Rhigos 400kV Substation

Volume 1: Non Technical Summary

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Non Technical Summary

The Application

This document is presented as a Non Technical Summary (NTS) of the Environmental Statement (ES) accompanying a full planning application on behalf of National Grid Electricity Transmission plc (National Grid) to Rhondda Cynon Taf County Borough Council for the proposed 400kV Air Insulated Switchgear (AIS) Substation on Hirwaun Industrial Estate, near Rhigos, Wales. The full submission comprises the NTS (Volume 1), the assessment chapters (Volume 2) and appendices containing supporting information (Volume 3). Copies have been deposited with Rhondda Cynon Taf County Borough Council Planning Department and may be viewed there. Alternatively, copies can be purchased from Enviros Consulting Ltd (Enviros) (01743 284800) for £120.00. Copies of the NTS can be supplied free of charge (excluding postage) from Enviros.

Background and Purpose of the Development

National Grid owns, maintains and operates the high voltage (275kV and 400kV) electricity transmission system throughout England and Wales. National Grid is also the system operator for the whole of the British transmission system, which includes that part of the system in Scotland (owned by the Scottish Transmission Owners). National Grid has duties under the Electricity Act 1989 to develop and maintain an 'economical, efficient and co-ordinated' system of electricity transmission.

The transmission system comprises approximately 7200 route kilometres of overhead transmission lines and approximately 660 circuit kilometres of underground transmission cable. The system also has over 300 substations which is where the primary transmission voltage (400kV or 275kV) is transformed to a lower voltage (132kV or less) and delivered as direct connections to the eight distribution network operators (DNOs), who take supplies and distribute electricity at lower voltages to consumers.

The proposed 400kV AIS substation is required to connect a proposed 300MW wind farm development approximately 4km to the south at Pen-y-Cymoedd, Hirwaun. This wind farm application is subject to Section 36 of the Electricity Act 1989 and was submitted, by the developers Nuon, to the Department of Energy and Climate Change (DECC) in November 2009. The substation will provide a more convenient connection for wind farm proposals in Strategic Search Areas (SSA's) E and F to contribute towards targets for renewable energy in Wales given in TAN 8 (Planning for Renewable Energy).

DECC was also consulted regarding minor overhead line works that would need to be undertaken by National Grid to connect the proposed substation to the existing 400kV overhead lines. This work would comprise the replacement of one existing tower with two new towers of the same height along the northern boundary. It was confirmed by DECC that this work would NOT require separate consent under Section 37 of the Electricity Act 1989 and is not subject to planning. However, for completeness sake, the potential impacts of both substation and overhead line works are considered as part of this ES.

The proposed substation site at Hirwaun Industrial Estate was selected based on the proximity of the existing National Grid overhead lines passing over the site and available space within an existing industrial estate away from any centres of population (see alternatives Chapter 2 for further details). The proposed substation layout would include the scope for the provision of future bays to connect the local Western Power Distribution (WPD) network. In order to keep any development and construction impact to a minimum it is proposed to construct a Nuon transformer compound (required as an interface between the wind farm and the National Grid 400kV substation) adjacent to the main National Grid substation site. This element is included in the main National Grid substation application as, although it would be operated by Nuon, it essentially forms part of the same overall substation development. The Nuon transformer compound is considered as part of this ES.

The Site

The proposed 400kV substation is located on the Hirwaun Industrial Estate, immediately south of the A465 and centred on national grid reference 293390 206470. The application area is approximately 16.7 hectares (ha) which includes the peat bog area to the east (see Figure 1). The proposed development area is approximately 7.8ha (i.e. excluding the peat bog as this will not be developed). The peat bog is included within the planning application as the intention is for it to be subject to ecological improvement as part of a management plan). The majority of the developed area is on made ground with the central/southern area comprising several layers of waste material including rubble, rubber and plastics.

The wider industrial estate comprises a mixture of old and new buildings and part of it is designated as a Site of Importance for Nature Conservation (SINC) based on its' peat bog and associated flora and fauna. Non bog areas of the SINC (including the footprint of the proposed substation) are essentially brownfield in nature but include mosaics of marshy and neutral grassland.

The whole of the Hirwaun Industrial Estate (including the application area) is also designated for business and industrial development (classes B1, B2 and B8 - business, general industrial and storage) within the RCT Local Plan.

