

Site Selection Consultation Document:  
Beauly Area 400kV Substation and  
Western Isles HVDC Converter  
September 2023





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## Glossary

Term	Definition
Alternating Current (AC)	Type of electrical current in which the direction of flow of electrons switches back and forth at regular intervals or cycles.
Ancient Woodland Inventory (AWI)	A database of land that is currently wooded and has been continually wooded, at least since 1750.
Area of Search (Study Area)	A broad geographical area within which possible sites might be capable of identification within approximately 5km of the required connectivity point; usually determined by geographical features such as coastlines or hill/mountain ranges, or designation boundaries, such as National Park boundaries.
Consultation	The dynamic process of dialogue between individuals or groups, based on a genuine exchange of views and, normally, with the objective of influencing decisions, policies or programmes of action.
Distribution Network (DNO)	A licensed company that owns and operates the network of cables, transformers and towers that provide electricity.
Gigawatt (GW)	A unit of electrical power equal to one billion watts.
High Voltage Direct Current (HVDC)	HVDC is an effective way to transmit electricity and is primarily transmitted in this form by overhead lines or underground cables.
Holistic Network Design (HND)	Detailed report identifying the electricity network needs to enable connection of 23GW of offshore wind, including the needs associated with the offshore and onshore transmission network, facilitating the UK government offshore wind target of 50GW by 2030.
Horizontal Directional Drilling (HDD)	A construction technique whereby a tunnel is drilled under a waterway or other designated area, and a pipeline or other utility is pulled through the drilled underground tunnel.
Kilovolt (kV)	A unit of electrical power equal to one thousand volts.

## Glossary

Term	Definition
Kilowatt	A unit of electrical power equal to one thousand watts.
Landscape Character Type (LCT)	A landscape type that is characterised by its distinct, recognisable and consistent pattern of elements that makes one landscape different from another.
Local Development Plan (LDP)	LDP's are usually prepared by the Local Planning Authority and set out the proposals for future development and use of land in their area.
Megawatt (MW)	A unit of electrical power equal to one million watts.
National Planning Framework 4 (NPF4)	A broad geographical area within which possible sites might be capable of identification within approximately 5km of the required connectivity point; usually determined by geographical features such as coastlines or hill/mountain ranges, or designation boundaries, such as National Park boundaries.
Preferred Site	The Option that achieves a best balance between environmental, engineering and economic criteria during the Stage 2 Detailed Site Selection.
Overhead line (OHL)	An electric line installed above ground, usually supported by lattice steel structures or poles.
Stakeholders	Organisations and individuals who can affect or are affected by SSEN Transmission works.
Substation	A node on the network to allow safe control of the electricity network. This could include convergence of multiple circuits, transformation of voltage or other functions to maintain and operate the electricity network.
The National Grid	The electricity transmission network in Great Britain.
Volts	The international unit of electric potential and electromotive force.
Watts	The unit of measurement for the rate at which electrical energy is transferred or used.
Works	Constructing new transmission infrastructure such as substations, overhead lines, underground cables, major refurbishment of these, the dismantling and removal of any parts of the system; and associated works, which may include formation of access tracks, bridge and road improvements, tree cutting, drainage etc.



## 1. Introduction

This document has been prepared by WSP UK Ltd on behalf of Scottish and Southern Electricity Networks Transmission (SSEN Transmission). SSEN Transmission, operating under licence held by Scottish Hydro Electric Transmission plc, owns, operates and develops the high voltage electricity transmission system in the north of Scotland and remote islands. This document invites comments from all interested parties on the site selection Site for a new 400 kilovolt (kV) substation and High Voltage Direct Current (HVDC) converter station and associated infrastructure (hereafter referred to as the 'Proposed Development') is required at Beauly, near Inverness.

This document describes the site selection process followed, site options identified, the appraisal undertaken, the alternatives considered during the selection of options and the suggestion for a Preferred Site. This document supports the information made available to the public and statutory authorities in February and March 2023 through the consultation booklet, public event banners and the ArcGIS Storymaps. This document can also be read in conjunction with the ArcGIS Storymaps<sup>1</sup> which provides access to the interactive mapping and it has been prepared in order to provide a more detailed overview of the process followed. We hope that in publishing this document we are facilitating a more standardised format for the public and statutory consultees alike to access the information previously presented and one which enables a wide range of information about the project to be easily downloaded.

### 1.1. Project background and need

As a result of the Scottish and UK Governments' Net Zero climate change targets, together with requirements set out in the British Energy Security Strategy (BESS) (April 2022) and subsequently in National Grid's, the Electricity System Operator's (ESO), "Pathway to 2030" Holistic Network Design (HND) (July 2022), significant increases in renewable generation capacity are required across the UK, resulting in significant investment in new transmission network infrastructure to transport this energy and reinforce the network.

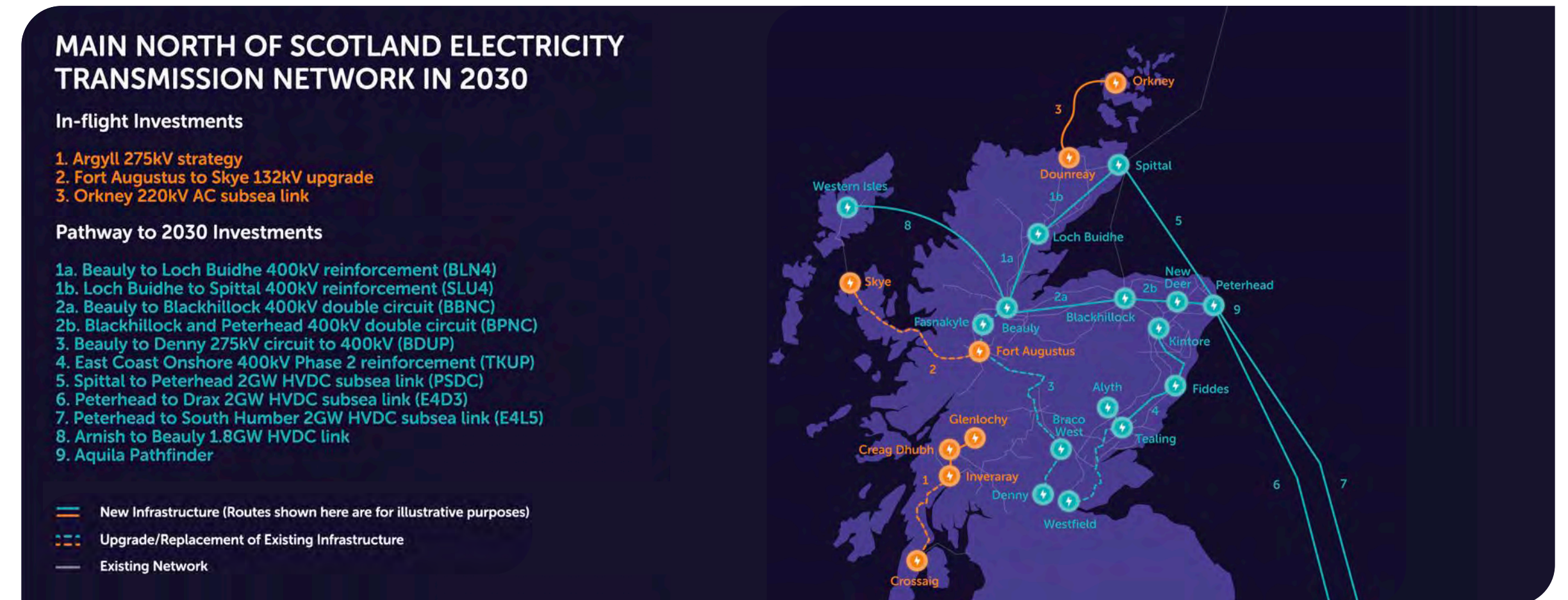
The BESS sets out the UK Government's plans to secure the country's future energy independence by reducing the dependence on, and price exposure to, volatile global wholesale gas markets. This will be achieved by accelerating the deployment of homegrown and affordable low carbon electricity generation, together with accelerating the enabling electricity network infrastructure required to connect and transport this power. The BESS included an increased ambition for offshore wind generation of 50 gigawatt (GW) by 2030, up from the previous target of 40GW.

To enable the connection of that 50GW of offshore wind by the 2030 target date, the GB National Grid Electricity System Operator (the ESO), working in collaboration with the three Great Britain Transmission Owners, developed what is known as the 'Holistic Network Design' (the HND). This sets out the onshore and electricity transmission infrastructure required across Great Britain to deliver this UK Government target, including projects in SSEN Transmission's Licence Area across the north of Scotland.

Caithness and the surrounding area is home to some of Scotland's best wind resources and the existing electricity transmission network in the region is at full capacity, meaning the planned new renewable energy generation to be undertaken as part of the ScotWind licensing round, required by BESS can't connect to the transmission network without significant network reinforcement. Projects such as the Western Isles link (see section 1.4.2) will require significant network reinforcement in order to provide energy to those who need it.

As part of the wider UK network reinforcements detailed in the BESS and HND, reinforcements required in SSEN Transmission's

Figure 1: Proposed new and upgraded/replacement infrastructure as part of the Pathway to 2030



Licence Area include proposed new 400kV links between Spittal and Beauly, and between Peterhead and Beauly. This is to transmit electricity generated by renewables in the north/east of Scotland to areas of demand on the wider Great Britain transmission network, as well as reinforcing the network in Scotland. In addition, new subsea links between Spittal and Peterhead, and from Peterhead to the north of England are required. These links require the creation of a new 400kV substation in the Beauly area, together with new sites at Loch Buidhe, Spittal and along the Beauly to Peterhead route to connect into the existing network. See Figures 1 and 2.

In December 2022, the energy regulator, Ofgem, approved the need for these projects as part of its Accelerated Strategic Transmission Investment (ASTI) framework decision.

These projects, alongside several other major network upgrades planned in the north of Scotland, are therefore part of a Great Britain-wide programme of works that are required to meet UK and Scottish Government energy targets; there is a clear expectation from Government and the energy regulator,

Ofgem, that these projects will be delivered by 2030. More specifically, these projects are needed to deliver Government 2030 renewable targets set out in the BESS.

Figure 2: Locations of required new 400kV substations between Spittal, Beauly and Peterhead areas



<sup>1</sup> ArcGIS Storymaps - New Beauly area 400kV substation and HVDC converter station. Available at: <https://pinpointgis.wsp.com/portal/apps/storymaps/stories/973011c448ba4803afb7fcc2634971f3>



## 1.2. Project overview

A new 400kV substation near the existing Beauly Substation is a key element in the delivery of the Pathway to 2030. It will facilitate connections of the new Spittal- Loch Buidhe- Beauly 400kV OHL and the new Beauly- Blackhillock- New Deer- Peterhead 400kV OHL onto the transmission network via the existing Beauly substation and Beauly-Denny 400kV OHL. In addition, an HVDC converter station is required in the vicinity of the existing Beauly substation, as this has been identified as the most suitable place on the 400kV network to connect the proposed Western Isles generation into. It is advantageous to locate the new HVDC converter station close to the new 400kV substation to minimise the amount of new infrastructure required in the Beauly area.



## 1.3. Strategic Considerations

### 1.3.1. New 400kV substation

The existing Beauly substation at Wester Balblair, together with the proposed new substation and Beauly – Denny 400kV OHL are the centre point of these critical reinforcements. The proposed new substation will serve as a ‘switch’, allowing power to be directed in whichever direction is needed.

The new 400kV substation comprises:

- A substation on a platform that is approximately 500m x 270m for an Air Insulated Switchgear Substation (AIS) ;
- Control building, switchgear and busbars;
- The site requires to be connected back to the existing Beauly substation, via the new 400kV infrastructure (either OHL or underground cables). This could be achieved by connecting directly onto the existing Beauly – Denny 400kV OHL;
- Connection with the proposed Spittal – Loch Buidhe – Beauly 400kV OHL; and
- Connection with the proposed Beauly – Blackhillock – New Deer – Peterhead 400kV OHL.

### 1.3.3. A combined solution

Potentially, the most efficient solution would be to combine the new 400kV substation with the new HVDC converter station at the same site. The advantages of this solution are that it removes the requirement for an AC underground cable connection between the two installations, which would reduce new infrastructure in the area, and would help reduce visual impacts across the wider Beauly area. The disadvantages are having to find a suitable large site (approximately 775m x 290m) which provides the opportunity to sensitively locate the site within the existing landscape and away from population centres. Our site selection process has considered both separate and joint site options and the corresponding connections for the proposed new 400kV OHLs.

### 1.3.2. Western Isles link and HVDC converter

The Western Isles is home to some of Scotland’s greatest wind resource and the existing network is at full capacity meaning no further generation can connect without significant network reinforcements. The new HVDC connection will transmit electricity generated by renewables on the Western Isles to areas of demand. This requires a significant connection using subsea and onshore underground cables to provide a link between the Western Isles and Beauly area, the most suitable place on the 400kV transmission network where it can connect to the existing Beauly – Denny 400kV OHL. The cable connection needs to be undergrounded as it is a High Voltage Direct Current (HVDC) connection. National Grid ESO’s 2022 Holistic Network Design (HND) required an increase to the size of this subsea link from its original 600 megawatt (MW) to 1.8 gigawatt (GW).

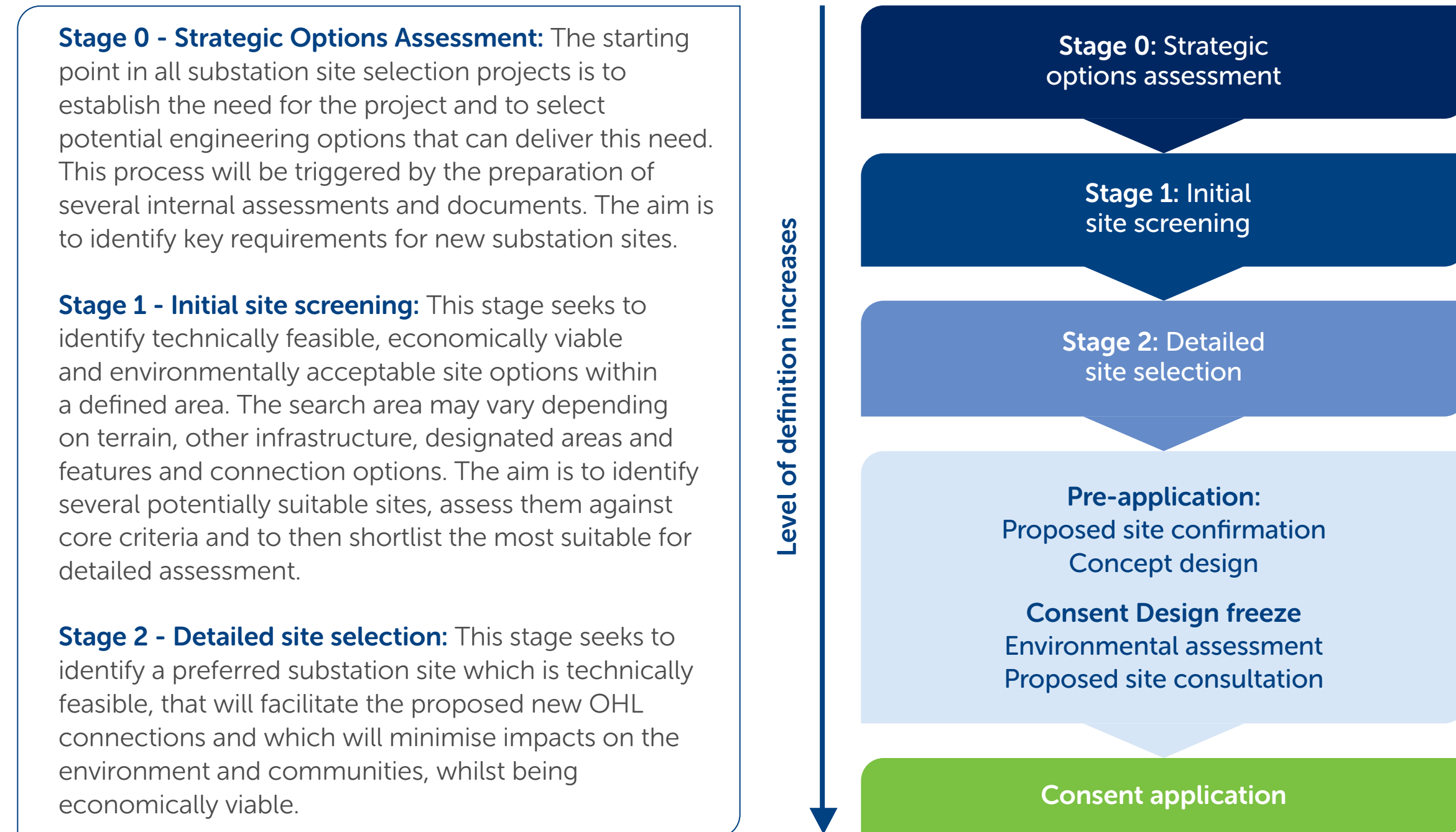
The elements of the Western Isles connection relevant to the Proposed Development are onshore works in the Highlands including:

- A new 525kV DC 1.8GW Bi-pole HVDC converter station to be located as close as possible to the new 400kV alternating current (AC) substation near Beauly in the Beauly area. The platform size will be approximately 300m x 275m;
- An AC underground cable connection to the new 400kV substation;
- HVDC underground cables from the converter station to a landfall on the West Coast at Dundonnell (this scope is being delivered under a separate project).
- Subsea HVDC cables between the landfalls at Dundonnell and Arnish point, Stornoway (this scope is being delivered under a separate project).



