infrastructure when travelling along the A9(T) as a result of the cumulative developments and the onshore Project. However, the existing visual experience of a cluster of

windfarms at the edge of the open moorland and substations within the settled farmlands would persist, with landform and vegetation providing some spatial and visual separation between the two types of development. The proposed landscape bunds would screen views of the energy infrastructure itself within the onshore substation area, and therefore no increased cumulative effects as a result of the onshore Project are likely to occur in transient views along the A9(T).

Users of the core path to Achanarras Quarry would experience views to the South of Achanarras Hill, across the moorland beyond the windfarms, and views north, across the settled farmlands including views of existing SHET-L Spittal substation, the proposed ESB asset development synchronous compensator, and of the onshore substation. The cumulative developments extending the extent of wind turbines in the view and the onshore substation extending the amount of energy infrastructure in the view are likely to be experienced in succession. As a worst case, a cumulative level of effect of no greater than moderate to minor is likely to occur, which is not significant in EIA terms.

The landscape enclosure provided by Achanarras and Spittal Hills and the Achanarras Burn, which is reinforced by existing vegetation, emphasises the transition from the open moorlands to the south and the settled and managed farmland to the north. The existing windfarms south of Spittal have limited visual influence on the onshore Project area and therefore no other cumulative effects on visual amenity are anticipated.

17.7.3 Cumulative construction and decommissioning effects

17.7.3.1 Potential effects on landscape character

The cumulative developments and the onshore Project are located within different LCTs, the separation of which are reinforced by landform and vegetation, and no significant cumulative effects during construction and decommissioning are therefore anticipated.

17.7.3.2 Potential effects on visual amenity

With respect to users of the A9(T), assuming a worst case scenario where the construction and decommissioning stages of the cumulative developments and the onshore Project are all simultaneous, there may be an increase in traffic and movement experienced from the A9(T) between Tacher to the south and Carsgoe to the north. The sensitivity of the receptor is classed as medium and the magnitude is medium-low to negligible, resulting in a temporary moderate to minor significance of effect over a greater portion of the A9(T) during the construction and decommissioning stages. The resultant significance of cumulative effect is minor, which is not significant in EIA terms.

17.7.4 Summary of cumulative effects

A summary of the outcomes of the assessment of cumulative effects for the construction, operation and maintenance and decommissioning stages of the onshore Project is provided in Table 17-30, with no significant cumulative effects likely to occur.

Table 17-30 Summary of assessment of cumulative effects

POTENTIAL IMPACT	RECEPTOR AND CUMULATIVE SCHEMES	SENSITIVITY OF RECEPTOR	MAGNITUDE OF IMPACT	CONSEQUENCE (SIGNIFICANCE OF EFFECT)	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT)
Construction and decommissioning*						
Effects on visual amenity	Users of A9(T) between Tacher and Carsgoe	Medium	Medium-Low to Negligible	Moderate-Minor (not significant)	None required above existing embedded mitigation measures.	Minor (not significant)
Operation and maintenance						
Effects on visual amenity	Users of core path to Achanarras Quarry	High	Medium-Low	Moderate-Minor (not significant)	None required above existing embedded mitigation measures.	Moderate-Minor (not significant)

**** In the absence of detailed information regarding decommissioning works, and unless otherwise stated, the impacts during the decommissioning of the onshore project are considered comparable with, or likely less than, those of the construction stage.***

17.8 Inter-related effects

Inter-related effects are the potential effects of multiple impacts, affecting one receptor or a group of receptors. Inter-related effects include interactions between the impacts of the different stages of the onshore Project (i.e. interaction of impacts across construction, operation and maintenance and decommissioning); the different components of the onshore Project (i.e. interaction of impacts related to the offshore export cable landfall, onshore export cable and onshore substation); as well as the interaction between impacts on a receptor within an onshore Project stage.

