06.
Substation Siting

6. Substation Siting

6.1 Substation Siting Study Area

For the purposes of identifying a site for the new Teviot Substation, a sub-Study Area was identified around the proposed Teviot Wind Farm. This allows for consideration of potential substation sites to the north, east, south and west of the proposed wind farm. The Study Area as well as key constraints influencing site selection are illustrated in Figure 9.

The sub-Study Area extends from the A7 in the west to the B6399 in the east. It is bounded to the south by a minor local road which connects the A7 at Fiddleton to the B60399 at Hermitage Schoolhouse. There are a small number of constraints of the highest or high amenity value present. These include watercourses which are part of the River Tweed SAC and SSSI including the Northhouse Burn and the Allan Water as well as a number of scheduled monuments clustered to the northeast of the sub-Study Area. The sub-Study Area is sparsely settled with scattered individual properties present. Landform is a key constraint with the sub-Study Area formed by a series of steeply sloping hills with elevations ranging from 300 to more than 500mAOD.

6.2 Identification of Substation Siting Options

Six potential substation sites have been identified based on the substation parameters and are illustrated in Figure 10. Existing topography and landform have been key considerations when identifying potential sites seeking to reduce the potential earthworks required to establish a substation platform.

Table 11 Overview of Potential Substation Sites

Option	Description
TEV-01	An approximate 10ha site located on the west side of the proposed Teviot Wind Farm. The site is located on the south side of a valley. There is a minor road which provides local access into the valley including Phaup Cottage and plantation forestry.
TEV-02	An approximate 8ha site located on the west side of the proposed Teviot Wind Farm. The site is located to the immediate east of the A7 with residential properties at Linhope to the north and Braehead to the south. The Linhope Burn is located to the north of the site draining in a western direction where it meets the River Tweed SAC.
TEV-03	An approximate 20ha site located to the north/northwest of the proposed Teviot Wind Farm. The site is located on lower lying north facing slopes of Southdean Rig. The A7 is located approximately 600m to the northwest of the site. It is bounded to the north and east by Northhouse Burn, which is also part of the River Tweed SAC.

Option	Description
TEV-04	An approximate 20ha site located to the south of the proposed Teviot Wind Farm on the minor local road running from Fiddleton to the Hermitage House. The site lies on the north facing slope of Geordie's Hill within a relatively narrow valley. The Langholm-Newcastleton SPA and SSSI and lies to the south of the site.
TEV-05	An approximate 70ha site located to the east of the proposed Teviot wind Farm. The site lies approximately 1.5km west of the B6399 on the edge of commercial forestry. Access to the site would via existing access tracks within the commercial forestry.
TEV-06	An approximate 30ha to the north/northeast of the proposed Teviot Wind Farm. The site is located on the north/northwest facing slopes of White Hill. Access is via an existing track which runs north to south from Stob Station house to commercial forestry.

Project Management Initials: DR Designer: LC Checked: DF Approved: DR

Scale @ A3 1:60,000

0 2.5 5 km

Coordinate System: British National Grid

AECOM

PROJECT
Cross Border Connection -
Gala North Substation to Border

CLIENT
SP Energy Networks

KEY

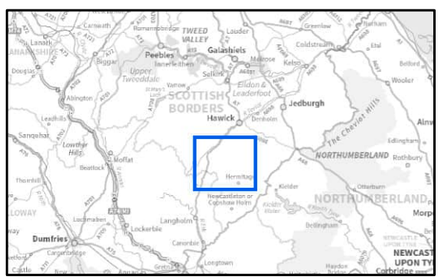
- Substation Siting sub-Study Area
- Category B / Grade II* Listed Building
- Category C / Grade II Listed Building
- Scheduled Monument
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory Site
- Woodland identified in the Native Woodland Survey of Scotland
- Locally Designated Landscape
- Long Distance Trail

Wind Turbine Location (Status)

- Consented
- Application Submitted
- Design/Scoping; Scoping
- Refused
- Wind Turbine Location - 2x Rotor Diameter

