Margam Port Talbot
National Grid Upgrade Works

Environmental Impact Assessment Screening Report

On behalf of **National Grid Electricity Transmission**

Project Ref: 331201497/A5/EIAScreening | Rev: 05 | Date: May 2025

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1 Introduction

1.1.1 This Environmental Impact Assessment (EIA) Screening Report has been prepared by Stantec UK Limited (Stantec) on behalf of National Grid Electricity Transmission (the 'Applicant'). The report will be submitted to Neath Port Talbot Council (NPTC) with a request for an EIA Screening Opinion to determine whether or not the proposed extension of an existing electricity substation and cable route (the 'Proposed Development') at Margam, Port Talbot, South Wales (the 'Site'), constitutes EIA development.

1.1.2 The Proposed Development does not fall within a clearly defined category in the *Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017, as amended*[1] (the 'EIA Regulations') however given the 'broad purpose and scope' of the Regulations the proposals could be considered to fall under Schedule 2 paragraph 10 'Infrastructure Projects' or paragraph 11 'Other Projects'. The most relevant sub-paragraph is considered to be Schedule 2 paragraph 10(b) 'Urban Development Project'. The relevant threshold for an Urban Development Project would be "… *more than 1 hectare of urban development which is not dwellinghouse development*". The applicable thresholds and criteria for alternative categorisation of the project (e.g. under Paragraph 11) is also likely to be exceeded by the Proposed Development. Therefore, this screening assessment has been prepared to determine whether the proposals would be likely to result in significant environmental effects.

1.1.3 This EIA Screening Report draws on a number Technical Notes prepared by Stantec as well as a number of figures and Technical Reports prepared by the Principal Contractor (Laing O'Rourke) (**Appendix 1 – 10**). For completeness these Technical Notes and Reports consider both the substation extension and the **full** cable route. However, on advice received by NPTC, this EIA Screening Report only covers the cable route from the electricity substation to the boundary of the Tata Steelworks (shown in red in **Appendix 2**). The remainder of the cable route within the Tata Steel land is shown in green for context and which has been approved as part of the Tata Steel Electric Arc Furnes (EAF) Application (LPA Ref. P2024/0711).

1.1.4 A planning application will be submitted for the proposed substation. The cable routes however are permitted under Schedule 2 Part 17 Class G 'Electricity Undertakings' of the *Town and Country Planning (General Permitted Development) (Wales) Order 1995/418 (as amended in 2019)*[2] ("GPDO"). As such, this EIA Screening Report has been prepared to cover both elements.

1.2 Requirement for EIA

1.2.1 In order to determine whether development is 'EIA development', regard must be had to the EIA Regulations. EIA development is development likely to have significant effects on the environment by virtue of factors such as its nature, size or location. The purpose of this Screening Report is to provide sufficient information to NPTC to be able to adopt an opinion as to whether the Proposed Development would be likely to result in significant environmental effects or not and therefore whether an EIA is required under the EIA Regulations.

1.2.2 Regulation 6 of the EIA Regulations requires a screening request to include:

- *'6.(1) A person who is minded to carry out development may request the relevant planning authority to adopt a screening opinion.*
- *(2) A request for a screening opinion in relation to an application for planning permission must be accompanied by—*
  - *(a)a plan sufficient to identify the land;*
  - *(b)a description of the development, including in particular—*

[1] 2017 No. 567 (W. 136)
[2] https://www.legislation.gov.uk/wsi/2019/330/made

- *(i)a description of the physical characteristics of the development and, where relevant, of demolition works;*
- *(ii)a description of the location of the development, with particular regard to the environmental sensitivity of geographical areas likely to be affected;*
    - *(c)a description of the aspects of the environment likely to be significantly affected by the development;*
    - *(d)a description of any likely significant effects, to the extent of the information available on those effects, of the proposed development on the environment resulting from—*
- *(i)the expected residues and emissions and the production of waste, where relevant; and*
- *(ii)the use of natural resources, in particular soil, land, water and biodiversity; and*
    - *(e)such other information or representations as the person making the request may wish to provide or make including any features of the proposed development or any measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment.'*

1.2.3 The Proposed Development is not of a type listed in Schedule 1. Therefore, in order to allow NPTC to determine the need for EIA, this report provides a description of the Site and Proposed Development, a review of the EIA Screening Criteria based on the EIA Regulations, a completed EIA Screening Checklist, and a site location plan in **Appendix 1**.

1.3 Planning and EIA History

1.3.1 An application was made in 2009 to NPTC for the development of a new Gas-Insulated Switchgear (GIS)[3] substation proposed to be located to the north of the Air-Insulated Switchgear (AIS)[4] substation. An EIA Screening Opinion (LPA Ref. P2008/1478) was requested for a proposed Margam 275 kV GIS substation on land 500 m north of British Oxygen Company (BOC) land, Margam, Port Talbot. NPTC adopted the opinion that the development was not EIA development, and that the application need not be accompanied by an Environmental Statement (ES). Additionally, the Secretary of State concluded that formal environmental impact assessment would not be necessary for an overhead line connection in 2009. This was issued by the Department of Energy and Climate Change dated 23rd January 2009. In April 2010, NPTC granted full permission for the erection of 275 kV GIS substation and associated laydown areas at Margam, Port Talbot (LPA Ref. P2009/0267). The planning permission was not implemented.

1.3.2 Since this permission was granted, there were some minor material amendments to the scheme as a result of further detailed design. As the original planning consent did not include a planning condition listing approved plans, these minor material amendments could not be addressed via a variation of a planning condition, and hence a new planning application was required in 2012 (LPA Ref. P2012/0832).

1.3.3 An Environmental Report was prepared in 2009, submitted in support of the 2009 application and updated to support the 2012 planning application.

Supporting Documents

1.3.4 This EIA Screening Report draws on a number of figures and Technical Reports prepared by the Principal Contractor including:

[3] A Gas Insulated Switchgear (GIS) is a type of high-voltage substation where the primary electrical components are enclosed in an insulating gas medium.

[4] An Air Insulated Switchgear (AIS) is a type of high voltage substation where the primary electrical components are installed outside.

- Proposed Site Plan (**Appendix 2**);
- Drainage Layout (**Appendix 3**);
- External Site Laydowns (**Appendix 4**);
- Temporary Compounds and Access Routes (**Appendix 5**);
- Construction Environmental Management Plan (**Appendix 7**);
- Peat Management Plan (**Appendix 8**);
- Preliminary Hydrological Impact Assessment (**Appendix 9**); and
- Geotechnical Considerations (**Appendix 10**).

1.3.5 This EIA Screening Report also draws on the, Technical Notes produced by Stantec for Landscape & Visual, Ecology, Hydrology and Flood Risk, Archaeology & Heritage and Ground Engineering (**Appendix 6**). These technical notes address both the substation extension and the cable route (including, for context, the route within the Tata Steel land). Considering the environmental baseline conditions at the Site, these were identified as the key issues to cover in further detail.

1.3.6 Paragraph 1.3.7 confirms the documents and assessments that will be submitted with the substation extension planning application, with paragraph 1.3.8 confirming the anticipated licenses and secondary consents that will be sought in relation to the cable route.

1.3.7 The following documents will be submitted in support of the Margam Substation Extension Planning Application. To note, the Management Plans cover both the substation extension and the full cable route:

- Air Quality Assessment;
- Lighting Strategy / Assessment;
- Transport Statement;
- Construction Logistics Plan;
- Heritage Statement including Archaeology;
- Evidence of Consultation / Agreement of Scope of Works for Planning Submission;
- Landscape and Visual Appraisal;
- Landscape and Habitat Management Plan;
- Landscape and Habitat Strategy Plan;
- Agricultural Land Quality Considerations Report;
- Soil Survey Management Plan;
- Tree Constraints Plan and Tree Protection Plan;
- Arboricultural Impact Assessment;
- Planning Statement;
- Design and Access Statement;
- Sustainability Assessment;

- Carbon Assessment;
- Ecological Impact Assessment Report (EcIA);
- Green Infrastructure Statement - Technical Note;
- Ecology Surveys – Detailing Mitigation, Compensation and Enhancement;
- Habitat Regulations Screening;
- Habitat Management Plan;
- Statement Of How Development Complies with Tan15 / Flood Consequence Assessment;
- Contaminated Land Desk-Top Assessment;
- Coal Mining Risk Assessment;
- Peat Management Plan;
- Construction Waste Management Plan;
- Surface Water Drainage Strategy;
- Flood Consequence Assessment;
- Fire Strategy;
- Noise Assessment (Operational Noise Assessment); and
- Construction Noise Assessment and Piling Method Statement.

1.3.8 It is anticipated that licenses and secondary consents will be sought in relation to the cable route for matters relating to:

- Water Resources and Drainage (e.g. SuDS Approving Body (SAB) application);
- Highways (e.g. s.278 Highways or TTRO);
- Noise (s.61);
- Waste;
- Ecology (e.g. Invasive Species Management, if deemed necessary); and
- Basic Asset Protection Agreement (Network Rail).

2 Site Description and Proposed Development

2.1 Site Description

2.1.1 The Site (**Appendix 1**) extends to 21.97 ha, running adjacent to the east of the Swansea to London railway line and the Middle Mother Ditch, before turning westwards, crossing both the railway and ditch. The cable route continues parallel to Heolcae'r-Bont, on Tata Steel land, where it crosses two further ditches, before turning northwards to the Port Talbot substation.

2.1.2 The Site currently largely comprises reedbed and marshy grassland. There are hedgerows and scrub present which follow the course of the drainage ditches and dissect and form the boundaries to the Site. The existing Margam substation is located in the north-east of the Site. The existing Margam substation covers an area of 6,725 m^2 and is up to 14.621 m in height (**Figure 1**).

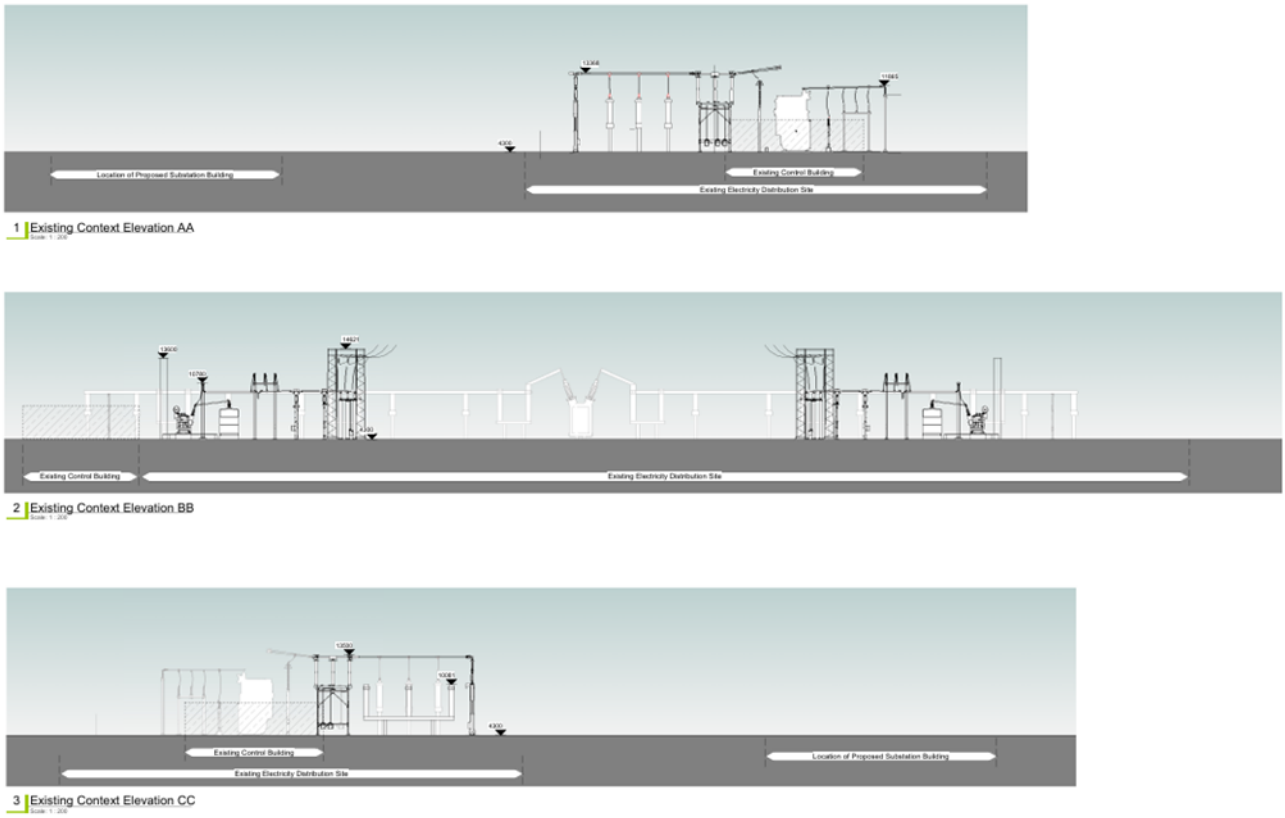


Figure 1. Existing Margam Substation Elevations

2.1.3 Access to the Site is currently provided from the north via the Cefn Gwrgan Road, which goes underneath the A4241 Harbour Way.

2.2 Site Context

2.2.1 The Site is located in Port Talbot, South Wales, which is approximately 14 km south-east of Swansea. The Site is approximately 1.2 km inland from the coastline with the Bristol Channel. The Site is located adjacent to the Tata Steelworks and associated land.

2.2.2 The north-eastern boundary of the Site is formed by the A4241 Harbour Way and land used as a golf course associated with the Tata Sports & Social Club, the reminder of which lies beyond the A4241, and residential properties to the north of Cefn Gwrgan Road on Brynhyfryd Road To the east, the Site is bound by woodland and the BOC Plant. The Margam Green Energy Plant and Western Wood Energy Plant both lie approximately 130 m east of the Site. Approximately 600 m east of the Site lies the A48, beyond which the M4 is located. To the south of the Site lies the Heolcae'r-Bont beyond which lies the

Eglwys Nunydd Reservoir, a rail depot (Margam Knuckle Yard) and Margam Moors. The west of the Site is bounded by land forming part of the Tata Steelworks.

2.3 Environmental Baseline Conditions

Landscape

2.3.1 The principal landscape character of the area surrounding the Site is industrial. There are some minor visible remnants of a rural past through field pattern and a network of drainage ditches. The landscape to the north and west is strongly influenced by mixed land uses; particularly industrial development. The coast is to the west beyond Tata Steelworks, although these areas are also heavily influenced by large scale industry and often the shore is not visible from the east due to intervening built development. The area to the east is strongly influenced by two major roads (the A48 and M4) and further east by sharply rising tree covered hills.

2.3.2 There are historic landscape features present in the area surrounding the Site. These include Margam Castle, Margam Country Park, the ruins of Capel Caer, a hill fort north of Margam Castle, Gorsedd Stones, and the remains of St Mary's Abbey. Some of these such as standing stones are subtle features in the local landscape. Although these landscape features are within the locality, none are present within, or directly influence the Site.

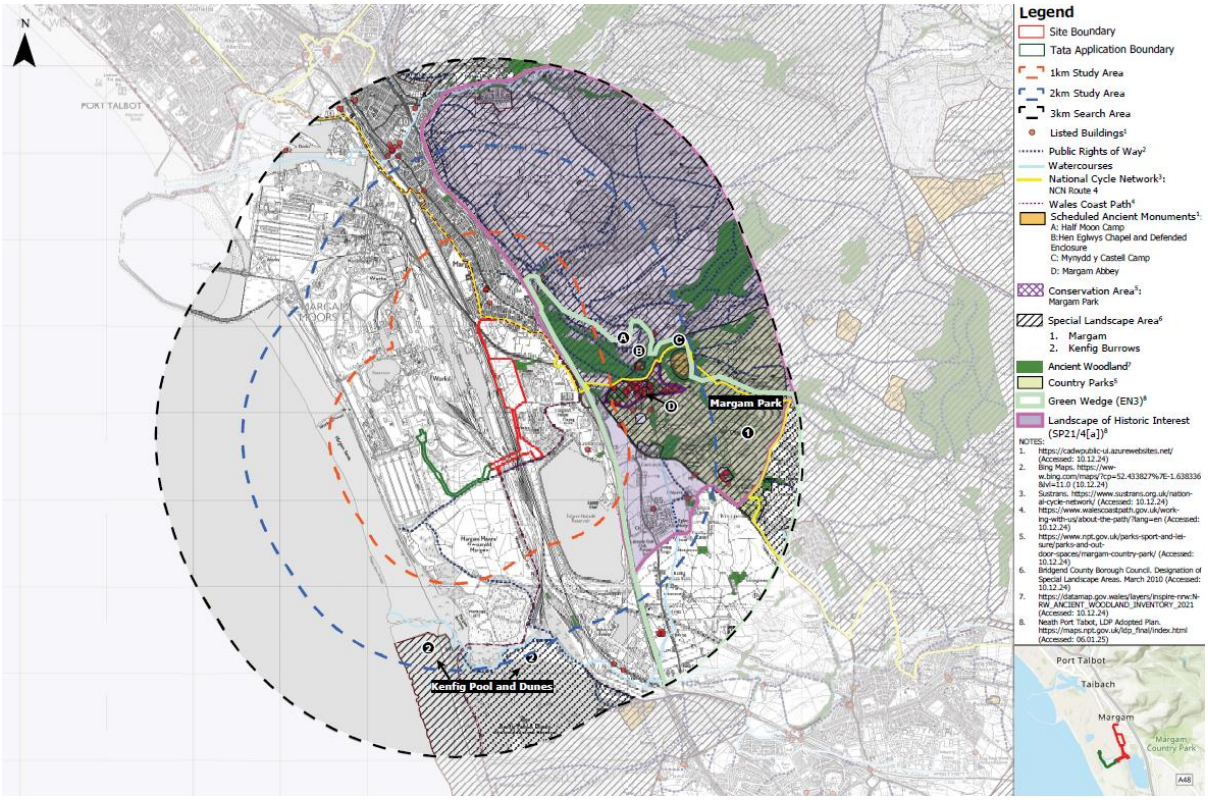


Figure 2. Landscape Planning Context

2.3.3 The Site is flat and low lying, surrounded by large-scale industrial development. This existing industrial development provides enclosure to the west, east and southeast of the site and obscures ground-level views in these directions. Industrial structures are very prominent elements in the locality of the Site and on the skyline from the surrounding area. They are also generally visible and prominent in views over long distances.

2.3.4 There are no Public Rights of Way (PRoW) within the Site. The nearest PRoW is located immediately to the south of the Site (Ref. 5/92.PT/2[5]) and the Welsh Coast Path, running along Heolcae'r-Bont.

[5] https://maps.npt.gov.uk/rights_of_way/index.html

Biodiversity

2.3.5 No statutorily designated (Site of Special Scientific Interest (SSSI), Special Protection Area (SPA), Ramsar, Special Area of Conservation (SAC)) or Local Wildlife Sites (LWS) are found within the Site. Part of the Site, comprising the proposed Margam substation extension and the first part of the cable route, falls within a Site of Importance for Nature Conservation (SINC) (Junction 38 Wetland Complex SINC) which is a non-statutory designation. The closest statutory designations are Margam Moors SSSI and Eglwys Nunydd Reservoir SSSI, adjacent to the south of the Site, and approximately 70 m south-east of the Site, respectively. Four European designated sites are located within 10 km of the Site, the closest is Kenfig / Cynffig SAC, located approximately 2 km south of the Site.

2.3.6 The Site comprises a complex of wetland habitats, with Habitat Surveys having been completed in 2024 (National Grid and BOC land), as detailed in the Ecology Technical Note (**Appendix 6.2**). The Ecology Technical Note also summarises Habitat Surveys undertaken previously in the Tata Steel land by RSK 2021-2024 (RSK, 2024). Of note, the wetland habitat types support the SINC designation outlined above and falls within the broad habitat category of 'Fen, Marsh and Swamp'. The Site contains reedbeds which are a Priority Habitat. Along the cable route the habitat transitions from the wetland complex into a swamp and marshy grassland complex with a network of wet and dry ditches and scrub. This habitat is considered to be former coastal floodplain grazing marsh, albeit it is understood to have been some time since the grassland has been managed through grazing, or the ditches managed, to the east of the railway line.

2.3.7 Within the Site to the west of the railway line, within land owned by Tata Steel, the habitats include former coastal floodplain grazing marsh (comprising poor semi-improved grassland within a network of ditches). Other habitats present include plantation woodland, scrub and ephemeral short perennial.

2.3.8 The NPTC pre-application response indicates that in the absence of information to the contrary, NPTC assumed the proposed substation Site to comprise irreplaceable habitat – specifically a bog and active peat-forming habitats. While it is noted that Peat is present within the Site, none of the peat present is at ground surface level, therefore there are no areas where the surface vegetation is classed as peat-forming or 'active' vegetation. This is confirmed with more detailed description in the "Ground Conditions and Land Contamination" section below.

2.3.9 A range of species surveys have been undertaken within the National Grid and BOC land through the 2024 season including, breeding birds, water vole and otter, great crested newt, reptiles and wintering birds, as summarised within the Ecology Technical Note (**Appendix 6.2**). Updated invertebrate surveys were not carried out in 2024 as it was considered likely that the Site and the BOC land will continue to support an important invertebrate assemblage similar to that recorded within the 2009 planning application surveys, given the continued presence of a mosaic of wetland habitats within the Site[6]. However, further update ecological surveys have been committed to in spring and early summer 2025 to meet with the requirements of NPT including: invertebrate scoping survey, reptile survey, water vole and otter survey, bat surveys and National Vegetation Classification (NVC) surveys.

2.3.10 Protected or notable species considered present within the National Grid and BOC land, based on desk study review, 2024 survey data, and feedback from NPT:

- Breeding bird assemblage including the Schedule 1 species Cetti's warbler; wintering birds present but do not include those species associated with the Eglwys Reservoir SSSI or other designated sites;
- Reptile population- low numbers identified in 2024 surveys but an exceptional population is assumed in the absence of core season survey data on a precautionary basis at the request of NPT;
- Water voles – low population of water vole assumed to be present based on identification of field signs and historical records;

[6] To expand, the footprint of the proposed substation remains swamp and scrub (as it was in 2009). The remainder of the National Grid landholding has transitioned towards a wetter habitat complex, with the grassland and marshy grassland transitioning to swamp and smaller area of marshy grassland, resulting in a reduction of overall diversity of habitats within the National Grid land (losing the drier, more floristic grassland). It is therefore considered reasonable and proportionate to assume for the purposes of assessment that the invertebrate assemblage within the site remains of the higher value described in 2009, given a review of the findings of that survey, the species described per habitat type and in the context of the current status of the habitats within the site.