Inter-related effects may arise as a result of the potential interaction between the various Project stages on landscape and visual receptors. The removal of landscape features, such as hedgerows and a very small discreet section of young broadleaf woodland belt within the onshore substation search area (as shown on Figure 17-6), during the construction stage are likely to persist into the operational stage even when these features will be reinstated through replacement planting due to the time it takes for planting to establish and mature. The LVIA assesses the likely landscape and visual effects during construction, operation and maintenance and decommissioning, including at Year 1 and Year 15, and therefore considers the potential for inter-related effects and no additional inter-related effects have been identified.

17.9 Whole Project assessment

This section considers the Project as a whole - the offshore elements and the onshore elements, and how the landscape and visual amenity effects of the two parts of the Project relate.

The offshore Project is summarised in chapter 5: Project description and a summary of the effects of the offshore Project is provided in chapter 18: Offshore EIA summary. The effects of the onshore Project are set out in section 17.6: Assessment of potential effects.

The onshore substation is located approximately 18 km from the landfall area and approximately 12 km from nearest coastal location. There are no areas from which it is possible to see both the offshore Project and the onshore substation at the same time and these two parts of the whole Project affect different areas of landscape character. There are therefore no effects on visual amenity or on landscape character arising from these two parts of the Project considered together that are different from the effects arising from the individual parts as reported in chapter 18 and section 17.6.

There is however a spatial overlap between the onshore Project and the offshore Project at the landfall. During the construction stage, construction vessels and cable lay vessels associated with the offshore Project and the active change of the erection of the offshore windfarm may be visible at the same time as construction activities at the landfall. Residential and visitor receptors in the immediate vicinity may therefore be subject to a slightly greater level of visual effect than that assessed for the individual elements of the Project during the construction stage. However, this would be short term, localised and temporary in nature.

17.10 Transboundary effects

Transboundary effects arise when impacts from a development within one European Economic Area (EEA) state's territory affects the environment of another EEA state(s).

There is no potential for transboundary impacts upon LVIA receptors due to construction, operation and maintenance and decommissioning of the onshore Project. The potential impacts are localised and will not affect other EEA states. Therefore, transboundary effects for LVIA receptors do not need to be considered further.

17.11 Summary of mitigation

The embedded mitigation measures proposed in Section 17.5.4 have been developed based on an indicative layout and would need to be refined through the post-consent design processes, however the use of landscape bunds as the principle means of screening the onshore substation, with proposed planting to soften the landscape effect of the landscape bunds is assumed to be embedded in the onshore Project. Secondary mitigation is therefore not required. Despite the impact assessment predicting significant impacts, Policy 11 (e) of NPF4 states that "*In addition, project design and mitigation will demonstrate how the following impacts are addressed: 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*."

17.12 References

Countryside Agency and Scottish Natural Heritage (SNH) (2002). Landscape Character Assessment Guidance for England and Scotland. Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity. An exploration of current thinking about landscape sensitivity and landscape capacity, to stimulate debate and encourage the development of common approaches. Available online at: https://publications.naturalengland.org.uk/publication/5601625141936128 [Accessed 18/09/2023].

Forestry and Land Scotland (FLS) (2023). Caithness Land Management Plan. Available online at https://forestryandland.gov.scot/what-we-do/planning/active/caithness-lmp#:~:text=Caithness%20LMP%20was%20approved%20by,plan%20and%20maps%20linked%20below. [Accessed 31/08/2023].

Landscape Institute (LI) and Institute of Environmental Management and Assessment (IEMA) (2013). Guidelines for Landscape and Visual Impact Assessment: Third Edition ('GLVIA3'). Available online at: https://www.landscapeinstitute.org/technical/glvia3-panel/ [Accessed 27/07/2023].

LI (2019a). Visual Representation of Development Proposals, Technical Information Note 06/19. Available online at: https://www.midsussex.gov.uk/media/6342/cd97-li_tgn-06-19_visual_representation.pdf [Accessed 27/07/2023].