## 1.4. Site selection process

The site selection process has followed formal internal guidance to enable a consistent and rigorous selection of sites for new substations and converter stations. The site selection process has three key stages, each increasing in detail and definition. Technical, environment and people and cost considerations are brought together in a way which seeks the best balance in accordance with SSEN's Transmission Network Operator's Licence and the Electricity Act 1989. This staged process leads to the identification of a finalised proposed substation site, which will be taken forward for planning. An overview of the Substation Site Selection Process is provided in Figure 3 below.



## 2. Stage 0: Strategic Options Assessment

A strategic options assessment undertaken by SSEN Transmission identified the following key requirements for the new substation sites:

- Proximity to the existing 400 kV network to minimise the amount of new overhead lines or cabling required to connect to the network. This was set nominally at 10 km for an effective Search Area, taking account of the local topographical and physical constraints.
- Large enough to accommodate the proposed individual or combined 400 kV substation/ HVDC converter station footprints, together with associated landscaping, contractor compounds, access and new connection routes.
- In areas which do not contain environmental designations and minimise impacts on local environmental receptors.
- Enable feasible connection routes for the proposed new 400 kV overhead lines and HVDC cables.
- Additional capacity for future connections.

## 3. Stage 1: Initial site screening

16 feasible Options were initially identified within a 10km search radius of the existing Beaulieu substation using publicly available data and Multi Criteria Analysis (MCA) to provide information about key constraints to the siting of the substation. The location of the 16 options is shown on Figure 5.

Assessment of the 16 options was undertaken against the key criteria within SSEN Transmission's internal guidance and using the Red, Amber, Green (RAG) matrix which is provided as Figure 4 below. This resulted in 12 of the 16 options being discounted from further assessment based on proximity to designated areas and local settlements, visual impact, engineering challenges and connectivity to the existing and future 400kV circuits around Beaulieu, when compared to the 4 shortlisted sites.

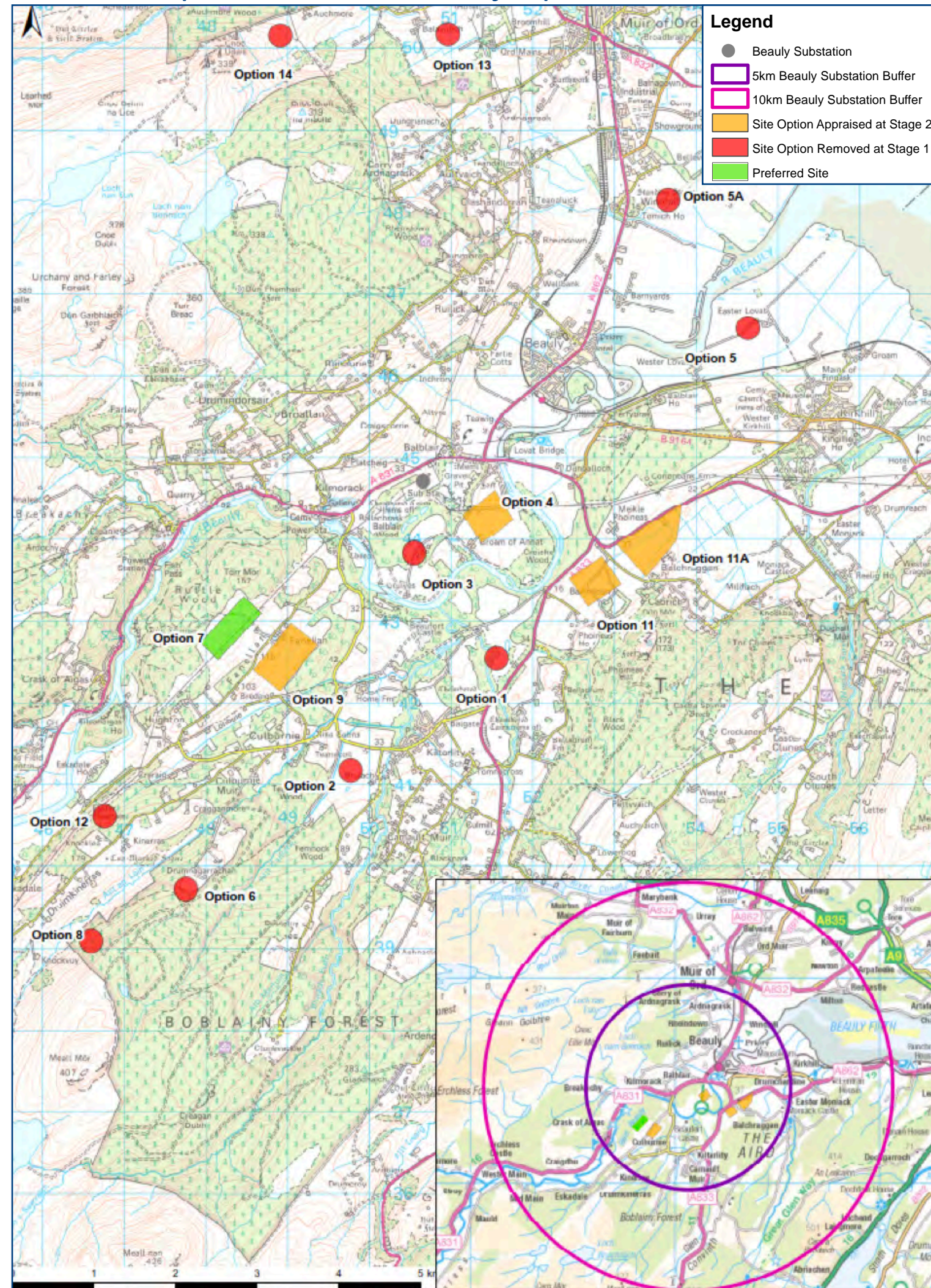
The following two pages show the location of each Option and the reasons why that Option was not taken forward to Stage 2.

Option 10 was an area represented by site Options 3 and 4 and therefore is not shown below. Options 4, 7, 9 and 11/ 11a were taken forward to Stage 2.

Performance	Comparative appraisal
Most viable	Low potential for the development to be constrained.
↓	Intermediate potential for the development to be constrained.
	High potential for the development to be constrained.
Least viable	



Figure 5: Location of 16 Options Assessed at Stage 1 (Initial Site Screening), interactive map available on ArcGIS Storymaps<sup>1</sup>.



Maps are based on currently available Ordnance Survey mapping 1:40, SSEN accept no responsibility for any new developments not shown.

### 3.1. Sites Discounted at Stage 1 - Key Constraints

#### Option 1 (Single):

- Approximately 2.3km from the existing Beaulieu substation.
- Ancient Woodland Inventory (AWI) covers site (2b Long-Established of Plantation Origin (LEPO) woodland). This AWI is not considered irreplaceable based on the definitions within National Planning Framework 4). The woodland has potential to support recreational activities.
- Removal of broadleaf riparian woodland would be required affecting one of the key characteristics of the Landscape Character Type (LCT).
- The watercourse of Bruiach Burn/Belladrum Burn routes through site and the site sits within an area with medium to high-risk of fluvial flooding.
- Contains Class 2 agricultural land and the current land use is for agricultural purposes.
- Potential planning policy conflicts relate to landscape character, flooding agricultural land and ancient/native woodland.
- This site was ruled out from an engineering basis due to the watercourses and potential for flooding.

#### Option 2 (Single/Combined):

- Approximately 3.6km from the existing Beaulieu substation.
- AWI (2b LEPO) covers margins of the site, this woodland has potential to support recreational activities.
- Limited potential for screening of sensitive receptors including, Culburnie, Kiltarlity, Bruiach and Camault Muir and users of the Allaburn Drive which is adjacent.
- The watercourse of Alt Caoiche, tributary of Allt an Loin routes through site and the site sits within an area with medium to high-risk of fluvial flooding.
- Contains Class 3.1 agricultural land and current land use is for agricultural purposes.
- Potential planning policy conflicts relate to: visual, flooding, agricultural land and ancient/native woodland.
- Constrained on 3 sides which limits the ability for new 400kV OHLs to connect to substations. One existing 33kV distribution line will need to be diverted.
- The site was mostly flat and offered little opportunity to win material in order to build up the platform level. Vast amounts of material would therefore have had to be imported in order to raise the level of the platform beyond the risk of flooding.

#### Option 3 (Single/Combined):

- Approximately 800m from the existing Beaulieu substation.
- AWI (2b LEPO) covers large area of the site, this woodland has the potential to support recreational activities
- Removal of broadleaf riparian woodland would be required affecting one of the key characteristics of the LCT.
- Contains Class 3.1 agricultural land and the current land use is for agricultural purposes.
- One Inventory GDL, Beaufort Castle located approximately 200m south.
- Potential planning policy conflicts relate to: landscape character, flooding agriculture and ancient/native woodland.
- Complex OHL connection options.
- This site did not allow for a combined site with the HVDC converter station.
- The site was shown within SEPA maps as at a risk of flooding from the River Beaulieu.

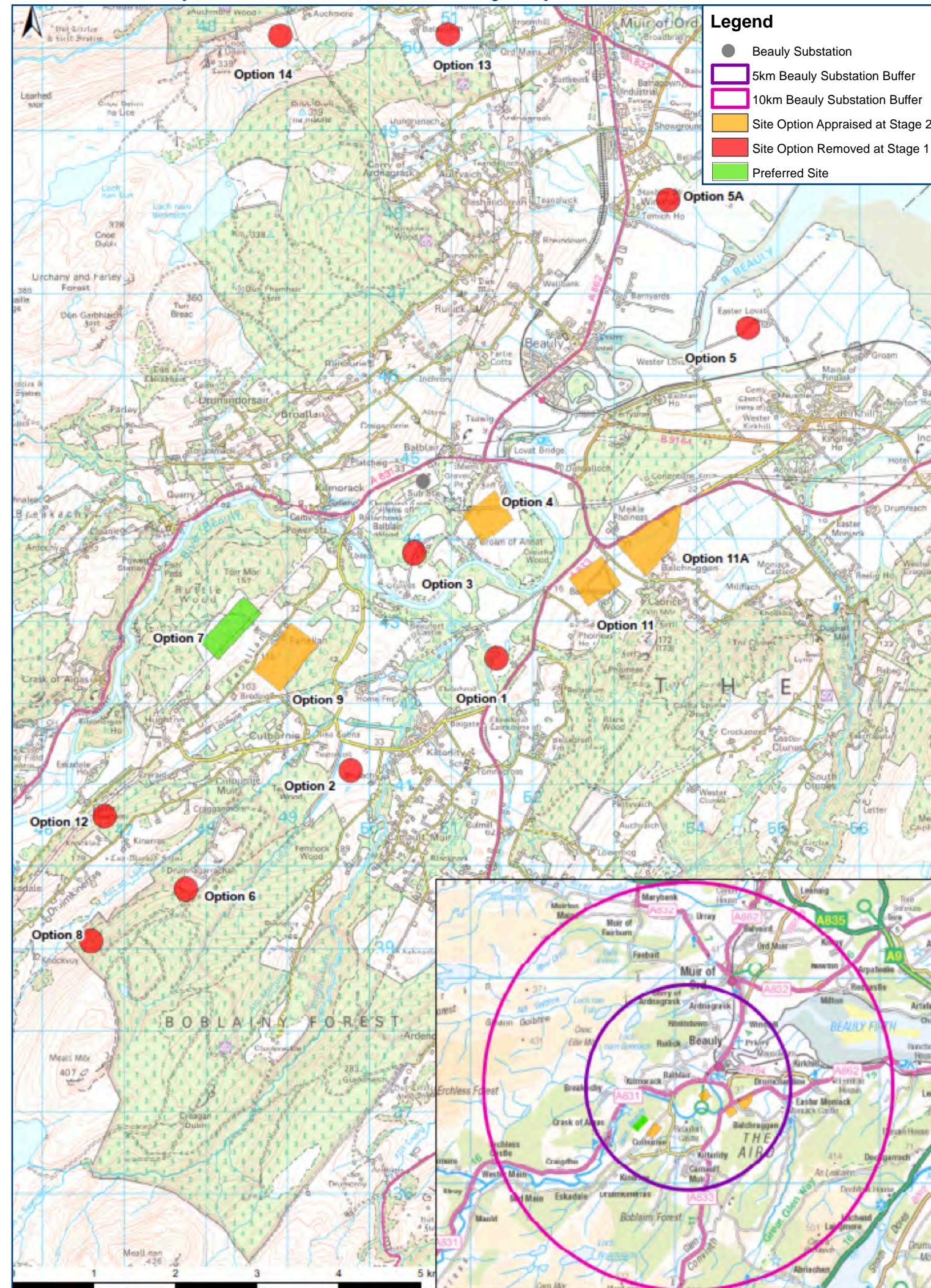
#### Option 5 (Single/Combined):

- Approximately 4.5km from the existing Beaulieu substation.
- Inner Moray Firth SPA and Beaulieu Firth SSSI (approximately 250m north) in close proximity.
- Very open low-lying landscape of the LCT, a substation would be very intrusive in this very open landscape. Limited potential for screening of sensitive receptors including users of the River Beaulieu, scattered residential properties of Beaulieu and Kirkhill.
- Contains Class 2 agricultural land and current land use is for agricultural purposes.
- The site sits within an area with medium to high-risk of coastal flooding.
- Potential planning policy conflicts relate to: landscape character, flooding, agriculture, visual and designated nature conservation sites.
- Distance of the site from the existing Beaulieu-Denny 400kV OHL and from the existing Beaulieu substation would mean a diversion of the OHL and additional new infrastructure.
- Connection of the new Beaulieu- Loch Buidhe 400kV OHL into this site would be challenging due to existing residential properties.
- Risk of salt pollution due to proximity to Beaulieu Firth.
- Significant public road improvements would be required including potential upgrade of a railway bridge.

<sup>1</sup> ArcGIS Storymaps - New Beaulieu area 400kV substation and HVDC converter station. Available at: <https://pinpointgis.wsp.com/portal/apps/storymaps/stories/973011c448ba4803afb7fcc2634971f3>



Figure 6: Location of 16 Options Assessed at Stage 1 (Initial Site Screening), interactive map available on ArcGIS Storymaps<sup>1</sup>.



### 3.1. Sites Discounted at Stage 1 - Key Constraints (continued)

#### Option 5a (Single/ Combined):

- Approximately 4.6 km from the existing Beauly substation.
- Inner Moray Firth SPA and Beauly Firth SSSI (approximately 500m south) in close proximity.
- Scheduled monument, Windhill standing stone (SM3127) located approximately 15m north.
- An unnamed tributary of the Beauly Firth routes through site and site sits within an area at medium to high-risk of fluvial flooding.
- Risk of the site being widely visible to the south and southeast. Limited potential for screening of sensitive receptors including residential properties at Windhill.
- Contains Class 2 agricultural land and the current land use is for agricultural purposes.
- Potential planning policy conflicts relate to flooding, agricultural, visual and cultural heritage.
- Distance of the site from the existing Beauly-Denny 400kv OHL and from the existing Beauly substation would mean a diversion of the OHL and additional new infrastructure.
- Connection of the new Beauly- Loch Buidhe 400kv OHL into this site would be challenging due to existing residential properties.
- Diversions required for 33kv and 11kv assets.

#### Option 6 (Single):

- Approximately 5.8km from the existing Beauly substation.
- Within Boblainy Forest, AWI (2b LEPO) covers the site, this woodland has the potential to support recreational activities.
- An unnamed tributary of the Allt Caoiche watercourse routes through the site.
- Potential planning policy conflicts relate to: flooding and ancient / native woodland.
- Technically challenging to create a new access route to site.
- Steep slopes / topography of site would make constructability challenging.

#### Option 8 (Single):

- Approximately 6.9km from the existing Beauly substation.
- Within Boblainy Forest with AWI present, this woodland has the potential to support recreational activities.
- Potential planning policy conflicts relate to: ancient/native woodland.
- Technically challenging to create a new access route to site.
- Steep slopes / topography of site would make constructability challenging.

#### Option 10:

- Option 10 was an area option represented by site Options 3 & 4, and is therefore not shown on the site options map.