- Bats – low suitability for roosting bats within the existing sub-station buildings. The Site has potential to supporting foraging bats; NPT note the presence of lesser horseshoe bats within 2km of the Site with the closest record being of a single male recorded using a building as a night-feeding perch within 500m of the Site to the east;
- Invertebrates – notable species of invertebrate were previously identified within the Site (Jacobs, 2012) and given the Site remains a wetland complex, the value of the Site for invertebrates likely remains the same;
- Invasive and Non-Native Species (INNS) – Whilst no INNS were recorded from within the Site boundary, a stand of Japanese knotweed has been identified immediately adjacent to the Site boundary, to the south of Heolcae'r Bont;
- Fish – The ditches present within the Site have the potential to support fish and eel species with the most suitable ditches on Site being the Upper Mother Ditch. Other ditches within the Site tend to be shallower, not continuous and lack flow; and
- Other Priority Species – the site provides habitat suitable for harvest mouse and hedgehog. Harvest mouse nests were identified within the Site by Ecological Clerk of Works during the Ground Investigation works.

2.3.11 A similar range of protected or notable species were identified by RSK during surveys of the Tata Steel land (cable route west of the railway line) undertaken 2022-2024, albeit no water vole were recorded within the Tata Steel land. It should be noted that whilst additional bird species were recorded within the wider Tata Steel Land, these were recorded from outside of the Site considered in this EIA Screening as those species were associated with the open Lake and the building habitats within the Tata Steel land. Furthermore, whilst badger was recorded within the Tata Steel land, the record of badger activity was from outside the Site considered in this EIA Screening.

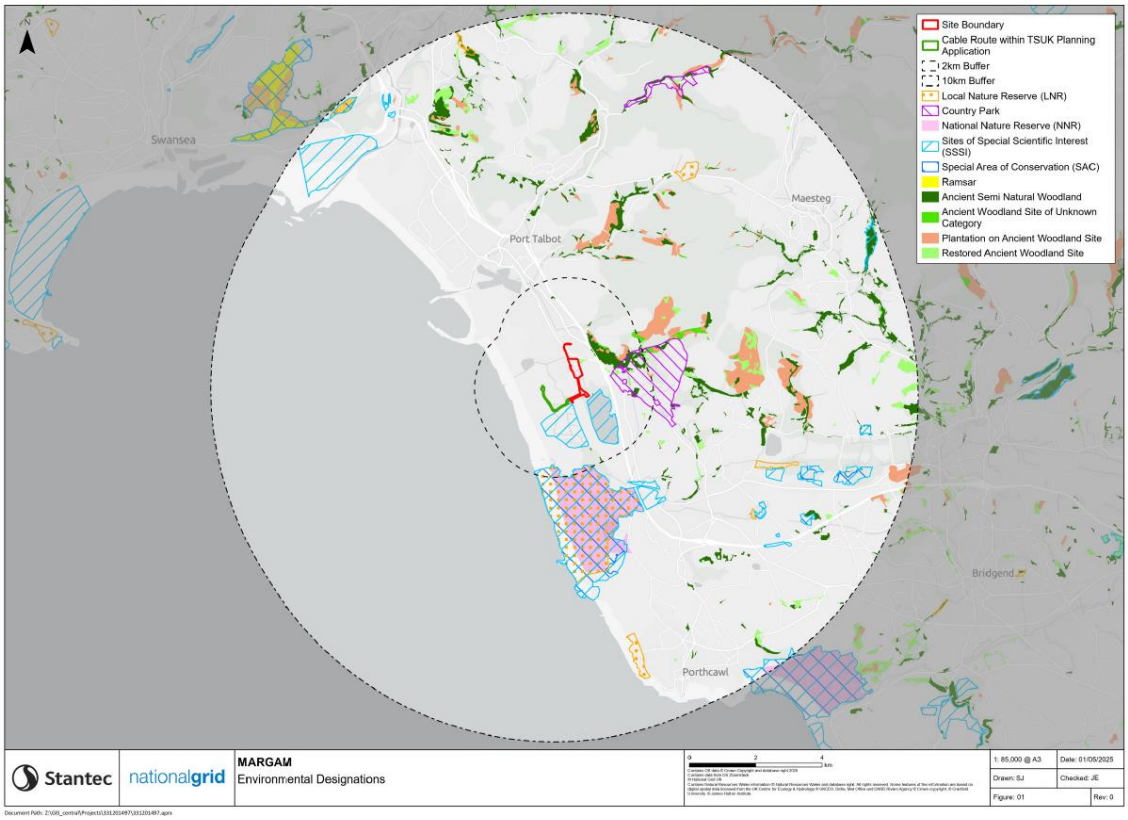


Figure 3. Designated Ecology Sites

Heritage and Archaeology

2.3.12 There are no designated historic assets within the Site boundary[7]. The nearest designated historic asset in the grade II listed building 'Milestone at Tollgate Park' (Reference Number: 23284), located approximately 500 m north of the Site. The Grade II* listed 'Beulah Calvinistic Methodist Chapel' (Reference Number: 14172) and its associated Grade II listed vestry and gates, piers and railings (Reference Numbers: 23282 and 23283) are located approximately 650 m north of the Site. The Grade II* listed building Margam Crematorium (Reference Number: 87732) is located approximately 750 m east of the Site.

2.3.13 The Margam Mountain Registered Historic Landscape (Reference Number: HLW (WGl/MGl) 2) is located approximately 950 m east of the Site beyond the M4, within which lies Margam Castle, Margam Park Registered Historic Park and Garden (Reference Number: PGW(Gm)52(NEP)) and Margam Abbey Scheduled Monument (Reference Number: GM005).

2.3.14 The Heritage and Archaeology Technical Note (**Appendix 6.4**) therefore concludes that there are several high importance heritage assets in the surrounding area, which include Listed Buildings, Scheduled Monuments and Grade I Registered Park and Gardens (which are treated as equally important according to national policy). It also identifies that the Site has a moderate potential for buried archaeological and paleoenvironmental remains to be present dating to the early Prehistoric period.Such remains, if present, would be confined to the peat deposit identified by the geotechnical investigations (see below). There is between 1.5 m and 2.2 m of deposits with low archaeological potential which could accommodate pile caps, ground beams and ground floor slab without directly impacting on any archaeological deposits. The cable route also passes close to the recorded site of the small arms range – Lower Mother – at its southern extent. However, this is recorded by the Pillbox Study group as having been removed

2.3.15 The Technical Note further concludes the route does not represent or would result in a strong likelihood of unacceptable impacts to archaeological and heritage assets. In agreement with the local planning archaeologist (LPA), further investigation of the historic environment, including non-designated heritage assets, is to be conducted in the form of a Historic Environment Desk Based Assessment (HEDBA). It is anticipated that while assets of local importance may be present, it is likely mitigation can be established to minimise impacts to a level acceptable to the LPA.

[7] https://cadw.gov.wales/advice-support/cof-cymru/search-cadw-records

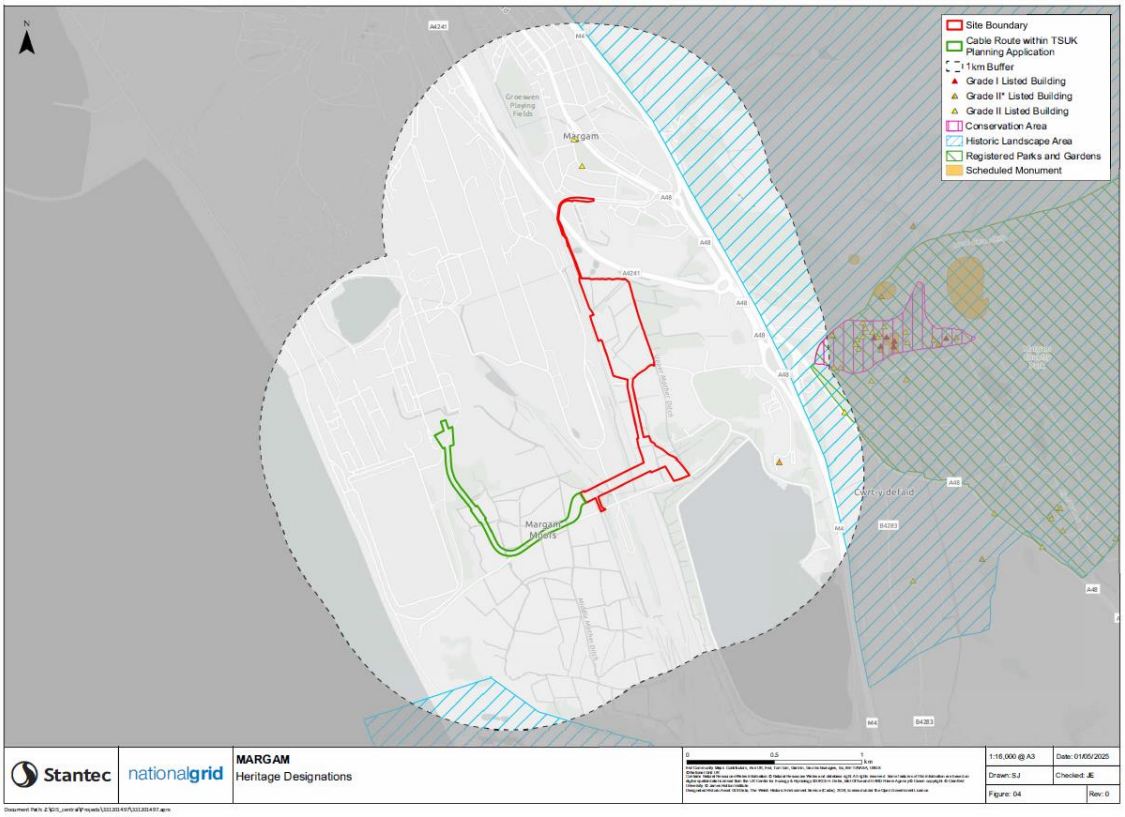


Figure 4: Designated Historic Assets

Agricultural Land

2.3.16 According to the Predictive Agricultural Land Classification Map[8], the majority of the Site is located within Grade 4 Agricultural Land, with a small section classified as non-agricultural.

[8] https://datamap.gov.wales/maps/new?layer=inspire-wg:wg_predictive_alc2#/

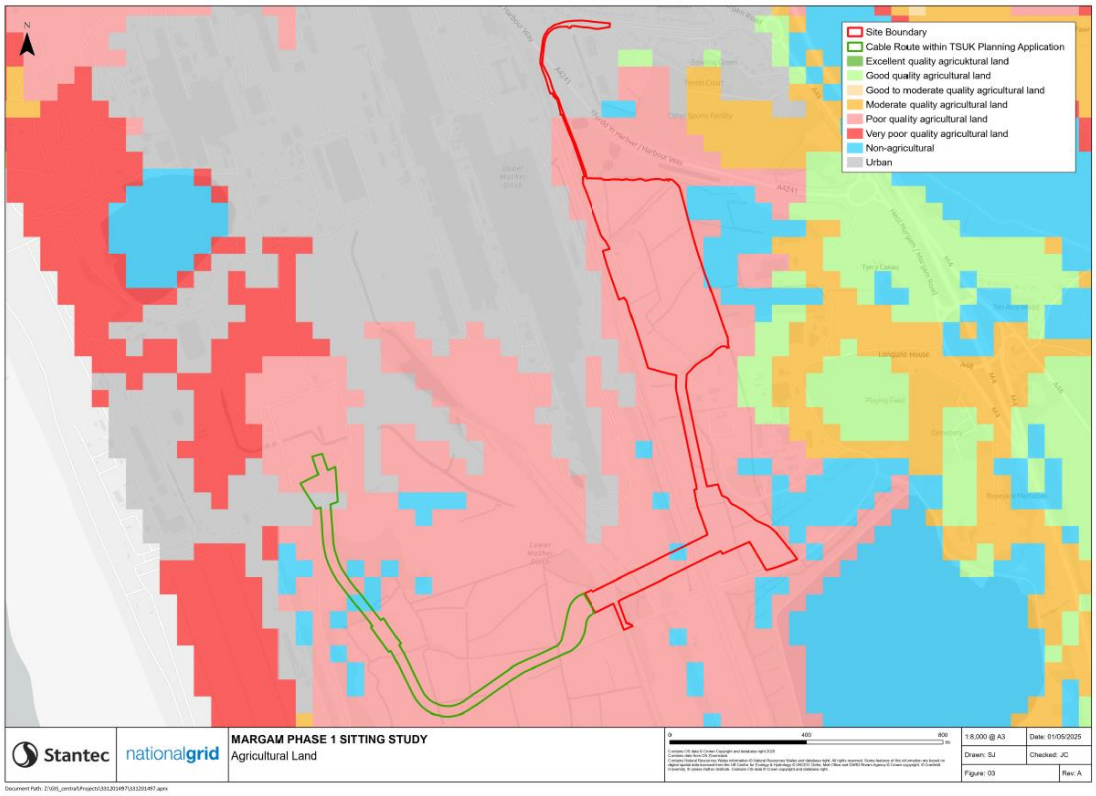


Figure 5: Agricultural Land Classification

Ground Conditions and Land Contamination

2.3.17 British Geological Survey (BGS) information indicates the Site to be underlain by bedrock deposits of the Carboniferous South Wales Lower and Middle Coal Measures Formations, which are described as grey coal-bearing mudstones and siltstones, with seatearths and minor sandstones. The bedrock deposits are overlain by superficial Quaternary Tidal Flat Deposits, which are described as comprising a mix of clay, silt, and sand, with layers of peat. 'Submerged forests' are also recorded. Superficial Quaternary Devensian Glaciofluvial ice contact deposits are recorded within approximately 100 m east of the Site boundary.

2.3.18 The natural geology at the location of the proposed cable route railway crossing is shown to be overlain by Landscaped Ground, described as an area where the land surface (natural or artificial) has been extensively remodelled, but where it is impracticable or impossible to delineate separate zones of Made Ground (described as an area where the pre-existing (natural or artificial) land surface is raised by artificial deposits), Worked Ground (described as an area where the land surface (natural or artificial) has been lowered as a result of man-made excavations), or Disturbed Ground (described as area of ill-defined surface disruption associated with surface or near-surface development or collapse).

2.3.19 The Site is shown to be underlain by several geological faults which may have resulted in localised variation in ground and groundwater conditions.

2.3.20 The Site is also shown to be underlain by a number of inferred coal seams, likely worked as part of the Morfa Colliery located to the north of the Site, which operated between approximately 1849 and 1913.

2.3.21 Various phases of ground investigation have been undertaken across the Site, further details of which are provided within the Ground Engineering Technical Note presented in **Appendix 6.5** of this report. A ground investigation was undertaken by Geotechnics Limited in 2024 at the location of the proposed Margam Substation and a Factual Report subsequently issued. The investigation comprised the formation of twelve boreholes and twenty trial pits, generally encountering ground conditions comprising topsoil, underlain by very soft or soft, occasionally firm or stiff, clay, with bands of fibrous peat between

0.8 m and 4.7 m thick, to depths of between 3.8 m and 7.3 m BGL. The clay was underlain by medium dense, dense or very dense gravel, to depths of between 6 m and 10.2 m BGL, underlain by stiff or very stiff clay, to depths of between 11.7 m and 13.3 m BGL, underlain in turn by extremely weak to very strong mudstone, siltstone and / or sandstone with occasional coal bands, between 0.25 m and 0.4 m in thickness, to a maximum proven thickness of 49.5 m BGL. Locally, Made Ground, described as clay, sand or gravel with ash, concrete, brick, coal, wood, glass, and / or slag, was encountered, to a maximum proven depth of 2.3 m BGL. Artesian or sub-artesian groundwater strikes were recorded at depths of between 0.2 m and 21 m BGL. Groundwater was recorded at depths of between 0.0 m and 0.1 m BGL during three subsequent monitoring rounds. As part of the investigation, a total of 42 No. soil, 1 No. groundwater, and 6 No. leachate samples were recovered and tested for a range of determinands, including heavy metals, PAHs, TPHs, and/ or asbestos.

2.3.22 The above ground investigation was used to prepare an interpretive Ground Investigation Report issued in February 2025 by Baker Hicks Limited. The results of the soil laboratory testing were compared against assessment criteria for a commercial end use, with no exceedances identified. In addition, no asbestos was identified in any of the samples tested. The results of the groundwater and leachate testing were compared against relevant assessment criteria for the protection of human health and the environment, with no exceedances identified. Ground gas monitoring was undertaken at 2 No. borehole locations. Due to the presence of shallow groundwater, the response zones were flooded during monitoring and the collection of representative data was not possible. Due to the presence of peat beneath the Site, a classification of Characteristic Situation 2 (low hazard potential) was considered appropriate, typically requiring the installation of a gas proof membrane across floor slabs. The report also concluded that, due to the poor ground conditions encountered, ground improvement and piled foundations are required to support the proposed structures at the Site.

2.3.23 A borehole located close to the proposed cable route area immediately to the west of the railway encountered low strength clay or silt with local peat bands to a depth of 9.7 m BGL, underlain by interbedded clay and gravel to a depth of 15.9 m BGL, underlain by mudstone, to the base of the borehole (16.90 m BLG). Groundwater was encountered at depths of 3.5 m and 5.7 m BGL during drilling and 1.38 m BGL during subsequent monitoring.

2.3.24 Available information indicates there to be no surface exposures of peat. To the east of the railway line (within the Site), the top surface of the peat is present at a minimum depth of 0.2 m BGL, extending to a maximum depth of 5.80 m BGL, with thicknesses ranging between 0.50 m and 4.70 m. To the west of the railway line (on Tata Steel land), peat deposits are thinner, ranging between 0.6 m and 1.5 m in thickness, present at depths of between 4.6 m and 8.0 m BGL.

2.3.25 A Coal Mining Risk Assessment undertaken by Baker Hicks concluded a low risk of coal workings at a depth that would affect the proposed development. Should unrecorded shallow mine workings be encountered, Laing O'Rourke will engage with the Coal Authority and other relevant parties to confirm required mitigation measures.

2.3.26 A Site-specific UXO Desk Study and Risk Assessment has been undertaken by Zetica Limited. The assessment concludes the risk to excavations, boreholes, piling and horizontal direction drilling to be low. UXO awareness briefings are recommended for workers involved in excavations.

2.3.27 In conclusion, based on existing information, the risk of significant contamination of the ground and groundwater is generally considered to be relatively low in undeveloped areas, including the proposed Margam Substation, where ground investigation and assessment has not identified significant contamination of the ground or groundwater. However, relatively higher risk localised conditions may exist in areas where development has occurred in the past, including the railway crossing, and the historical rifle range, which has not been previously investigated based on information reviewed as part of this assessment. Further ground investigation and assessment is therefore required to confirm current Site conditions and potential impacts on human health and the environment, including an assessment of the risk posed by ground gas.

Water Resources and Flood Risk

2.3.28 Surface water features across the Site and surrounding area generally comprise a series of interconnected drainage ditches, including the Mother Ditch system (comprising the Upper, Middle and Lower Mother Ditches). The Eglwys Nunydd Reservoir is located approximately 70 m to the southeast of the Site.

2.3.29 The Site is located within Flood Zones 2 and 3 and is at risk of flooding from rivers and the sea, according to the Natural Resources Wales Flood Map for Planning[9]. Small areas of the Site, including parts of the network of ditches, are at risk of surface water flooding or flooding from small watercourses. The Development Advice Map (DAM) indicates that the substation Site is primarily in Zone C2, meaning that it does not benefit from defences.

2.3.30 Further fluvial modelling demonstrates that the substation Site is at risk of flooding in the 1 in 1,000 year fluvial flood event (with and without Climate Change), and the 1 in 100 year fluvial flood event (with Climate Change) (**Figure 6**).

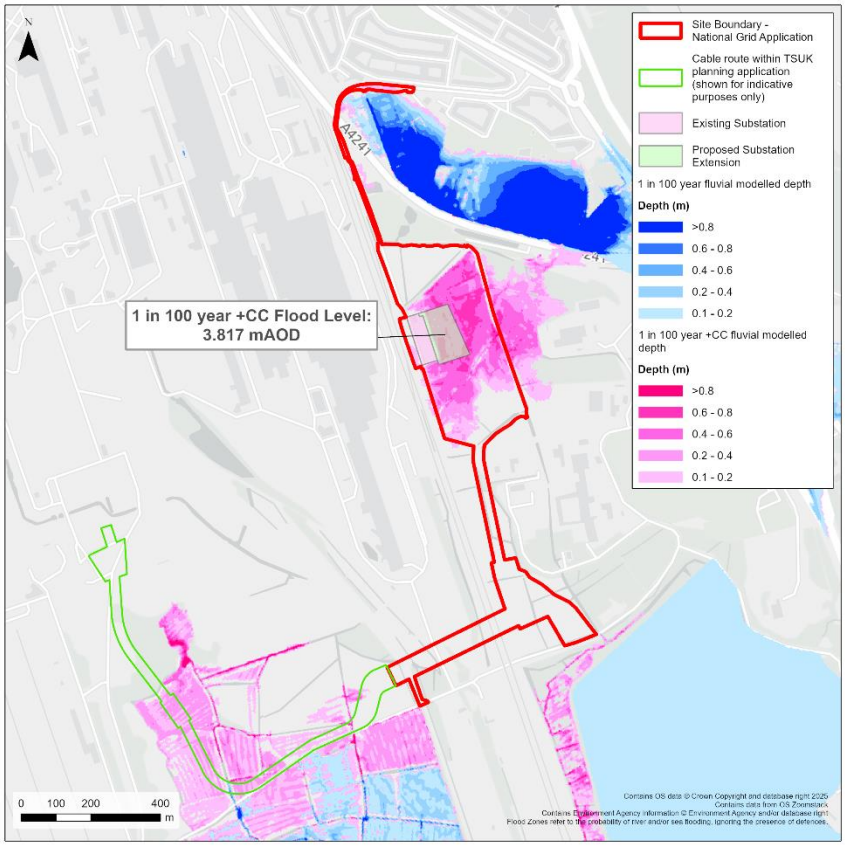


Figure 6: Flood Risk – 1 in 100 year + Climate Change

2.3.31 A draft Flood Consequence Assessment (FCA) has been provided by Baker Hicks which also demonstrates the flood risk at the site. As National Grid requires that the development is not at risk of flooding in the 1 in 100 year + Climate Change event, one recommendation of the FCA is that a fluvial defence wall is constructed with a crest level at 5 m AOD in order to protect the substation from flooding in a 1 in 100 year + Climate Change event. Using the NRW modelling, this shows that the resulting displacement of floodplain storage leads to a small increase in flood levels in undeveloped land in the vicinity of the site that doesn't impact properties.