A disused road (Fourteenth Avenue) runs through the south-west part of the site. Part of this road is adopted by RCTCBC although the section adjoining the site entrances is owned by Ashtenne. A sewage works is located approximately 100m north of the site. The boundary of the Brecon Beacons National Park lies approximately 100m to the north (on the opposite side of the A465). There are several residential properties within 200m of the site, the closest of which is approximately 80m to the west. The closest towns are Rhigos, approximately 1km to the south-west, and Hirwaun, approximately 1.5km to the east. Much of the wider area is open moorland and farmland interspersed with small hamlets.

Development Description

The main elements of the 400kV substation include:

- Typical substation kit comprising: six bay 400kV AIS substation; high voltage conductors elevated at approximately 12m above ground level; two supergrid transformers (SGTs) for the Nuon area of the site (within acoustic enclosures – approximately 5.5m high).

- Single storey buildings (approximately 4.5m high) including: National Grid amenity building (11.8m x 9.9m); National Grid ancillary building (3x containers 6.0m x 2.4m); Nuon control and amenity building (15m x 13m); approximately 13x relay /control / battery rooms of 3m wide by 5m long (all measurements are approximate). The main amenity buildings would be of modular construction. The proposed building colour would be goose wing grey.

- Car park with approximately 6 bays.

- Temporary laydown areas would be located as shown in Figure 1.2.

- The finished appearance of the site will have a perimeter fenced tarmac access road, with the interior finished ground level being a gravel surface.

- Two new towers, 52m high, are required to connect the new substation into the grid. These are to be located as shown in Figure 1.3. These towers will be constructed along the line of the existing overheads, with one existing tower (also 52m high) being dismantled. The overhead lines will connect to the substation by downleads onto two landing gantries approximately 12-14m high.

Scope of the EIA

For a development deemed to be subject to Schedule 2 of The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (the 1999 EIA Regulations), the planning application for the proposed development also requires an accompanying ES, setting out the findings of an Environmental Impact Assessment (EIA). The findings of the relevant technical EIA assessments have therefore been collated into the ES to ensure that it is compliant with all regulatory requirements, and meets the standards set out in Government guidance and best practice. This document presents a Non Technical Summary of that ES.

Issues to be covered were identified as:

- Planning Policy;
- Ecology;
- Archaeology;
- Traffic and Transport;
- Noise and Vibration;
- Landscape and Visual Impact;
- Geology/Soils;
- Hydrology and Hydrogeology; and
- Other Issues (including Air Quality, Sustainability, Electric and Magnetic Fields and Design and Access Statement).

Alternatives Sites

Under its licence, National Grid has an obligation to provide the most economic and efficient solution for the electricity supply industry for the connection of customers. As part of this process a site selection study was undertaken against criteria including:

- The new substation should be as close as possible to existing infrastructure to reduce the length of overhead lines required, due to their visual impact and cost.
- Where possible, the substation should be located on a brown field site or one set aside for development.
- Due to its location, the impact on the Brecon Beacons National Park should be minimised.
- In accordance with National Grid's licence obligations, the connection offer should be the most economical and feasible solution for the industry as a whole.

In addition to three proposed new sites being identified (see below) consideration was also given to modifications at two existing sites at Swansea and Cilfynydd. These were dismissed however because of the extensive new overhead lines that would be required (28km and 36km respectively). The three new sites included:

- Option 1 – immediately north of the A465 at Hirwaun.
- Option 2 – located within the Hirwaun Industrial Estate
- Option 3 – located to the south of the A465, to the west of Rhigos

Option 1 was considered unsuitable because of the close proximity to the Brecon Beacons National Park and its location within an area designated for its ecological value at a European level. Option 3 was dismissed based on its location on a greenfield site and its high visibility from surrounding areas. Option 2 was considered to be the preferred option largely based on its location within an existing industrial estate and relatively good screening from surrounding areas. It is this option that forms the basis of this ES.

The site layout was also amended to avoid any direct impacts on the peat bog area to the east.

Planning Policy

The proposed substation was assessed against national, regional and local policies.

National land use policy is by 20 topic based Technical Advice Notes (TANs). TANs applicable to this proposed development included those regarding noise, design, nature conservation, planning flood risk, transport and renewable energy. The proposed development is considered to contribute to the renewable energy targets within TAN 8 (Planning for Renewable Energy) and is considered in accordance with the other relevant TANs.