#### Option 12 (Single/Combined):

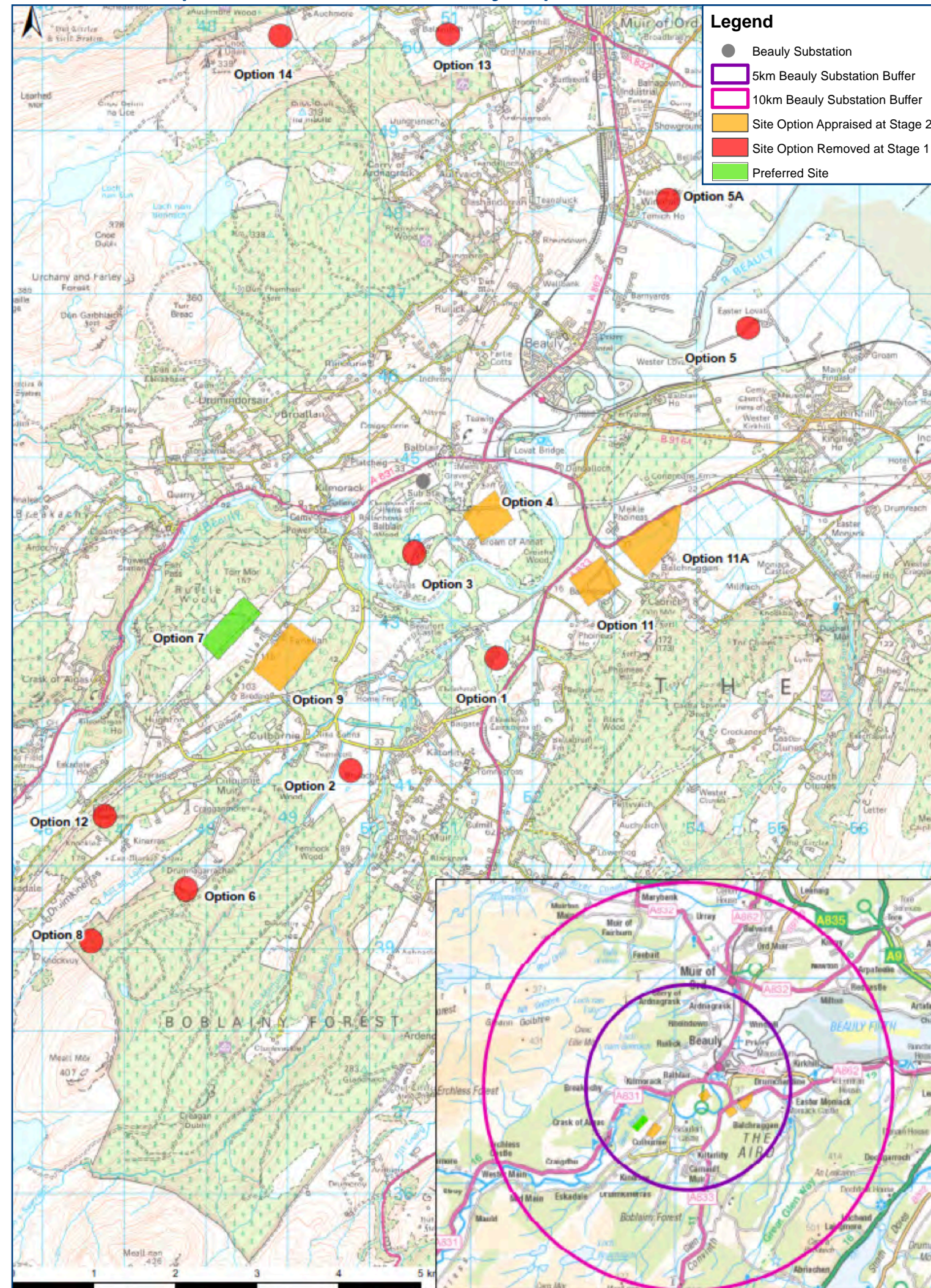
- Approximately 5.5km from the existing Beauly substation.
- Within Eskadale Wood used for commercial forestry, with AWI (2b LEPO) overlaps site, this woodland has the potential to support recreational activities.
- Significant earthworks and forestry removal would be required affecting the key characteristics of the LCT and risks altering the character of a sensitive area of landscape. Clearly visible from a long section of the A831 and from Aigas.
- An unnamed tributary of Bruiach Burn / Belladrum Burn water course routes through.
- Potential planning policy conflicts relate to: landscape character, flooding and ancient/native woodland.
- Constrained on 3 sides which limits the ability for new 400kv OHLs to connect to substation.
- Significant public road improvements required for access.

#### Option 13 (Single/Combined):

- Approximately 5.5km from the existing Beauly substation.
- An unnamed tributary flows through the Site.
- Potential planning policy conflicts relate to: flooding.
- Distance of the site from the existing Beauly-Denny 400kv OHL and from the existing Beauly substation would mean a diversion of the OHL and additional new infrastructure.
- Connection of the new Beauly- Blackhillock 400kv OHL into this site would be challenging due to existing residential properties.
- Significant public road improvements required for access.



Figure 7: Location of 16 Options Assessed at Stage 1 (Initial Site Screening), interactive map available on ArcGIS Storymaps<sup>1</sup>.



### 3.1. Sites Discounted at Stage 1 - Key Constraints (continued)

#### Option 14a (Single/ Combined):

- Approximately 5.7km from the existing Beauty substation.
- An unnamed tributary routes through the site.
- Site sits high towards the top of the broad valley running west from Muir of Ord and the lower valley of the River Conon.

- Potential planning policy conflicts relate to: flooding and visual.
- Distance of the site from the existing Beauty-Denny 400kv OHL and from the existing Beauty substation would mean a diversion of the OHL and additional new infrastructure.
- Connection of the new Beauty- Blackhillock 400kv OHL into this site would be challenging due to existing residential properties.

### 3.2. Sites Taken to Stage 2 - Key Constraints

#### Option 4 (Single/Combined)

- Environmental constraints limited to containing Class 2 agricultural land and being within medium to high-risk areas of fluvial flooding.
- There is no Ancient Woodland or watercourses crossing through the site.
- Potential planning policy conflicts relate to flooding and agriculture.
- Constrained on 3 sides reducing the land available for construction laydown.
- Adjacent land not available for permanent and temporary requirements such as construction compounds and SuDS.
- Existing 132kv and 275kv OHLs cross site, so will require additional outages to divert these. OHLs may also lead to a non standard substation layout.
- Only minor public road improvements required for access.

#### Option 7 (Single/Combined)

- Environmental constraints generally limited to visual. The Site lies close to the top of a hill, visible from Fanellan and Culburnie and across the broad valley to the east, including Kiltarlity and Camalt Muir and Beaufort Castle Estate. Areas of woodland and lines of trees would provide partial screening (more so in summer) and a degree of landform and planting mitigation would be possible.
- Generally free from other environmental constraints that would preclude the development of this Option.
- Potential planning policy conflicts relate to visual, but could potentially be mitigated through further design work.
- Additional outages required to divert the Beauty/Denny 400kv OHL to facilitate the site and future connection.
- Significant upgrade works required for improvements to bridge north of site at Kilmorack.

#### Option 9 (Single)

- Environmental constraints generally limited to visual. The Site overlooks and risks being visible from the broad valley containing Camalt Muir, Beaufort Castle and Kiltarlity. More locally it would risk being visible from Fanellan and from scattered residential properties in the Culburnie area. Areas of woodland and lines of trees would provide partial screening (more so in summer) and a degree of landform and planting mitigation would be possible.
- Generally free from other environmental constraints that would preclude the development of this Option.
- Potential planning policy conflicts relate to visual, but could potentially be mitigated through further design work.
- Site is reserved for HVDC convertor station, which would result in greater land take and earthwork requirements.
- Close to main A road, reducing public road improvements required.

#### Option 11 (Single)

- Environmental constraints limited to containing Class 3.1 agricultural land.
- Generally free from other environmental constraints that would preclude the development of this Option.
- Potential planning policy conflicts relate to agriculture.
- Significant diversion of Beauty/Denny 400kv OHL required.
- The site was mostly flat/ gentle slope and offered little opportunity to win material in order to build up the platform level. Vast amounts of material would therefore have had to be imported in order to create the platform at a suitable level.

#### Option 11a (Single)

- Environmental constraints limited to crosses three unnamed watercourses and contains Class 3.1 agricultural land.
- Generally free from other environmental constraints that would preclude the development of this Option.
- Potential planning policy conflicts relate to: flooding and agriculture.



## 4. Stage 2: Detailed Site Selection

Following the completion of the Stage 1 initial screening process a total of five sites were identified and taken forward to Stage 2. These sites were taken forward to Stage 2 as they were determined to be technically feasible, economically viable and environmentally acceptable site options. Environmental and engineering surveys have been undertaken for these sites to supplement information gathered from desk-based assessments. These five sites have been set out as four Options and were consulted upon (see Figure 8 and 9), summary details of those Options are set out below:

- Option 7 Combined: comprising a site for locating both the HVDC converter station and 400kV substation on a shared substation platform.
- Option 7/9: Option 7 comprising a site for locating the 400kV substation and Option 9 comprising a site for locating the HVDC converter station.
- Option 11/11a: Option 11 comprising a site for locating the 400kV substation and Option 11a comprising a site for locating the HVDC converter station.
- Option 4/11: Option 4 comprising a site for locating the 400kV substation and Option 11 comprising a site for locating the HVDC converter station.

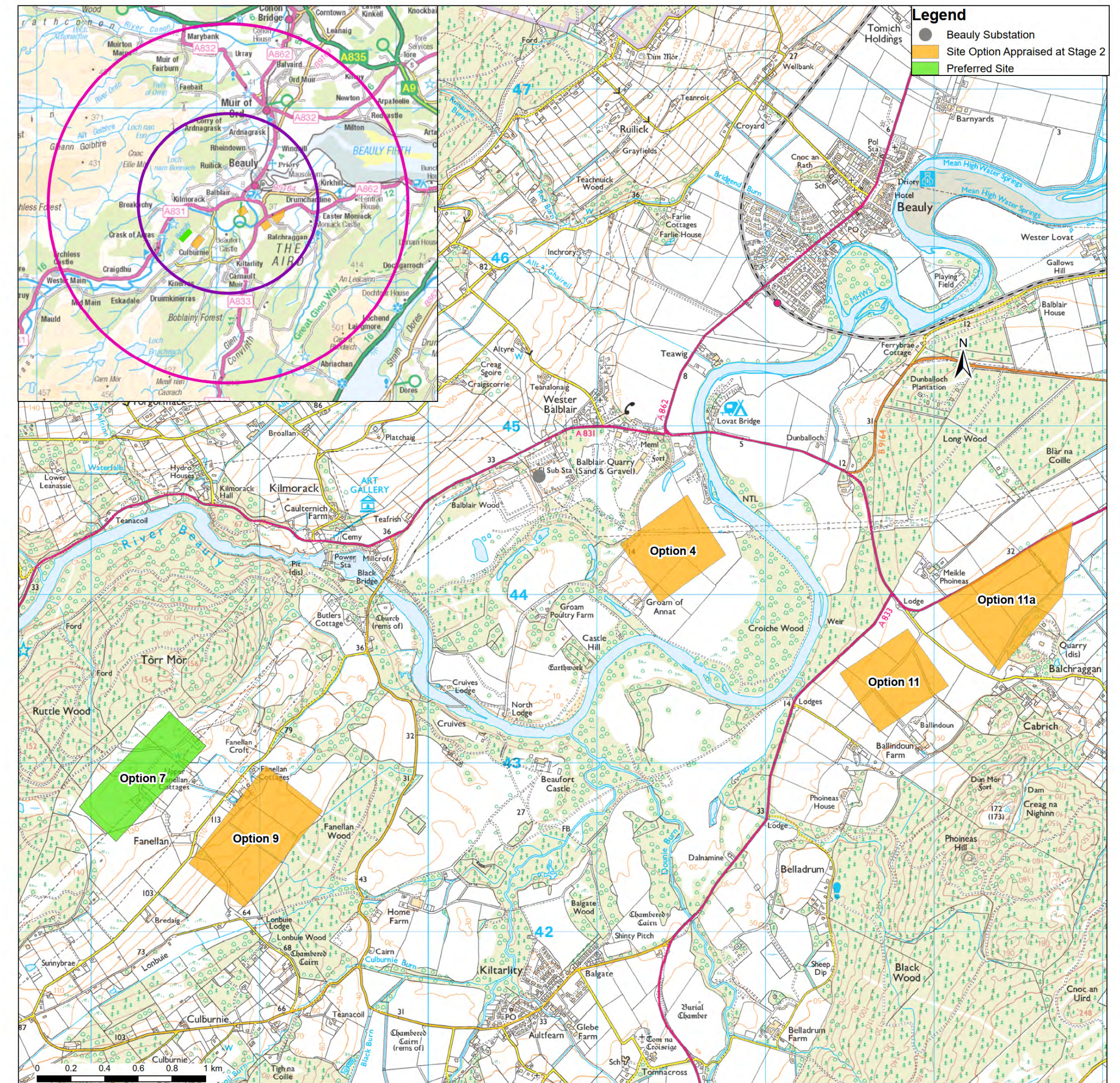
Following consultation with statutory and non statutory consultees, additional Options were investigated (see section 5):

1. Options in proximity to the quarry and up on the hill west of Broallan.
2. Options to extend the existing Beauly substation.

**Figure 8: Indicative Aerial images of the Four Site Options Assessed at Stage 2 (Detailed Site Selection)**



**Figure 9: Location of Four Options Assessed at Stage 2 (Detailed Site Selection)**



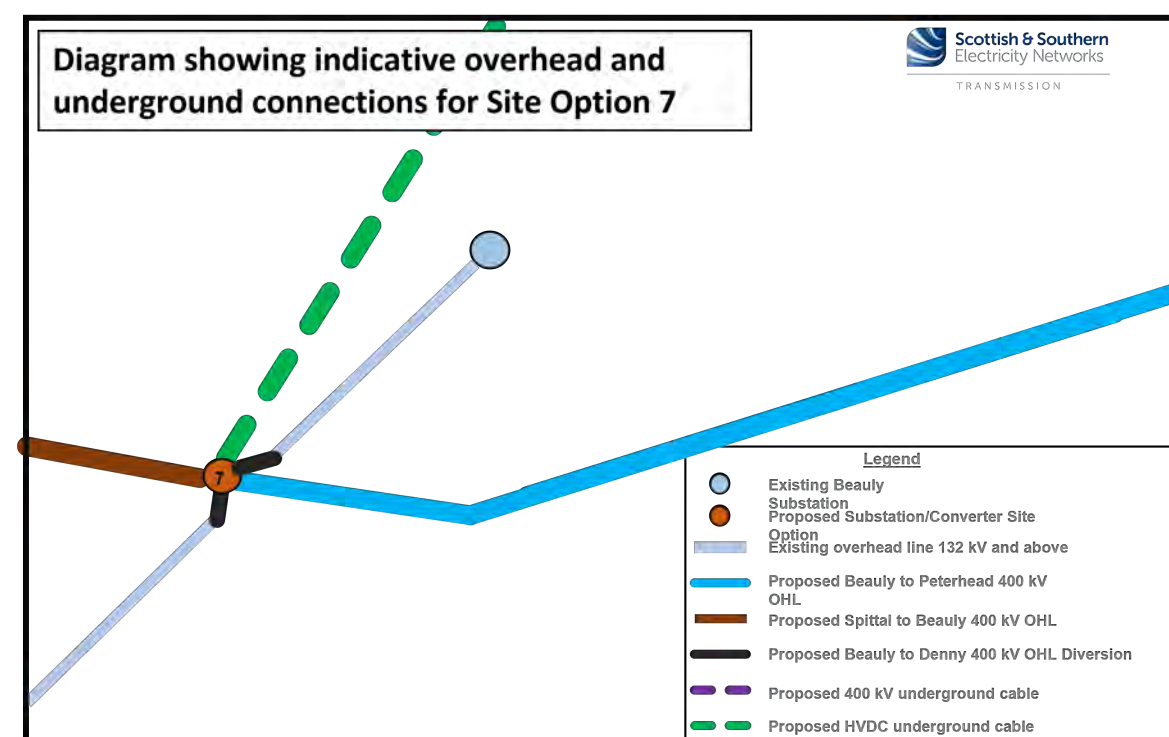


## 4.1. Connection Considerations

The new substation will facilitate the connections of the new Spittal- Loch Buidhe- Beauly 400kv OHL and the new Beauly- Blackhillock- New Deer- Peterhead 400kv OHL, onto the transmission network via the existing Beauly substation and Beauly- Denny 400kv OHL. Therefore the chosen site for the new substation will need to have space around it to enable the new 400kV connections (this could be OHL or Cable) to connect into the sites. The routing of these connections are being investigated under separate projects however connections have been taken into consideration as part of the Stage 2 (detailed site selection) assessments. Indicative layouts for the connections for each of the four options are indicated in Figures 10, 11, 12 and 13.

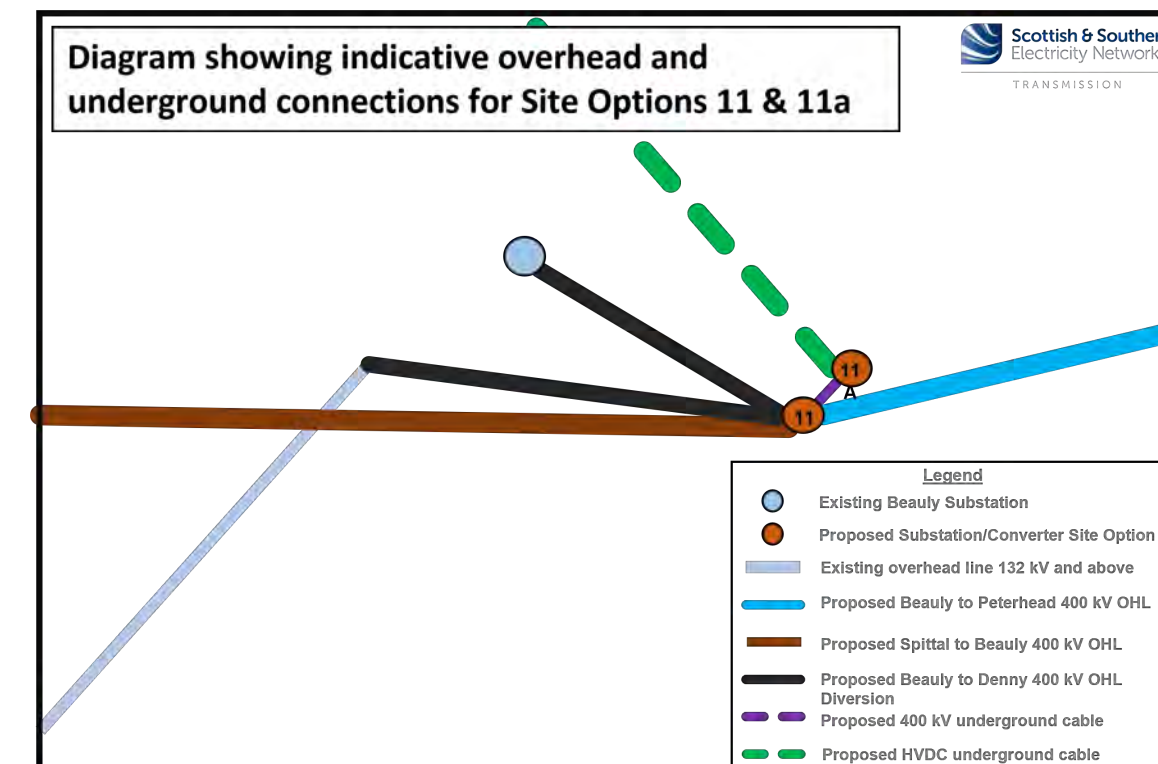
Where two single sites make up an Option, for example Option 7/9, additional 400kV AC underground cables are required to provide a connection between the 400 kV substation and the HVDC Converter station.