2.3.32 Further hydrological modelling has been commissioned by National Grid to include site specific topographic data such as road levels and culvert dimensions. Details of this enhanced modelling will be confirmed in the final FCA, which will be submitted as the planning application of the substation is progressed.

2.3.33 Based on the Site being relatively low-lying, at an elevation of approximately 5 m AOD, groundwater is anticipated to be relatively shallow. The superficial deposits beneath the Site are classified as unproductive, described as being largely unable to provide usable water supplies and unlikely to have surface water and wetland ecosystems dependent on them. The bedrock deposits beneath the Site are classified as a Secondary A aquifer, described as comprising permeable layers that can support local

[9] https://flood-map-for-planning.naturalresources.wales/

water supplies, and may form an important source of base flow to rivers. The Site is not located on or within 250 m of a Source Protection Zone (SPZ).

2.3.34 A Preliminary Hydrogeological Assessment (**Appendix 9**) has been produced which contains further details on hydrogeological baseline conditions, through these are largely covered by the above water resources and ground conditions sections.

Air Quality

2.3.35 The Site is not located within an Air Quality Management Area (AQMA). The nearest AQMA to the Site is the 'Neath Port Talbot AQMA Taibach / Margam', adjacent to the north of the Site boundary and approximately 700 m north of the proposed substation extension. This AQMA was declared in 2000 for exceedances of PM_{10} from industrial sources.

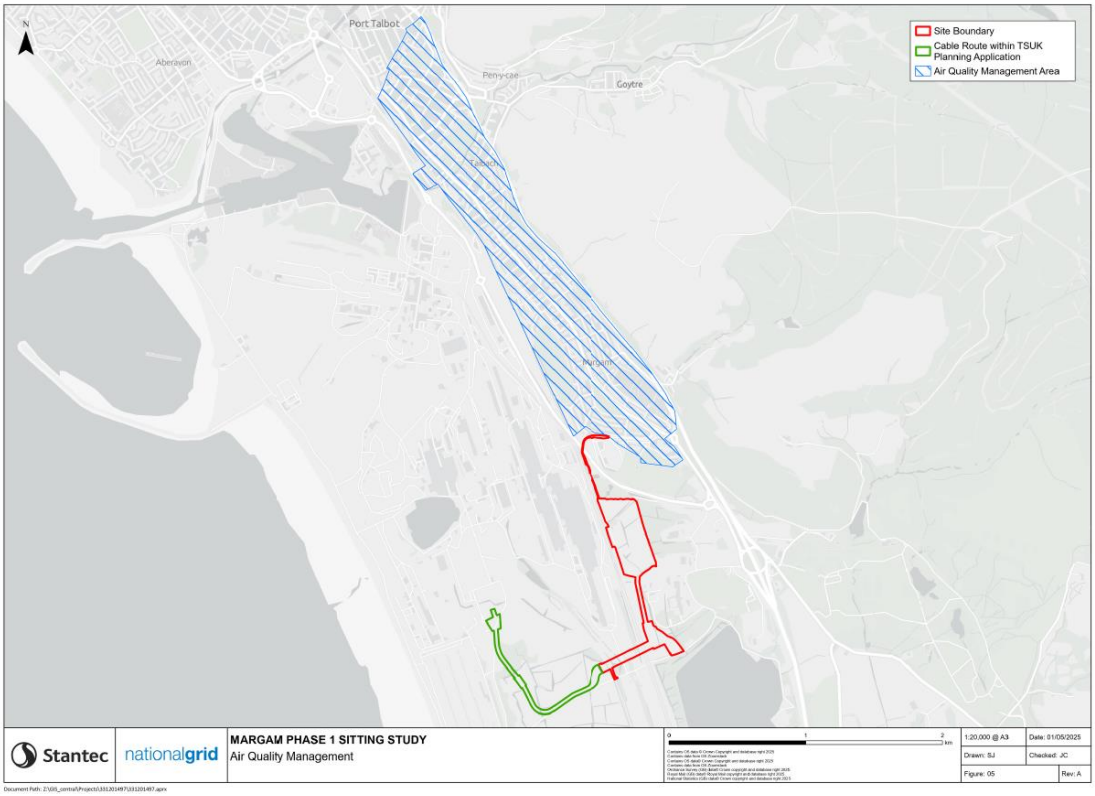


Figure 7: AQMA Mapping

Noise

2.3.36 The existing Margam 275 kV substation is surrounded by heavy industrial development comprising the Tata Steel and the BOC plant. The nearest cluster of residential properties lies approximately 30 m north of the access road and approximately 450 m to the north-east of the remainder of the Site. The M4 motorway is around 650 m east of the Site.

2.4 The Proposed Development

2.4.1 Due to the proposed substation extension sitting outside the existing operational land, a planning application will be submitted with the cable route proposals falling under Part 17 Class G 'Electricity Undertakings' of the GPDO. There is no prior approval application for this type of permitted development right. The proposals therefore comprise a planning application (for the substation) and a 'permitted development' (for the cables) for the following:

- Development of a new 275 kV double busbar[10] substation to replace existing Margam Substation, including a GIS hall and amenities building (**Appendix 2**); and
- A total of 6 cables (2 circuits of cable with 3 cables per circuit) of 275 kV between Margam and Port Talbot substations to include cable trenching and Horizontal Directional Drilled (HDD) cable (see **Figure 11** below). This describes the full cable route, part of the cable route and one of the HDD runs is located within Tata Steel land and has been approved as part of the Tata Steel EAF Application (LPA Ref. P2024/0711).

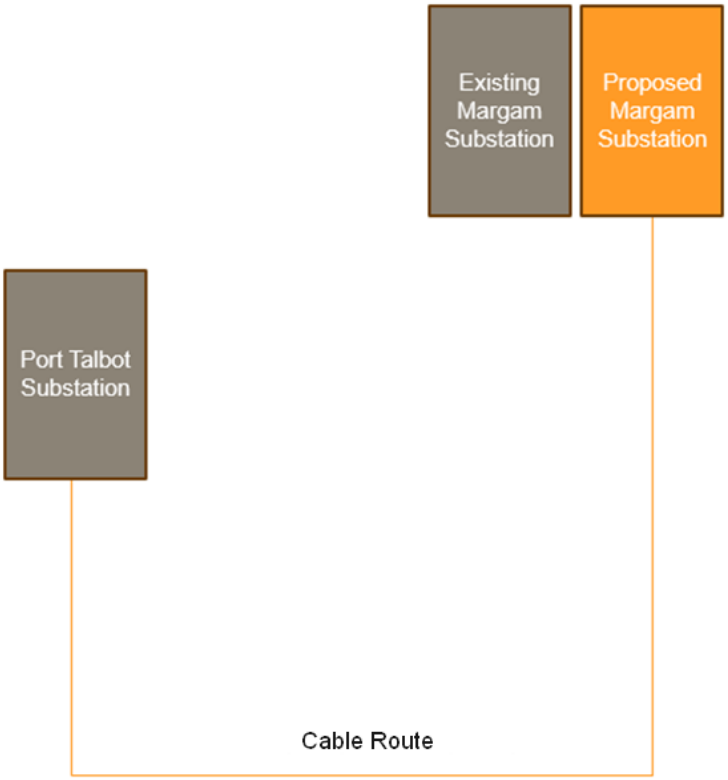


Figure 8. Development Schematic

Margam Substation and Amenities Building

2.4.2 As shown in **Appendix 4**, the proposed extension to Margam Substation will be located immediately to the east of the existing Margam Substation, towards the north-east of the Site. The proposed extension to the substation with a height of 12.91 m will be constructed on a raised platform set at a level of 4.15 m AOD to tie into with the existing substation. The Gross External Area (GEA) for the GIS Hall is 1,862.84 m^2 and the ridge height will be 17.06 m. The primary materials are steel and brick, with material colours including green, brown, dark blue and grey.

2.4.3 The amenities building will contain ancillary office space, with changing and WC facilities. The ridge level is 8.077 m and the primary material colours will be grey, dark blue and black.

2.4.4 **Figures 9** and **10** and below show the proposed elevations for the GIS Hall and the amenities building.

[10] In electric power distribution, a busbar (also bus bar) is a metallic strip or bar, typically housed inside switchgear, panel boards, and busway enclosures for local high current power distribution.

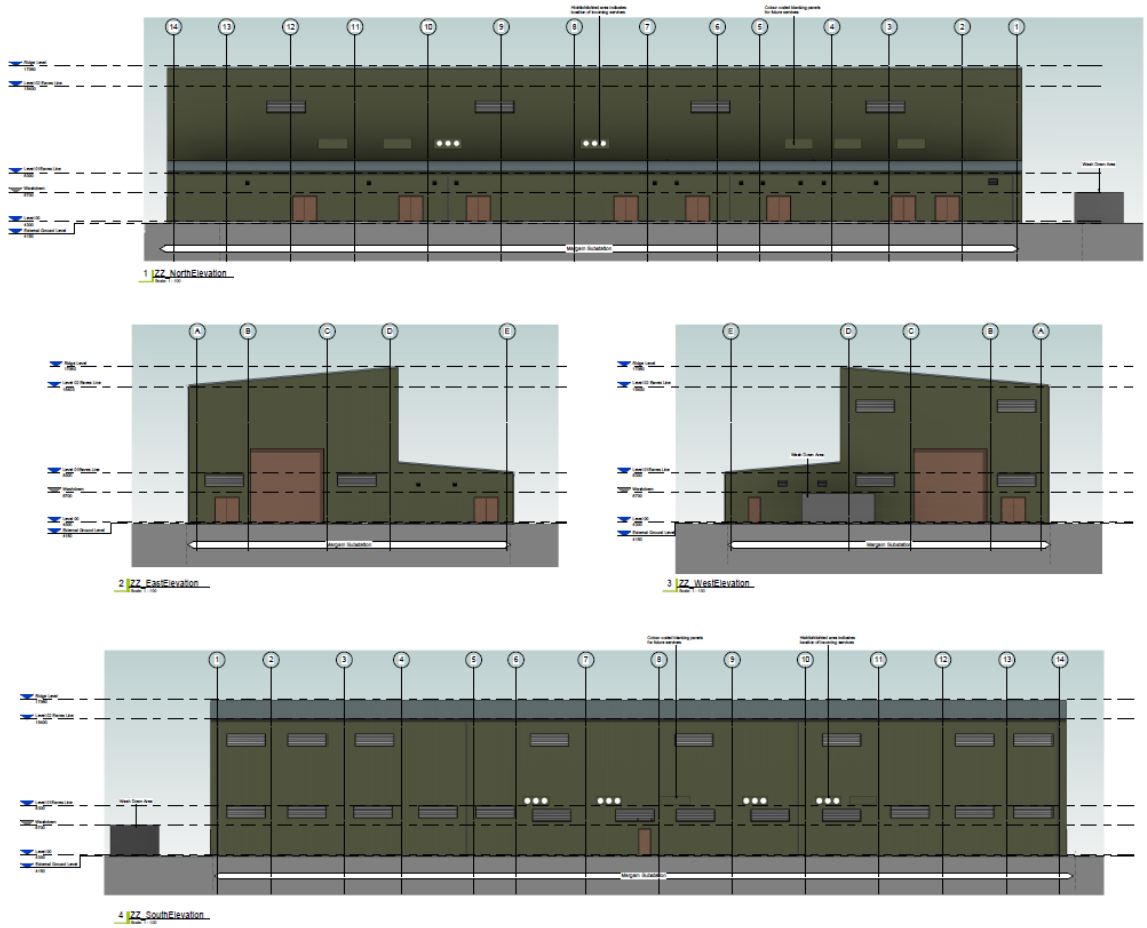


Figure 9. Proposed GIS Hall Elevations

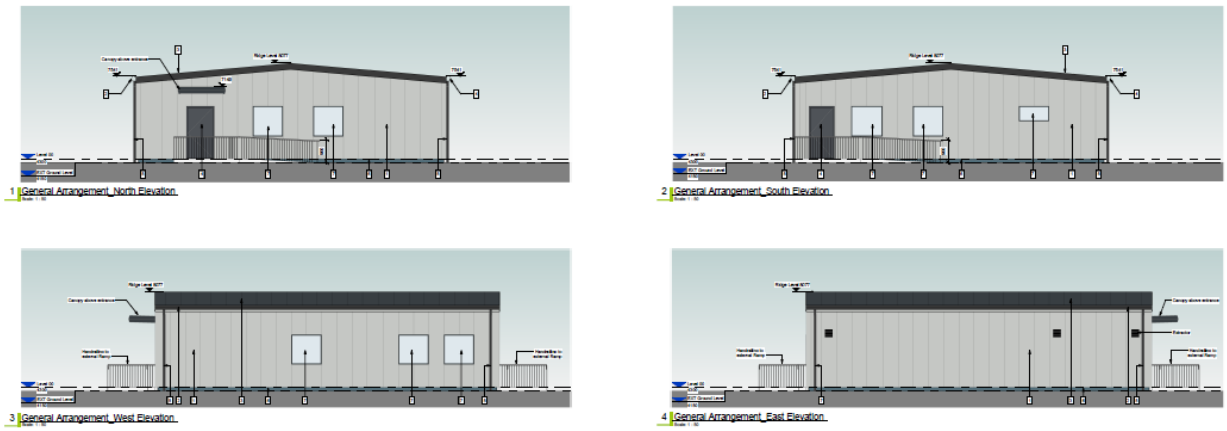


Figure 10. Proposed amenities building elevations

Cable Routing

2.4.5 The full cable route (also shown in **Appendix 4** and **Figure 11**) begins at the proposed Margam Substation and travel in a broadly southwards direction, parallel to the railway line, passing to the west of the BOC plant before turning almost 90 degrees towards the west to south-west and crossing under the railway to the north of Heolcae'r-Bont. The cable route then follows a broadly south-west direction to the north of Margam Moors SSSI towards the Tata Steel land.

2.4.6 The cable route then turns in a broadly north to north-westerly direction before connecting to the Port Talbot substation. This part of the cable route has been approved as part of the Tata Steel EAF Application (LPA Ref. P2024/0711).

Flood Defence Wall and Drainage

2.4.7 A flood defence wall is proposed to protect the existing sub-station and proposed sub-station set at a level of 5 m AOD. As a worst case, the flood wall will consist of a sheet piled wall offset 2 m outside of the new and existing Margam perimeter fenceline to meet the requirements of NG TS 2.10.13 §2.4. The flood defence wall will be designed and constructed to resist the loads imposed by extreme flood events. The substation is an unmanned facility (with only occasional use of the amenity building for inspection and maintenance) and therefore the flood gates to allow access through the flood defence wall will be kept locked shut. They will only be opened to allow access for planned inspection and maintenance activities.

2.4.8 It is proposed to discharge surface water runoff at a controlled rate into the existing tributary network. The proposed discharge rate from the development shall not exceed the greenfield runoff rate of 2.9 litres per second for up to and including the 1 in 100-year return period peak storm event with 40% climate change allowance. The attenuation required to limit flow rates to 2.9 litres per second is achieved by providing a detention basin located north of the Site. Surface water runoff from the Site and access road shall be conveyed to the basin via a traditional gravity sewer pipe network with chambers. Due to level constraints the basin outflow shall then be pumped to the adjacent Upper Mother Ditch. Surface water drainage provision for new development is subject both to the planning process and, following implementation of Schedule 3 to the Flood and Water Management Act 2010[11], approval by the SuDS Approval Body (SAB). The flood defence wall, flood gates, SuDS detention basin and ditch diversion (described below) are shown in **Appendix 3.**

Construction

2.4.9 Construction phase activities will be limited to the construction swathes shown on **Appendix 4**. The temporary construction compounds and temporary haul roads (**Appendix 5**) will be located within the construction swathes. For all temporary compounds and haul roads lightweight aggregates or trackway will be utilised to mitigate long term compaction and impact to the ground. All areas utilising lightweight aggregate will include a separation layer between the aggregates and ground to enable a clean removal and reinstatement of the area. After works are complete and the temporary working area has been de-mobilised, a Landscape and Environmental Plan will be put in place to assess the condition of the ground, potential areas of over compaction and outline any recommend remediation actions that can be put in place, such as deep soil aeration, to restore the ground condition. Further details are provided in the Geotechnical Considerations Report (**Appendix 10)**.

Margam Substation Extension

2.4.10 The Principal Contractor will mobilise a site establishment team to undertake vegetation clearance within the construction compound areas and substation extension area, followed by installation of hardstanding to the two construction compound areas. The temporary offices and welfare, along with parking facilities will be installed at the Northern most compound (**Appendix 4**). Demolition of an existing amenity building will be required to allow for the new amenity building and to enable installation of the new busbar support structures.

2.4.11 Within the Substation extension area and construction compounds following the vegetation clearance and welfare installation, enabling works will be undertaken which includes:

- Diversion of the existing ditch;
  - Location shown at **Appendix 3** Drainage Layout.
- Access Road installation;
  - The temporary haul roads for the full cable route are shown on **Appendix 5**. For temporary compounds and haul roads lightweight aggregates or trackway will be used to mitigate long term compaction and impact to the ground. All areas utilising lightweight aggregate will include a

[11] https://www.legislation.gov.uk/ukpga/2010/29/contents

separation layer between the aggregates and ground to enable a clean removal and reinstatement of the area. Further details are provided in the Geotechnical Considerations Report (**Appendix 10)**.

- Temporary utility (including drainage) installation;
- Hoarding and fence installation;
- Cut and fill earthworks and ground stabilisation works; and
  - Required to achieve the substation levels. Due to the shallow level of ground water, seepage during the initial cut and fill is expected. This ground water will be managed in line with necessary permits and licenses. As the seepage is likely to be rising groundwater an abstraction license is likely to be required.
- Installation of piling rig and crane working platforms.
  - To construct the substation extension (substation footprint) heavy plant to be required, such as piling rigs, cranes, and excavators. These items of plant will require a working platform for their safe operation. This working platform will be made up of permeable engineered fill and will be designed such that it can be incorporated into the permanent works, this avoids having to remove and replace with additional material. Thus, there will be no further impact beyond the permanent platform within the substation footprint. Further details are provided in the Geotechnical Considerations Report (**Appendix 10)**.

2.4.12 Following completion of the enabling works piling will commence; Auger piling will be undertaken to support the civil structures; the majority of the piling works will be in the area of the GIS hall. In addition to the piled foundations, ground improvement to the remainder of the substation footprint at Margam will be required. This is to prevent differential settlement between the structures and elements such as service routes and access roads. The method of ground improvement is under review but may require additional piles, or areas of ground stabilisation. Once the piling is complete, the main civil structures will be constructed. In the case of the GIS hall, this will comprise a ground bearing slab, and foundations tied into the piles. There will be service ducts and pits incorporated into the slab itself. The slab will have all necessary cast-in fixings required for the GIS hall and GIS equipment.

2.4.13 Once the GIS hall plinth has been installed, the building structure will be erected. The hall will comprise a steel frame with panels. Once deemed weatherproof, the interior of the hall will be fitted out with lighting and power and the drainage connected into the site system. The GIS plant within the hall will be installed by welding its support structure onto the steel rails cast into the plinth.

2.4.14 A back-up diesel generator system will also be installed. The back-up generator will be used in circumstances of electricity supply outages to the substation, this may include an overhead line being down, tree on the line or planned outages. Based on historical data for the Margam substation supply, there have been approximately 15 hours per year of down time when the back-up generator is assumed to have been used. The generator is located in the north-west corner of the GIS compound, externally to the GIS hall but within the fenced area (**Appendix 2**).

2.4.15 Sulphur Hexafluoride (SF6) **free**[12] pipework will be installed as the main plant is installed, allowing sequential charging of the GIS plant with SF6 free gas. The local control panels, relay panels, DC and AC distribution boards, communication panels and metering panels will all be installed and wired together.

2.4.16 Simultaneously, the external mechanical and electrical installation will be completed, this will consist of landing gantries, gas insulated and air insulated busbars (installed on raised supports), Mechanically Switched Capacitor with Damping Network[13] (MSCDN) and connections to the existing substation, along with modifications to existing overhead lines. The electrical earthing of this plant and of the GIS hall as a whole will be undertaken.

2.4.17 The last civil activities such as permanent site boundary electric fencing, lighting, roadways, landscaping and any required drainage / flood mitigation (including flood defence wall) will be completed after the majority of site installation works have been completed.

[13] MSCDN is a form of mechanically switched capacitor which assists in managing and controlling system voltage levels across the network.

2.4.18 Prior to completion commissioning tests will be required, starting with testing individual items of plant and culminating with testing the installed system as a whole. Following testing the substation will be connected into the high voltage transmission system.

Following successful commissioning and completion of defect rectification, the site installation facilities will be removed and where required temporary working areas will be restored.

Cables

2.4.19 The full cable construction programme is expected to start in Summer / Autumn 2025 and be completed by Spring / Summer 2027. The construction works will be undertaken by multiple teams working at the same time on different sections of the route. The cable route will have 3 HDD runs, one of which will be located within Tata Steel land (see **Figure 11**- note that the trenching will be located within these areas shown rather than covering the entire yellow area). These are expected to:

- Cross the existing high pressure BOC gas mains and minimise impact on areas of shallow peat within the SINC and BOC land (within the Site);
- Cross the railway line and associated sidings (within the Site); and
- Cross an area of suspected contaminated land (Made Ground – asbestos fibres[14]) and woodland in Tata Steel land (within Tata Steel land).