Regional and local policies were considered for a range of environmental topics, including ecology, landscape, transport and archaeology. Overall, it is considered that the proposed development is in accordance with land – use policy and is not in contravention of other relevant policies. Further details regarding specific environmental topics and related policies are given in the individual chapters within the ES.

Ecology

The proposed substation site forms part of a Hirwaun Industrial Estate Site of Importance for Nature Conservation (SINC). This designation is primarily for the peat bog habitat located to the east of the proposed substation footprint, but also includes the surrounding mosaic of habitats, some of which would be directly lost to the substation. The original location of the substation encroached onto the peat bog although, following discussions with statutory consultees, this was redesigned and moved further west to avoid this direct impact. The planning application includes the majority of the peat bog area as the intention is to enhance this area within a peat bog management plan.

A series of ecological surveys were also undertaken for the development site. These included habitat, reptile, great crested newt, breeding birds and invertebrate surveys. No great crested newts were identified. Breeding birds were found to be using the site, and a very small number of reptiles were identified. Invertebrates were also recorded, including some species of moth of notable interest. However, the assessment concluded that the main impacts are likely to be the loss of some scrub and woodland within the SINC but, with appropriate ecological mitigation and enhancement, the overall impact is likely to be positive, particularly with improvement to the bog area

Archaeology and Cultural Heritage

The desk-based assessment has established that the site once formed part of a battle site which more than likely relates to one of the skirmishes of the Battle of Hirwaun Wrgant also referred to as the Battle of Hirwaun Gwrgant and the Hirwaun Battle. This infers that there may be evidence such as buckles, arrowheads and spearheads, relating to the battle on the Site. It must be noted however that no early medieval or medieval artefacts have been found within the Study Area to date, and the potential for such remains to be present is limited.

Site investigation works have established that the majority of the site is covered by made ground although there are pockets of peat remaining below the made ground which have the potential for archaeological remains. It has also been established that the southern part of the substation footprint once formed part of an Ironstone Quarry, although the area was later filled with predominantly inert material. The quarrying activities within the southern area would have removed the archaeological deposits which may have been present in this area.

It is recommended that a Watching Brief (archaeologist overseeing ground works) should be present during further excavation work where peat deposits are likely to be affected.

Traffic

An assessment of construction traffic was undertaken based on the estimated number of vehicles over the two year construction period. The site is relatively well served by the local road network, with the majority of the construction traffic travelling to site via the A465 and A4061. Vehicle movements at peak times were assessed, and no significant impact from the increase in traffic volumes is predicted. A study of the abnormal loads to the site with the delivery of the transformers has also been made. Traffic generation during the operation of the site is negligible, as the site is unmanned on a day to day basis.

Noise and Vibration

An environmental noise impact assessment for the proposed development has been completed. The assessment has focussed on several key locations which are representative of the residential properties in the vicinity of the development.

Construction and decommissioning noise will be controlled through formal agreements with the Local Authority. This will ensure any impacts are minimised and whilst there may be periods of short term disturbance, any impact is likely to be ‘not significant’. The predictions, undertaken using accepted methodologies, demonstrate that the operation of the proposed development will result in a minor or negligible impact.

Landscape and Visual Impact

Overall, the landscape and visual assessment has established that the proposed substation will change the baseline conditions in terms of direct and indirect impacts on the landscape and impacts on visual amenity. However, the extent and significance of such impacts would be limited due to the site selection and positioning of the substation within Hirwaun Industrial Estate.

It is anticipated that the proposed substation would form a relatively discrete element in the landscape, largely screened by existing vegetation and positioned within an industrial estate. Therefore, the proposed substation would have a limited impact on both visual amenity and landscape character, including the Brecon Beacons National Park, Special Landscape Areas and LANDMAP aspects. It is inevitable that the towers that form part of the proposed development would be the most visible component, but these would replace one existing tower and the position of the substation in relation to the electricity transmission network minimises the requirement for such infrastructure. Overall, it is considered that the proposed substation would be acceptable in the context of the potential landscape and visual impacts

Geology / Soils

The proposed substation development site was assessed in respect of ground contamination and effects on soils. The geology underlying the site comprises made ground (thickest deposits identified in the south-west of the site where landfilling with principally inert wastes historically occurred) underlain by discontinuous peat deposits and then by glacial till deposits. The whole development site is underlain beneath these drift deposits by the Lower Coal Measures (comprising sandstones, mudstones, siltstones and coal beds) which are classified as a Minor Aquifer.