Figure 10: Indicative Overhead and Underground Connections for Option 7 Combined.



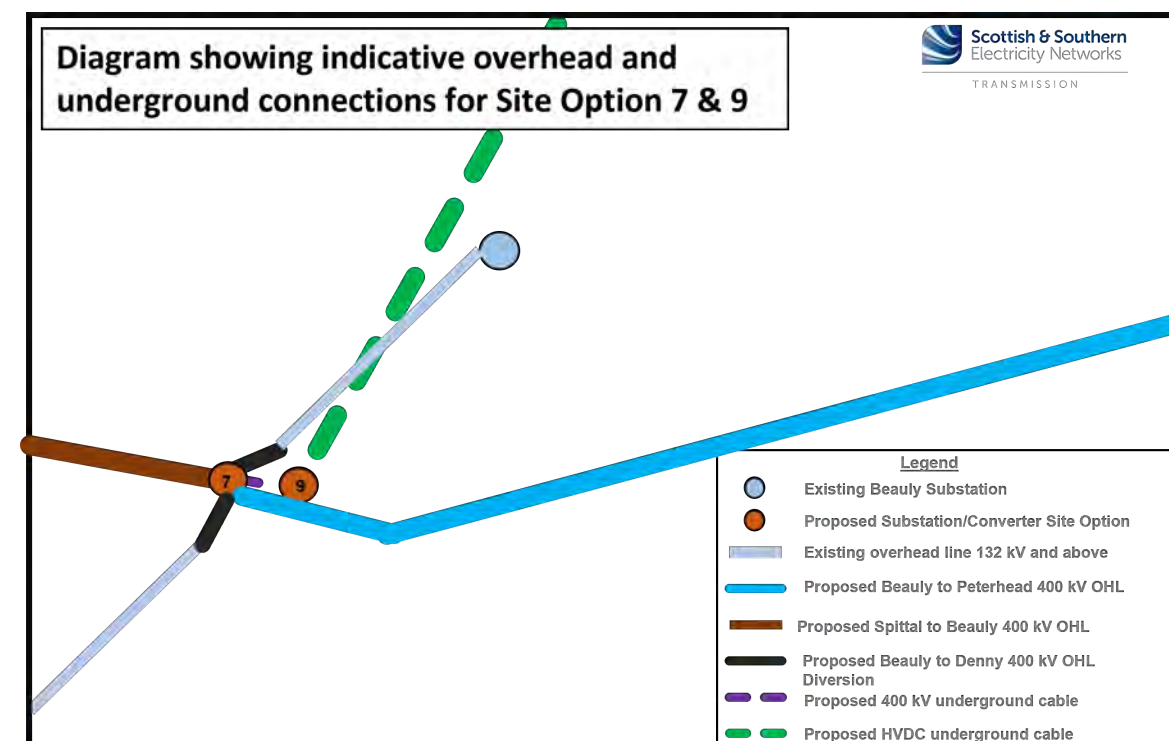
Option 7 Combined requires the diversion of the existing Beauly-Denny 400 kV OHL, and a HVDC underground cable connection into the general area of the Beauly Substation. As both the HVDC converter station and 400kV substation are located within the Site Option, 400 kV underground cables to connect the two are not required. Option 7 will facilitate the connections of both the Beauly to Peterhead 400 kV OHL and the Spittal to Beauly 400 kV which route from the east and west respectively.

Figure 12: Indicative Overhead and Underground Connections for Option 11/11a.



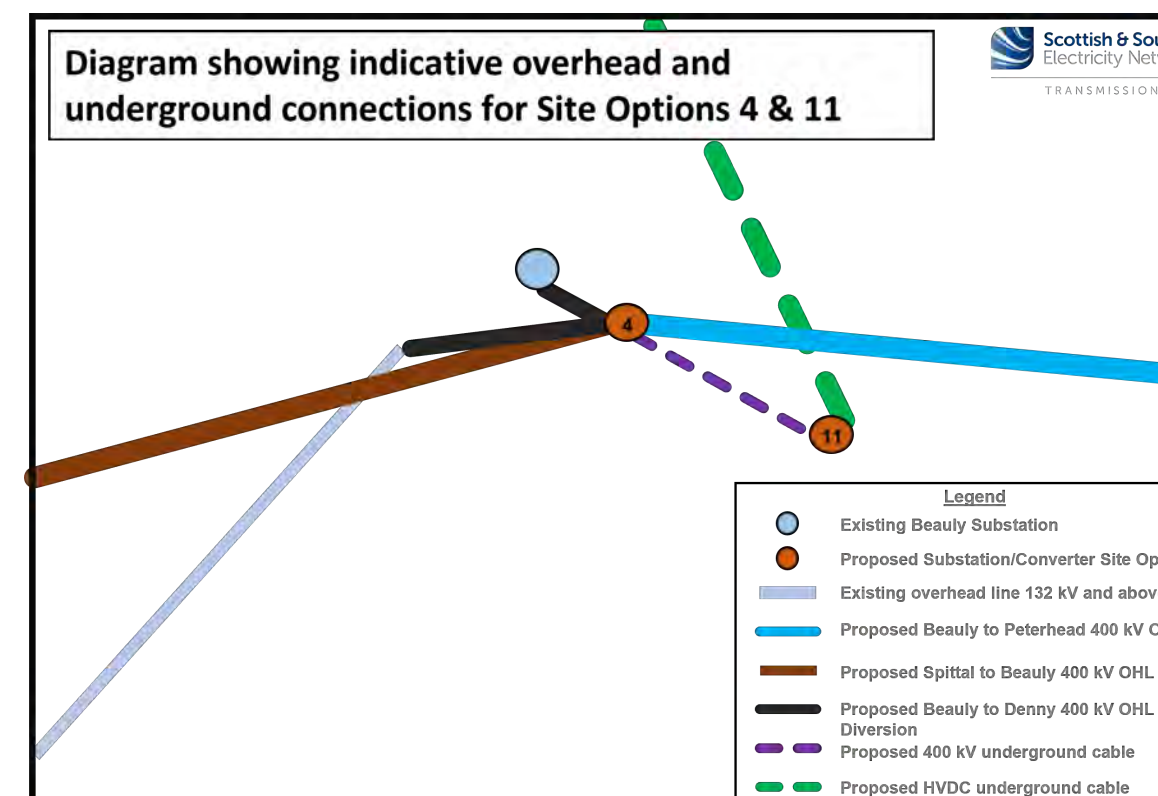
Option 11/11a requires the diversion of the existing Beauly-Denny 400 kV OHL and a HVDC underground cable connection into the general area of the existing Beauly Substation, which will need to cross under the River Beauly. Additionally 400 kV underground cables to connect the separate HVDC converter station (at Option 11a) and 400 kV substation (at Option 11) are required. Option 11/11a will facilitate the connections for both the Beauly to Peterhead 400 kV OHL and the Spittal to Beauly 400 kV which route from the east and west respectively.

Figure 11: Indicative Overhead and Underground Connections for Option 7/9.



Option 7/9 requires the same connections as Option 7 Combined as described above, however additionally 400 kV underground cables to connect the separate HVDC converter station (at Option 9) and 400 kV substation (at Option 7) are required.

Figure 13: Indicative Overhead and Underground Connections for Option 4/11.



Considering that elements 4 and 11 of the Option lie across the River Beauly, the connections between them are a key consideration. Option 4/11 requires the diversion of the existing Beauly-Denny 400 kV OHL. A HVDC underground cable connection into the general area of the existing Beauly Substation and 400kV underground cables to connect the separate HVDC converter station (Option 11) and 400kV substation (Option 4) are required, both of which will need to cross under the River Beauly. Option 4/11 will facilitate the connections for both the Beauly to Peterhead 400kV OHL and the Spittal to Beauly 400kV which route from the east and west respectively.



## 4.2. Comparative Assessment

Tables 1, 2, 3 and 4 below provide a summary of the key differentiating factors between each of the Options. For Table 2, as the connections required as part of the Proposed Development is a key aspect of the selection of a preferred substation site option, the assessment has also considered the identified connections as an additional factor.

**Table 1: Summary RAG**

	Designated Areas	Protected Species	Habitats	Ornithology	Geology, Hydrology, Hydrogeology	Heritage Designations	Heritage Assets	Landscape Designations	Landscape Character	Visual	Agriculture	Forestry	Recreation	Planning Policy	Planning Proposals	Connectivity - Existing circuits/network	Connectivity - Future development possibilities	Connectivity – Interface with SSE Distribution and Generation	Connectivity – DNO Connection	Footprint Requirements - Technology	Footprint Requirements - Adjacent Land Use	Footprint Requirements - Space Availability	Hazards	Ground Conditions	Environmental Conditions	Construction Access	Operation and Maintenance	Cost - Capital	Cost - Operational
Option 7 Combined	Yellow	Yellow	Green	Green	Green	Yellow	Green	Green	Yellow	Red	Green	Green	Yellow	Yellow	Green	Green	Yellow	Green	Green	Green	Green	Green	Yellow	Green	Green	Red	Green	Green	Green
Option 7/9	Yellow	Yellow	Red	Green	Green	Yellow	Green	Green	Yellow	Red	Green	Green	Yellow	Yellow	Green	Yellow	Yellow	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Red	Green	Yellow	Yellow
Option 4/11	Yellow	Red	Red	Green	Green	Yellow	Yellow	Green	Yellow	Yellow	Red	Green	Yellow	Red	Green	Yellow	Red	Green	Green	Green	Red	Yellow	Green	Green	Red	Yellow	Green	Red	Yellow
Option 11/11A	Yellow	Yellow	Red	Green	Red	Yellow	Yellow	Green	Yellow	Yellow	Red	Green	Yellow	Red	Green	Yellow	Yellow	Green	Green	Green	Yellow	Green	Green	Yellow	Yellow	Green	Green	Yellow	Yellow



**Table 2: Environmental comparison of shortlisted options**

Environmental topics		Option 7 Combined	Option 7/9	Option 11/11a	Option 4/11
Natural heritage	Designations	<p>All Options were assigned an Amber rating as they are all potentially linked to statutory designated sites.</p> <ul style="list-style-type: none"> <li>Statutory SPA sites qualifying for supporting non-breeding geese species are present within 20km of all Options.</li> <li>All Options contain suitable habitats to support wintering geese, are potentially hydrologically connected to further statutory designations including SPA, Ramsar, SAC and SSSI designations, are within or partially within a Buglife IIA, Buglife B-line and/or Butterfly Conservation's Scottish Priority Landscapes, which may provide potential opportunities to positively influence the Proposed Development's landscape design, with regard to biodiversity.</li> <li>Woodland listed on the AWI occurs adjacent to Option 7 Combined and Option 7/9 but no AWI occurs within any of the Options.</li> <li>An IBA was identified within 2km of Option 11/11a, and Option 4/11.</li> </ul>	<p>All Options were assigned an Amber rating as they are all potentially linked to statutory designated sites.</p> <ul style="list-style-type: none"> <li>Statutory SPA sites qualifying for supporting non-breeding geese species are present within 20km of all Options.</li> <li>All Options contain suitable habitats to support wintering geese, are potentially hydrologically connected to further statutory designations including SPA, Ramsar, SAC and SSSI designations, are within or partially within a Buglife IIA, Buglife B-line and/or Butterfly Conservation's Scottish Priority Landscapes, which may provide potential opportunities to positively influence the Proposed Development's landscape design, with regard to biodiversity.</li> <li>Woodland listed on the AWI occurs adjacent to Option 7 Combined and Option 7/9 but no AWI occurs within any of the Options.</li> <li>An IBA was identified within 2km of Option 11/11a, and Option 4/11.</li> </ul>	<p>All Options were assigned an Amber rating as they are all potentially linked to statutory designated sites.</p> <ul style="list-style-type: none"> <li>Statutory SPA sites qualifying for supporting non-breeding geese species are present within 20km of all Options.</li> <li>All Options contain suitable habitats to support wintering geese, are potentially hydrologically connected to further statutory designations including SPA, Ramsar, SAC and SSSI designations, are within or partially within a Buglife IIA, Buglife B-line and/or Butterfly Conservation's Scottish Priority Landscapes, which may provide potential opportunities to positively influence the Proposed Development's landscape design, with regard to biodiversity.</li> <li>Woodland listed on the AWI occurs adjacent to Option 7 Combined and Option 7/9 but no AWI occurs within any of the Options.</li> <li>An IBA was identified within 2km of Option 11/11a, and Option 4/11.</li> </ul>	<p>All Options were assigned an Amber rating as they are all potentially linked to statutory designated sites.</p> <ul style="list-style-type: none"> <li>Statutory SPA sites qualifying for supporting non-breeding geese species are present within 20km of all Options.</li> <li>All Options contain suitable habitats to support wintering geese, are potentially hydrologically connected to further statutory designations including SPA, Ramsar, SAC and SSSI designations, are within or partially within a Buglife IIA, Buglife B-line and/or Butterfly Conservation's Scottish Priority Landscapes, which may provide potential opportunities to positively influence the Proposed Development's landscape design, with regard to biodiversity.</li> <li>Woodland listed on the AWI occurs adjacent to Option 7 Combined and Option 7/9 but no AWI occurs within any of the Options.</li> <li>An IBA was identified within 2km of Option 11/11a, and Option 4/11.</li> </ul>



Environmental topics		Option 7 Combined	Option 7/9	Option 11/11a	Option 4/11
Natural heritage	Protected Species	<p>Assigned an Amber rating as Options 7 Combined, Option 7/9, and Option 11/11a had similar potential to support protected or notable species.</p> <ul style="list-style-type: none"> <li>All Options contained habitat suitable to support protected or notable species. Including potential roosting habitat and suitable foraging and commuting habitat for bats; foraging and commuting habitat as well as some areas suitable for otter to rest; and suitable habitat to support water vole, badger, and brown hare.</li> <li>Option contained woodland habitats and treelines suitable to support red squirrel, pine marten and wildcat. These edge habitats could also be used by hedgehogs and reptiles.</li> </ul>	<p>Assigned an Amber rating as Options 7 Combined, Option 7/9, and Option 11/11a had similar potential to support protected or notable species.</p> <ul style="list-style-type: none"> <li>All Options contained habitat suitable to support protected or notable species. Including potential roosting habitat and suitable foraging and commuting habitat for bats; foraging and commuting habitat as well as some areas suitable for otter to rest; and suitable habitat to support water vole, badger, and brown hare.</li> <li>Option contained woodland habitats and treelines suitable to support red squirrel, pine marten and wildcat. These edge habitats could also be used by hedgehogs and reptiles.</li> </ul>	<p>Assigned an Amber rating as Options 7 Combined, Option 7/9, and Option 11/11a had similar potential to support protected or notable species.</p> <ul style="list-style-type: none"> <li>All Options contained habitat suitable to support protected or notable species. Including potential roosting habitat and suitable foraging and commuting habitat for bats; foraging and commuting habitat as well as some areas suitable for otter to rest; and suitable habitat to support water vole, badger, and brown hare.</li> <li>Option contained woodland habitats and treelines suitable to support red squirrel, pine marten and wildcat. These edge habitats could also be used by hedgehogs and reptiles.</li> </ul>	<p>Assigned a Red rating because development north of the River Beaully is likely to have significant effect on protected or notable species by reducing their habitat in an already potentially restricted territory.</p> <ul style="list-style-type: none"> <li>All Options contained habitat suitable to support protected or notable species. Including potential roosting habitat and suitable foraging and commuting habitat for bats; foraging and commuting habitat as well as some areas suitable for otter to rest; and suitable habitat to support water vole, badger, and brown hare.</li> <li>Option contains woodland habitats and treelines suitable to support red squirrel, pine marten and wildcat. These edge habitats could also be used by hedgehog and reptiles.</li> <li>Within 500m of five ponds that could be suitable for breeding amphibians. Terrestrial habitats within the Option (such as woodland habitat) could be used as hibernacula if present.</li> </ul>
	Habitats	<p>Assigned a Green rating due to the lack of priority habitats and comparatively the lowest Biodiversity Units (BU) value (64.14 BU).</p> <p>No Annex 1 habitats were found to be present within any of the Options.</p>	<p>Assigned a Red rating because the number of BUs impacted would be over 120% of that found at Option 7 Combined (136.82 BU).</p> <p>No Annex 1 habitats were found to be present within any of the Options.</p>	<p>Assigned a Red rating because the number of BUs impacted would be over 120% of that found at Option 7 Combined (113.96) BU and Option 4/11 has a value of 99.14 BU.</p> <p>No Annex 1 habitats were found to be present within any of the Options. Notably this Option contains native hedgerows and mature trees which provide habitat linkages.</p>	<p>Assigned a Red rating because the number of BUs impacted would be over 120% of that found at Option 7 Combined (99.14 BU).</p> <p>No Annex 1 habitats were found to be present within any of the Options. Notably this Option contains native hedgerows and mature trees which provide habitat linkages.</p>