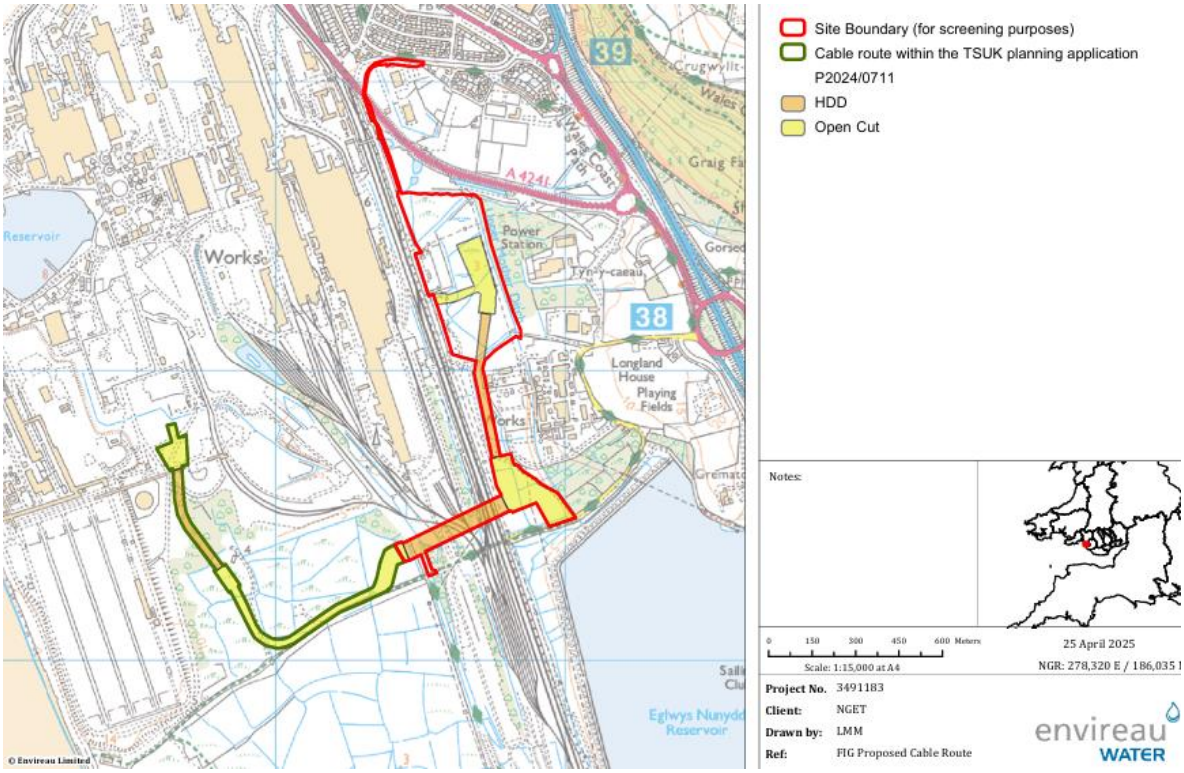


Figure 11. Proposed Cable Route showing HDD and open cut trenching sections

2.4.20 The works will typically commence with a period of vegetation clearance and ground stabilisation works (which involves soil mixing with cementitious material) along the sections of open cut trenching. This will be followed by commencement of the HDD runs and then the open cut trenching itself. The exact sequencing of the works is subject to review during the detailed design period.

[14] Currently the route avoids the identified asbestos fibres (HDD beneath contamination). At the time of preparing the EIA Screening report, further ground investigations are being undertaken. If contamination is found, the area around the proposed HDD compound will require remediation prior to works commencing.

2.4.21 To cross the existing ditches along the cable route, temporary crossings will be installed, known as flumes. These localised flumes will maintain the flow of water within the ditches, whilst allowing the installation of cable trenches and crossing of construction traffic. An example ditch flume is shown in **Figure 12**, note the separation layer for removal. **Figure 13** shows the reinstatement of the ditch, allowing for future seeding / planting as required.





Figures 12 and 13. Ditch Flume and Ditch Reinstatement

2.4.22 For operation and maintenance purposes it is expected there will be two separate trenches running alongside one another, each with 3 No. HV cables plus associated communication cabling. The total swathe for the two trenches will be confirmed during the detailed design phase.

2.4.23 The below images show the two 275 kV circuits during construction and at reinstatement. The deepest sections of open cut trenching will be limited to the ditch crossing points. Trenching depth will increase to cross ditches. The final depth will be dependent on the size of the ditch; typically for a 2 m deep ditch the depth to the underside of cables would increase to 3.5 m. The design depth is 6.040 m to underside of cables, due to the depth the spacing between trenches may need to be increased to 10 m. this allows for the necessary heat dissipation between cables.

2.4.24 The dimensions shown below are the likely worst-case dimensions. Note, the pink hatched areas are zones of soil stabilisations. **Figure 14** shows a section through a typical open cut trenching swathe with temporary storage of excavated materials depicted on the right.

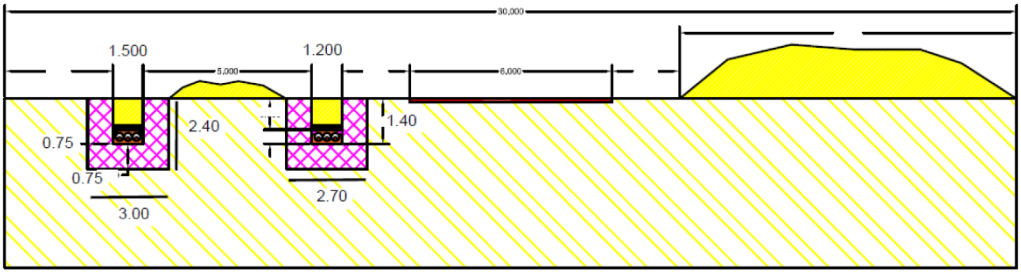


Figure 14. Typical Open Cut Cross-Section

2.4.25 **Figure 15** shows a section through a typical reinstated open cut trench swathe with all temporary elements removed. The stabilised material will be removed to 500 mm below finished ground level and reinstated with permeable material, allowing for planting, landscaping and free draining of water. **Figure 17** also shows an example image of a reinstated cable route, note the cable route in the foreground and background with the reinstated field in between.



Figure 15. Typical Open Cut Cross-Section - Reinstated

2.4.26 During excavation of the cable trenches, the spoil, if stored along the route, is stored directly on the ground with any drainage points covered to prevent ingress, however the Principal Contractor could use different methods of storage. Where possible, excavated material will be utilised for backfill. Spoil will be tested and any contaminated material will be disposed of correctly. Tarmac / asphalt will not be used as backfill and will be disposed of correctly.

2.4.27 As explained in **Appendix 9** Preliminary Hydrogeological Risk Assessment, within open cut sections of the cable route, the Principal Contractor is undertaking ground stabilisation to support the sides of the excavation. This allows safe placement of cables and minimises ground water seepage, removing the need for groundwater abstraction. Should stabilisation not be a permitted or technically feasible methodology then groundwater abstraction may be required in any alternative method.

2.4.28 The HDD runs will each have a launch and receive compound, which typically can be up to 90 m x 40 m. Their locations are shown on the Temporary Compounds and Access Routes Plan at **Appendix 5**. Ditches within the HDD compounds will be temporarily flumed. As above, for the temporary compounds and haul roads will utilise lightweight aggregates or trackway to mitigate long term compaction and impact to the ground. All areas utilising lightweight aggregate will include a separation layer between the aggregates and ground to enable a clean removal and reinstatement of the area.

2.4.29 When undertaking the HDD, it is expected that ground water will infiltrate the HDD route, this water is kept in a closed loop system i.e. drilling fluid and dewatering of HDD is kept within a closed loop system. If the volume of water infiltrating the closed loop system is too great to manage there may be a requirement to dispose of the water and drilling fluid (bentonite) off Site. All water abstraction and discharging will follow the required license and permitting system.

2.4.30 The finished cable route will have cable joint pits and link pillars at cable joint locations, which are typically at 500 m intervals.





Figures 16 and 17. Typical HDD compound (left) and cable trench construction (right)



Figure 18. A section of the Hornsea 3 cable corridor after reinstatement

Working Hours

2.4.31 Planned working hours are 07:00 to 18:00 Monday to Friday and 07:00 to 13:00 on Saturday. Work outside of these hours may be required for operations such as the HDD and cable jointing. Works outside of the core hours will be notified in advance to the NPTC.

Access

2.4.32 Access for the substation extension during construction and operation will be from Cerfn Gwrgan Road, via the M4 and A48. Additional access during the construction phase will be required from Heolcae'r-Bont to the south-east for the Site. Access details and any highway improvements required will be decided upon in consultation with NPTC to ensure that environmental effects are minimised as far as reasonably practicable.

2.5 Mitigation

2.5.1 In accordance with 2024 IEMA Mitigation in EIA Guidance[15] mitigation is defined as follows:

- **Primary mitigation** (also known as embedded mitigation)**:** *"Modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project, and do not require additional action to be taken.""*
    - Primary mitigation example: avoiding a key habitat or archaeological feature through the development's layout and operation.
- **Secondary mitigation**: *"Actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning consent."*
    - Secondary mitigation example: Describing certain lighting limits, which will be subject to the submission of a detailed lighting layout as a condition of approval.
- **Tertiary mitigation:** *"Actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects."*
    - Tertiary mitigation example: activities within a draft Construction Environmental Management Plan (CEMP).

[15] IEMA Guidance: Implementing the Mitigation Hierarchy from Concept to Construction

2.6 Design Evolution, Construction Methodology and Environmental Considerations

Primary Mitigation

Substation Technology

2.6.1 There were two main types of technology configurations considered, AIS and GIS substations. As per the Applicants policy [PS(T)_023], the starting position is to seek to deploy an AIS-only solution. However, the same policy suggests that the proximity of the Site to saline waters and the coast does not allow for an outdoor AIS solution for this project. Thus, an indoor GIS solution is preferred. The existing Margam substation is outdoor AIS and has suffered significantly from pollution.

2.6.2 In line with the National Grid Environmental Action Plan 2021-2025, which seeks to phase out SF_6 solutions by 2050, the Applicant's proposed configuration for the 275 kV substation is an SF_6 **free** GIS solution. The use of SF_6 **free** gas removes the need to use SF_6 itself, which has a very high global warming potential. This greatly reduces operational carbon emissions compared to standard GIS substation design.

2.6.3 Additionally, the use of AIS technology would have used a greater footprint than the proposed GIS substation (**Figure 19**, provides a comparison of the AIS footprint (shown in red) with the GIS footprint (shown in blue)), thereby impacting and disturbing a greater area with potential effects on ecology. The proposed GIS substation takes up a smaller footprint and therefore reduces environmental impact including on ground compaction and ecological effects through avoidance.

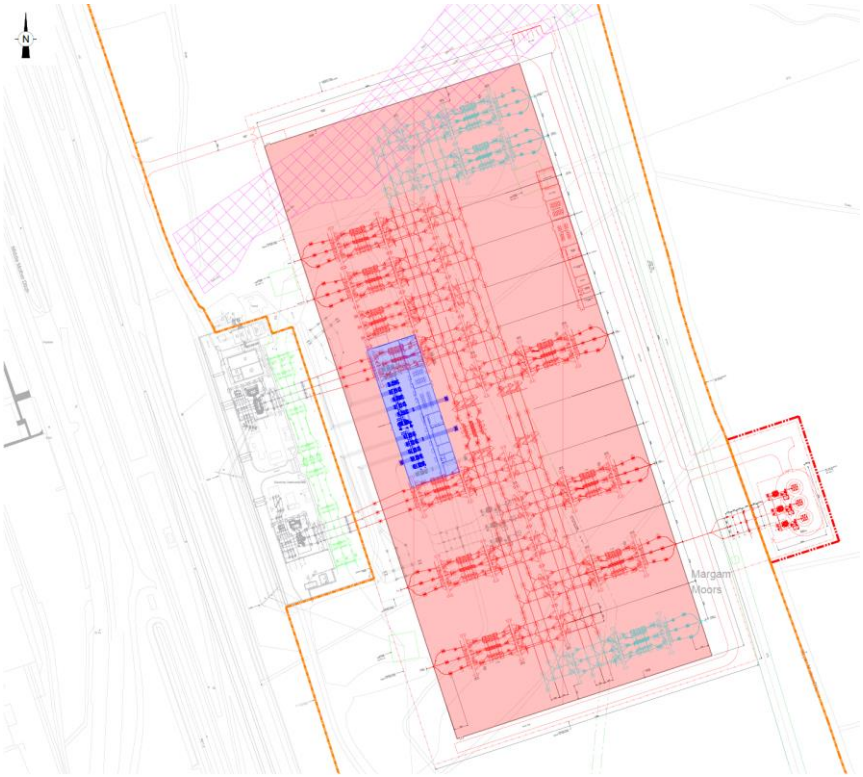


Figure 19. AIS (red) vs GIS (blue) substation footprint

Piling

2.6.4 Due to the soft ground conditions encountered on Site, all above ground structures will require deep foundations (piling). This includes the GIS hall, as well as numerous elements of HV equipment that sit externally to the hall. Typically, when encountering ground conditions as shown in the GI report a methodology of Continuous Flight Auger (CFA) piling would be utilised. This method relies on an auger removing the ground to the required depth, before concrete is pumped in.

2.6.5 The GI report has shown peat deposits at levels of approximately 1 m below the surface alongside Margam substation. To avoid removal of significant volumes of peat the Principal Contractor is reviewing the possible use of either Displacement Auger (DAP) or precast driven piles. Both methods will significantly reduce the impact and removal of the below surface peat. Whilst precast driven piles may have an element of noise disturbance, they have an advantage of not requiring wet concrete on site.

2.6.6 As the detail design progresses, minimising potential adverse environmental effects will be the primary consideration in determining the final piling methodology - between DAP and precast driven piles.

Horizontal Direction Drilling and Cable Design

2.6.7 The HDD has undergone design development to produce a layout that minimises disruption at ground level and below. The initial design (**Figure 20**) is known as a single shot layout, which whilst simpler to design and install would have required a larger HDD compound (due to overall width of the layout), increasing disruption and impact at ground level including ecological impact.

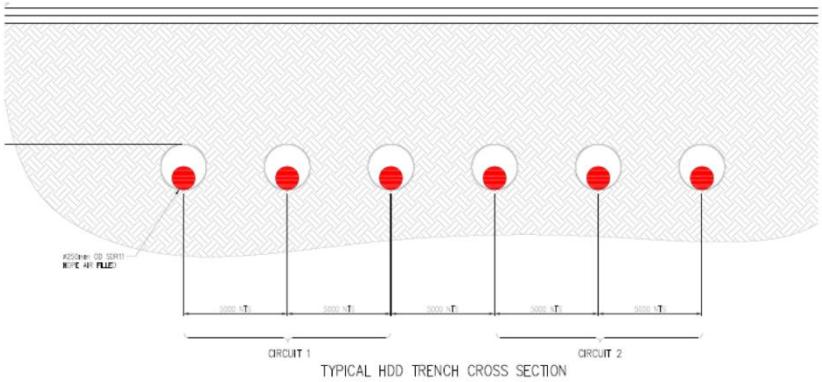


Figure 20. Early HDD Design, overall width impact of approximately 30m

2.6.8 Through design consultation, including working with cable suppliers to provide a cable type and size that meets the required heat dissipation, a trefoil formation has been developed. This reduces overall impact by closely bunching the cables, as shown in **Figure 21**. The deepest section of HDD is expected to be below Network Rails asset, this is still under development but is expected to be up to 15 m below the rail bed.

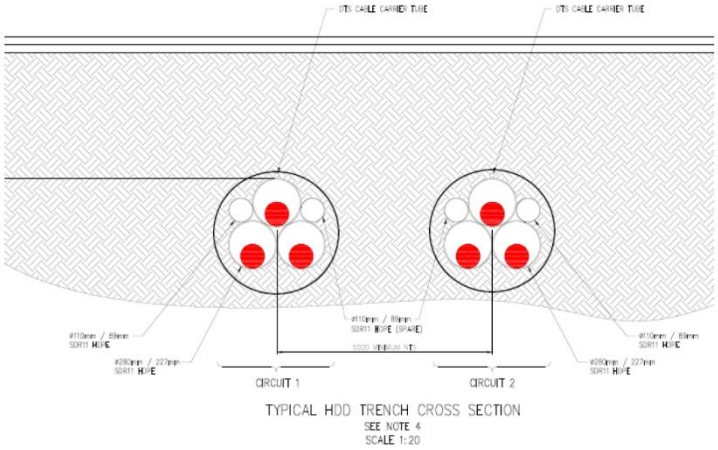


Figure 21. Section of current HDD Design. Up to 10m between circuits and an 812mm drill bore required

Temporary Compounds and Access Roads

2.6.9 As described above, lightweight aggregate and track matting for temporary HDD compounds and access roads will be used to reduce compaction and long-term impact to the ground.

Tertiary Mitigation

Construction Environmental Management Plan

2.6.10 In order to avoid significant effects during the construction phase, best practice measures will be implemented through a Construction Environment Management Plan (CEMP) (**Appendix 7**) which will be prepared by the Principal Contractor and to be agreed with NPTC before works commence on the Site. Responsibility for implementing the CEMP will lie with the Principal Contractor. Whilst the CEMP is a live document, it includes the following:

- A table showing the objectives, mitigation / optimisation measures, and responsibilities for the implementation of those measures;
- Arrangements for environmental monitoring;
- Provision for reporting, public liaison, and prior notification of particular construction related activities; and
- The mechanism for the public to register complaints and the procedures for responding to such complaints.

2.6.11 The CEMP will also contain the following documents:

- Environmental Risk Assessment;
- Site Waste Management Plan (SWMP);
- Construction Noise and Vibration Report;
- Construction Biodiversity Management Plan;
- Water Management Plan (WMP); and
- Peat Management Plan.

2.6.12 Additionally, an Environmental Emergency Plan will contain contact during normal working hours and emergency details outside working hours.

Mitigation Summary

2.6.13 A high-level summary of the proposed mitigation measures is provided in **Table 1**. Further details on mitigation measures are provided in the above section, within the Screening Assessment at **Table 3** and within the Technical Notes in **Appendix 6**. The Management Plans cover both the Margam substation extension and the cable route. The CEMP will be secured via planning condition to the Margam substation extension application. Mitigation for the cable route will be implemented through continued engagement and agreement with NPTC, licensing, secondary consents etc. Off-site mitigation will be secured through an appropriate legal agreement.

Table 1. Summary of Mitigation

Topic Area (s)	Mitigation	Substation	Cables
Waste	A Construction Waste Management Plan / Site Waste Management Plan will form part of the CEMP.	✓	✓
Noise & Vibration	Best practice measures implemented through the CEMP. The CEMP will include a Construction Noise and Vibration Report.	✓	✓-
	A Piling Method Statement will be submitted with the substation application.	✓	X- no piling associated with cables.
	An operational Noise Assessment will be submitted with the substation application.	✓	X- cables will be buried and no associated noise impacts during operation are anticipated.
Air Quality	Best practice measures implemented through the CEMP.	✓	✓
	An Air Quality Assessment will be submitted with the substation application.	✓	X- as above for noise.
Lighting	Best practice measures implemented through the CEMP.	✓	✓
	A Lighting Strategy / Assessment will be submitted with the substation application.	✓	X- as above for noise and air quality.
Water Resources & Flood Risk	A Water Management Plan will form part of the CEMP to address all key aspects of mitigating both surface and groundwater, including drilling waters.	✓	✓
	A Flood Consequence Assessment Report and Drainage Report will be submitted in support of the substation application, which outlines details of the flood defence wall and proposed SuDS. This will also outline measures for any compensatory floodplain storage required as a result of floodplain loss caused by the flood defence wall	✓	X
	Secondary consents will be sought for the cable route in relation to drainage.	X	✓
Ground Conditions & Contamination	A Peat Management Plan will form part of the CEMP.	✓	✓
	A Ground Investigation Specification has been prepared which sets out the ground investigation requirements, the investigation will inform the need and nature of any required mitigation which would be implemented to ensure environmental effects are not significant.	✓	✓
	A Contaminated Land Desk-Top Assessment and Coal Mining Risk Assessment Report will be submitted in support of the substation application	✓	X
	Displacement piling methods will be considered. Drilled displacement piles, a type of augured pile, that do not remove material but displace the surrounding soil laterally, creating a similar profiled regular shaft pile. Mitigation measures will include controlling water through an abstraction and discharge system, designed and permitted under appropriate consent, with remaining water within the pile being managed in accordance with the WMP.	✓	X
	HDD mitigation measures are outlined in the CEMP.	X	✓
Biodiversity	A Construction Biodiversity Management Plan will form part of the CEMP and include mitigation for designated sites, habitats and protected species.	✓	✓

Topic Area (s)	Mitigation	Substation	Cables
	A Peat Management will form part of the CEMP.	✓	✓
	A Water Management Plan will form part of the CEMP. Mitigation Strategy for Invasive and Non-Native Species (included in CEMP).	✓	✓
	Retention and protection of existing trees and vegetation where practicable and appropriate, as informed by an arboricultural impact assessment and ecological management targets for the retained areas of SINC.	✓	✓
	Minimisation of the loss of SINC and Priority Habitats, while seeking opportunities for mitigation, compensation and enhancement.	✓	✓
	Compensation for the loss of SINC and Priority habitats will be secured (to be secured via s.106 agreement with further details provided in **Appendix 6.2**.	✓	✓
	Mitigation hierarchy for protected species and specific methods statements and mitigation strategies, where needed.	✓	✓
	Net Benefits for Biodiversity will be secured through both on-site and, as required, off-site measures (to be secured via s.106 agreement with further details provided in **Appendix 6.2**).	✓	✓
Landscape & Visual Effects	Mitigation requirements in relation to the Site and Proposed Development would be developed in discussion with NPTC and other relevant stakeholders as well as the internal iterative design process and cross-discipline work with ecology, hydrology and flood risk, and ground conditions teams. Mitigation will aim to reduce any identified potential landscape and / or visual effects in addition to providing improved green infrastructure connectivity and ecological resilience where practicable. A Landscape and Habitat Strategy Plan will provide an overview of proposed mitigation from a landscape and visual perspective.	✓	X- Minimal visual effects anticipated during operation due to buried nature of cables
	A Landscape and Habitat Management Plan (LHMP) will provide guidance on the management and maintenance of any proposed mitigation as part of the Landscape and Visual Appraisal.	✓	X
	Net Benefits for Biodiversity.	✓	X
Cultural Heritage & Archaeology	Should archaeological features be identified which require intrusive evaluation it is anticipated that, suitable mitigation measures will be agreed with NPTC and be implemented prior to the development commencing.	✓	✓
Transport & Access	Best practice measures implemented through the Construction Logistics Plan and Traffic Management Plan.	✓	✓
	A Transport Statement will be submitted in support of the substation application.	✓	X
	Secondary consents will be sought for the cable route in relation to highways and access.	X	✓
Accidents & Disasters	An Environmental Emergency Plan will be prepared to be read in conjunction with the CEMP.	✓	✓

3 Screening Assessment

3.1 Introduction

3.1.1 In determining whether the development constitutes EIA development, considerations should be had to the following questions:

- Is the proposed development of a type listed in Schedule 1 of the EIA Regulations?
- If not, is it a Schedule 2 development under the EIA Regulations?
- Is it located within or partly within a sensitive area?
- Does it meet any of the relevant thresholds and criteria set out in Column 2 of Schedule 2?
- Would it lead to likely significant effects on the environment after the application of standard mitigation measures?