The assessment identified risks to soils and humans, with the highest risk relating to the potential impact to humans (construction and demolition workers). However, all risks can be mitigated, with the residual risks being low and it is considered that the proposed development is unlikely to give rise to any significant adverse impacts.

Water Resources

The potential impacts of the proposed substation on surface waters, groundwater, water supply, sewerage and flood risk were assessed. An assessment of any potential effects on the adjacent peat bog area was also undertaken.

An unnamed watercourse/ drain flows south to north across the Hirwaun Bog (adjacent to the substation footprint) and a surface water drain flows to the north-west from the north-west corner of the proposed development site. Both of these surface water features appear to drain into the Cwm Wyrfa 500m to the west of the site.

The key potential impacts identified were:

- Pollution to surface water and shallow groundwater during the construction/ decommissioning phase, from oils;
- Pollution to surface waters and groundwater during construction from silts and cement;
- Pollution from dewatering activities during the construction of the substation; and
- Potential to create pathways from shallow to deep groundwater from piling activities.

A range of site investigation works have been undertaken to establish the surface and groundwater conditions of the site. Changes to the surface water drainage regime following construction of the substation are unlikely to impact the adjacent Hirwaun Bog, as only a relatively small area will be covered in hardstanding. Construction works are also not considered to affect the adjacent peat bog, as the groundwater flow direction underlying the proposed development in the west of the site is considered to flow to the west (i.e. away from the peat bog and towards the Cwm Wyrfa). The risk to the peat bog from dewatering activities is considered to be Moderate/ Low.

Mitigation has been suggested where the unmitigated risk during construction and decommissioning was assessed as moderate or above (no mitigation required during the operational phase). The resulting mitigated risks identified are:

- There will be a **Moderate/ Low** risk from the mobilisation of silt to the surface water receptors;
- It is considered that there will be a **Moderate / Low** residual risk relating to the pollution of the shallow groundwaters and local watercourse, connected to the site via drains, with oils and other chemicals, during the construction phase;
- The use of cement on the site and in particular the washing out of cementitious material is considered to pose a **Moderate / Low** residual risk to the local watercourses and the shallow groundwater; and

- The use of concrete to form foundations is considered to pose a **Moderate / Low** residual risk to shallow groundwater and deeper groundwater in the Coal Measures.

The chapter concludes that there are no significant flood risks or impacts in relation to the proposals.