Existing Transmission System

- 132kV OHL



TITLE
Figure 9
Substation Siting sub-Study Area

REFERENCE
GH_20240827_RS_9_v2

SHEET NUMBER
1 of 1

DATE
27/08/24

Project Management Initials: DR Designer: LC Checked: DF Approved: DR

TEV01
TEV02
TEV03
TEV04
TEV05
TEV06

Scale @ A3 1:60,000

0 2.5 5 km

Coordinate System: British National Grid

AECOM

PROJECT
Cross Border Connection -
Gala North Substation to Border

CLIENT
SP Energy Networks

KEY

- Potential Substation Site
- Substation Siting sub-Study Area
- Category B / Grade II* Listed Building
- Category C / Grade II Listed Building
- Scheduled Monument
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory Site
- Woodland identified in the Native Woodland Survey of Scotland
- Locally Designated Landscape
- Long Distance Trail

Wind Turbine Location (Status)

- Consented
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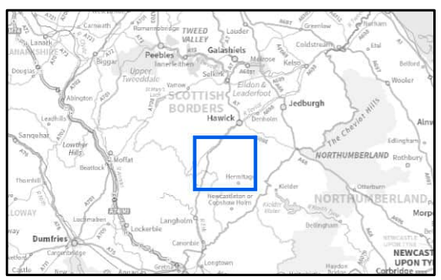
- Wind Turbine Location - 2x Rotor Diameter

Existing Transmission System

- 132kV OHL



TITLE
Figure 10
Substation Siting Options

REFERENCE
GH_20240827_RS_10_v2

SHEET NUMBER
1 of 2

DATE
27/08/24

Project Management Initials: DR Designer: LC Checked: DF Approved: DR

TEV01

TEV02

TEV03

TEV04

TEV05

TEV06

Scale @ A3 1:20,000

0 1,000 2,000 m

Coordinate System: British National Grid

AECOM

PROJECT
Cross Border Connection -
Gala North Substation to Border

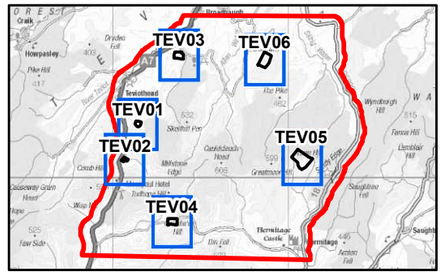
CLIENT
SP Energy Networks

KEY

- Potential Substation Site
- Substation Siting sub-Study Area
- Scheduled Monument
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Ancient Woodland Inventory Site
- Woodland identified in the Native Woodland Survey of Scotland
- Locally Designated Landscape

Wind Turbine Location (Status)

- Application Submitted
- Wind Turbine Location - 2x Rotor Diameter



TITLE
Figure 10
Substation Siting Options

REFERENCE
GH_20240827_RS_10_v2

SHEET NUMBER
2 of 2

DATE
27/08/24

6.3 Appraisal of Siting Options

The following sections summarise the appraisal of alternative substation siting options. A more detailed appraisal of the sites taking account of the routeing and siting objectives and considerations is contained in Appendix F.

TEV-01

TEV-01 lies to the west of the sub-Study Area and would only be suited to potential OHL routes within the west of the overall Study Area. It is located within a valley formed by Binks Hill to the north and Meg's Hill to the south. The site lies on the north facing slopes of Meg's Hill.

While there are no sites or areas of the highest or high environmental value present within the immediate proximity of the site, Frostley Burn lies to the west of the site and is part of the River Tweed SAC. The requirement to establish a new access crossing the Phaup Burn which drains into the Frostley Burn increases the potential to impact on the River Tweed SAC.

There are two residential properties in the vicinity of the site, Frostley Burn to the west and Phaup Cottage to the east. The proximity of the properties to the site, in particular Phaup Cottage increases the potential for amenity impacts (noise and/or visual).

The access to the valley is well established with a wide junction connecting to the A7. The access runs broadly west to east up the valley into the commercial forestry located to the east of valley. Owing to topography the site is located on the southern side of the valley and would require a new road crossing of the Phaup Burn to provide into TEV-01.