3.1.2 These questions are explored further in this section with reference to the EIA Regulations.

Regulation 5(8) of the EIA Regulations states: "Where a local planning authority or the Welsh Ministers have to decide under these Regulations whether Schedule 2 development is EIA development, the authority or the Welsh Ministers must take into account in making that decision-

Any information provided by the person minded to carry out development;

the available results of other environmental assessments carried out…

such of the selection criteria set out in Schedule 3 as are relevant to the development."

Schedule 1

3.1.3 EIA is mandatory for projects listed in Schedule 1 of the EIA Regulations. Schedule 1 developments are large scale projects for which significant effects would be expected and comprise developments such as new airports and power stations. **The Proposed Development is not of a type listed in Schedule 1.**

Schedule 2

3.1.4 EIA may be required for projects listed in Schedule 2. If the development proposed is of a type listed in Schedule 2 and is within a sensitive area or meets any of the relevant thresholds or criteria in Column 2 of Schedule 2 then it will constitute EIA development where it is likely to have significant effects on the environment by virtue of factors such as its nature, size or location.

Sensitive Areas

3.1.5 Sensitive Areas are defined in the EIA Regulations under Regulation 2(1) as:

- *"land notified under section 28(1) (sites of special scientific interest) of the Wildlife and Countryside Act 1981;*
- *a National Park within the meaning of the National Parks and Access to the Countryside Act 1949;*
- *a property appearing on the World Heritage List kept under Article 11(2) of the 1972 UNESCO Convention for the Protection of the World Cultural and Natural Heritage;*
- *a scheduled monument within the meaning given by section 3 of the Historic Environment (Wales) Act 2023;*

- *an area of outstanding natural beauty designated as such by an order made under section 82(2) (areas of outstanding natural beauty) of the Countryside and Rights of Way Act 2000;*

- *a European site"*

3.1.6 In considering the sensitivity of a particular location, regard should also be had to whether any national or internationally agreed environmental standards (e.g. air quality) are already being approached or exceeded. The Site is not within a sensitive area as defined by the EIA Regulations.

Thresholds

3.1.7 The Proposed Development does not fall within a clearly defined category in the EIA Regulations however given the 'broad purpose and scope' of the Regulations the proposals could be considered to fall under Schedule 2 paragraph 10 'Infrastructure Projects' or paragraph 11 'Other Projects'. The most relevant sub-paragraph is considered to be Schedule 2 paragraph 10(b) 'Urban Development Project'. The relevant threshold for an Urban Development Project would be "… *more than 1 hectare of urban development which is not dwellinghouse development*". The applicable thresholds and criteria for alternative categorisation of the project (e.g. under Paragraph 11) is also likely to be exceeded by the Proposed Development. Therefore, this screening assessment has been prepared to determine whether the proposals would be likely to result in significant environmental effects. In order to achieve a decision as to whether the proposals would be likely to result in significant environmental effects, Schedule 3 of the EIA Regulations need to be taken into account. Information on these is set out below.

Schedule 3

3.1.8 Schedule 3 of the EIA Regulations sets out selection criteria which relate to specific matters including: the characteristics of the development; the location of the development; and the characteristics of the potential impact. These factors should be taken into account as part of the screening process and are set out below:

Characteristics:

3.1.9 The characteristics of development must be considered with particular regard to:

- The size and design of the whole development;

- Cumulation with other existing development and / or approved development;

- The use of natural resources, in particular land, soil, water and biodiversity;

- The production of waste;

- Pollution and nuisances;

- The risk of major accidents and / or disasters relevant to the development concerned, including those caused by climate change, in accordance with scientific knowledge; and

- The risks to human health (for example, due to water contamination or air pollution).

Location:

3.1.10 The environmental sensitivity of geographical areas likely to be affected by development must be considered, with particular regard to:

- The existing and approved land use;

- The relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground; and

- The absorption capacity of the natural environment, paying particular attention to the following areas:

  (i) wetlands, riparian areas, river mouths;

  (ii) coastal zones and the marine environment;

  (iii) mountain and forest areas;

  (iv) nature reserves and parks;

  (v) European sites and other areas classified or protected under national legislation;

  (vi) areas in which there has already been a failure to meet the environmental quality standards, laid down in retained EU law and relevant to the project, or in which it is considered that there is such a failure;

  (vii) densely populated areas; and

  (viii) landscapes and sites of historical, cultural or archaeological significance.

Potential Impact:

3.1.11 The likely significant effects of the development on the environment must be considered in relation to the above criteria, with regard to the impact of the development on the factors specified in regulation 4(2), taking into account:

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

Consideration of Cumulative Effects

3.1.12 Schedule 3(1)(b) and 3(9)(g) of the EIA Regulations requires consideration of a development cumulatively with other existing and approved development

3.1.13 A search of the NPTC planning register identified six developments as set out in **Table 2** for cumulative effects consideration.

Table 2: Cumulative Development

Site Address and Application Reference Number	Description	Current Status	Distance and direction from Site
Port Talbot Steelworks Grange Road Margam Ref. P2024/0711	Full planning permission for the demolition of existing buildings and structures, partial infill of the BOS lagoon, and construction of a new electric arc furnace-based steel production facility (1 no. arc furnace, 2 no. ladle furnaces). The development includes chemical/material storage and transfer infrastructure, pipework and cabling (above and below ground), buildings, fume and dust treatment plant, water treatment facility and material handling systems, electrical control rooms and power infrastructure, offices and ancillary facilities, together with new and amended roads and rail lines, landscaping and green infrastructure, lighting, hardstanding, CCTV, drainage and associated engineering operations. Outline planning permission (with all matters reserved except for access and landscaping) for the construction of a scrap metal handling facility and associated scrap yards, scrap processing facility, new substation, underground and overground electrical infrastructure, and new and amended roads and rail lines, landscape and green infrastructure, lighting, hardstanding, CCTV, drainage and associated engineering operations.	Approved March 2025	Adjacent to the western Site boundary.
Port Talbot Steelworks, Compound Grange Road Margam Ref: P2024/0693	The installation and retention of concrete hardstanding for industrial use associated with the continued operations of the steelworks, and landscaping, green infrastructure and drainage works	Approved December 2024	Approximately 300 m north of the Site
Western Wood Energy Biomass Plant, Longland Lane, Margam Ref: P2024/0296	Construction and operation of a hydrogen production facility including associated compression, storage and infrastructure, a hydrogen tube-trailer filling station and renewable electricity connection via a private wire from the existing biomass plant.	Approved October 2024	Approximately 150 m east of the Site
Land West Of Junction 38 Of The M4 Ref: P2021/1255	Full planning application of the development of a metal processing facility totalling 28,500sq.m of floorspace comprising a powder processing plant (17,377sq.m), warehouse and store (5,428 sq.m) office building (1,442 sq.m), amenity building (776 sq.m), laboratory (200 sq.m), services building (470 sq.m), substation (107 sq.m), phase 2 (2,700 sq.m), CCTV, storage tanks and plant, parking, servicing and roads and associated works. (Additional and Revised information including details of diversion of water main, Boundary treatment and Acoustic Fencing details, external lighting scheme, revised Noise Impact Assessment, Revised Health Impact Assessment, and Air Quality Clarification Information).	Approved January 2023	Approximately 325 m east of the Site.
Y Bryn Wind Farm Land North-East Of The M4 Motorway	Development of National Significance: Installation of up to 18 wind turbines with maximum heights ranging between up to 206 m, up to 230 m, and up to 250 m to	Validated April 2024, awaiting decision.	Approximately 1.25 km east of the Site

Site Address and Application Reference Number	Description	Current Status	Distance and direction from Site
Between Port Talbot And Maesteg Ref: P2024/0029	blade tip. Each with foundations, external transformer housings, crane hardstanding and erection area; together with ancillary infrastructure and construction enabling works including substation, control building and compound; energy storage facility; two permanent wind monitoring locations; upgraded and new access tracks and highway junctions; underground cable runs; site signage; borrow pits; temporary construction and storage compounds and laydown areas. (Planning and Environment Decisions Wales consultation to Local Planning Authority on an application for a Development of National Significance)		
Crown Wharf Port Talbot Docks Ref: P2023/0858	Demolition of existing structures and erection of a Sustainable Aviation Fuel (SAF) production facility, including the production of green hydrogen and sustainable diesel, enclosed ground flare, storage tanks, installation of pipework and electrical, processing and utility equipment, administration, warehouse and laboratory buildings, new access, car parking and transport infrastructure including a truck loading area and associated works, hard and soft landscaping, areas for temporary construction laydown, and associated development.	Validated November 2023, awaiting decision	Approximately 2.75 km north of the Site

Screening Assessment

3.1.14 This section assesses the Proposed Development against the EIA screening criteria outlined above and presents the assessment of the environmental effects likely to occur as a result of the proposed development. **Table 3** sets out a review of all the above criteria and requirements and specifically addresses the proposed development at the site.

Table 3: Screening Assessment

Part 1 - Question	**Part 2 - Answer to the question and explanation of reasons** (Yes/No or Not Known (?) or N/A)		**Part 3 - Is a Significant Effect Likely?** (Yes/No or Not Known (?) or N/A)	
1. Natural Resources				
1.1 Will construction, operation or decommissioning of the project involve actions which will cause physical changes in the topography of the area?	**Y**	There would be changes to the Site during the construction phase to achieve platform levels for the substation extension, and to install the cables. The proposed works to achieve the substation levels include using a cut and fill method, the cables will be installed using open cut trenching and HDD. One ditch will be diverted and all other ditches crossed will be temporarily flumed. No material changes to topography along the cable route, as the excavated land will be infilled after the cables have been installed.	**N**	Although construction of the cable routing will involve excavation, the excavated land will be infilled (subject to testing for contamination) after the construction phase once the cables have been installed. So, the land will be returned to its original topography. The majority of excavated material from the Proposed Development would be reinstated in situ. Excavated material not suitable for reuse would be removed from Site. The reinstatement of the excavated trench will be carried out using approved backfill material placed directly around the cables with protection covers placed above the cables in the excavation and reinstated material will be carefully compacted. The topography during operation will be returned to near baseline conditions for the cable route following the infill of the excavated land. The drainage ditch will require diverting ahead of construction commencing. The proposed diversion route is shown within **Appendix 3**, however this route will be finalised once Topographical survey data is available. To divert the ditch the new route will be excavated to a depth determined during the detail design period, this is not expected to be deeper than current ditches within the area. Should the excavation encounter peat it will be managed as per the peat management plan, for example, to be re-buried. Once the newly diverted ditch is complete and tied into the ditch under diversion, these ditches (within the substation footprint) will be stopped up and infilled in line with the earthworks design. Best practise measures will be implemented to reduce the impacts of ground disturbance for both the substation

Part 1 - Question	Part 2 - Answer to the question and explanation of reasons (Yes/No or Not Known (?) or N/A)		Part 3 - Is a Significant Effect Likely? (Yes/No or Not Known (?) or N/A)	
				extension and the cable routes, as detailed within the CEMP. These will include erosion control, minimising disturbed areas, phasing of works, drainage and runoff controls, limiting the exposure of bare ground and ongoing monitoring. For temporary compounds and haul roads the Principal Contractor (Laing O'Rourke) will be utilising lightweight aggregates or trackway to mitigate long term compaction and impact to the ground. All areas utilising lightweight aggregate will include a separation layer between the aggregates and ground to enable a clean removal and reinstatement of the area. The Geotechnical Considerations Report (**Appendix 10**) considers potential impacts on ground from temporary compounds and access routes. The recommendation is the use of lightweight, aggerate and trackway to mitigate this. The maximum duration of the compounds and trackway will be in place is 18 months, these compounds and access routes are required for cable installation and testing, as well as the civils elements of works. As above, where topsoil is removed to enable construction activities it will be appropriately stored for planned re-use. In addition, post completion of works an assessment of ground compaction will be undertaken and any over-compacted topsoil will be aerated through methods determined in the Landscape Management Plan. **Figure 18** shows an example from another project of reinstatement following cable installation. With the employment of careful environmental management techniques secured through a CEMP, significant effects are not considered likely.
1.2 Will construction or operation of the project use natural resources above or below ground such as land, soil, water, materials / minerals or energy which are non-renewable or in short supply?	**N**	The construction of a substation extension and the requisite underground cables will use land with poor agricultural value set within a heavily industrialised landscape. The footprint of land required has been reduced through design by using GIS rather than AIS substation technology as described in Section 2.6 of this report. No significant effects are anticipated. Any potential effects during the construction phase would be mitigated using best practice measures set out within a CEMP and outlined in Section 2.6 of this Report. Operational activity will be limited.	**N/A**	

Part 1 - Question	Part 2 - Answer to the question and explanation of reasons (Yes/No or Not Known (?) or N/A)		Part 3 - Is a Significant Effect Likely? (Yes/No or Not Known (?) or N/A)	
1.3 Are there any areas on / around the location which contain important, high quality or scarce resources which could be affected by the project, e.g. forestry, agriculture, water / coastal, fisheries, minerals?	**Y**	The Site is located in a heavily industrialised landscape and the fields within the Site comprise Grade 4 Agricultural Land which is considered to be poor quality. The coast is approximately 1.2 km to the west of the Site, separated from the Proposed Development by Tata Steelworks. There are no forestry, fisheries, tourism, or minerals resources that could be affected by the proposals. However, there is peat present on the Site as described in Section 2.3 and summarised below: ▪ There are no exposures of peat along the cable route at surface level. ▪ East of the railway line, 2.3 m of peat is typically present at depths between 1.1 and 3.9 m BGL (within the Site) ▪ West of the railway line, peat deposits are thinner (in the order of 1 m) and present at depths > 4.5 m BGL (within Tata Steel land)	**N**	To ensure compliance with the National Peatland Action Programme and effective management, a Peat Management Plan (**Appendix 8**) will be implemented for the entire construction phase. This plan aims to identify and implement best practices to ensure that peatlands and peat deposits across the development are either undisturbed or managed appropriately The Peat Management Plan will serve as a framework for the construction process, aiming to minimise or mitigate the impacts on identified peat hotspots. The plan will include the following key components: ▪ Peat Surveys: Detailed mapping of peat depths and quality; ▪ Impact Mitigation: Strategies to reduce the impact of construction activities on peatlands; ▪ Excavation and Storage: Guidelines for peat extraction, storage, and potential reuse; and ▪ Restoration: Plans to restore disturbed areas and maintain ecological balance post-construction. This approach ensures that peat management is integrated throughout the construction phase to meet environmental and regulatory requirements. Where possible, peat will be left undisturbed and in situ to retain its long-term carbon storage capacity. Peat disturbance is anticipated to be minimal, and the use of HDD will minimise impact to peat. The HDD compounds themselves will sit at ground level and there will therefore be no impact on the peat as it is not present at ground level. Whilst there is some potential for trenching to intersect peat deposits east of the railway line, the Preliminary Hydrogeological Impact Assessment concludes that it is unlikely that a significant thickness of peat will be excavated. Where excavation is required into peat, protocols will be implemented to minimise any impact. This includes carefully storing any peat than requires excavation to ensure it does not dry out, limiting duration of storage, and reburying stored peat in suitable locations within the Site. With the implementation of the above Peat Management Plan, significant effects on peat are not considered likely.
2. Waste				

Part 1 - Question	Part 2 - Answer to the question and explanation of reasons (Yes/No or Not Known (?) or N/A)		Part 3 - Is a Significant Effect Likely? (Yes/No or Not Known (?) or N/A)	
2.1 Will the project produce solid wastes during construction or operation or decommissioning?	**Y**	As with nearly all construction, the Proposed Development will result in some waste from the preparation and undertaking of works. The overall design life of the cables is approximately 40 years. During that time the cables are not anticipated to be replaced. If the cables are to be decommissioned in the future, the constituent parts will be decommissioned in accordance with the relevant legislation in place at that time.	**N**	Waste would be managed and reduced in accordance with all applicable legislation and disposed of in line with best practice. Any waste generated during the construction phase of the development would be reused and recycled, where possible. A SWMP will be produced and form part of the CEMP. The excavated material from the construction phase of the Proposed Development will be reinstated *in situ*, unless it is not suitable based on geotechnical and / or geo-environmental assessment. The Ground Engineering Technical note (**Appendix 6.5**) concludes that the risk of contamination of the ground and groundwater is generally considered to be relatively low in undeveloped areas, although higher risk localised conditions may exist in previously developed areas, such as the railway, and the historical rifle range. Further ground investigation and assessment will be undertaken to confirm the anticipated ground conditions. Once operational the substation will be unmanned. The only access to the Site will be for routine inspection, maintenance and repair works to the substation and cables. Waste from the operational phase would therefore be minimal. Significant effects as a result of the production of solid waste are not considered likely.
3. Pollution and Nuisances				
3.1 Will the project release pollutants or any hazardous, toxic or noxious substances to air?	**Y**	During the construction phase of the Proposed Development, dust would be generated and there would be emissions associated with plant and vehicles. Construction phase vehicle emissions will be managed through the implementation of the CEMP. The soil movement could potentially lead to the disturbance and possible mobilisation of ground gases given the presence of Made Ground, peat and coal bearing strata. Risks associated with ground gas will be further quantified as part of further ground investigation and assessment. Disturbance of the ground will be minimised through the embedded design of the Proposed Development, for example through the use of HDD in the cable route. Additionally, as above, lightweight aggregates	**N**	Dust generation during construction would be managed in accordance with standard best practice measures, enforced through a CEMP. Measures would include locating dust-generating activities away from sensitive receptors, dust barriers such as hoarding, water management to control dust and appropriately sized equipment chosen based on the required tasks with preference to non-diesel equipment where feasible. The areas where soils are disturbed will be kept to a minimum and unnecessary soil removal will be avoided. As detailed in the CEMP, any materials that need to be stockpiled will be managed in accordance with best practise to reduce air or water pollution. During the construction phase, worker safety will take

Part 1 - Question	Part 2 - Answer to the question and explanation of reasons (Yes/No or Not Known (?) or N/A)		Part 3 - Is a Significant Effect Likely? (Yes/No or Not Known (?) or N/A)	
		or trackway will be used for temporary compounds and haul rods. to mitigate long term compaction and impact to the ground. There would be a minimal emissions associated with the traffic movements during the operational phase of the development as although the substation will have ancillary office space, this will not be occupied full-time and only used when maintenance and inspection is required. Therefore, no significant effects are anticipated for emissions associated with vehicular movements during construction or operation. A Transport Statement will be produced and submitted in support of the planning application.		account of the potential for ground gas. Appropriate monitoring and use of personal protective equipment (PPE) will be used to mitigate the risks to Site workers. Due to the design of the foundations and structures, ground gas should not be permitted to accumulate and pose a significant risk, however, if monitoring of the ground gas shows significantly elevated gas concentrations, then appropriate gas protection measures (e.g. impermeable membrane) would be incorporated into the foundation / structural design of the substation. Further ground investigation and assessment will confirm current Site conditions and potential impacts on human health and the environment which will be used to inform the implementation of suitable mitigation measures. Ground intrusive works on the cables during operation will only take place if a fault is detected and appropriate mitigation will be followed. The CEMP will include an Environmental Emergency Plan. A back-up diesel generator will be installed but not used regularly, it will only be used in circumstances of power outages to the substation. There is an existing back up diesel generator at the Site and based on historical data for the Margam substation supply, there have been approximately 15 hours of per year of down time when the back-up generator is assumed to have been used. The Proposed Development is not considered to release levels of pollutants that would result in likely significantly effects, following the implementation of standard mitigation measures. As above, best practice measures will be set out in the CEMP to be adhered to by the appointed contractor.
3.2 Will the project cause noise and vibration or release of light, heat, energy or electromagnetic radiation?	**Y**	The potential exists for noise effects to result from the substation extension construction and the cable installation however these will not be substantial or prolonged. There are limited sensitive receptors, as the Site is located in a heavily industrialised setting adjacent to the existing Tata Steel. The closest local dwellings are located approximately 450 m north of the Site. A PRoW runs adjacent to the southern Site boundary where the cable route is located, as such any effects on the PRoW will be temporary and limited to the construction phase. The operation of high voltage electrical transmission equipment can generate acoustic noise. Temporary lighting	**N**	During construction, any noise effects will be managed in accordance with best practice measures, implemented through the CEMP and are not anticipated to generate significant adverse effects. Best practise measures will include use of quieter and lower vibration equipment, installation of sound-absorbing barriers where appropriate, timing of works, Site layout, training and awareness and monitoring and reporting. These measures will be set out in the CEMP and secured by planning condition. The CEMP will also include a Construction Noise and Vibration Report. The nature and character of the noise will generally depend on the type of installation and how it is operated. An