Environmental topics		Option 7 Combined	Option 7/9	Option 11/11a	Option 4/11
Natural heritage	Ornithology	Assigned a Green rating as although the Option has suitability to support overwintering waterfowl and suitability to support breeding and non-breeding activities for other species of conservational concern, it is unlikely that the Proposed Development would compromise the conservation status of species utilising the Site, due to the abundance of similar habitats within the local area.	Assigned a Green rating as although the Option has suitability to support overwintering waterfowl and suitability to support breeding and non-breeding activities for other species of conservational concern, it is unlikely that the Proposed Development would compromise the conservation status of species utilising the Site, due to the abundance of similar habitats within the local area.	Assigned a Green rating as although the Option has suitability to support overwintering waterfowl and suitability to support breeding and non-breeding activities for other species of conservational concern, it is unlikely that the Proposed Development would compromise the conservation status of species utilising the Site, due to the abundance of similar habitats within the local area.	Assigned a Green rating as although the Option has suitability to support overwintering waterfowl and suitability to support breeding and non-breeding activities for other species of conservational concern, it is unlikely that the Proposed Development would compromise the conservation status of species utilising the Site, due to the abundance of similar habitats within the local area.
	Hydrology/Geology	Assigned a Green rating as there are no watercourses crossing through the Options.	Assigned a Green rating as there are no watercourses crossing through the Options.	Assigned a Red rating due to three unnamed watercourses crossing through the Option.	Assigned a Green rating as there are no watercourses crossing through the Option.
Cultural heritage	Designations	Assigned an Amber rating due to the potential for setting impacts on the Scheduled Monuments (six within 3km) and Garden & Designed Landscape (GDL) (Beaufort Castle (GDL00052), located approximately 1km from this Option) due to proximity and visibility from these assets. There is also potential for direct impacts on known undesignated assets within the Option.  Comparatively larger distance from Beaufort Castle (GDL00052) than other Options, where impacts on setting, following implementation of screening mitigation, are unlikely to be significant.	Assigned an Amber rating due to the potential for setting impacts on the Scheduled Monuments (seven within 3km) and GDL (Beaufort Castle (GDL00052), located approximately 370m from this Option) due to proximity and visibility from these assets. There is also potential for direct impacts on known undesignated assets within the Option.  The potential exists to reduce impacts by siting any development in the lower portions of the Option to the east.	Assigned an Amber rating due to the potential for adverse setting impacts on the Scheduled Monuments (12 within 3km) and GDL (Beaufort Castle (GDL00052), located approximately 280m from this Option) due to proximity and visibility from these assets. There is also potential for direct impacts on known undesignated assets within the Option.	Assigned an Amber rating due to the potential for adverse setting impacts on the Scheduled Monuments (12 within 3km) and GDL (Beaufort Castle (GDL00052), located approximately 280m from this Option) due to proximity and visibility from these assets. There is also potential for direct impacts on known undesignated assets within the Option.



Environmental topics		Option 7 Combined	Option 7/9	Option 11/11a	Option 4/11
Cultural heritage	Cultural heritage assets	Assigned a Green rating due to the minor anticipated setting impacts on cultural heritage assets.  Comparatively larger distance from the nearest Listed Building and the distance from Category A/B Listed Buildings.	Assigned a Green rating due to the minor anticipated setting impacts on cultural heritage assets.	Assigned an Amber rating due to the close proximity of the Option to a cluster of Category C farmstead buildings and will likely directly disturb the setting of Phoineas House, which is historically associated with the land of the proposed Option.	Assigned an Amber rating due to the close proximity of the Option to a cluster of Category C farmstead buildings and will likely directly disturb the setting of Phoineas House, which is historically associated with the land of the proposed Option.
Landscape and visual	Designations	Assigned a Green rating as it is very unlikely that the substation infrastructure within Option would have any effects on the nearest landscape designation, the Central Highlands Wild Land Area (WLA) given the distance, topography and intervening vegetation.	Assigned a Green rating as it is very unlikely that the substation infrastructure within Option would have any effects on the nearest landscape designation, the Central Highlands Wild Land Area (WLA) given the distance, topography and intervening vegetation.	Assigned a Green rating as it is very unlikely that the substation infrastructure within Option would have any effects on the nearest landscape designation, the Central Highlands Wild Land Area (WLA) given the distance, topography and intervening vegetation.	Assigned a Green rating as it is very unlikely that the substation infrastructure within Option would have any effects on the nearest landscape designation, the Central Highlands Wild Land Area (WLA) given the distance, topography and intervening vegetation.
	Landscape Character	Assigned an Amber rating. The Option risks creating a prominent incongruous feature in the landscape at this location close to the top of the hill. However, the site offers the potential for significant mitigation: careful siting and sinking the development platform into the rising ground would allow the creation of new landform which, together with extensive woodland planting would help integrate development into the landscape and reduce the risk of it being a prominent feature.	Assigned an Amber rating. The Option risks creating a prominent incongruous feature in the landscape at this location part close to the top of the hill, part on an open hillside. However, the site offers the potential for significant mitigation similar to that noted for Option 7 Combined, which would help integrate development into the landscape and reduce the risk of it being a prominent feature.	Assigned an Amber rating due to the location of the Option at a relatively low level in a generally well wooded landscape. This would limit the prominence of development such that effects on the character of the landscape would be reasonably well contained. Mitigation woodland planting would, over time, help integrate development into the landscape.	Assigned an Amber rating due to the location of the Option at a relatively low level in a generally well wooded landscape. This would limit the prominence of development such that effects on the character of the landscape would be reasonably well contained. Mitigation woodland planting would, over time, help integrate development into the landscape.



Environmental topics		Option 7 Combined	Option 7/9	Option 11/11a	Option 4/11
	Visual	Assigned a Red rating as the Option lies close to the top of the hill, likely to be very intrusive for a small number of houses in the immediate vicinity, and widely visible across the valley to the east and southeast, particularly if the terminal towers for the connecting overhead lines cluster around the site. The form of the site offers the potential for substantial mitigation of the substation. Cutting the platform level into the hillside could bring the roof level down below the skyline and new landform and extensive planting would screen development in most views.	Assigned a Red rating as the Option lies close to the top of the hill and would surround Fanellan, very intrusive for a small number of houses in the immediate vicinity, and widely visible across the valley to the east and southeast, particularly if the terminal towers for the connecting overhead lines cluster around the site. The form of the site offers the potential for substantial mitigation of the substation. Cutting the platform level into the hillside could bring the roof level down below the skyline and new landform and extensive planting would screen development in most views.	Assigned an Amber rating as there are a relatively limited number of sensitive receptors close to the site, and the topography of the area together with the presence of extensive woodland would limit wider visibility. Both parts of the Option offer good potential for mitigation by landform and for woodland screen planting which would reduce the visual influence of the substation itself. Terminal towers for the connecting overhead lines would be widely visible but would be sat relatively low and backdropped in views from the north.	Assigned an Amber rating as there are a relatively limited number of sensitive receptors close to the site, and the topography of the area together with the presence of extensive woodland would limit wider visibility. Option 11 offers good potential for mitigation by landform and this together with woodland screen planting to both parts of the site for would reduce the visual influence of the substation itself. Terminal towers for the connecting overhead lines would be widely visible but would be sat relatively low and backdropped in views from the north.
Land Use	Agriculture	Assigned an Amber rating as the Option contains land classed as 3.2, 4.2 and 5.3 in Scotland Soil's National Scale Land Capability for Agriculture. Therefore, this Option does not include high-quality agricultural land classification (Class 1, 2 and 3.1).	Both Options assigned an Amber rating as the Options contains land classed as 3.2, 4.2 and 5.3 in Scotland Soil's NationalScale Land Capability for Agriculture. Therefore, this Options do not include high-quality agricultural land classification (Class 1, 2 and 3.1).	Assigned a Red rating as the Option contains land classified as Class 3.1 and 3.2 in Scotland Soil's National Scale Land Capability for Agriculture. Therefore, this Option includes high-quality agricultural land classification (Class 1, 2 and 3.1). Land with soil classification of podzol is also found within 100m to the south.	Assigned a Red rating as the Option contains land classified as Class 3.1 and 3.2 in Scotland Soil's National Scale Land Capability for Agriculture. Therefore, this Option includes high-quality agricultural land classification (Class 1, 2 and 3.1). Land with soil classification of podzol is also found within 100m to the south.
	Woodland Forestry	Assigned a Green rating as there is no commercial forestry currently occurring on any the Option	Assigned a Green rating as there is no commercial forestry currently occurring on any the Option	Assigned a Green rating as there is no commercial forestry currently occurring on any the Option	Assigned a Green rating as there is no commercial forestry currently occurring on any the Option
	Recreation	Assigned an Amber rating as there are no existing core paths or cycle routes within 100m of the Option.  There is potential for recreational activities in the large, wooded area to the north of the Option extending to the River Beauly.	Assigned an Amber rating as there are no existing core paths or cycle routes within the Option. 'Home Farm to Hughton by Lonbuie' core path is within 100m.  There is potential for recreational activities in the large, wooded area to the north of the Option extending to the River Beauly.	Assigned an Amber rating as there are no existing core paths or cycle routes within 100m of the Option.  There is potential for recreational activities in wooded areas adjacent to the Option and the River Beauly within 100m.	Assigned an Amber rating due to the to the 'War Memorial to Black Bridge by Balblair Wood' core path being located within the north western corner of this Option. There is a core path named 'Lovat Bridge to Black Bridge' which in within 100m of the Option to the south east.  There is potential for recreational activities in wooded areas adjacent to the Option and the River Beauly within 100m.



Environmental topics		Option 7 Combined	Option 7/9	Option 11/11a	Option 4/11
Planning	Policy	Assigned an Amber rating due to potential conflict with Policy 61: Landscape within the Highland Wide LDP.	Assigned an Amber rating due to potential conflict with Policy 61: Landscape within the Highland Wide LDP.	Assigned a Red rating due to the conflict with Policy 28: Sustainable Design of the Highland Wide LDP due to the presence of high-quality agricultural land within this Option.	Assigned a Red rating due to the conflict with 28: Sustainable Design of the Highland Wide LDP due to the presence of high quality agricultural land within this Option and potential conflict with Policy 64: Flood Risk and Policy and Policy.
	Proposals	Assigned a Green rating as there are no planning proposals within 100 m of the Option that have been submitted within the last 5 years and are awaiting construction/ completion.	Assigned a Green rating as there are no planning proposals within 100 m of the Option that have been submitted within the last 5 years and are awaiting construction/ completion.	Assigned a Green rating as there are no planning proposals within 100 m of the Option that have been submitted within the last 5 years and are awaiting construction/ completion.	Assigned a Green rating as there are no planning proposals within 100 m of the Option that have been submitted within the last 5 years and are awaiting construction/ completion.

## Connectivity

As stated in Section 4.1, the ability to join the new 400kv connections to the new substation site is essential, it shapes our site selection. The connections for each Option are shown on Figures 10, 11, 12 and 13.

### Beauly to Denny 400kV OHL Diversion

For the connection to the existing Beauly to Denny 400kV OHL, Options 7 Combined and Option 7/9 are located on the existing alignment, therefore minimal diversion is required for these Options. For Options 4/11 and Option 11/11a, the route for diverting the existing Beauly to Denny 400kV OHL covers a much longer distance (approximately 1km and 3 km respectively) when compared to Option 7 Combined and Option 7/9. Therefore Option 4/11 and 11/11a would introduce comparatively more overhead line infrastructure in the wider Beauly area and increase potential environmental impacts.

### Spittal to Beauly 400kV OHL

For the connection to the Spittal to Beauly 400kV OHL, as this routes from the west, the distance to Option 7 Combined and Option 7/9 is minimal as these Options are located in the west of the Beauly area. For Options 4/11 and Option 11/11a, this connection covers a much longer distance (approximately 4km

and 5km respectively) when compared to Option 7 Combined and Option 7/9 (approximately <1km). Option 4/11 and 11/11a would therefore introduce comparatively more overhead line infrastructure into the wider Beauly area and increasing the area for potential environmental impacts, for landscape and visual in particular.

### Beauly to Peterhead 400kV OHL

For the connection to the Beauly to Peterhead 400kV OHL, as this routes from the east the distance to Option 4/11 and Option 11/11a is shorter (approximately 1km and <1 km respectively as these Options are located in the east of the Beauly area) compared to Option 7 Combined and Option 7/9 (which cover a distance of approximately 5km). Option 7 Combined and Option 7/9 would therefore introduce comparatively more overhead line infrastructure wider Beauly area and increasing the area for potential environmental impacts, for landscape and visual in particular.

### HVDC Underground Cable

For the required HVDC underground cable, Option 7/9 has the shortest distance compared to the other site Options (Option 7 Combined approximately 2km, Option 7/9 approximately 2km, Option 4/11 approximately 2km and Option

11/11a approximately 3km). All site Options will require one river crossing. Additionally potential routes for the HVDC underground cable for Option 11/11a would likely pass through areas of Ancient Woodland (Native Woodland).

### 400kV Underground Cables

400 kV underground cables are not required for Option 7 Combined, which reduces the potential for environmental impacts compared to all the other Options. The route for the 400kV underground cables for Option 7/9, Option 4/11 and Option 11/11a would cover distances of <1km, 1km and <1km respectively. Additionally, the potential routes for the 400kV underground cables for Option 4/11 would likely cross a large area of Ancient Woodland (Native Woodland) at Croiche Wood and require HDD under the river.

### Conclusion

When considering the potential connections in isolation, Option 7 Combined is preferred from a technical, economic, community and environmental perspective as it limits the works for the diversion of the Beauly-Denny OHL, the distance for the Spittal to Beauly 400kV OHL connection and removes the requirement for a separate 400kV underground connection.



**Table 3: Engineering comparison of shortlisted options**

Engineering topics		Option 7 Combined	Option 7/9	Option 11/11a	Option 4/11
Connectivity - Existing circuits/network	Distance and feasibility of connecting to the existing circuits/network (400kV)	Within 1km and has minimised diversion requirements and complexities.	Within 1km and has minimised diversion requirements and complexities.	Requires a greater diversion of the Beauly/Denny line.	Within 1km and has minimised diversion requirements and complexities.
	Distance and feasibility of connecting to HVDC	HVDC converter station within 1km distance.	HVDC converter station between 1-5km distance.	HVDC converter station between 1-5km distance.	HVDC converter station between 1-5km distance.
	Outages for modification to existing circuits	Outage requirement prior to the construction of the site to suitably divert the OHL.	Outage requirement prior to the construction of the site to suitably divert the OHL.	Minimum possible network outage solution.	Additional outages required to divert 132kV and 275kV OHL. Potential to avoid with reorientation or nonstandard arrangement.
Connectivity - Future development possibilities	Extension of site or other circuits	Boundary constraints but has potential space to extend.	Opportunity for expansion	Boundary constraints but has potential space to extend.	Constraints on 3 boundary edges from existing OHL, the River Beauly, and potential flood plains.
Connectivity - Interface with SSE Distribution and Generation	Consideration of Business Separation and whole system requirements (Generation)	No interface	No interface	No interface.	No interface.
	Consideration of Business Separation and wholesystem requirements (Generation)	No interface	No interface.	No interface.	No interface.
	Consideration of Business Separation and whole system requirements (Distribution)	No interface.	No interface.	No interface.	No interface.



Engineering topics		Option 7 Combined	Option 7/9	Option 11/11a	Option 4/11
Connectivity - DNO Connection	Proximity of LVAC supplies	Within 1km proximity to a DNO connection.	Within 1km proximity to a DNO connection.	Within 1km proximity to a DNO connection.	Within 1km proximity to a DNO connection.
Footprint Requirements - Technology	i.e., AIS/GIS or certainty of sizing on non-standard plant and equipment	Can accommodate either technology.	Can accommodate either technology.	Can accommodate either technology.	Can accommodate either technology.
Footprint Requirements - Adjacent Land Use	Availability for ancillary infrastructure like welfare compounds, laydown areas (Temporary)	Space available.	Space available.	Space available.	Space available.
	Availability for ancillary infrastructure like screening and SuDS infrastructure. (Permanent)	Space available.	Space available.	Proximity to the flood zone at Site Option 11 but there may be space provision to allow for a solution at this location.	May not be suitable for SuDS due to the surrounding flooding potential from the Beaully River.
Footprint Requirements - Space Availability	Non-standard substation configurations to accommodate site specific considerations	Space available.	Space available.	Space available.	Constraints on the boundary edges of the site it has been assessed that the site may only work with a modification to shape.
Hazards	Unique Hazards	There are no unique hazards.	There are no unique hazards.	There are no unique hazards.	There are no unique hazards.
	Existing Utilities	Minimal to none, existing utilities which would require diversion or protection.	From desktop studies, there will need to be some diversions to 132kV and 275kV lines.	From desktop studies, there will need to be some diversions to 132kV and 275kV lines.	From desktop studies, there will need to be some diversions to 132kV and 275kV lines.
Ground Conditions	Topography	Rolling undulations.	Rolling undulations.	Slopes across the site between 5-15% gradient.	Generally flat, open expanse of land.
	Geology (Superficial Deposits – Peat)	No areas of peat or clay identified.	No areas of peat or clay identified.	No areas of peat or clay identified.	No areas of peat or clay identified.
	Geology (Site testing to verify properties)				



Engineering topics		Option 7 Combined	Option 7/9	Option 11/11a	Option 4/11
Environmental Conditions	Elevation	Between 100m and 200m AOD.	Between 100m and 200m AOD.	Below 100m AOD.	Below 100m AOD.
	Salt Pollution	Greater than 6km from the coastline.	Greater than 6km from the coastline.	Between 2km and 6km from the coastline.	Greater than 6km from the coastline.
	Flooding	No risk of flooding as per SEPA maps.	No risk of flooding as per SEPA maps.	No risk of flooding as per SEPA maps.	High risk of Surface Water flooding as per SEPA maps.
	Carbon Footprint				
	SF6	Assumption of the project is that all technology will be SF6 free.	Assumption of the project is that all technology will be SF6 free.	Assumption of the project is that all technology will be SF6 free.	Assumption of the project is that all technology will be SF6 free.
	Contaminated Land				
	Noise (proximity to dwellings/residential properties)	Minimal surrounding properties.	Properties within the vicinity	Properties within the vicinity	Properties within the vicinity
Construction Access	Substation Access Road (from public road)	Require less than 0.5km of upgraded access road.	Require less than 0.5km of upgraded access road.	Require less than 0.5km of upgraded access road.	Require less than 0.5km of upgraded access road.
	Construction and Transformer Delivery Route	Significant road improvements required. Considers alternative route to site, avoiding bridge with weight restriction.	Significant road improvements required. Considers alternative route to site, avoiding bridge with weight restriction.	Close proximity to the main A-class road.	Minor road upgrades required.
Construction Safety	Customer access disruption during construction				
Operation and Maintenance	Access	All within 0.5km to 1km of a well-maintained public road.	All within 0.5km to 1km of a well-maintained public road.	All within 0.5km to 1km of a well-maintained public road.	All within 0.5km to 1km of a well-maintained public road.