TEV-02

TEV-01 lies to the west of the sub-Study Area and would only be suited to potential OHL routes within the west of the overall Study Area. It is located on a relatively lower lying and less steeply sloping area to the south of Linhope, adjacent to the A7.

There are no sites or areas of the highest or high environmental value present within the immediate proximity of the site. It is bounded to the west and east by watercourses (Combe Sike and Linhope Burn) which drain into Frostley Burn which is part of the River Tweed SAC. An unnamed watercourse drains the hill into Combe Sike and would require to be diverted or culverted in order to accommodate a substation on the site. As a result TEV-02 has increased potential to impact on the River Tweed SAC.

While the site is remote from larger settlement, there is a cluster of buildings including residential property (referred to as Linhope) to the north as well as a property (Braehead) to the south. Existing woodland would provide some screening, however, due to their proximity to the site some amenity impacts (noise and/or visual) would occur.

While the site is adjacent to the A7 it is constrained in terms of access. The existing access to the properties at Linhope is narrow and includes a bridge over the Frostley Burn. This would require significant upgrading in order to facilitate access. Alternatively, a new access could be established off of the A7 but would require a new crossing of the Combe Sike.

TEV-03

TEV-03 lies to the northwest of the sub-Study Area. It would be suitable for potential OHL routes within the west of the overall Study Area as well as for potential routes crossing over the Study Area to the north of the proposed Teviot Wind Farm.

There are a number of sites or areas of the highest or high environmental value within the vicinity of the site including Northhouse Burn to the north/northeast which is part of the River Tweed SAC as well as a number of scheduled monuments to the west. The proximity to Northhouse Burn as well as the potentially the requirement for a new access crossing it increases the potential to impact on the River Tweed SAC. There is also some potential to impact on the setting of the scheduled monuments, however, this may be reduced due to landform and limits on intervisibility.

TEV-03 is located in a relatively prominent position on the north-facing slope of Southdean Rig. It is likely that it will be partly visible from the A7 to the north, particularly for those travelling southbound. There is a cluster of properties to the west of the site as well as to the north. While landform may help to screen some views of a substation at TEV-03 some amenity related impacts (noise and/or visual) would occur.

Access to the site is via an established local road which is routed east/southeast following the landform. The majority of the road is single carriageway with passing places. An access track including a crossing of the Northhouse Burn could provide access into the site but would require upgrading.

TEV-04

TEV-04 is located to the south of the sub-Study Area. In relation to potential OHL routes it is considered more constrained than alternatives. This is because it is located to the south of the proposed Teviot Wind Farm within a valley formed by a series of hills to the north and south. The nature of the landform and topography constrains the development of OHL route options towards TEV-04 compared to other options on the western or eastern margins of the proposed wind farm.

TEV-04 is located away from sites or areas of the highest or high amenity value. The Langholm-Newcastle SPA and SSSI lies to the south, less than 1km at its nearest point. Cultural heritage designations are sufficiently far enough away that they should not be affected. However, TEV-04 lies within the northern part of an area of moderate environmental value; the Langholm RSA designated by Dumfries and Galloway Council. A substation within the RSA has the potential for greater landscape impacts.

The valley in which the site is located is sparsely settled largely owing to the steep hillslopes to the north and south. There are some individual properties present where the landform widens and flattens including Carrett Rig to the west and Billhope to the east. While these are relatively distant to the site, the rural nature of the valley means some amenity impacts (noise and/or visual) are likely to occur.

Access to the site is via an existing local road which runs from west to east between Fiddleton and Hermitage. This is formed of a single track with passing places. Significant upgrades would be required to provide access to the site.

TEV-05

TEV-05 lies to the east of the sub-Study Area. It would be suitable for potential OHL routes crossing over the overall Study Area from west to east to the north of proposed Teviot Wind Farm as well those located entirely within the east of the Study.