Part 1 - Question	Part 2 - Answer to the question and explanation of reasons (Yes/No or Not Known (?) or N/A)		Part 3 - Is a Significant Effect Likely? (Yes/No or Not Known (?) or N/A)	
		is anticipated to be required during the construction phase to ensure safety of personnel working on-Site. During operation, security lighting will be installed around the substation, with no lighting effects anticipated on the cable route once installed. The construction works may emit vibration due to piling, HDD and excavation, however there are limited sensitive receptors and best practice methods will be set out in the Piling Method Statement and the CEMP.		Operational Noise Assessment will be undertaken for the substation extension with reference to BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' and any NPTC specific requirements. A computer noise model will be used to predict the noise propagation of the substation and the transformers including the contribution of the new plant at the nearest receptor during both daytime (07:00 to 23:00 hours) and night-time (23:00 to 07:00 hours) operations. Recommendations for acoustic mitigation measures will be provided, if required. Any construction phase lighting will be implemented in accordance with best practise techniques to avoid light glare and minimise other associated impacts, including on the retained areas of SINC and other nearby designated ecology sites (e.g. Margam Moors SSSI). These measures include appropriately designed luminaries, minimisation of light break-out, louvres and shields, visual screening, reducing light levels outside working hours, automated lighting controls, directional lighting and appropriate number of lighting units. These measures will be set out in the CEMP and secured by planning condition. Operational lighting will be designed to meet the requirements on NG TS 2.10.04 and subsequently in line with CIBSE Lighting Guide 1 'The Industrial Environment' and BS 5489-1:2003+A2:2008. The Maintained average illuminance will be 6.0 lux and this shall apply to all substation perimeter fencing, gates and access roads, verges and footpaths, designated walkways. The lighting is to allow safe movement of vehicles (using their headlights) and pedestrians in the sub- station site. The lighting will not operate overnight and shall be sensor controlled or switched only when operatives are on site. Localised task lighting may be deployed for maintenance and inspection and to meet the requirements of HSG 38 'Lighting at Work'. Consideration will also be taken to light colour in relation to the ILP Guidance Notes GN01/21 in relation to The Reduction of Obtrusive Light and GN 08/23 in relation to Bats and Artificial Light and Night. A Lighting Strategy / Assessment will be submitted in support of the substation application. No significant effects relating to electromagnetic radiation are

Part 1 - Question	Part 2 - Answer to the question and explanation of reasons (Yes/No or Not Known (?) or N/A)		Part 3 - Is a Significant Effect Likely? (Yes/No or Not Known (?) or N/A)	
				anticipated given that substations do not produce a significant external electric field, and the magnetic field levels at the boundary of a substation are typically at a level of 1 or 2 µT, but this decreases significantly to levels lower than at an average home within approximately 1-2 metres. As is the case for all National Grid assets and operations, assets are designed to comply with relevant exposure guidelines for Electromagnetic Fields (EMF). These are set out in UK policy to comply with guidelines set out by the International Commission on Non-Ionizing Radiation Protection which were incorporated into an EU Council Recommendation in 1999 (1999/519/EC). The Proposed Development will be designed to comply with such guidelines and as such, it is not considered likely there will be any significant effects from EMFs. Overall, significant effects as a result of pollution sources are not considered likely given the appropriate implementation of mitigation measures described above.
3.3 Will the project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater, coastal waters or the sea?	**Y**	During construction, there is potential for contamination associated with movement of materials, such as soils, for the substation extension construction and cable trench excavation. Hydrocarbons will be used as part of the construction phases of the Proposed Development. This would involve plant and vehicle fuel and lubricants. Their use will be controlled through the implementation of the CEMP and will not result in any significant adverse effects on land or water. Measures in the CEMP include tank strength and specification requirements, refuelling measures including daily maintenance of containers, tanks and delivery hoses and general measures to reduce environmental impact including spill prevention, safe housekeeping, regular inspections, safe handling of chemicals (see within points 5.1.3, 5.1.4 and 6.1 of the CEMP at **Appendix 7)**, As above, the CEMP will contain best practise measures to reduce air or water pollution associated with any required stockpiling. These measures include locating stockpiles away from watercourses, ditches and drains, at ground level, controlling runoff by situating on an impermeable surface in a bunded area at least 10 m away from any	**N**	During the construction phase, worker safety will take account of the potential for elevated soil gas concentrations to accumulate in enclosed spaces. Appropriate monitoring and use of Personal Protective Equipment (PPE) will be used to mitigate the risks to Site workers. Due to the design of the foundations and structures, ground gas should not be permitted to accumulate and pose a significant risk, however, if monitoring of the ground gas shows significantly elevated gas concentrations, then appropriate gas protection measures (e.g., impermeable membrane) would be incorporated into the foundation/structural design of the substation. An Environmental Emergency Plan will form part of the CEMP. The Ground Engineering Technical note (**Appendix 6.5**) concludes that the risk of contamination of the ground and groundwater is generally considered to be relatively low in undeveloped areas, although higher risk localised conditions may exist in previously developed areas, such as the railway, and the historical rifle range. Further ground investigation and assessment will be undertaken to confirm the anticipated ground conditions and land quality, which will in turn confirm the requirement for and

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		watercourse and disposing of stockpiles in accordance with legal requirements. Any contaminated runoff from stockpiles must be contained and disposed of in accordance with legal requirements. During dry weather additional measures will be taken including dust control by covering or dampening materials as needed and height control. Further details are contained within the CEMP at **Appendix 7**. Following the implementation of standard mitigation measures such as health and safety procedures for construction workers and ensuring that any chemicals or oils are stored in appropriately bunded containers and non-permeable membranes are used for pollution prevention, any potential significant effects will be mitigated. All relevant legislation (during construction, and if necessary, during operation) to prevent accidental spillages of contaminants and to avoid releases of pollutants will be followed. Surface water run-off and foul water drainage will be managed on-Site during the construction and operational phases. As described in Section 2.4, when undertaking the HDD, it is expected that ground water will infiltrate the HDD route, this water is kept in a closed loop system i.e. drilling fluid and dewatering of HDD is kept within a closed loop system. If the volume of water infiltrating the closed loop system is too great to manage there may be a requirement to dispose of the water and drilling fluid (bentonite) off Site. All water abstraction and discharging will follow the required license and permitting system.		nature of remedial measures. A remediation strategy and verification plan will be prepared, as required, and ongoing monitoring undertaken to confirm the successful implementation of the remedial measures. Significant effects are therefore not considered likely.
3.4 Are there any areas on or around the location which are already subject to pollution or environmental damage, e.g. where existing legal environmental standards are exceeded, which could be affected by the project?	**Y**	The Site is not located within an AQMA, however the Neath Port Talbot AQMA Taibach / Margam is adjacent to the northern Site boundary and approximately 700 m north of the proposed Margam Substation extension. This AQMA was declared for exceedance of PM_{10} associated with industrial emissions. During construction, air quality effects will be managed by a CEMP which will include standard, best practice measures including locating dust-generating activities away from sensitive receptors, dust barriers such as hoarding, water management to control dust and appropriately sized equipment chosen based on the required tasks with	**N**	Effects from the construction from noise and dust will be mitigated through the CEMP as described above. Significant effects as a result of pollution are considered unlikely. A Construction Logistics Plan (CLP) would be prepared to ensure that all traffic associated with the construction works operate in a safe and compliant manner at all times. The CLP would be signed by the appointed contractor and the highway authorities. This agreement would include for the repair of any damage caused to highway infrastructure by the construction traffic. The CLP would: ▪ Ensure effects on local residents, properties, businesses

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		preference to non-diesel equipment where feasible. Dust generation is not anticipated to generate significant adverse effects. The Site is not located within or in close proximity to a groundwater SPZ.		and schools caused by construction traffic, where practicable, are kept to an absolute minimum; ▪ Maximise safety in all aspects of the project associated with movements of traffic; ▪ Ensure all third-party traffic interfacing with the project are kept safe from the on-going works; ▪ Include clear, regular liaison with NPTC regarding traffic caused by operations; and ▪ Identify suitable signage and traffic controls to be used for all access points. During operation, the Proposed Development will not contribute to industrial emissions, operational vehicle movements and use of the back-up generator will also be limited and therefore significant effects are not anticipated.
4. Population and Human Health				
4.1 Will there be any risk of major accidents (including those caused by climate change, in accordance with scientific knowledge) during construction, operation or decommissioning?	**Y**	As with any construction phase of a project, there is some risk of accidents to construction workers from plant, machinery and construction materials. The Site is also at risk of flooding, with potential for climate change and extreme weather patterns to impact the Proposed Development during operation. The Applicant has notified the Health and Safety Executive (HSE) of the construction early works via the submission of a F10[16]. An updated F10 will be raised for the main works 6 weeks prior to the anticipated start date.	**N**	During the construction activities, the contractor(s) will implement measures in accordance with Health and Safety legislation / requirement, and best practice to minimise the risks of accidents that could have adverse effects on people or the environment. All such measures will form part of the CEMP to be secured at a later stage, the CEMP will include and Environmental Emergency Plan. Appropriate legislative procedures will be in place during design, construction and operation such as The Construction (Design and Management) Regulations 2015 ('the 2015 CDM Regulations'), The Health and Safety at Work Act 1974, and wayleave and easement agreements for identified utilities. The construction activities will be controlled by National Grid's Transmission's health and safety frameworks and policies, which are consistently deployed on their construction sites. Worker safety will take account of the potential for elevated soil gas concentrations to accumulate in enclosed spaces. Appropriate monitoring and use of PPE will be used to mitigate the risks to Site workers. Due to the design of the foundations and structures, ground gas should not be

[16] An F10 notification is a formal notice sent to the Health and Safety Executive (HSE), alerting them that a construction project is commencing which meets specific criteria under the Construction (Design and Management) Regulations 2015 (CDM 2015).

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				permitted to accumulate and pose a significant risk, however, if monitoring of the ground gas shows significantly elevated gas concentrations, then appropriate gas protection measures (e.g., impermeable membrane) would be incorporated into the foundation/structural design of the substation. The risk of contamination of the ground and groundwater is generally considered to be relatively low in undeveloped areas, although higher risk localised conditions may exist in previously developed areas, such as the railway, and the historical rifle range. Further ground investigation and assessment will be undertaken to confirm the anticipated ground conditions and land quality, which will in turn confirm the requirement for and nature of remedial measures. A Ground Investigation Specification has been prepared which sets out the ground investigation requirements. The length of excavations will be minimised at any one time and there will be an appropriate separation distance between the working areas and human receptors to avoid any effects on human health. As stated in the Hydrology and Flood Risk Technical Note (**Appendix 6.3**), Natural Resources Wales flood level data will be used to ensure the resilient design of the substation over its intended design life, whilst taking climate change into account. There is potential risk of flooding with a climate change event which will be mitigated by the proposed Flood Defence Wall around the substation. A Flood Consequence Assessment and WMP will be submitted in support of the application. The Flood Consequence Assessment concludes that the proposed flood defence wall is set above the design flood level and therefore there is no significant risk of structural damage to the proposed facility and its operation would not be affected. Once installed, the cable route will not be at risk of flooding and will have no impact on the flood risk elsewhere. Significant effects are not considered likely.
4.2 Will the project present a risk to the population (having regard to population density) and their human	**Y**	The construction phase of the Proposed Development will result in the emission of dust, noise and vibration, particularly during the piling works for the substation extension and cable trench excavations. The proposed	**N**	Dust generation will be managed in accordance with standard best practice measures, enforced through the CEMP, and is not anticipated to generate adverse effects to human health such that it presents a risk to the population.

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health during construction, operation or decommissioning? (for example due to water contamination or air pollution)		Margam Substation will be located on undeveloped land adjacent to the existing Margam Substation. During operation, when ground intrusive works may be required to take place if there is a fault, there is also the likelihood of dust, noise and vibration emissions. There are limited residential dwellings around the Site, with the closest residential properties approximately 450 m north-east of the substation extension Site, beyond the A4241 Harbour Way. A PRoW runs along the southern Site boundary.		Storage areas for both building materials and any temporarily excavated materials will be within the construction compound with soils stored within the working width and Site compounds. The storage area for plant machinery and materials will be within the construction compound, so as to be separated from human receptors. Any unsuitable or hazardous material which is excavated would be removed from Site to reduce any risk to human receptors. During the construction phase, the standard Site working hours detailed in Section 2.4 will minimise the effect of noise, dust and vibration on human receptors. During operation, the land uses proposed are not highly contaminative and it is not expected that there is a high risk of contaminants being released into the environment. As a result, a risk is not presented to the population. Therefore, significant effects are not considered likely.
5. Water Resources				
5.1 Are there any water resources including surface waters, e.g. rivers, lakes/ponds, coastal or underground waters on or around the location which could be affected by the project, particularly in terms of their volume and flood risk?	**Y**	The Environmental Baseline Conditions in Section 2.3 identify that the substation extension and cable route crosses areas of Flood Zone 2 and 3. Despite the proximity to the coast, the risk of tidal flooding is considered low due to existing tidal flood defences along the coastline to the west of the Tata Steel land. The cabling connecting the substation with the Tata Steel works will be placed underground and constructed through the use of open cut trenching and HDD. Soil stabilisation works will be required. One ditch will be diverted and all other ditches crossed will be temporarily flumed. To cross the numerous ditches along the cable route, temporary crossings will be installed, known as flumes. These localised flumes will maintain the flow of water within the ditches, whilst allowing the installation of cable trenches and crossing of construction traffic. The Site is not located within or adjacent to a SPZ.	**N**	A WMP will form part of the CEMP. The WMP will outline management of flood risk during the construction phase. The WMP will also address mitigation of both surface and groundwater, including drilling waters, and detail the necessary controls and consents required to meet regulatory discharge requirements. Potential impacts to and from the Site from flood risk and an introduction of new impermeable surfaces have been assessed in a Flood Consequence Assessment (FCA) to submitted in support of the planning application. The FCA concludes that the location of the Proposed Development can be justified in the manner required by TAN15 and that it meets all but one of the TAN15 acceptability criteria (no flooding elsewhere). However, the impact of displaced floodwaters will be minimal given that the only location where the increase in flood extent would be is the internal access roads in the adjacent BOC facility. It would not affect any developed areas. A flood defence and drainage strategy based on an attenuated discharge to the local drainage network has been developed to demonstrate the feasibility of the proposed SuDS solution. It is proposed to discharge surface water runoff at a controlled rate into the existing

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				tributary network. The proposed discharge rate from the development shall not exceed the greenfield runoff rate of 2.9 litres per second for up to and including the 1 in 100-year return period peak storm event with 40% climate change allowance. The attenuation required to limit flow rates to 2.9 litres per second is achieved by providing a detention basin located north of the Site. Surface water runoff from the site and access road shall be conveyed to the basin via a traditional gravity sewer pipe network with chambers. Due to level constraints the basin outflow shall then be pumped to the adjacent Upper Mother Ditch. SAB[17] approval of the drainage scheme will be sought in parallel to the planning application for the proposed extension of Margam Substation. A Flood Defence Wall is proposed around the substation extension. The Flood Consequence Assessment concludes that the proposed flood defence wall is set above the design flood level and therefore there is no significant risk of structural damage to the proposed facility and its operation would not be affected. Once installed, the cable route will not be at risk of flooding and will have no impact on the flood risk elsewhere. As above, the HDD will use a closed-loop water system and if required, any excess water will be removed from the Site in accordance with the required licence and permitting system. A Preliminary Hydrogeological Impact Assessment (**Appendix 9**) demonstrates that there are no significant hydrological or hydrogeological impacts associated with the planned trenching and ground stabilisation works, associated with the proposed cable route. The impact assessment accounts for mitigation that is embedded or will be incorporated into the proposed construction works. Once the construction activity is complete, the ditch crossings (flumes) will be removed and the ditch will be reinstated, as shown in **Figures 12 and 13**. All works will comply with ordinary water crossing licence requirements. Significant effects on water resources are therefore not considered likely.
6. Biodiversity (Species and Habitats)				

[17] SuDS Approving Body

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6.1 Are there any protected areas which are designated or classified for their terrestrial, avian and marine ecological value, or any non-designated / non-classified areas which are important or sensitive for reasons of their terrestrial, avian and marine ecological value, located on or around the location and which could be affected by the project? (e.g. wetlands, watercourses or other water-bodies, the coastal zone, mountains, forests or woodlands, undesignated nature reserves or parks. (Where designated indicate level of designation (international, national, regional or local))).	**Y**	There are no statutory ecological designations within the Site boundary. There are four European statutory designated sites within 10 km and two SSSIs lie within 2 km of the Site. Part of the Site is designated (non-statutory) by a SINC and the Site contains reedbed which is considered a Priority Habitat. The Site comprises a complex of wetland habitats which transitions into swamp and marshy grassland complex along the cable route with a network of wet and dry ditches and scrub. This habitat is considered to be former coastal floodplain grazing marsh, albeit it is understood to have been some time since the grassland has been managed through grazing, or the ditches managed, to the east of the railway line. Other habitats present include plantation woodland, scrub, ephemeral short perennial and bare ground. The NPTC pre-application response indicates that in the absence of information to the contrary, NPTC assumed the proposed substation Site to comprise irreplaceable habitat – specifically a bog and active peat-forming habitats. Whilst peat has been confirmed at a variety of depths through the ground investigation work, there is no *Sphagnum* moss present within the Site which is the typical species seen in bog habitats and the ground investigation works have determined that the peat layers are buried deposits, sitting at various depths, with the shallowest at around 20 – 80 cm and other peat layers much deeper than that and with variable thickness of peat deposits. The peat layers lie beneath sandy organic clays at the surface (Baker Hicks, 2025; Geotechnics, 2025). Given these findings and the evidenced change in the habitats through the comparison of the 2008 and 2024 Phase 1 Habitat Survey plans, the habitats within the site are not considered to fall into the “irreplaceable” category, as defined in the PPW as “*Habitats, including the natural resources which underpin them, which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. Examples include, ancient woodland and veteran trees, ancient hedgerows, wet woodlands, sand dunes, peatland, species*	**N**	The Ecological Technical Note concludes that no significant impacts on European designated sites are anticipated given that there are no possible source-receptor pathways between the proposed development and these any of the European sites within 10 km of the Site. Nonetheless, a Shadow Habitats Regulation Assessment will be submitted in support of the Margam substation extension planning application. It is anticipated that the document is likely to be limited to a screening since the potential for Likely Significant Effects on European sites is considered unlikely. The Proposed Development will minimise and avoid significant indirect impacts on nearby SSSIs and SINCs (e.g. through noise, lighting) through the inclusion of best practise mitigation measures for transport, air quality, lighting and noise. For example, any lighting will be implemented in accordance with best practise techniques to avoid light glare and minimise other associated impacts, particularly with reference to GN 08/23 in relation to Bats and Artificial Light and Night. Air Quality mitigation measures will be implemented including locating dust-generating activities away from sensitive receptors, dust barriers such as hoarding, water management to control dust and appropriately sized equipment chosen based on the required tasks with preference to non-diesel equipment where feasible. Noise and vibration mitigation will include use of quieter and lower vibration equipment, installation of sound-absorbing barriers where appropriate, timing of works, Site layout, training and awareness and monitoring and reporting, particularly with a view to avoiding noise impacts on birds using the Eglwys Reservoir SSSI. The Proposed Development aims to minimise the loss of the SINC and Priority Habitats, while seeking opportunities for mitigation, compensation and enhancement. Habitat management within the Site is proposed to include targeted, rotational management of the ditches, reedbed and willow scrub habitat, with a view to maintaining and enhancing the mosaic of habitats within retained areas towards those for which the SINC was designated. Furthermore, off-site locations are being investigated to enable delivery of compensation and enhancement, through habitat creation and ongoing management and monitoring, to secure the

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		rich grassland, long undisturbed soils, blanket bog, salt marsh and lowland fen." The habitats present have clearly changed over a relatively short timescale and whilst they undoubtedly remain Priority Habitat types of County value, they are habitats which can be recreated, given the right site conditions.		provision of net benefits for biodiversity. Further details can be found in the Ecology Technical Note at **Appendix 6.2**. Any buried peat will be managed, and potential effects will be mitigated through the Peat Management Plan which will include detailed mapping of peat depths and quality, strategies to reduce the impact of construction activities on peatlands, guidelines for peat extraction, storage and potential reuse and plans to restore disturbed areas and maintain ecological balance post-construction. This approach ensures that peat management is integrated throughout the construction phase to meet environmental and regulatory requirements. The CEMP will include a construction biodiversity management plan. Trees will be retained and protected during construction, where practicable and appropriate, as informed by an arboricultural impact assessment and ecological management targets for the retained areas of SINC. Trees to be retained as part of the Proposed Development will be protected during the construction phase through the use of temporary tree protection fencing to prevent access within the Root Protection Zone or canopy spread of trees. Where access is unavoidable, alternative protection arrangements such as ground protection (sufficient to protect the structure of the soil from compaction), and / or access facilitation pruning (to ensure a reasonable clearance for operations is provided) will be required. With the implementation of the proposed mitigation, no significant effects on designated sites or priority habitats are anticipated.
6.2 Could any protected, important or sensitive species of flora or fauna which use areas on or around the site, e.g. for breeding, nesting, foraging, resting, over-wintering, or migration, be affected by the project?	**Y**	As detailed in Section 2.3 of this report and in the Ecology Technical Note at **Appendix 6.2**, protected or notable species considered present within the National Grid and BOC land, based on desk study review, 2024 survey data, and feedback from NPT: ▪ Breeding bird assemblage including the Schedule 1 species Cetti's warbler; wintering birds present but do not include those species associated with the Eglwys Reservoir SSSI or other designated sites; ▪ Reptile population- low numbers identified in 2024	**N**	All wild birds, their nests, and eggs are protected under the Wildlife and Countryside Act 1981. Therefore, all Site clearance and tree felling activities will be scheduled to occur outside the bird nesting season, which runs from 1st March to 31st August (inclusive). In localized areas where this timing is not feasible due to other constraints, each specific area will be inspected by an ecologist. If nesting birds are confirmed or suspected, no vegetation removal will take place until such time as the birds have finished nesting, as confirmed by a suitably qualified ecologist.