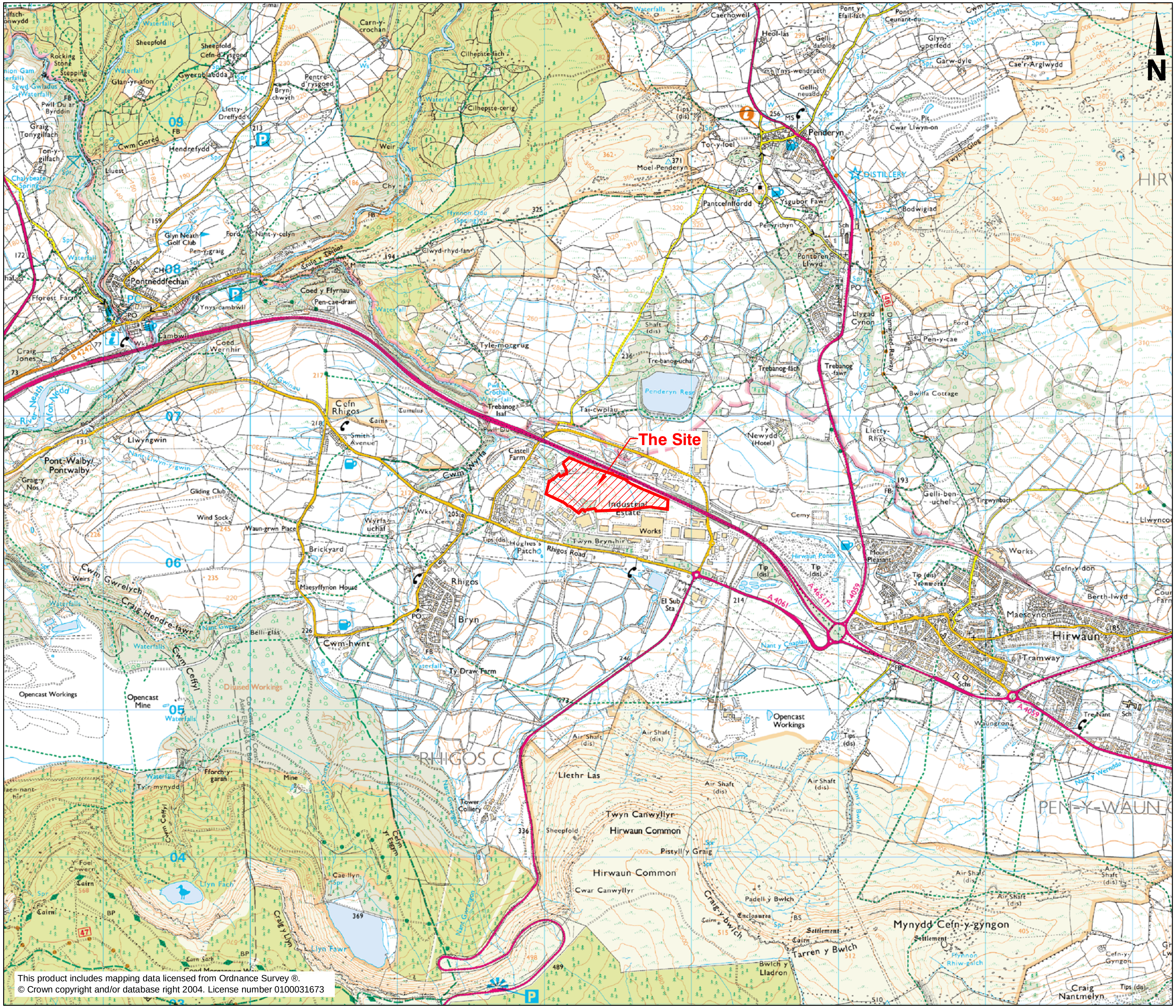
Other Issues

Other topics that were included within the ES include:

- Air Quality: Air quality issues which need to be addressed are largely restricted to dust arising from construction activities to ensure that this is properly controlled. The proposed substation will not have any associated direct emissions to air from its daily operations, although the potential leakage from sulphur hexafluoride (SF6), used as insulation in circuit breakers, was assessed but not found to be a significant issue. During construction, any dust emissions from the site could be blown towards off-site sensitive receptors. The predominant wind direction for this area is west to south-west and the nearest sensitive receptors downwind of the prevailing wind direction are on the opposite side of the A465 (approximately 100m to 150m from the site). Most of the dust generated from the construction process is likely to settle out before reaching the nearest properties. However, standard dust control measures would be used at the site to mitigate this.

- Sustainability: The proposed development was assessed against the general sustainable development principles including quality of life, protecting environmental limits and pollution prevention. Growing demand for electricity generation for homes and businesses means that the substation is required to facilitate the proposed wind farm at Pen-y-Cymoedd. This wind farm and substation therefore contributes to the provision of electricity from renewable sources, which are an important component of UK and Welsh energy policy, forming part of the sustainable vision for Wales. The proposed development has been chosen for its proximity to the existing overhead lines and location on previously developed land which is designated for employment use. Pollution prevention techniques will be employed and a site waste management plan will be developed in consultation with the statutory consultees.

- Electric and Magnetic Fields (EMF): An assessment of EMF was undertaken for the substation and overhead line modifications. All equipment that generates, distributes or uses electricity produces EMFs and EMFs are found in all areas where electricity is in use (e.g. offices and homes). The area considered for the assessment extends 10m outside the substation security fence, and 100m to the side of the overhead line. This is sufficient to cover all areas where there may potentially be significant effects of EMFs. The levels of EMF generated by the substation and overhead line are not considered to be significant when applied against recognised guidelines.



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PROPOSED 400kV SUBSTATION AT HIRWAUN INDUSTRIAL ESTATE, RHIGOS

FIGURE 1

SITE LOCATION PLAN

SCALE: 1:25,000 @ A3	CAN: NA1000026
CONTENT: RTL	DRAWN: AJR
CHECKED: ACH	DATE: JAN 2010

ENVIROS