Table 4: Cost comparison of shortlisted options

Cost	Option 7 Combined	Option 7/9	Option 11/11a	Option 4/11
Capital	<p>Lowest capital cost option, predominantly due to less land take in comparison to other sites due to shared platform (e.g. temporary construction compounds, drainage, access) and less of a diversion of the existing Beaulieu –Denny OHL than other sites.</p> <p>While there will be significant amount of earth movements due to undulating topography which will increase costs, the existing Ground investigations data provides confidence that the site is workable.</p>	<p>Option 7/9, Option 11/11a, and Option 4//11 are similar in that they are split sites which require underground cable connections to connect the two sites and additional temporary construction compound (with utility connections) increasing the cost above the lowest cost Option. Bridge upgrade required and multiple minor roads are likely to be modified/ upgraded increasing the cost.</p> <p>Option 7/9 requires less of a diversion of the existing Beaulieu –Denny OHL than Option 11/11a and Option 4/11, though an additional outage would be required which would increase the cost of the project.</p> <p>While there will be significant amount of earth movements due to undulating topography which will increase costs, the existing Ground investigations data provides confidence that the site is workable.</p>	<p>Option 11/11a, Option 7/9, and Option 4//11 are similar in that they are split sites which require underground cable connections to connect the two sites and additional temporary construction compound (with utility connections) increasing the cost above the lowest cost Option. Elements also driving increased cost are a more substantial diversion of the existing Beaulieu –Denny OHL, requirement of piled foundations due to presence of gravels and potential import of materials to raise platform level which would increase the cost.</p>	<p>Highest capital cost, predominately due to the potential requirement to divert the existing 275kV and 132kV OHL that intersects Site 4 and cable connections required between site 4 and 11 which would require HDD under the river, not required in alternative options.</p> <p>Option 4//11, Option 11/11a, and Option 7/9 are similar in that they are split sites which require underground cable connections to connect the two sites and additional temporary construction compound (with utility connections) increasing the cost above the lowest cost Option.</p> <p>Elements also driving increased cost are larger amounts of imported material required to raise the platform as a mitigation to flood risk, and a more substantial diversion of the existing Beaulieu –Denny OHL.</p>
Operational	<p>This site does not require an underground cable connection between the two sites because both sites are on a shared platform, which is why this site has been scored green and the other sites amber.</p> <p>Otherwise no significant differences between sites i.e. in terms of access, drainage, retaining structures. This is based on the assumption that the substation site is based on an Air-In-sulated switchgear (AIS) option.</p>	<p>This site will require a cable connection between the substation and HVDC Converter station, which will be an additional asset to maintain.</p>	<p>This site will require a cable connection between the substation and HVDC Converter station, which will be an additional asset to maintain.</p>	<p>This site will require a cable connection between the substation and HVDC Converter station, which will be an additional asset to maintain.</p>



## 4.3. Summary of Comparative Assessment

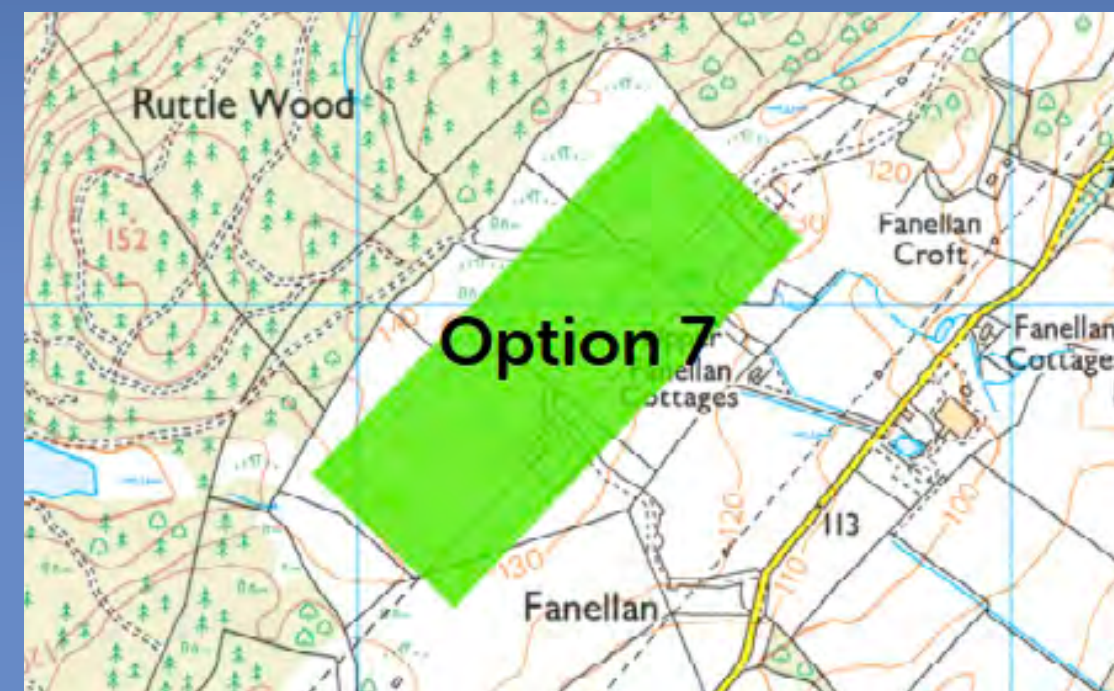
### 4.3.1. Environmental

When considering the Stage 2 substation Options in isolation, all options return comparative ratings from an environmental perspective. Site Option 7 Combined is rated the best with regards to natural heritage, cultural heritage, land use and planning (as described in Table 2, above). However, Option 7 Combined and Option 7/9 are located on a hillside and would be widely visible across the valley, although a degree of landscape screening would be possible. When compared to Option 4/11 and Option 11/11a and the potential landscape and visual impacts of Option 7 Combined and Option 7/9 result in them being the least preferred option from an environmental perspective when the substation sites are considered in isolation.

However, as stated in Section 3.1 and 3.2, the connections to and from each of the Site Options are an important part of the overall consideration for siting the substation. When considering the connections for each Option, Option 4/11 and Option 11/11a will significantly increase the amount of overhead line infrastructure required for the diversion of the existing Beaulay–Denny 400kV OHL and the Spittal to Beaulay 400kV OHL when compared to Option 7 Combined and Option 7/9. Conversely, the Option 7 Combined and Option 7 and 9 will introduce additional OHL infrastructure for the Beaulay to Peterhead 400kV OHL. For the HVDC underground cables, all options require a similar length of infrastructure and the environmental constraints are broadly similar with the exception of Option 11/11a which is likely to pass through areas of Ancient Woodland (Native Woodland). For the 400kV underground cable, Option 7 Combined does not require this connection, for the remaining options a similar length of infrastructure is required and the

environmental constraints are broadly similar with the exception of Option 4/11 which is likely to pass through areas of Ancient Woodland (Native Woodland) at Croiche Wood. When considering the potential connections in isolation, Option 7 Combined is preferred as it limits the works to the Beaulay–Denny OHL, the distance for the Spittal–Beaulay 400kV OHL connection and removes the requirement for a separate 400kV underground connection (as shown on Figure 10).

When considering the potential impacts of the substation Options and connections together, Option 7 Combined is comparatively considered to be preferred, this option limits the distance of linear infrastructure (overhead line and underground cable) within the wider Beaulay area and the associated environmental impacts. It is noted that Option 7 Combined may have widespread landscape and visual impacts, however this option will provide opportunity for landform and planting mitigation.



### 4.3.2. Engineering

Site Option 7 Combined is the advised site from an engineering perspective. This is a result of favourable scoring on Connectivity (Existing circuits/network) and Footprint Requirements. This site allows for the least amount of re-routing of the Beaulay/Denny 400kV OHL as well as the room to accommodate the HVDC converter station in situ. Furthermore, there is adjacent land available for both temporary and permanent ancillary infrastructure. It has also been assessed that this site can accommodate and provide suitable routing for future connections. Topography at Option 7 has been identified as an opportunity to lower the site platform level and screen the site further using an earth works bund with won material through the undulating land profile. The remaining sides of the site are naturally screened by woodland. The co-location of the substation and converter station and HVDC reduces earthworks and land take requirements.

The second preferred option is Option 7/9 which allow for more adjacent land surrounding the substation which would be located at Site 7. This would also provide room for future site expansion. The HVDC converter station would be located at Site 9.

This is less favourable as it may restrict future connections due to cable routes and buildings used by the HVDC project. Site Option 11 is unfavourable in general comparison, but the main factor is due to the extended diversion requirements of the Beaulay/Denny OHL. Site Option 4/11 is the least favourable due to general constraints on adjacent land, and proximity of both 132kV and 275kV OHL routes which would need to be diverted in order to allow for the site platform position.

The next steps with Site Option 7 will be to refine the site based on ongoing interfacing projects such as the connections to the Western Isles HVDC link, Loch Buidhe, and Blackhillock. The preferred OHL diversion route for the Beaulay/Denny line will be further developed following a RAG assessment of the potential options.

### 4.3.3. Conclusion

When considering the substation site options alongside the required connections to and from each site, Option 7 Combined is the best on balance as it reduces the engineering complexities and cost of siting the Proposed Development whilst also offering the best opportunity to limit overall environmental impacts in the wider Beaulay area.



#### 4.4. Additional Options

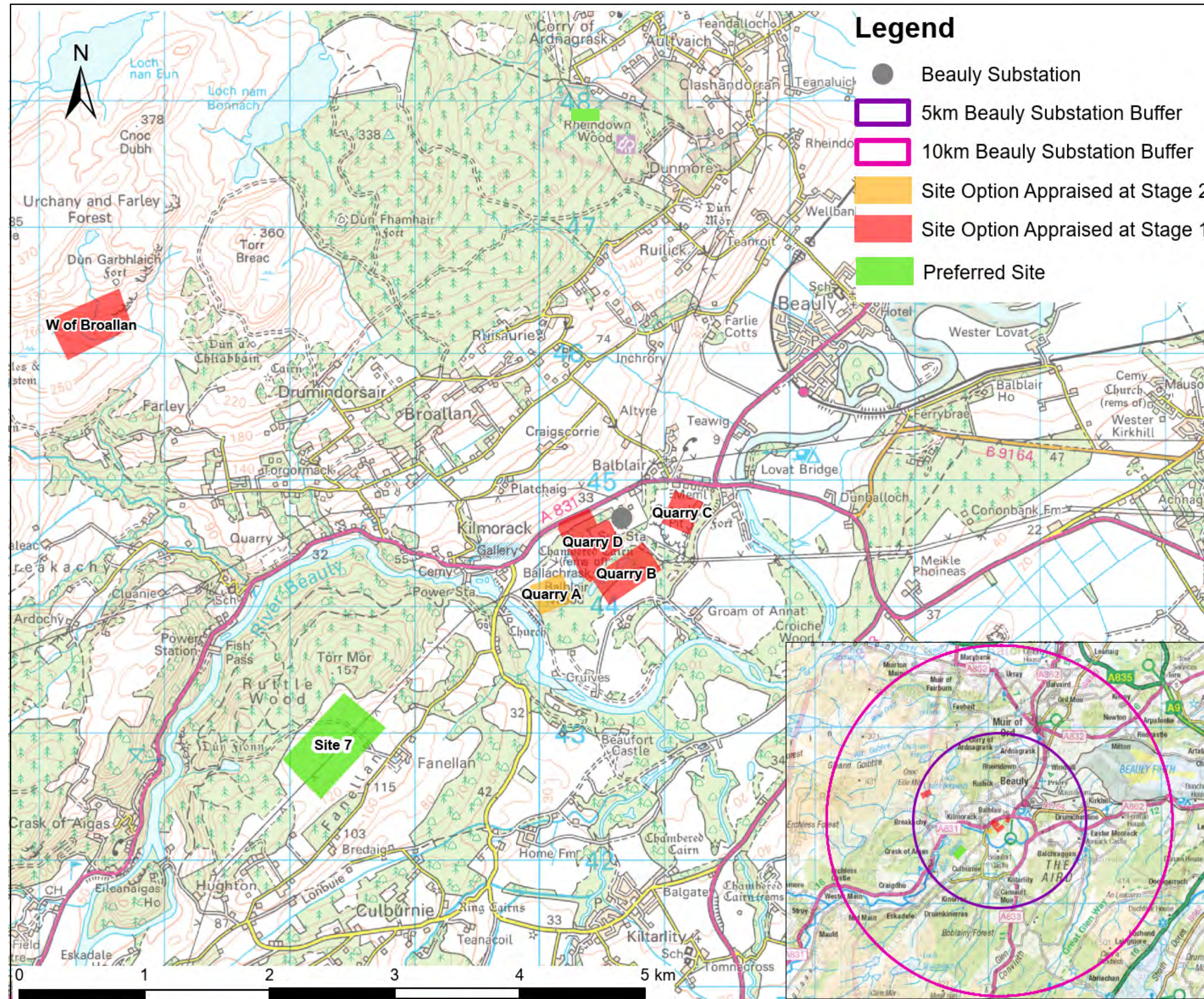
Potential Site Options near to the existing quarry at Balblair were not originally considered due to the operational nature of the Quarry, space restrictions, cumulative impacts with the existing Beaully substation and proximity to the settlement of Wester Balblair. However, following feedback from consultation with communities and statutory stakeholders throughout March 2023, additional Site Options Quarry A, B, C, D and West of Broellan) will be considered. These options are located in close proximity to the existing Beaully substation, potentially making use of the existing quarry (see Figure 15). These Options will be subject to a Stage 1 assessment and, where feasible, taken through, to a Stage 2 assessment and compared against the current best on balance option, Site Option 7 Combined.

Figure 15: Aerial shot of Additional Site Option (Quarry Site A) located on the existing quarry to the east of the existing Beaully Substation.





Figure 16: Location of Additional Options Assessed at Stage 1 (Initial Site Screening).



## 5.1. Additional Options Discounted at Stage 1 - Key Constraints

### Quarry Site B

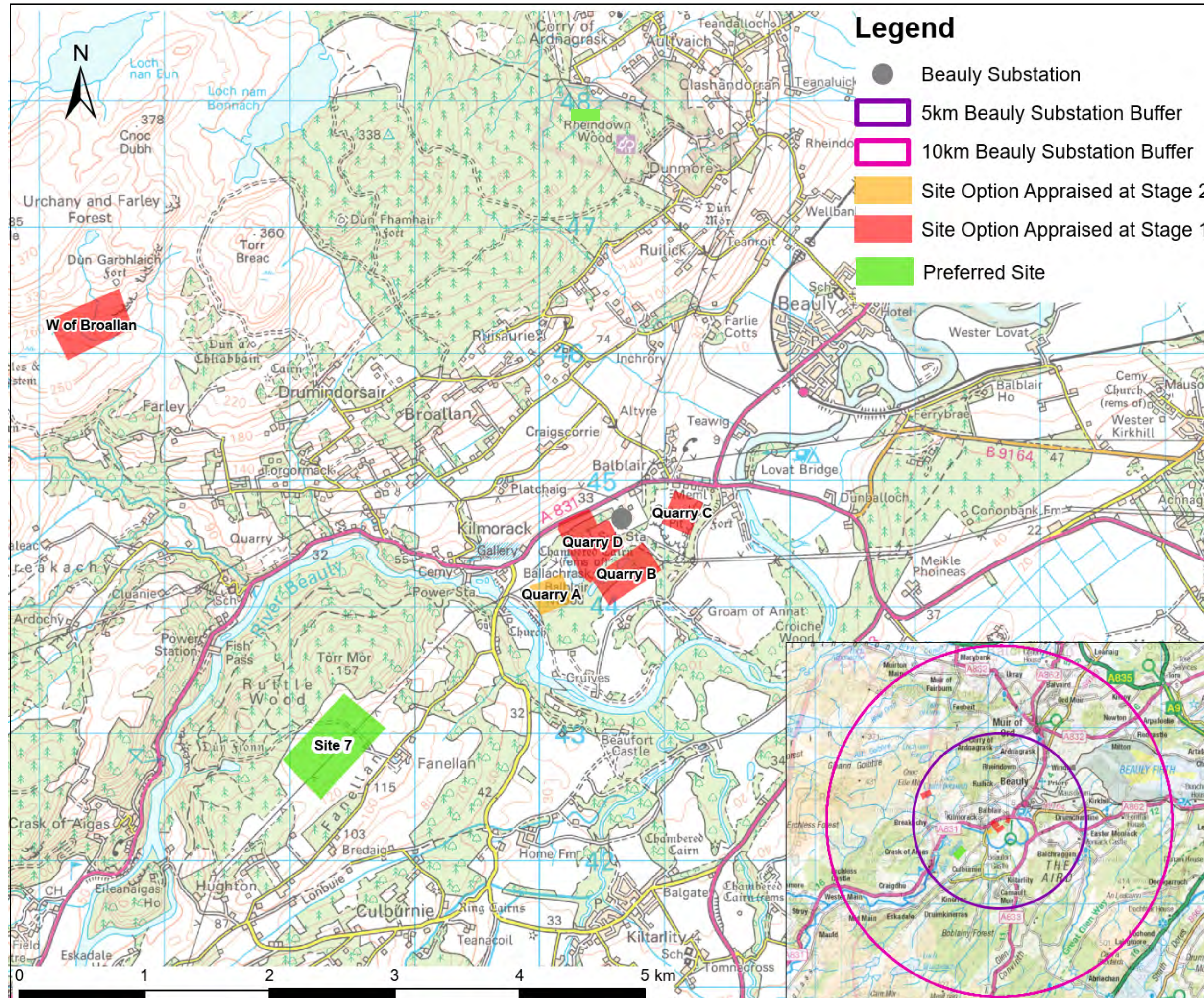
- Approximately 120m from the existing Beauty Substation.
- AWI (2b LEPO) covers margins of the site, this woodland has potential to support recreational activities.
- Three unnamed water features route through the site and the site sits within an area with low to medium-risk of fluvial flooding.
- Sits across a former meander of the River Beauty and would necessitate the removal of a relatively large area of mixed woodland with oxbow ponds, affecting one of the key characteristics of the LCT, though likely only very locally.
- Contains Class 3.1 agricultural land and the current land use is for agricultural purposes.
- Potential planning policy conflicts relate to landscape character, flooding, agricultural land and ancient/native woodland.
- Connectivity to future OHL (Beauty to Loch Buidhe 400kv OHL) would be challenging
- Diversion of an existing OHL required and outages required to enable this.
- Limited space available for ancillary infrastructure, such as temporary compounds, welfare, screening and SuDs.
- Noise- close to residential properties, risk of adding to the current levels from the existing Beauty substation.