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	surveys but an exceptional population is assumed in the absence of core season survey data on a precautionary basis at the request of NPT; ▪ Water voles - low population of water vole assumed to be present based on identification of field signs and historical records; ▪ Bats – low suitability for roosting bats within the existing sub-station buildings. The Site has potential to supporting foraging bats; NPT note the presence of lesser horseshoe bats within 2 km of the Site with the closest record being of a single male recorded using a building as a night-feeding perch within 500 m of the Site to the east; ▪ Invertebrates – notable species of invertebrate were previously identified within the Site (Jacobs, 2012) and given the Site remains a wetland complex, the value of the Site for invertebrates likely remains the same; ▪ Invasive and Non-Native Species (INNS) – Whilst no INNS were recorded from within the Site boundary, a stand of Japanese knotweed has been identified immediately adjacent to the Site boundary, to the south of Heolcae'r Bont. ▪ Fish – The ditches present within the Site have the potential to support fish and eel species with the most suitable ditches on Site being the Upper Mother Ditch. Other ditches within the Site tend to be shallower, not continuous and lack flow. ▪ Other Priority Species – the site provides habitat suitable for harvest mouse and hedgehog. Harvest mouse nests were identified within the Site by Ecological Clerk of Works during the Ground Investigation works. A similar range of protected or notable species were identified by RSK during surveys of the Tata Steel Land (cable route west of the railway line) undertaken 2022-2024, albeit no water vole were recorded within the Tata Steel land. Furthermore, additional bird species were recorded, but these were associated with the open Lake and the building habitats within the Tata Steel land and	All Site clearance and tree felling will be conducted in accordance with approved method statements and under the supervision of the Ecological Clerk of Works. Impacts on protected species will be mitigated following the hierarchy of mitigation as follows: ▪ Avoidance wherever possible, either through avoiding contact with the protected or notable species, or through timing of works (e.g. avoidance of habitat clearance during the bird breeding season); ▪ Where avoidance is not possible, mitigation measures will be put in place to minimise and manage impacts (e.g. through minimising impacts of lighting through timing of use of lighting and lighting type); and ▪ Where mitigation measures are not sufficient to ameliorate impacts and deliver net benefits, identification and deliver of compensatory and enhancement measures, which may also include off-site habitat creation and enhancement, will be required. Mitigation, compensation and enhancement measures for species will be described in the Ecological Impact Assessment. A summary of anticipated measures for species, based on reasonable worst-case scenarios for baseline given that some surveys are yet to be completed, is provided in the Ecology Technical Note at **Appendix 6.2**. As above, the CEMP will include a construction biodiversity management plan. It is anticipated that species measures will be secured by Condition and or through other planning mechanism e.g. Section 106 agreement, as appropriate. With the implementation of the proposed mitigation compensation and enhancement, secured through planning mechanisms, no significant effects on protected species are anticipated.

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		badger was also recorded on the Tata Steel land, but outside of the proposed cable route Site itself.		
7. Landscape and Visual				
7.1 Are there any areas or features on or around the location which are protected for their landscape and scenic value, and/or any non-designated / non-classified areas or features of high landscape or scenic value on or around the location which could be affected by the project? Where designated indicate level of designation (international, national, regional or local).	**Y**	The Landscape and Visual Technical Note (**Appendix 6.1**) draws on relevant layers from the LANDMAP[18] and identifies potential landscape effects to include loss of vegetation which may impact local landscape character. However, the Site is not located within or in close proximity to any landscape designations and the surrounding context of the Site is heavily industrialised. There are historic landscape features as described in the baseline conditions and section 8 of this screening matrix below. Potential landscape effects are therefore limited to loss of vegetation and impacts on agricultural land.	**N**	The Landscape and Visual Technical Note sets out that the Site at present has an undeveloped character but has a low sensitivity to change due to the influence and impingement of surrounding urbanising features. Although there are designated landscapes to the east of the site, including the regionally designated Margam Country Park and Margam Special Landscape Area, these would experience no direct or indirect effects during construction and operation given the scale of the Proposed Development in the wider industrial context. Mitigation requirements in relation to the Site and Proposed Development would be developed in discussion with NPTC and other relevant stakeholders as well as the internal iterative design process and cross-discipline work with ecology, hydrology and flood risk, and ground conditions teams. Mitigation will reduce any identified potential landscape and / or visual effects in addition to providing improved green infrastructure connectivity and ecological resilience where practicable. Although there is no requirement for BNG uplift in Wales through the use of a metric as is currently used in England, 'Net Benefit for Biodiversity' implies that all new development should promote the resilience of existing ecosystems at the design stage. Mitigation measures are proposed to result in a net benefit for biodiversity. A Landscape and Visual Appraisal (LVA) will be submitted in support of the Margam Substation Extension planning application. A Landscape Strategy Plan (or similar) which would accompany the LVA would outline the mitigation proposals and provide some rationale behind them. Although there would be unavoidable direct significant effects on landscape character and features within the Site footprint such as landform and existing vegetation during construction and the early stages of operation, these effects would reduce to non-significant over time as managed clearance of existing

[18] https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/evidence-to-inform-development-planning/landmap-the-welsh-landscape-baseline/?lang=en

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				overgrown vegetation, natural regeneration and proposed planting largely replenishes the character lost to the Proposed Development and improves green and blue infrastructure within the Site.
7.2 Is the project in a location where it is likely to be highly visible to many people? (If so, from where, what direction, and what distance?)	**Y**	As stated within the Landscape and Visual Technical Note (**Appendix 6.1**), views of the Site are predominantly experienced from distant viewpoints on higher land to the east. There are publicly accessible locations close to the Site including recreational areas to the south-east and north, the railway line, the A48 road and the M4 motorway. However, views of the Site are typically restricted by existing vegetation, large buildings and structures forming obstructions in the flat landscape. Views from private properties are mainly from the urban edge of Margam to the north and properties scattered throughout rising land to the east. Potentially affected receptors would be nearby residents, users of recreational areas, public footpaths, users of public roads, and the railway. These would include residential receptors at Abbot's Close north of the Site, users of the railway, road users of the M4, A48, B4283 and recreational users of the local network of PRoW, and local sports facilities. Industrial development provides enclosure to the west, east and southeast of the Site and obscures ground-level views in these directions. Industrial structures are very prominent elements in the locality of the Site and on the skyline from the surrounding area. They are visible and prominent in views over long distances. Potential visual effects primarily comprise short-term construction phase impacts on users of local PRoW.	**N**	Any impacts on users of the PRoW / long-distance trail would be temporary given that the cable route will be below ground and covered once construction works are complete. These effects are considered to be short-term and reversible. It should be noted that all effects as a result of demolition / construction would be short-term, reversible, and generally localised. The nature of the proposals, and the industrial context of its surroundings, provide assurance that following these short-term, phased effects, the views associated with these receptors will return to near baseline conditions. The proposed substation is within a landscape of industrial character and will be seen in views backgrounded by the large-scale industrial buildings of the Tata Steelworks. The proposed GIS Hall, which will the most prominent visual element within the Proposed Development at 13 m height, will be similar in style but smaller in scale and height than the surrounding industrial buildings. Mitigation is provided through inherent design and the retention of existing trees and shrubs which ensure that effects are reduced to an acceptable level. The cable trenching would result in temporary effects during construction but will not be visible once complete. No significant impacts are predicted for visual receptors beyond the construction stage, with the majority of receptors experiencing either a negligible or neutral level of effect, and in some cases no change is predicted. Significant visual effects are therefore not anticipated at Year 15 of the Proposed Development.
8. Cultural Heritage/Archaeology				
8.1 Are there any areas or features which are protected for their cultural heritage or archaeological value, or any non-designated / classified areas and/or features of cultural heritage or	**Y**	As described in Section 2.3, there are no designated historic assets within the Site boundary. There are historic landscape features present in the area surrounding the Site. The Margam Mountain Registered Historic Landscape is located approximately 950 m east of the Site, containing Margam Castle, a registered park and	**N**	As stated within the Archaeology and Heritage Technical Note (**Appendix 6.4**), there is no indication that nationally important remains are likely to be present. Although there are several high importance heritage assets in the surrounding area given the existing modern and industrial activities in close proximity to the Site, incremental change is likely to be of no more than less than significant harm (if any) as a result

Part 1 - Question	Part 2 - Answer to the question and explanation of reasons (Yes/No or Not Known (?) or N/A)		Part 3 - Is a Significant Effect Likely? (Yes/No or Not Known (?) or N/A)	
archaeological importance on or around the location which could be affected by the project (including potential impacts on setting, and views to, from and within)? Where designated indicate level of designation (international, national, regional or local).		garden and scheduled monuments. All of these features are separated from the Site by the M4.		of any groundworks and then “operation” of the completed cable route and substation (which has also been assessed as being disturbed ground). The cable route passes close to the recorded site of the small arms range – Lower Mother – at its southern extent. However, this is recorded by the Pillbox Study group as having been removed. Any remains are unlikely to survive to a high degree due to modern development and changes in land use. The Archaeology and Heritage Technical Note concludes that the cable route would not result in a strong likelihood of unacceptable impacts to archaeological and heritage assets. Should archaeological features be identified which require intrusive evaluation it is anticipated that, suitable mitigation measures will be agreed with NPTC and be implemented prior to the development commencing. In light of the above, the development is not anticipated to result in likely significant effects on archaeology that cannot be mitigated. The content of a formal planning application submission would be subject to formal agreement with Heneb (GGAT region). It is anticipated that the content of the planning application would be: ▪ Historic Environment Desk-Based Assessment (HEDBA): a formally structured assessment to Chartered Institute for Archaeologist (CIfA) standards and guidelines to present and assess historic environment evidence (Heneb may also request a HEDBA for the Permitted Development element of the Site if needed (i.e. the cable route). ▪ Pre-determination archaeological fieldwork: the form (and need) of this stage would be subject to the conclusions of the HEDBA and discussion with Heneb (GGAT) and could include archaeological monitoring of intrusive activities or trial trench evaluation. ▪ Post-determination archaeological mitigation: the form (and need) of this stage would be subject to the conclusions of the HEDBA and discussion with Heneb (GGAT), and could include archaeological monitoring of construction related activities or specific areas of archaeological fieldwork prior to construction.

Part 1 - Question	Part 2 - Answer to the question and explanation of reasons (Yes/No or Not Known (?) or N/A)		Part 3 - Is a Significant Effect Likely? (Yes/No or Not Known (?) or N/A)	
9. Transport and Access				
9.1 Are there any routes on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?	**Y**	The main Site access will be obtained from Cerfn Gwrgan Road, via the M4 and A48. PRoW along Heol Cae'r Bont including the Wales Coastal Path is located immediately south of the Site. The Tata Sports & Social Club and grounds is located adjacent to the Site in the north-east.	**N**	As set out above, during the construction phase, a CLP will be implemented that will ensure that standard, best practice measures are adopted to prevent any significant effects such as, loading and unloading of materials will occur within the Site and appropriate hoarding / fencing will be placed around the Site's boundaries. Once operational the substation will be unmanned; journeys by car to and from the Site are not anticipated to be greater than at present. The only access to the Site will be for infrequent maintenance and repair works. A Transport Statement will be prepared and submitted with the application.
9.2 Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?	**Y**	As above, the Site is accessed by the Cerfn Gwrgan Road, via the M4 and A48. The construction phase of the Proposed Development would involve changes to traffic movements and the introduction of construction haulage vehicles. Additional access during the construction phase will be required from Heolcae'r-Bont to the south-east for the construction of the cable route. Once operational the substation will be unmanned; journeys by car to and from the Site are not anticipated to be greater than at present. The only access to the Site will be for infrequent maintenance and repair works.	**N**	Mitigation during the construction phase will be managed by a CEMP and the CLP. Effects during construction are short term and reversible and are therefore not considered to be significant. During operation, the Site will return to near baseline conditions. Therefore, significant effects are not anticipated.
10. Land Use				
10.1 Are there existing land uses or community facilities on or around the location which could be affected by the project? E.g. housing, densely populated areas, industry / commerce, farm/agricultural holdings, forestry, tourism, mining, quarrying, facilities relating to health, education, places of worship, leisure /sports / recreation.	**Y**	There are various land uses surrounding the Site that may be impacted by the Proposed Development. Land uses include: ▪ Industrial uses associated with the Tata Steelworks and BOC plant; ▪ PRoW to the south of the Site; ▪ Residential areas to the north-east; ▪ The Wales Coastal Path immediately to the south; and ▪ Tata Sports & Social Club and grounds.	**N**	The construction phase of the Proposed Development may result in traffic and noise however these effects will be managed by best practice measures and will not be significant. As above, a CEMP and CLP will be implemented and include best practise mitigation measures for transport, air quality, lighting and noise. For example, any lighting will be implemented in accordance with best practise techniques to avoid light glare and minimise other associated impacts. Air Quality mitigation measures will be implemented including locating dust-generating activities away from sensitive receptors, dust barriers such as hoarding, water management to control dust and appropriately sized equipment chosen based on the required tasks with

Part 1 - Question	Part 2 - Answer to the question and explanation of reasons (Yes/No or Not Known (?) or N/A)		Part 3 - Is a Significant Effect Likely? (Yes/No or Not Known (?) or N/A)	
		No effects on agriculture holdings, forestry, tourism, mining, quarrying, facilities relating to health, education or places of worship are anticipated.		preference to non-diesel equipment where feasible. Noise and vibration mitigation will include use of quieter and lower vibration equipment, installation of sound-absorbing barriers where appropriate, timing of works, Site layout, training and awareness and monitoring and reporting. As above, impacts on users of the Wales Coastal Path PRoW would be temporary given that the cable route will be below ground and covered once construction works are complete. These effects are considered to be short-term and reversible.
10.2 Are there any plans for future land uses on or around the location which could be affected by the project?	**N**	There are no known plans for future land which could be affected by the project.	**N/A**	
11. Land Stability and Climate				
11.1 Is the location susceptible to earthquakes, subsidence, landslides, erosion, or extreme /adverse climatic conditions, e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	**Y**	The Site is not in a location susceptible to earthquakes, landslides, erosion or extreme / adverse climatic conditions. The Site is located within an area of historical coal mining and the presence of shallow coal workings could result in localised ground movement.	**N**	The Site is not in a location susceptible to earthquakes, subsidence, landslides, erosion or extreme climatic conditions. A Coal Mining Risk Assessment has concluded the risk to be low. However, the presence of unrecorded shallow workings, which may result in localised ground movement, will be considered as part of further ground investigation and the design of the Proposed Development. Suitable mitigation measures relating to land stability will be implemented if required. Therefore, no significant effects are anticipated in relation to land stability and climate.
12. Cumulative Effects				
12.1 Could this project together with existing and/or approved development result in cumulation of impacts during the construction/operation phase?	**Y**	Six schemes with potential for cumulative effects have been identified. The potential exists for cumulative effects in terms of road traffic and noise emissions.	**N**	The schemes are all well located in terms of highways connections and access to the M4 via junction 38. Any schemes in proximity will implement a CEMP during the construction phase, which should mitigate any potentially significant effects that could arise. Following the implementation of the CEMP and embedded and additional mitigation measures implemented during the construction and operational phases for topics such as ecology and landscape, and low associated traffic volumes as described above, no significant cumulative effects are considered likely.

Part 1 - Question	**Part 2 - Answer to the question and explanation of reasons** (Yes/No or Not Known (?) or N/A)		**Part 3 - Is a Significant Effect Likely?** (Yes/No or Not Known (?) or N/A)	
				Moreover, the cumulative schemes are either located within existing development (LPA Ref: P2024/0711, P2024/0296, P2024/0693 and the Port Talbot Substation), or separated by intervening development (LPA Ref: P2021/1255) or distance (LPA Ref: P2024/0029 is approximately 1.25km away from the Site). LPA Ref: P2023/0858 is separated both by intervening development and distance, as it is approximately 2.75km from the Site. Given the natural and scale of the Proposed Development, no significant cumulative effects are anticipated.
Transboundary Effects				
13.1 Is the project likely to lead to transboundary effects?	**N**	No.	**N/A**	

4 Conclusions

4.1.1 The screening assessment has considered whether the proposed extension of Margam Substation and the cables between Margam and Port Talbot Substations are likely to give rise to significant effects on the environment by virtue of factors such as its nature, size or location. The Proposed Development does not fall within a clearly defined category in the EIA Regulations however given the 'broad purpose and scope' of the Regulations the proposals could be considered to comprise a Schedule 2 paragraph 10(b) Urban Development project. The Site is not in a 'sensitive area' as defined by the EIA Regulations, therefore the relevant threshold for an Urban Development Project would be *"… more than 1 hectare of urban development which is not dwellinghouse development"*.

4.1.2 This screening report has set out a clear description of the Site and surrounding area as well as describing the Proposed Development. The principal environmental effects from the Proposed Development will relate to potential land contamination, the presence of peat and ecological habitats. The risk of contamination of the ground and groundwater is generally considered to be low, although relatively higher risk localised conditions may exist in areas including railway and historical rifle range. Excavated material that is not suitable for reuse will be disposed of at a suitable off-Site facility. Further ground investigation and assessment will inform the requirement and nature of remedial and / or mitigation measures, which would be implemented and monitored to ensure environmental effects are not significant.

4.1.3 Within the NPTC pre-application response NPTC stated that the Site comprised irreplaceable habitat – specifically a bog and active peat-forming habitats. However, data from site investigation carried out across the Site (RSK Geosciences, Jan 2022) (RSK Geosciences, Oct 2022) (BakerHicks, Jan 2025) demonstrates that the peat is present at depth, with no 'active' peat formations present. This is consistent with the review of The Peatlands of Wales Map which does not identify any peatlands within the Site. Any buried peat will be managed, and potential effects will be mitigated through the Peat Management Plan.

4.1.4 An Ecology Technical Note is appended to this EIA Screening Report (**Appendix 6.2**) this summarises the habitat and species surveys that have been undertaken for the Site and suitable mitigation is proposed in the form of minimising the loss of the SINC and Priority Habitats, while seeking opportunities for mitigation, compensation and enhancement in order for the Proposed Development to deliver an overall net biodiversity benefit for habitats and species. Specific species mitigation, compensation and enhancement will be included where relevant in the Ecological Impact Assessment.

4.1.5 Significant cumulative effects are not considered likely due to the industrial and developed context, intervening development and distance as well as suitable and strategic access to the M4. Any effects would be managed in accordance with standard methods, with each cumulative scheme anticipated to implement its own CEMP and scheme of mitigation.

4.1.6 As concluded in the Screening Report previously prepared (P2008/1478) for the proposed substation upgrade, which was considered by NPTC to not comprise EIA development, the substation extension and cable route considered within this EIA Screening Report is also not considered likely to give rise to significant environmental effects.

4.1.7 In conclusion therefore, this screening assessment has identified that significant effects on the environment are not considered likely either alone or in combination with other development. The Proposed Development would be of a sufficiently limited scale that effects could be managed in accordance with standard methods and best practice measures. Neither the substation extension nor the cable route are considered to be EIA development as defined by the EIA Regulations.

APPENDIX 1 SITE LOCATION PLAN



N

30 0 30 60 90 120 150
SCALE 1:3000 m

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ALL PROPRIETARY PRODUCTS TO BE AS SPECIFIED OR EQUAL APPROVED.

SITE BOUNDARY

SITE BOUNDARY
SITE AREA:
(219692.943 m2)
(21.97 Hectares)
(54.29 Acres)

"The cable route within the TSUK planning application P2024/0711 is shown purely for indicative purposes only and does not form part of this EIA Screening Request. It is included for the EIA Screening to demonstrate cumulative purposes only"

(54376.290 m2)
(5.44 Hectares)
(13.44 Acres)

Rev.	Description	Cre'd	Chk'd / Appr'd	Date
P03	Drawing and RLB updated to reflect EIA screening Feedback. Feedback received on 23/04/2025.	GP	OTr / JK	25/04/25
P02	Drawing updated to reflect EIA screening Feedback	GP	OTr/RW	20/03/25
P01	First Issue	OTr	RW / RC	05/12/24

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Master Scheme No:	Sub-Scheme No:	Site:
		MARGAM & PORT TALBOT

Scheme Name: Margam Substation

Document Title: Site Plan_EIA Screening Outline

Created by:	Date:	Checked by:	Date:	Approved by:	Date:
OT	05/12/24	RW	05/12/24	RC	05/12/24

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	DWG	As indicated	A0	1 OF 1	P03

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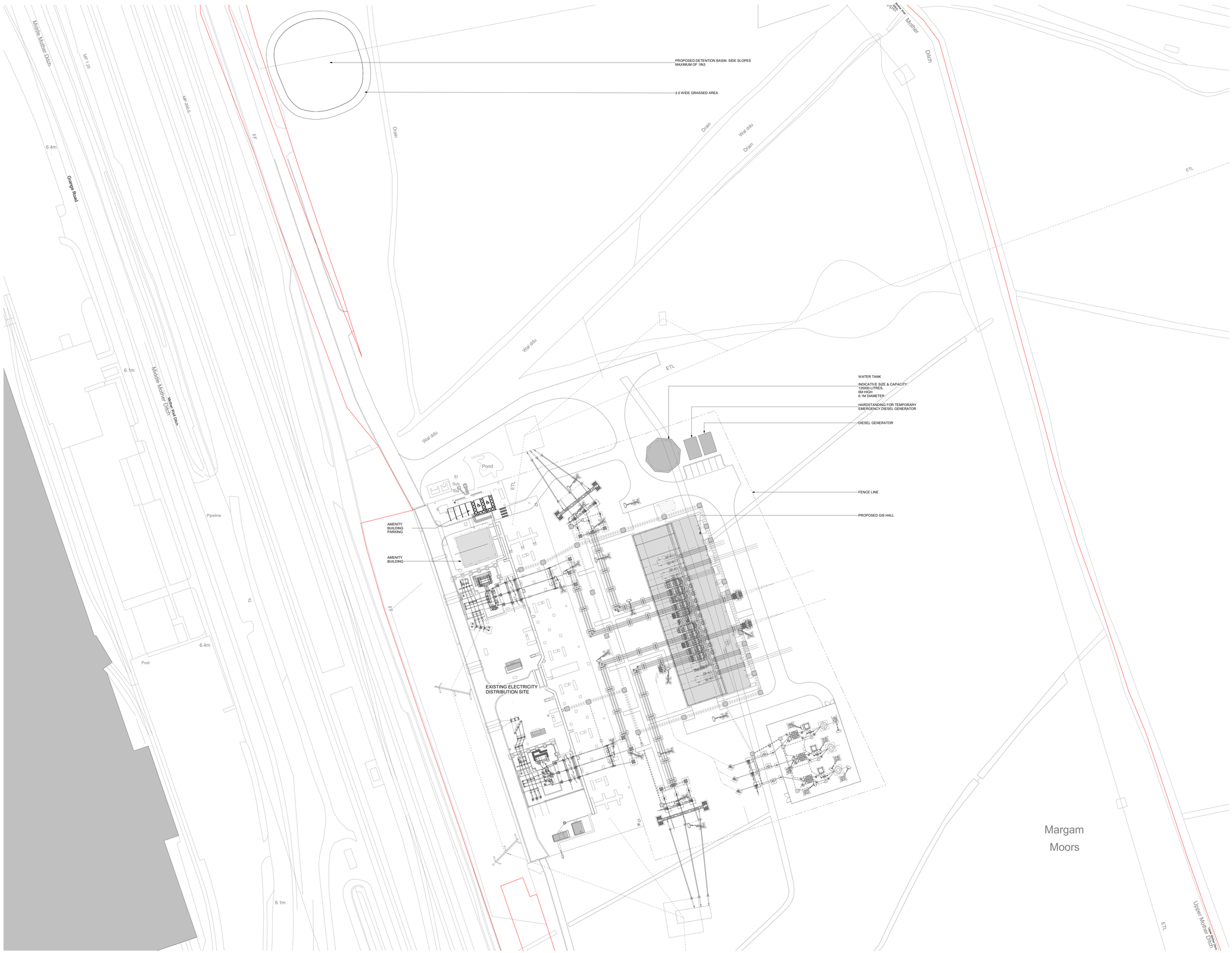
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APPENDIX 2 PROPOSED SITE PLAN (MARGAM SUBSTATION)



1 Margam Site Plan - Proposed
Scale: 1 : 500

5 0 5 10 15 20 25
SCALE 1:500 m

FOR PLANNING

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KEYPLAN

NOTE:

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P02	Issued For Planning	DSB	OT / RW	10/02/25
P01	First Issue	DSB	RW / JK	03/02/25
Rev	Description	Cre'd	Chk'd / App'd	Date

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Master Scheme No:	Sub-Scheme No:	Site:
		MARGAM

Scheme Name: Margam Substation

Document Title: Margam GIS Hall - Proposed Site Plan

Created by:	Date:	Checked by:	Date:	Approved by:	Date:
DSB	30/01/25	RW	30/01/25	JK	30/01/25
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	DWG	As indicated	A0		P02

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APPENDIX 3 DRAINAGE LAYOUT PLAN

N

HARBOUR WAY (FFORDD YR HARBWR)
A4241

EXISTING BALANCING POND

UPPER MOTHER DITCH

Margam Moors

TABLE - DETENTION BASIN WITH 1in3 SIDE SLOPES		
BASIN FOOTPRINT (m²)	DEPTH (m)	ATTENUATION VOLUME PROVIDED (m³)
983	2.75	1360

*BASIN DEPTH IS CONSIDERATE OF 300mm FREEBOARD AND NOT INCLUDED WITHIN ATTENUATION PROVIDED

END OF DIVERTED DITCH (TIES BACK INTO EXISTING DITCH)

WATERCOURSE DIVERSION INDICATIVE. FINAL LOCATION TO BE CONSIDERATE OF FUTURE WORKS TO AVOID ITS PROPOSED EXTENTS.