There are no sites of the highest or high environmental value in the immediate vicinity of the site. There are no landscape or ecological designations, however, there are a small number of cultural heritage designations present including the Catrail, a linear earthwork broadly running eastwards through commercial forestry to the north of the site as well as some smaller sites to the north/northwest. The distribution of these designations as well as intervening commercial forestry and/or landform is such that setting impacts from a substation should be avoided.

TEV-05 is located away from settlement. There are some individual properties present along the B6399, however, these are typically well-screened from TEV-05 by a combination of landform and/or commercial forestry. A result the potential for amenity related impacts (noise and/or visual) is considered to be lower to TEV-05 relative to the other sites.

A large area has been identified for TEV-05 which includes an area on the margins of commercial forestry as well as open moorland. Subject to the precise siting of the substation there is the potential for some commercial forestry to be lost. Part of the site is underlain by class 1 and class 5 peatlands. The precise siting of the substation within TEV-05 should seek to reduce potential impacts on peat and carbon rich soils as much as possible.

Access to the site is via existing tracks within the commercial forestry which in turn are accessed from the B6399. While existing forestry tracks would require to be upgraded and extended in order to provide access to the site.

TEV-06

TEV-06 is located to the north of the proposed Teviot Wind Farm. It would only be suitable for potential OHL routes coming from the west and crossing the overall Study Area and continuing to the east.

There are a number of scheduled monuments present within the immediate vicinity of the site. These include hillforts and earthworks thought to date from the Iron Age as well as a number of sites related with Stobs Camp which was used for military training before and during the First World War. The location and distribution of these sites means that some setting impacts would be unavoidable and make this site less preferable to alternatives.

The site is located within a generally remote area and distant from settlement, however, some individual properties which could experience amenity impacts (noise and/or visual) are present including Penchrise Farm to the east of the site on the northeast of White Hill as well as properties on the local road to the west including Dodburn and Shankfoot.

The site is considered to be significantly constrained in terms of access. An existing single carriageway track is routed southwards from the B6399 at Stobs to Penchrise Farm. This would require significant upgrading to enable access for construction of a substation in this location.

6.4 Substation Siting Conclusions

The preferred site for the substation is dependent on the route options and vice versa, however, based on the appraisal of substation siting options some emerging conclusions can be drawn which also help to inform the identification of route options. Table 12 provides an overview of the emerging conclusions from the assessment of substation sites.

Table 12 Appraisal of Substation Sites

Option	Key Findings	Conclusion
TEV-01	There are no environmental or technical constraints which would prevent the development of a substation in this location. There are a number of constraints which would influence its design including access arrangements and its location further up a valley, however, these are not considered sufficient to discount the site at this stage.	Potential site
TEV-02	There are no environmental or technical constraints which would prevent the development of a substation in this location. The site is immediately adjacent to the A7 and would therefore be a prominent feature, however, there would be opportunities to reduce potential adverse effects through design and mitigation.	Potential site
TEV-03	The site is located in a prominent location on the A7 in close proximity to a number of environmental constraints, however, there would be opportunities to reduce potential adverse effects through design and mitigation.	Potential site
TEV-04	The site is located within a Regional Scenic Area and is therefore of higher landscape sensitivity compared to others. In addition, the location of the site is considered significantly more constrained than alternatives in terms of potential new OHL routes and it is therefore discounted.	Discount
TEV-05	While the site is located within an area of peatland on the margins of commercial forestry it otherwise avoids or reduces potential impacts on environmental or settlement related considerations. It provides scope for potential new OHL routes to connect to it from the west or east. It is considered to provide a feasible siting option. It is also located between the proposed Teviot Wind Farm (to the west) and the proposed Liddesdale (or Borders) Wind Farm (to the east) and provides some benefits with respect to connecting to it.	Potential site

Option	Key Findings	Conclusion
TEV-06	The site offers no environmental or technical advantages. It is located close to and has high potential to impact on cultural heritage sites of the highest or high environmental value and is considered to be highly constrained in relation to accessibility compared to others.	Discount* (consideration was given to route options to TEV-06