### Quarry Site C

- Approximately 120m from the existing Beauty Substation.
- Scheduled Monument, Corff House fort (SM3195), located approximately 30m east.
- Potential to conflict with planning policy (Policy 53: Minerals within the Highland Wide LDP). However, the quarry is due to close in December 2025 and will therefore no longer be operational should this site be taken forward. Quarry restoration may however be affected.
- Land currently in use for quarry activities and industrial components, therefore ground conditions are unknown and contaminated land is likely.
- Limited space available would prevent future expansion if required.
- Noise- close to residential properties, risk of adding to the current levels from the existing Beauty substation.
- Unique engineering hazards as a result of proximity to quarry.
- Option was noted as a potential site for the LT14 Western Isles HVDC convertor station only, due to impact of connecting Beauty/Denny OHL and the impact to both existing and future connections.



Figure 17: Location of Additional Options Assessed at Stage 1 (Initial Site Screening).



## 5.1. Additional Options Discounted at Stage 1 - Key Constraints

### Quarry Site D

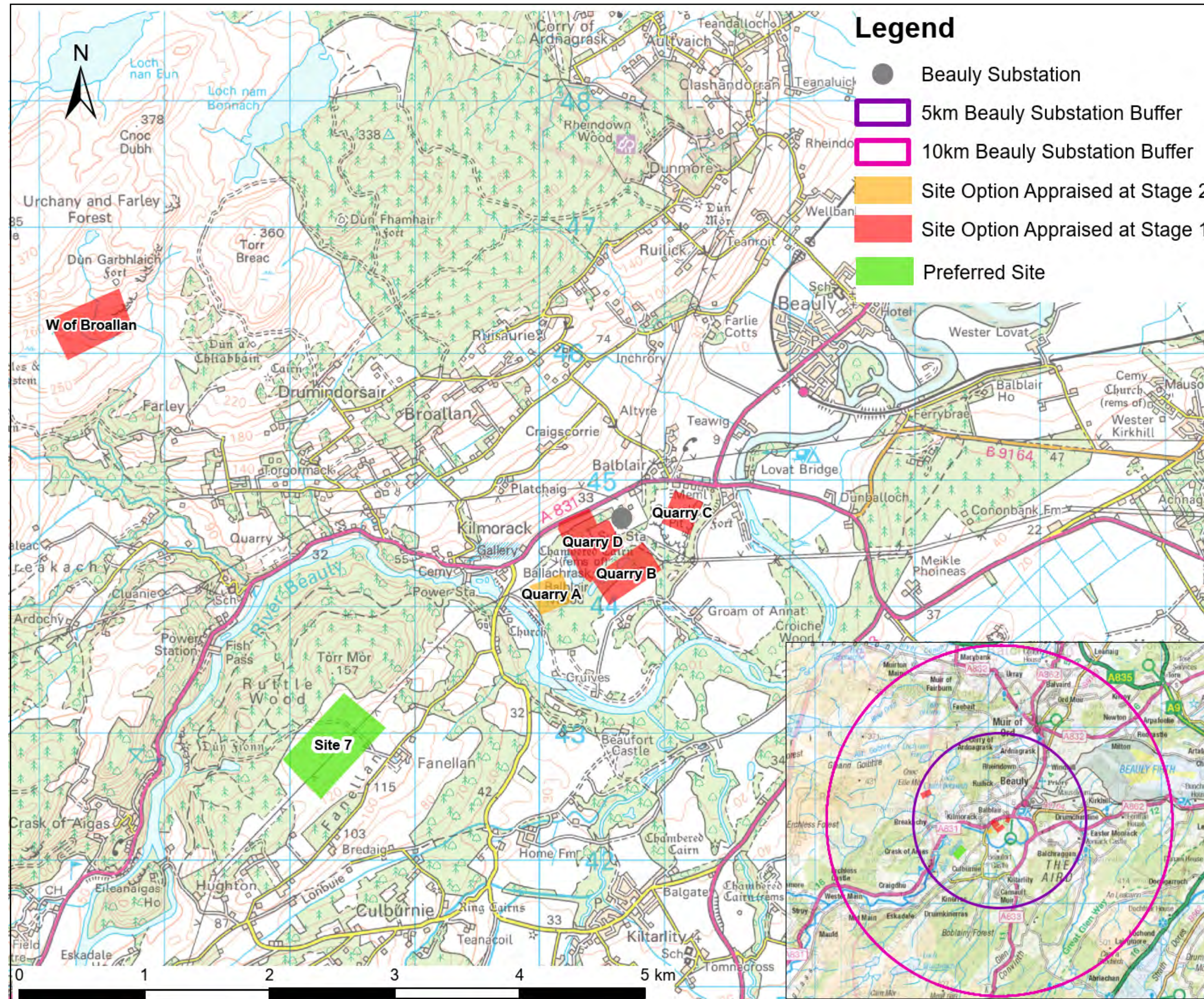
- The site is an extension to the existing Beaully Substation.
- Land currently in use as a quarry, comprising bare ground and structures associated with the quarry activities and woodland.
- An unnamed water features route through the site and three unnamed water features are located 20m, 35m and 65m north west.
- Potential for direct and indirect impacts on 14 non-designated assets within the Site.
- Potential to conflict with planning policy (Policy 53: Minerals within the Highland Wide LDP). However, the quarry is due to close in December 2025 and will therefore no longer be operational should this site be taken forward. Quarry restoration may however be affected.
- The existing 400kv platform at Beaully would not be able to accommodate the new Beaully 2 due to limited room, surrounding land would be required.
- Limited space available would limit technology choice to GIS arrangement, would prevent future expansion, if required and result in a non standardised design of substation.
- Significant earthworks requirements in order to build up to existing platform level for the GIS hall.
- Complex and prolonged outages to the network required to facilitate construction and commissioning.
- Connectivity to future OHL (Beaully to Loch Buidhe 400kv OHL) would be challenging.
- The position of the site on land impacted by the quarry works results in unique hazards, unfavourable topography, and risk of contaminated land.
- Noise- close to residential properties, risk of adding to the current levels from the existing Beaully substation.

### West of Broallan Site

- Approximately 5km from the existing Beaully Substation.
- An unnamed watercourse routes through the site and the site sits within an area with low to medium-risk of fluvial flooding.
- Scheduled Monument, Dun Garbhaich fort (SM2422), located approximately 50m north.
- Brings presence of infrastructure to an area where there is currently none, this would likely to compromise the sense of remoteness and lack of human artefact, a key characteristic of the LCT.
- Technically challenging to create a new access route to site due to the remote location.
- Steep slopes / topography of site would make constructability challenging.
- Distance of the site from the existing Beaully-Denny 400kv OHL and from the existing Beaully substation would mean a diversion of the OHL and additional new infrastructure.
- Future connections from the new 400kv OHLs would also be challenging and may result in a 'wirescape'.
- Elevation of site would constrain choice of technology to GIS.



Figure 18: Location of Additional Options Assessed at Stage 1 (Initial Site Screening).



## 5.2. Additional Options Taken to Stage 2 - Key Constraints

### Quarry Site A

- Environmental constraints limited to containing AWI (2b LEPO), however quarry activities have removed the majority of woodland within the site.
- Generally free from other environmental constraints that would preclude the development of this Option.
- Potential to conflict with planning policy (Policy 53: Minerals within the Highland Wide LDP). However, the quarry is due to close in December 2025 and will therefore no longer be operational should this site be taken forward. Quarry restoration may however be affected.
- The position of the site on land impacted by the quarry works results in unique hazards, unfavourable topography, and risk of contaminated land.
- Noise- Close to residential properties, risk of adding to the current levels from the existing Beauty substation.
- Connectivity to future OHL (Beauty to Loch Buidhe 400kv OHL) would be challenging.
- Limited space would limit technology choice for the substation to GIS arrangement and also prevent future expansion if required.



### 5.3. Additional Options Stage 2: Detailed Site Selection

Following the completion of the Stage 1 initial screening process, a total of one Additional Option site (Quarry A) was identified and taken forward to Stage 2. This site was taken forward to Stage 2 as it was determined to be a technically feasible, economically viable and environmentally acceptable site option. Quarry A site cannot accommodate both the 400kV substation and HVDC converter station designs as a combined site, due to size constraints of the site. Therefore it has been paired with Option 7 and Option 4, which were previously determined to be technically feasible, economically viable and environmentally acceptable site options taken through to Stage 2. Environmental and engineering surveys have been undertaken for these sites to supplement information gathered from desk-based assessments. This additional Option site has been set out as two variant Options. Summary details of those Options are set out below:

- Option 7 / Quarry A: Option 7 comprising a site for locating the 400kV substation and Option A comprising a site for locating the HVDC converter station. This options was suggested by the community in a meeting in August 2023.
- Option 4 / Quarry A: Option 4 comprising a site for locating the 400kV substation and Option A comprising a site for locating the HVDC converter station.

### 5.4. Additional Options Comparative Assessment

Tables 5,6 and 7 provide a summary of the key differentiating factors between each of the Stage 2 Options.

Table 5: Summary RAG

	Designated Areas	Protected Species	Habitats	Ornithology	Geology, Hydrology, Hydrogeology	Cultural Heritage Designations	Heritage Assets	Landscape Designations	Landscape Character	Visual	Agriculture	Forestry	Recreation	Planning Policy	Planning Proposals	Connectivity - Existing circuits/ network	Connectivity - Future development possibilities	Connectivity – Interface with SSE Distribution and Generation	Connectivity – DNO Connection	Footprint Requirements - Technology	Footprint Requirements - Adjacent Land use	Footprint Requirements - Space Availability	Hazards	Ground Conditions	Environmental Conditions	Construction Access	Operation and Maintenance
Option 7 Combined	Yellow	Yellow	Green	Green	Green	Yellow	Green	Green	Yellow	Red	Yellow	Green	Yellow	Yellow	Green	Yellow	Green	Green	Green	Green	Green	Green	Yellow	Green	Green	Red	Green
Option 7 /Quarry A	Yellow	Green	Red	Green	Yellow	Yellow	Yellow	Green	Yellow	Red	Yellow	Green	Yellow	Yellow	Green	Yellow	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow	Red	Green
Option 4 /Quarry A	Yellow	Red	Red	Green	Yellow	Yellow	Green	Green	Green	Green	Red	Green	Yellow	Red	Green	Yellow	Red	Green	Green	Green	Red	Yellow	Green	Green	Red	Yellow	Green



**Table 6: Environmental comparison of shortlisted options**

Environmental topics		Option 7 Combined	Option 7/Quarry A	Option 4/Quarry A
Natural heritage	Designations	<p>Assigned an Amber rating as they are all potentially linked to statutory designated sites.</p> <ul style="list-style-type: none"> <li>Statutory SPA sites qualifying for supporting non-breeding geese species are present within 20km.</li> <li>Contains suitable habitats to support wintering geese and are potentially hydrologically connected to further statutory designations including SPA, Ramsar, SAC and SSSI designations.</li> <li>Within a Butterfly Conservation's Scottish Priority Landscapes, and within 2km of a Buglife B-line, which may provide potential opportunities to positively influence the Proposed Development's landscape design, with regard to biodiversity.</li> <li>Woodland listed on the AWI occurs adjacent to Option 7 Combined.</li> </ul>	<p>Assigned an Amber rating as they are all potentially linked to statutory designated sites.</p> <ul style="list-style-type: none"> <li>Statutory SPA sites qualifying for supporting non-breeding geese species are present within 20km.</li> <li>Contains suitable habitats to support wintering geese and are potentially hydrologically connected to further statutory designations including SPA, Ramsar, SAC and SSSI designations.</li> <li>Within a Buglife IIA, Buglife B-line and Butterfly Conservation's Scottish Priority Landscapes, which may provide potential opportunities to positively influence the Proposed Development's landscape design, with regard to biodiversity.</li> <li>Woodland listed on the AWI occurs adjacent and covers the area of the Quarry A part of Option 7 /Quarry A. However, quarry activities have removed the majority of woodland within the site.</li> </ul>	<p>Assigned an Amber rating as they are all potentially linked to statutory designated sites.</p> <ul style="list-style-type: none"> <li>Statutory SPA sites qualifying for supporting non-breeding geese species are present within 20km.</li> <li>Contains suitable habitats to support wintering geese and are potentially hydrologically connected to further statutory designations including SPA, Ramsar, SAC and SSSI designations.</li> <li>Within a Buglife IIA, Butterfly Conservation's Scottish Priority Landscapes and within 2km of a Buglife B-line, which may provide potential opportunities to positively influence the Proposed Development's landscape design, with regard to biodiversity.</li> <li>Woodland listed on the AWI occurs adjacent and covers the area of the Quarry A part of Option 4 / Quarry A. However, quarry activities have removed the majority of woodland within the site.</li> <li>An IBA was identified within 2km.</li> </ul>



Environmental topics		Option 7 Combined	Option 7/Quarry A	Option 4/Quarry A
Natural heritage	Protected Species	<p>Assigned an Amber rating as Options 7 Combined and Option 7/ A had similar potential to support protected or notable species.</p> <ul style="list-style-type: none"> <li>Option contains habitat suitable to support protected or notable species. Including potential roosting habitat and suitable foraging and commuting habitat for bats; foraging and commuting habitat as well as some areas suitable for otter to rest; and suitable habitat to support water vole, badger, and brown hare.</li> <li>Option contained woodland habitats and treelines suitable to support red squirrel, pine marten and wildcat. These edge habitats could also be used by hedgehogs and reptiles.</li> </ul>	<p>Assigned an Amber rating as Options 7 Combined and Option 7/ A had similar potential to support protected or notable species.</p> <ul style="list-style-type: none"> <li>Option contains habitat suitable to support protected or notable species. Including potential roosting habitat and suitable foraging and commuting habitat for bats; foraging and commuting habitat as well as some areas suitable for otter to rest; and suitable habitat to support water vole, badger, and brown hare.</li> <li>Option contains woodland habitats and treelines suitable to support red squirrel, pine marten and wildcat. These edge habitats could also be used by hedgehog and reptiles.</li> <li>Within 500m of eight ponds that could be suitable for breeding amphibians. Terrestrial habitats within the Option (such as woodland habitat) could be used as hibernacula if present.</li> </ul>	<p>Assigned a Red rating because development north of the River Beaully is likely to have significant effect on protected or notable species by reducing their habitat in an already potentially restricted territory.</p> <ul style="list-style-type: none"> <li>Option contains habitat suitable to support protected or notable species. Including potential roosting habitat and suitable foraging and commuting habitat for bats; foraging and commuting habitat as well as some areas suitable for otter to rest; and suitable habitat to support water vole, badger, and brown hare.</li> <li>Option contains woodland habitats and treelines suitable to support red squirrel, pine marten and wildcat. These edge habitats could also be used by hedgehog and reptiles.</li> <li>Within 500m of five ponds that could be suitable for breeding amphibians. Terrestrial habitats within the Option (such as woodland habitat) could be used as hibernacula if present.</li> </ul>
	Habitats	<p>Assigned a Green rating due to the lack of priority habitats and comparatively the lowest Biodiversity Units (BU) value (64.14 BU).</p> <p>No Annex 1 habitats were found to be present within any of the Options.</p>	<p>Assigned a Red rating because the number of BUs impacted (117.90 BU)<sup>2</sup> would be over 120% of that found at Option 7 Combined.</p> <p>No Annex 1 habitats were found to be present within any of the Options.</p>	<p>Assigned a Red rating because the number of BUs impacted (107.76 BU)<sup>2</sup> would be over 120% of that found at Option 7 Combined.</p> <p>No Annex 1 habitats were found to be present within any of the Options. Notably this Option contains native hedgerows and mature trees which provide habitat linkages.</p>
	Ornithology	<p>Assigned a Green rating as although the Option has suitability to support overwintering waterfowl and suitability to support breeding and non-breeding activities for other species of conservational concern, it is unlikely that the Proposed Development would compromise the conservation status of species utilising the Site, due to the abundance of similar habitats within the local area.</p>	<p>Assigned a Green rating as although the Option has suitability to support overwintering waterfowl and suitability to support breeding and non-breeding activities for other species of conservational concern, it is unlikely that the Proposed Development would compromise the conservation status of species utilising the Site, due to the abundance of similar habitats within the local area.</p>	<p>Assigned a Green rating as although the Option has suitability to support overwintering waterfowl and suitability to support breeding and non-breeding activities for other species of conservational concern, it is unlikely that the Proposed Development would compromise the conservation status of species utilising the Site, due to the abundance of similar habitats within the local area.</p>

<sup>2</sup> It is recognised that the biodiversity value within Quarry A may otherwise be considered to be lower, given the nature of the active quarry options within and due to the limitations of the toolkit.