LI (2019b). Visual Representation of Development Proposals: Earth Curvature, Technical Information Note 09/19. Available online at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TIN-09-19_EarthCurvature.pdf [Accessed 27/07/2023].

Marine Scotland (MS) and Energy Consents Unit (ECU) (2022). Guidance for applicants on using the design envelope for applications under section 36 of the Electricity Act 198. Available online at: https://www.gov.scot/publications/guidance-applicants-using-design-envelope-applications-under-section-36-electricity-act-1989/documents/ [Accessed 27/07/2023].

NatureScot (2019). Scottish LCTs Map and Descriptions. Available online at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/scottish-landscape-character-types-map-and-descriptions [Accessed 27/07/2023].

NatureScot (2022a). Landscape Sensitivity Assessment Guidance. Available online at: https://www.nature.scot/sites/default/files/2022-05/Landscape%20Sensitivity%20Assessment%20Guidance%20%28Methodology%29.pdf [Accessed 27/07/2023].

NatureScot (2022b). Landscape Character Assessment in Scotland. Available online at: https://www.nature.scot/professional-advice/landscape/landscape-character-assessment/landscape-character-assessment-scotland [Accessed 27/07/2023].

Scottish Government (2023). National Planning Framework 4. Available online at: https://www.gov.scot/publications/national-planning-framework-4/documents/ [Accessed 27/07/2023].

Scottish Natural Heritage (SNH) (NatureScot) (2017). Visual Representation of Wind Farms. Version 2.2. February 2017. Available online at: https://tethys.pnnl.gov/sites/default/files/publications/SNH-2017-VisualWindfarms.pdf [Accessed 27/07/2023].

Stanton, C. (1998). Caithness and Sutherland Landscape Character Assessment. Scottish Natural Heritage Review No. 103.

Sustrans (2023). The National Cycle Network. Available online at: https://www.sustrans.org.uk/national-cycle-network [Accessed 27/07/2023].

The Highland Council (THC) (2012). Highland-wide Local Development Plan. April 2012. Available online at: https://www.highland.gov.uk/info/178/local_and_statutory_development_plans/199/highland-wide_local_development_plan [Accessed 27/07/2023].

THC (2016). Visualisation Standards for Wind Energy Developments. July 2016. Available online at: https://www.highland.gov.uk/downloads/file/12880/visualisation_standards_for_wind_energy_developments [Accessed 27/07/2023].

THC (2018). Caithness and Sutherland Local Development Plan (CasPlan). CasPlan Adopted. August 2018. Available online at: https://www.highland.gov.uk/downloads/file/19712/casplan_adopted [Accessed 27/07/2023].

THC (2017). Onshore Wind Energy Supplementary Guidance (OWESG). Supplementary Guidance published in November 2016 with Addendum published in December 2017. Available online at: https://www.highland.gov.uk/downloads/file/16949/onshore_wind_energy_supplementary_guidance-_nov_2016 [Accessed 31/08/223]

THC (2023). Paths in the Highlands: Interactive Map of Our Core Paths. Available online at: https://www.highland.gov.uk/info/1225/countryside_farming_and_wildlife/161/outdoor_access/4 [Accessed 27/07/2023].

17.13 Abbreviations

ACRONYM	DEFINITION
3D	Three-dimensional
AIS	Air Insulated Structure
AOD	Above ordnance datum
CaSPlan	Caithness and Sutherland LDP
CEMP	Construction Environment Management Plan
CJB	Cable Joint Bay
CLO	Community Liaison Officer
cm	Centimetre
DTM	Digital Terrain Model
ECU	Energy Consents Unit
EEA	European Economic Area
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ELC	European Landscape Convention
ESB	Electricity Supply Board
FLS	Forestry and Land Scotland
GIS	Gas Insulated Structure
GLVIA3	Guidelines for Landscape and Visual Impact Assessment 3