Environmental topics		Option 7 Combined	Option 7/Quarry A	Option 4/Quarry A
Natural heritage	Hydrology/Geology	Assigned a Green rating as there are no watercourses crossing through the Options.	Assigned an Amber rating due to the presence of a one SEPA registered abstraction within the Option. There are no watercourses crossing through the Options.	Assigned an Amber rating due to the presence of a one SEPA registered abstraction within the Option. There are no watercourses crossing through the Options.
Cultural heritage	Designations	<p>Assigned an Amber rating due to the potential for setting impacts on the Scheduled Monuments (six within 3km) and Garden &amp; Designed Landscape (GDL) (Beaufort Castle (GDL00052), located approximately 1km from this Option) due to proximity and visibility from these assets. There is also potential for direct impacts on known undesignated assets within the Option.</p> <p>Comparatively larger distance from Beaufort Castle (GDL00052) than other Options, where impacts on setting, following implementation of screening mitigation, are unlikely to be significant.</p>	Assigned an Amber rating due to the potential for setting impacts on the Scheduled Monuments (seven within 3km) and GDL (Beaufort Castle (GDL00052), located approximately 300m from this Option) due to proximity and visibility from these assets. There is also potential for direct impacts on known undesignated assets within the Option.	Assigned an Amber rating due to the potential for adverse setting impacts on the Scheduled Monuments (11 within 3km) and GDL (Beaufort Castle (GDL00052), located approximately 250m from this Option) due to proximity and visibility from these assets. There is also potential for direct impacts on known undesignated assets within the Option. The potential exists to reduce impacts by additional screening measures, such as landscaping and lowering the height above ground level of the substation.
	Cultural heritage assets	<p>Assigned a Green rating due to the minor anticipated setting impacts on cultural heritage assets.</p> <p>Comparatively larger distance from Listed Buildings greatly reducing the potential for impacts due to changes within the setting of these Cultural Heritage Assets.</p>	Assigned a Green rating as it is unlikely that the proximity of the Option will directly affect the setting of Category B Kiltarlity Old Parish Church Burial Ground (230m west), as its setting is directly related to the Church.	Assigned a Green rating as it is unlikely that the proximity of the Option will directly affect the setting of Category B Kiltarlity Old Parish Church Burial Ground (230m west), as its setting is directly related to the Church.
Landscape and visual	Designations	Assigned a Green rating as it is very unlikely that the substation infrastructure within Option would have any effects on the nearest landscape designation, the Central Highlands Wild Land Area (WLA) given the distance, topography and intervening vegetation.	Assigned a Green rating as it is very unlikely that the substation infrastructure within Option would have any effects on the nearest landscape designation, the Central Highlands Wild Land Area (WLA) given the distance, topography and intervening vegetation.	Assigned a Green rating as it is very unlikely that the substation infrastructure within Option would have any effects on the nearest landscape designation, the Central Highlands Wild Land Area (WLA) given the distance, topography and intervening vegetation.



Environmental topics		Option 7 Combined	Option 7/Quarry A	Option 4/Quarry A
Landscape and visual	Landscape Character	Assigned an Amber rating. The Option risks creating a prominent incongruous feature in the landscape at this location close to the top of the hill. However, the site offers the potential for significant mitigation: careful siting and sinking the development platform into the rising ground would allow the creation of new landform which, together with extensive woodland planting would help integrate development into the landscape and reduce the risk of it being a prominent feature.	Assigned an Amber rating. The Option risks creating a prominent incongruous feature in the landscape at this location part close to the top of the hill (Option 7), with the HVDC converter station on an existing quarry adjacent to the existing Beaulieu Substation which would have a relatively limited effect (Quarry A). However, the site offers the potential for significant mitigation similar to that noted for Option 7 Combined, which would help integrate development into the landscape and reduce the risk of it being a prominent feature. As a consequence of splitting the site, there would be less development at Option 7 and potentially more room for landform and planting mitigation at this site.	Assigned a Green rating due to the location of the Option at a relatively low level in a generally well wooded landscape, in close proximity to the existing Beaulieu substation. This would limit the extension of infrastructure in the wider landscape and the prominence of development such that effects on the character of the landscape would be reasonably well contained. Careful siting and mitigation woodland planting would over time help integrate development into the landscape.
	Visual	Assigned a Red rating as the Option lies close to the top of the hill, likely to be very intrusive for a small number of houses in the immediate vicinity, and widely visible across the valley to the east and southeast, particularly if the terminal towers for the connecting overhead lines cluster around the site. The form of the site offers the potential for substantial mitigation of the substation. Cutting the platform level into the hillside could bring the roof level down below the skyline and new landform and extensive planting would screen development in most views.	Assigned an Amber rating. The Option lies close to the top of the hill, likely to be very intrusive for a small number of houses in the immediate vicinity, and widely visible across the valley to the east and southeast, particularly if the terminal towers for the connecting overhead lines cluster around the site. However, The form of the site offers the potential for substantial mitigation of the substation. Cutting the platform level into the hillside could bring the roof level down below the skyline and new landform and extensive planting would screen development in most views. As a consequence of splitting the site, there would be less development on the hilltop to be mitigated and greater potential for mitigation of the Option 7.	Assigned an Amber rating as there are a relatively limited number of sensitive receptors close to the site, and the topography of the area together with the presence of extensive woodland would limit wider visibility. Option 4 has potential for mitigation by advance planting on northern edges of the site to reduce the visual influence of the substation itself. Terminal towers for the connecting overhead lines would be more widely visible but would be sat relatively low such that from much of the surrounding area, views of them would be limited or filtered by the extensive belts of woodland.



Environmental topics		Option 7 Combined	Option 7/Quarry A	Option 4/Quarry A
Land Use	Agriculture	Assigned an Amber rating as the Option contains land classed as 3.2, 4.2 and 5.3 in Scotland Soil's National Scale Land Capability for Agriculture. Therefore, this Option does not include high-quality agricultural land classification (Class 1, 2 and 3.1).	Assigned an Amber rating as the Options contains land classed as 3.2, 4.1, 4.2 and 5.3 in Scotland Soil's National Scale Land Capability for Agriculture. Therefore, this Options do not include high-quality agricultural land classification (Class 1, 2 and 3.1).	Assigned a Red rating as the Option contains land classified as Class 2.0, 3.1 and 3.2, 4.1 and 4.2 in Scotland Soil's National Scale Land Capability for Agriculture. Therefore, this Option includes high-quality agricultural land classification (Class 1, 2 and 3.1).
	Woodland Forestry	Assigned a Green rating as there is no commercial forestry currently occurring on any the Option.	Assigned a Green rating as there is no commercial forestry currently occurring on any the Option.	Assigned a Green rating as there is no commercial forestry currently occurring on any the Option.
	Recreation	Assigned an Amber rating as there are no existing core paths or cycle routes within 100m of the Option.  There is potential for recreational activities in the large, wooded area to the north of the Option extending to the River Beauly.	Assigned an Amber rating as there are no existing core paths or cycle routes within 100m of the Option.  There is potential for recreational activities in large wooded areas adjacent and to the north of the Option and the River Beauly within 100m.	Assigned an Amber rating due to the 'War Memorial to Black Bridge by Balblair Wood' core path being located within the north western corner of this Option. There is a core path named 'Lovat Bridge to Black Bridge' which are within 100m of the Option to the south east.  There is potential for recreational activities in wooded areas adjacent to the Option and the River Beauly within 100m.
Planning	Policy	Assigned an Amber rating due to potential conflict with Policy 61: Landscape within the Highland Wide LDP.	Assigned an Amber rating due to potential conflict with Policy 61: Landscape within the Highland Wide LDP. As the Option is located within an existing working quarry with presence of AWI there is potential to conflict with Policy 53: Minerals and Policy 6: Forestry, Woodland and Trees within the NPF4. However, risks are considered to be limited as the area has been previously cleared for the quarry and the quarry is due to close in December 2025 and no longer be operational should this site be taken forward, Quarry restoration may however be affected.	Assigned a Red rating due to the conflict with 28: Sustainable Design, Policy 77: Public Access and potential to conflict with Policy 64: Flood Risk of the Highland Wide LDP. As the Option is located within an existing working quarry with presence of AWI there is potential to conflict with Policy 53: Minerals and Policy 6: Forestry, Woodland and Trees within the NPF4. However, risks are considered to be limited as the area has been previously cleared for the quarry and the quarry is due to close in December 2025 and no longer be operational should this site be taken forward, Quarry restoration may however be affected.
	Proposals	Assigned a Green rating as there are no planning proposals within 100 m of the Option that have been submitted within the last 5 years and are awaiting construction/ completion.	Assigned a Green rating as there are no planning proposals within 100 m of the Option that have been submitted within the last 5 years and are awaiting construction/ completion.	Assigned a Green rating as there are no planning proposals within 100 m of the Option that have been submitted within the last 5 years and are awaiting construction/ completion.



**Table 7 : Engineering comparison of shortlisted options**

Engineering topics		Option 7 Combined	Option 7/Quarry A	Option 4/Quarry A
Connectivity - Existing circuits/network	Distance and feasibility of connecting to the existing circuits/network (400kV)	Within 1km and has minimised diversion requirements and complexities.	Within 1km and has minimised diversion requirements and complexities.	Within 1km and has minimised diversion requirements and complexities.
	Planned circuits (Blackhillock connection)	Viable connection route	Viable connection route	Viable connection route
	Planned circuits (Loch Buidhe connection)	Viable connection route	Viable connection route	Cannot directly approach the site from north due to number of properties along route. Therefore, significant interface with Beauly/Denny line. May require extensive cabling.
	Distance and feasibility of connecting to LT14 Western Isles HVDC	Within 1km and has minimised diversion requirements and complexities.	HVDC converter station between 1-5km distance.	Within 1km and has minimised diversion requirements and complexities.
	Outages for modification to existing circuits	Outage requirement prior to the construction of the site to suitably divert the OHL.	Outage requirement prior to the construction of the site to suitably divert the OHL.	Additional outages required to divert 132kV and 275kV OHL. Potential to avoid with reorientation or non-standard arrangement.
Connectivity - Future development possibilities	Extension of site or other circuits	Boundary constraints but has potential space to extend.	Opportunity for expansion.	Constraints on 3 boundary edges from existing OHL, the River Beauly, and potential flood plains.
Connectivity - Interface with SSE Distribution and Generation	Consideration of Business Separation and whole system requirements (Generation)	No interface	No interface	No interface
	Consideration of Business Separation and whole system requirements (Distribution)	No interface.	No interface	No interface



Engineering topics		Option 7 Combined	Option 7/Quarry A	Option 4/Quarry A
Connectivity - DNO Connection	Proximity of LVAC supplies	Within 1km proximity to a DNO connection.	Within 1km proximity to a DNO connection.	Within 1km proximity to a DNO connection.
Footprint Requirements - Technology	i.e., AIS/GIS or certainty of sizing on non-standard plant and equipment	Can accommodate either technology.	Can accommodate either technology.	Can accommodate either technology but AIS may need to be non-standard configuration. GIS may be advised through further design development.
Footprint Requirements - Adjacent Land Use	Availability for ancillary infrastructure like welfare compounds, laydown areas (Temporary)	Space available.	Space available.	Space available.
	Availability for ancillary infrastructure like screening and SuDS infrastructure. (Permanent)	Space available.	Space available.	May not be suitable for SuDS due to the surrounding flooding potential from the River Beauly.
Footprint Requirements - Space Availability	Non-standard substation configurations to accommodate site specific considerations	Space available.	Space available.	Constraints on the boundary edges of the Site. It has been assessed that the site may only work with a modification to shape.
Hazards	Unique Hazards	There are no unique hazards.	There are no unique hazards.	There are no unique hazards.
	Existing Utilities	Minimal to none, existing utilities which would require diversion or protection.	Minimal to none, existing utilities which would require diversion or protection.	From desktop studies, there will need to be some diversions to 132kV and 275kV lines. Captured within 'Outages for modification to existing circuits'
Ground Conditions	Topography	Rolling undulations.	Rolling undulations.	Generally flat, open expanse of land.
	Geology (Superficial Deposits – Peat)	No areas of peat or clay identified.	No areas of peat or clay identified.	No areas of peat or clay identified.
	Geology (Site testing to verify properties)			



Engineering topics		Option 7 Combined	Option 7/Quarry A	Option 4/Quarry A
Environmental Conditions	Elevation	Between 100m and 200m AOD.	Between 100m and 200m AOD.	Between 100m AOD.
	Salt Pollution	Greater than 6km from the coastline.	Greater than 6km from the coastline.	Greater than 6km from the coastline.
	Flooding	No risk of flooding as per SEPA maps.	No risk of flooding as per SEPA maps.	High likelihood of surface water flooding as per SEPA maps.
	Carbon Footprint			
	SF6	Assumption of the project is that all technology will be SF6 free.	Assumption of the project is that all technology will be SF6 free.	Assumption of the project is that all technology will be SF6 free.
	Contaminated Land	No indication of contaminated land.	No indication of contaminated land	No indication of contaminated land
	Noise (proximity to dwellings/residential properties)	As per MCA Noise Map.	As per MCA Noise Map	As per MCA Noise Map
Construction Access	Substation Access Road (from public road)	Require less than 0.5km of upgraded access road.	Require less than 0.5km of upgraded access road.	Require less than 0.5km of upgraded access road.
	Construction and Transformer Delivery Route	Significant road improvements required. Considers alternative route to site, avoiding bridge with weight restriction.	Significant road improvements required. Considers alternative route to site, avoiding bridge with weight restriction.	Minor road upgrades required.
Construction Safety	Customer access disruption during construction			
Operation and Maintenance	Access	All within 0.5km to 1km of a well-maintained public road.	All within 0.5km to 1km of a well-maintained public road.	All within 0.5km to 1km of a well-maintained public road.



## 5.4. Additional Options Key Engineering Comparisons

From an environmental perspective Option 4/Quarry A is preferred from a landscape and visual perspective compared to Option 7 Combined due to its lower setting, it also limits the spread of infrastructure, concentrating development within an area of existing electrical infrastructure, however, engineering constraints would make development of Option 4/ Quarry A challenging. Option 4/Quarry A is the least preferred from an engineering perspective due to propensity to flooding, general constraints on adjacent land, and proximity of both 132kV and 275kV OHL routes which would need to be diverted in order to allow for the site platform position. As a result Option 4/Quarry A has been deemed no longer viable from an engineering perspective thus outweighing the slight landscape and visual benefit and has been discounted from further detailed comparison.

### Option 7 Combined versus split site Option 7 /Quarry A

- When comparing Option 7 Combined to Option 7/Quarry A from a substation perspective, Option 7 Combined would provide the benefit of increased land available surrounding the site to accommodate site expansion or future new connections, if required.
- Approximately 2km of underground cable would be required to connect the substation at Option 7 to the HVDC converter station at Quarry Site A. This would require a HDD crossing under the River Beauly, This may introduce additional electrical losses and reactive power need and potentially changing the converter station design (multiple cables and bore holes required).
- Option 7 Combined is considered the most technical and cost-efficient solution to progress with compared to the Option 7/ Quarry site A.
- Option 7 Combined is the Preferred Site from an engineering perspective compared to the quarry sites and the west of Broallan site due to lesser noise impacts, connectivity constraints and future connection potential.

Figure 18: Aerial shot of Preferred Site (Option 7 Combined).



## 6. Summary of Site Selection Process

Following evaluation of the different site options, both pre and post consultation, Option 7 combined is the preferred choice for the site from both an engineering and environmental perspective. This is due to the following reasons:

- Option 7 combined limits the distance of linear infrastructure (overhead line and underground cable) within the wider Beauly area and reduces the associated environmental impacts.
- Option 7 combined is preferred from a connection perspective as it limits the work to the Beauly-Denny OHL, the distance for the Spittal to Beauly 400kV OHL connection and removes the requirement for a separate 400kV underground connection.
- Option 7 combined does have some environmental impacts from a visual perspective but does present substantial opportunity for landform and planting mitigation. It is also preferred from the perspective of environmental conditions (salt pollution, flooding, SF6, contaminated land and noise) as well as from a biodiversity, geology, hydrogeology and hydrology perspective. Option 7 combined minimizes impacts on adjacent land uses, maximises the space available and best accommodates the technology required.
- From an engineering perspective, Option 7 combined is considered the most technical and cost-effective solution. Option 7 minimizes the use of HDD, reduces cabling and provides greater opportunity for future connectivity. Option 7 also doesn't limit technology choice and presents less risk of unique hazards and contamination.