ACRONYM	DEFINITION
Ha	Hectares
HDD	Horizontal Directional Drilling
HES	Historic Environment Scotland
HwLDP	Highland-wide Local Development Plan
HVDC	High Voltage Direct Current
IEMA	Institute of Environmental Management and Assessment
km	Kilometre
kV	Kilovolt
LCA	Landscape Character Assessment or Landscape Character Area
LCT	Landscape Character Type
LDP	Local Development Plan
LI	Landscape Institute
LLCT	Local Landscape Character Type
LVIA	Landscape and Visual Assessment
m	Metre
mm	Millimetre
MD-LOT	Marine Directorate - Licensing Operations Team
MS-LOT	Marine Scotland - Licensing Operations Team
NC500	North Coast 500

ACRONYM	DEFINITION
NCR	National Cycle Route
NPF4	National Planning Framework 4
NW	North West
OIC	Orkney Islands Council
ORCA	Orkney Research Centre for Archaeology
OS	Ordnance Survey
OWESG	Onshore Wind Energy Supplementary Guidance
PAC	Pre-Application Consultation
PDE	Project Design Envelope
PPP	Planning Permission in Principle
SHET-L	Scottish Hydro Electric Transmission plc
SLA	Special Landscape Areas
SLQ	Special Landscape Qualities
SLVIA	Seascape Landscape and Visual Impact Assessment
SNH	Scottish National Heritage (NatureScot)
SS	Supporting Study
SSSI	Site of Special Scientific Interest
T	Trunk
THC	The Highland Council

ACRONYM	DEFINITION
TJB	Transition Joint Bay
UK	United Kingdom
USB	Universal Serial Bus
VP	Viewpoint
W	West
WSP	Williams Sale Partnership
WTG	Wind Turbine Generator
ZOI	Zones of Influence
ZTV	Zone of Theoretical Visibility

17.14 Glossary

Note: Those descriptions marked with an asterisk are as per the terminology provided in the GLVIA3 (LI and IEMA (2013) glossary.

TERM	DEFINITION
Designated Landscape*	Areas of landscape identified as being of importance at international, national or local levels, either defined by statue or identified in development plans or other documents.
Indirect effects*	Direct effects relate to the host landscape and concern both physical and perceptual effects on the receptor. Indirect effects relate to those landscapes and receptors which separated by distance from the development and therefore are only affected in terms of visual or perceptual effects. The Landscape Institute also defines indirect effects as those which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.
Key characteristics*	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
Landscape character*	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape Character Area (LCA)*	These are single unique areas which are the discrete geographical areas of a particular landscape type.
Landscape Character Types (LCTs)*	These are distinct types of landscapes that are usually homogenous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern, and perceptual and aesthetic attributes. (Topic Paper 6, Countryside Agency and SNH 2002)
Landscape effects*	Effects on the landscape as a resource in its own right.
Landscape quality (condition)*	A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Landscape receptors *	Defined aspects of the landscape resource that have the potential to be affected by a proposal.
Landscape value*	The relative value that is attached to different seascape and/or landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.

TERM	DEFINITION
Magnitude (of effect)*	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term, in duration.
Sensitivity*	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Susceptibility*	The ability of a defined seascape, landscape or visual receptor to accommodate the specific offshore Project without undue negative consequences.
Visual amenity*	The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of people living, working, recreating, visiting or travelling through an area.
Visual effect*	Effects on specific views and on the general visual amenity experienced by people. (Landscape Institute and IEMA, 2013)
Visual Receptors*	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visual sensitivity	The sensitivity of visual receptors such as residents, relative to their location and context, to visual change proposed by development.
Visualisation	Computer visualisation, photomontage, or other technique to illustrate the appearance of the development from a known location.
Zone of Theoretical Visibility (ZTV)*	A map, usually digitally produced, showing areas of land within which, a development is theoretical visible.