PROPOSED FLOOD GATE AT NEW ACCESS TO NEW SUB STATION

PROPOSED ACCESS ROAD

PROPOSED SITE FINISHED LEVEL 4.15m

ECOLOGICAL EXCLUSION ZONE

EXISTING PYLON

PROPOSED SURFACE WATER GRAVITY SEWER SYSTEM CONVEYING RUNOFF FROM OFFSITE ACCESS ROAD TO ONSITE DRAINAGE SYSTEM. EXACT LOCATIONS AND TYPE OF CHAMBERS AND PIPE TO BE DETERMINED PRIOR TO DETAILED DESIGN BEING CARRIED OUT.

EXISTING SUB STATION

EXISTING PYLON

START OF EXISTING DITCH DIVERSION

PROPOSED PUMP CHAMBER. FLOW TO BE LIMITED TO 2.9 l/sec FOR UP TO 1 IN 100-YEAR RETURN PERIOD WITH 40% CLIMATE CHANGE APPLIED, IN ACCORDANCE WITH WELSH GOVERNMENT CLIMATE CHANGE GUIDANCE.

PROPOSED OUTFALL TO EXISTING DITCH. ALTHON PCC HEADWALL OR SIMILAR APPROVED.

3.0m WIDE GRASSED MAINTENANCE AREA.

PROPOSED DETENTION BASIN. SIDE SLOPES MAXIMUM OF 1in3.

PROPOSED OUTLET HEADWALL FROM DETENTION BASIN

NATIVE PLANTING / WILDFLOWERS TO BE INCORPORATED INTO EARTHWORKS AND / OR GRASSED AREAS TO SUPPORT AMENITY AND BIODIVERSITY.

PROPOSED INLET HEADWALL TO DETENTION BASIN. SEDIMENT FOREBAY PROVIDED AT INLET LOCATION.

EXISTING ACCESS TO EXISTING SUB STATION

PROPOSED FLOOD GATE AT EXISTING ACCESS TO EXISTING SUB STATION

PROPOSED FLOOD GATE AT EXISTING ACCESS TO EXISTING SUB STATION

Upper Mother Ditch

Middle Mother Ditch

MIDDLE MOTHER DITCH

GRANGE ROAD

MP 1.25

MP 200.5

MP 200.25

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4. ALL DRAINAGE DESIGN IN ACCORDANCE WITH:
   - 4.1. NATIONAL GRID TECHNICAL SPECIFICATION (NGTS) 2.10.09 SITE DRAINAGE (ISSUE 1).
   - 4.2. TO BE READ IN CONJUNCTION WITH DRAINAGE STRATEGY STATEMENT (30004240-BHK-XX-XX-RP-X-001)

KEY:

- PROPOSED SURFACE WATER PIPE AND CHAMBER
- PROPOSED PUMP CHAMBER
- PROPOSED PENSTOCK CHAMBER
- PROPOSED HEADWALL INLET / OUTLET
- PROPOSED DETENTION BASIN
- PROPOSED 3m WIDE MAINTENANCE AREA ADJACENT DETENTION BASIN
- EARTHWORKS (FILL). INDICATIVE ONLY - EXTENT TO BE CONFIRMED FOLLOWING UNDERTAKING OF TOPOGRAPHICAL SURVEY.
- PROPOSED BUILDING
- PROPOSED GRASSED AREA
- PROPOSED GRAVEL SURFACING
- PROPOSED ACCESS ROAD AND INTERNAL ACCESS ROUTES
- PROPOSED FILTER DRAIN. INDICATIVE ONLY - LOCATION AND EXTENTS OF FILTER DRAINS TO BE VERIFIED FOLLOWING COMPLETION OF TOPOGRAPHICAL SURVEY.
- EXISTING DITCH
- EXISTING DITCH TO BE REMOVED
- DIVERTED EXISTING DITCH
- ECOLOGICAL EXCLUSION ZONE
- PROPOSED INDICATIVE FLOOD DEFENCE WALL. HEIGHT TO BE DETERMINED. WALL TO EXCOMPASS EXISTING AND PROPOSED SUB STATIONS.

FOR PLANNING

Health & Safety
CDM regulations 2015

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Refer to the CDM Regulation 9 Risk Register for full details.

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3. WORKS ADJACENT TO EXISTING LIVE COMPOUND.
4. WORKS WITHIN HIGH FLOOD RISK AREA.

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Rev	Description	Cre'd	Chk'd	App'd	Date
P03	DRAFT ISSUE FOR PLANNING	PB	CE	JS	25/11/2024
P02	DRAFT ISSUE FOR PLANNING	PB	CE	JS	31/10/2024
P01	DRAFT ISSUE FOR PLANNING	PB	CE	JS	29/10/2024

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Master Scheme No:	Sub-Scheme No:	Site:
101677		MARGAM 275kV

Scheme Name:
MARGAM SITE STRATEGY AND TATA STEEL CONNECTION

Document Title:
MARGAM CONCEPTUAL DRAINAGE LAYOUT SHEET 01

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APPENDIX 4 EXTERNAL SITE LAYDOWNS



N

30 0 30 60 90 120 150
SCALE 1:3000 m

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ALL PROPRIETARY PRODUCTS TO BE AS SPECIFIED OR EQUAL APPROVED.

Site Laydown Key

Site Welfare Compound:
To Include:
- Site Office
- Meeting Room
- Double Stack Cabin
- Canteen
- Changing Area
- WC's
- Drying Room
- Staff Parking

Delivery And Construction Activities To Be Managed From Here

Temporary Construction Swathe - Compound required for Pulling cable.

Proposed Substation Area Working Space: 4m Working Space to fence/flood wall boundary in green.

HDD below ground cable route with temporary access required along route'

Retained as existing/possible opportunity for mitigation/compensation

NOTE:

DRAWING TO BE PRINTED IN COLOUR

SITE BOUNDARY

EIA SCREENING BOUNDARY
SITE AREA:
(219692.943 m2)
(21.97 Hectares)
(54.29 Acres)

"The cable route within the TSUK planning application P/2024/0711 is shown purely for indicative purposes only and does not form part of this EIA Screening Request. It is included for the EIA Screening to demonstrate cumulative purposes only)

(54376.290 m2)
(5.44 Hectares)
(13.44 Acres)

P04	Drawing and RLB updated to reflect EIA screening Feedback. Feedback received on 23/04/2025	GP	OTr / JK	25/04/25
P03	Drawing updated to reflect EIA screening Feedback	GP	OTr/RW	20/03/25
P02	Updated Red Line Boundary to reflect National Grid Feedback	OTr	RW / RC	21/11/24
P01	First Issue	OTr	OTh / RC	19/11/24
Rev.	Description	Cre'd	Chk'd / Appr'd	Date

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Master Scheme No:	Sub-Scheme No:	Site:
		MARGAM & PORT TALBOT

Scheme Name: Margam Substation

Document Title: Site Plan External Laydowns

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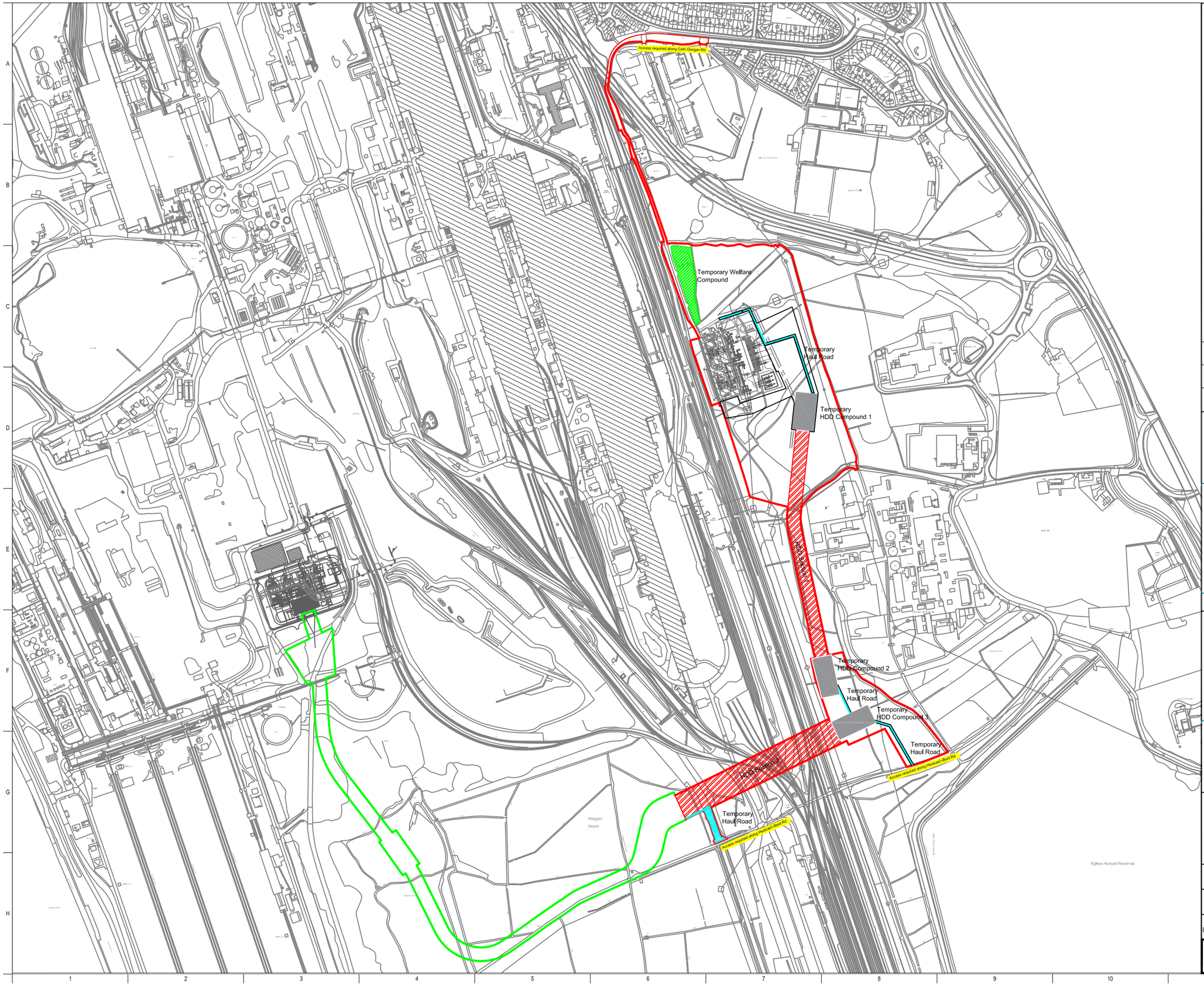
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APPENDIX 5 TEMPORARY COMPOUNDS AND ACCESS ROUTES



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5. TEMPORARY FOOT ACCESS REQUIRED ALONG HDD SECTIONS OF ROUTE
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P03	Updated to exclude TSUK Land Issued By: Jordan Riseley Checked/Verified By: Rob Jones	24/04/2025
P02	Updated RLB Issued By: Jordan Riseley Checked/Verified By: Rob Jones	26/03/2025
P01	First Issue Issued By: Jordan Riseley Checked/Verified By: Rob Jones	12/03/2025

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Project

Margam & Port Talbot Substations

Drawing

Margam & Port Tabot Cable Route
-
Temporary Compounds and Access Routes

Purpose of Issue: *S5 - For Review & Acceptance by the Client*	NG Ref Number: *TBC*
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APPENDIX 6 SUPPORTING TECHNICAL NOTES

Technical Note 6.1

To:	National Grid	From:	Landscape & Visual Click or tap here to enter text.
Project/File:	Margam Port Talbot	Date:	27/03/2025

1. INTRODUCTION

1.1 This Technical Note has been prepared by Stantec UK Limited (Stantec) and provides input to the proposed extension to the Margam substation and underground cable route (the 'Proposed Development') at Margam, Port Talbot, South Wales (the 'Site') from a landscape and visual perspective.

1.2 The following paragraphs provide an overview of current baseline conditions within the area; including landscape character and features, typical visibility, and the receptors who may experience change as a result of the options.

Baseline and Site Context

1.3 Overarching landscape character in Wales is typically identified through the use of LANDMAP (Natural Resources Wales), which makes use of discrete layered datasets; Geological Landscape, Landscape Habitats, Visual and Sensory, Historic Landscape, and Cultural Landscape Services. For Neath and Port Talbot, a Landscape Assessment was undertaken in December 2004 by White Consultants which provided outline Landscape Character Areas (LCAs) which were further informed by the associated LANDMAP layers.

1.4 The overriding landscape character of the area immediately surrounding the Site is industrial. There are some minor visible remnants of a rural past through field pattern and a network of drainage ditches. The landscape to the north and west is strongly influenced by mixed land uses and particularly industrial development. The coast is to the west beyond Tata steel works, although these areas are also heavily influenced by large scale industry and often the shore is not visible due to intervening built development. The area to the east is influenced by the M4 and the A48, and further east by sharply rising wooded hills.

1.5 There are historic landscape features present in the area surrounding the Site. These include Margam Castle, Margam Country Park, the ruins of Capel Caer, a hill fort north of Margam Castle, gorsedd stones and the remains of St Mary's Abbey. Some of these such as standing stones are subtle features in the local landscape. Although these landscape features are within the locality, none are present within, or directly influence the Site.

1.6 The Site is flat and low lying, typical of a coastal location. It is currently undeveloped grazing land which is surrounded by large-scale industrial development. This industrial development provides enclosure to the west and south of the Site and obscures views in these directions. Industrial structures are very prominent elements in the locality of the Site and on the skyline from the surrounding area. They are visible and prominent in views over long distances.

1.7 The Site has a partly enclosed character due to the scrub on its boundaries and woodland on land to the east and southeast. The industrial development to the west and rising hills to the east emphasis this sense of enclosure. The majority of the wider application site consists of rough grassland, marshy land and areas of scrub. The Site is sub-divided by a ditch with sporadic scrub along its length. Other ditches run along the site boundaries to the north and south.

1.8 A block of woodland adjoins the eastern edge of the Site. There are areas of scrub and trees on- site, and trees are present alongside the ditch on the northern boundary.

1.9 This is a diverse and complex landscape due to the range of different landform, landcover and uses. The areas to the west are within a functional, industrial and urbanised setting while the landscape changes markedly to the east where landform rises to upland forestry.

1.10 The Site at present has an undeveloped character but has a low sensitivity to change due to the influence and impingement of surrounding urbanising features.

1.11 There are no Public Rights of Way (PRoW) within the Site, however the Wales Coast Path long-distance trail which is protected under Policy T04/1 runs just south of the proposed cable route, and directly south of the temporary construction swathe at the proposed southern access. A PRoW traverses Heolcae'r-Bont south of the Site, running adjacent to the proposed cable route for approximately 420 m.

Views

1.12 Views of the Site are predominantly experienced from distant viewpoints on higher land to the east. There are publicly accessible locations close to the Site including recreational areas to the southeast and north, the railway line, the A48 road and the M4 motorway. However, views of the Site are typically restricted by vegetation, large buildings and structures forming obstructions in the flat landscape. Views from private properties are mainly from the urban edge of Margam to the north and properties scattered throughout rising land to the east.

Receptors

1.13 Potentially affected receptors would be residents, users of recreational areas and public footpaths, users of public roads, and the railway. These would include residential receptors at Abbot's Close north of the Site, users of the railway, road users of the M4, A48, A4241 and recreational users of the local network of PRoW, Wales Coast Path, and local sports facilities.

2. METHODOLOGY

1.14 This Technical Note has been compiled utilising the following sources of information:

- Google Earth Pro for aerial photography and Google Street View;
- LANDMAP, Wales landscape character dataset Natural Resources Wales / LANDMAP - the Welsh landscape baseline;
- Neath Port Talbot LANDMAP Landscape Assessment;
- Wales Coast Path / Interactive Coast Path Map for the course of the Wales Coast Path long-distance trail;
- www.magic.defra.gov.uk for an initial review of statutory and non-statutory designations;
- https://www.sustrans.org.uk for routes on the National Cycle Network; and
- Stantec's own in-house GIS portal for other designations.

1.15 The Technical Note has been compiled using the above available desk-based information, and no site surveys have taken place to confirm the information within it.

1.16 The Technical Note assumes the parameters regarding the proposed substation extents and cable route as defined on the document/drawing MARPT-BHK-01-ZZ-DG-A-130018 Site Plan_EIA Screening Outline.

1.17 This Technical Note provides an overview of the current baseline conditions within and around the application site and surrounding area, and provides a high-level opinion on the suitability of the substation extension and cable route only, as illustrated on the above document /drawing.

3. POTENTIAL LANDSCAPE AND VISUAL CONSTRAINTS

1.18 Landscape and Visual constraints relating to the Proposed Development are defined as:

- Loss of vegetation (long-term) and short-term (construction swathe) impacts on agricultural land, which may lead to temporary or permanent impacts on local landscape character. However, the substation extension and cable route do not lie within any landscape designations;
- Potentially significant short-term visual impacts are predicted for users of the Wales Coast Path during the construction phase as they pass south of the temporary construction swathe / access road;
- Potentially significant short-term visual impacts for recreational users of the PRoW along Heolcae'r-Bont to the south during the construction phase given the proximity of the works which may include vegetation clearance subsequently opening up views towards the proposed substation extension as a result of access widening, would be immediately adjacent to the PRoW for approximately 420 m. Any future detailed assessment may require sequential visual assessment from the Heolcae'r-Bont PRoW to identify any significant impacts;
- Potentially significant short-term visual impacts for highly sensitive receptors on high ground to the east of the Site who would experience views towards demolition / construction activity;
- Potentially significant short to medium-term visual impacts for residents to the north of the proposed application site at Abbott's Close who may experience views towards demolition / construction activity in addition to views of the proposed GIS Hall prior to mitigation establishment;
- Potentially significant short to medium-term visual impacts for recreational users of the golf course adjacent to the northern application site boundary who may experience views towards demolition / construction activity in addition to views of the proposed GIS Hall prior to mitigation establishment;
- Potential non-significant short to medium-term visual impacts for road users along the A4242 (Harbour Way) who may experience views towards demolition / construction activity in addition to views of the proposed GIS Hall prior to mitigation establishment;
- Potential non-significant long-term visual impacts for users of the South Wales mainline as they pass the Site; and
- Potential non-significant long-term visual impacts for users of the wider PRoW network, particularly on high ground to the east of the application site, and potential short-term landscape impacts should there be a requirement to divert the Wales Coast Path / PRoW during construction.

4. MITIGATION

1.19 Mitigation requirements in relation to the Site and Proposed Development would be developed in discussion with the LPA and other relevant stakeholders as well as the internal iterative design process and cross-discipline work with ecology, hydrology and flood risk, and ground conditions teams. Mitigation will aim to reduce any identified potential landscape and/or visual effects in addition to providing improved green infrastructure connectivity and ecological resilience where practicable.

1.20 Although there is no requirement for BNG uplift in Wales through the use of a metric as is currently used in England, 'Net Benefit for Biodiversity' implies that all new development should promote the resilience of existing ecosystems at the design stage.

5. CONCLUSIONS

1.21 Following a desktop review of the Site from a landscape perspective, although there would be vegetation loss, there would be potential for mitigation proposals which could result in a net benefit for biodiversity.

1.22 From a visual perspective, potentially significant impacts on sensitive receptors along the PRoW and Wales Coast Path to the south would be temporary and short-term during construction in relation to the cable route. Given that the cable route would be below ground, impacts beyond construction are not predicted. Other potentially significant short-term effects are predicted for recreational users on high ground east of the Site given their open views towards it. Longer term impacts may occur through vegetation clearance to facilitate the widening of access, potentially opening up views towards the Proposed Development including the GIS Hall. It should be noted no physical impacts are predicted for either the Wales Coast Path or the Heolcae'r-Bont PRoW, other than temporary diversions which may be required during the construction phase.

1.23 Residents at the southern extents of Margam may experience short to medium-term visual impacts during construction and during the early stages of operation while mitigation proposals are establishing. Given the scale of the proposed GIS Hall, it is likely it would be the most visible element of the Proposed Development, however its location, i.e. adjacent to the Tata Steel Works, means that its form would not appear unusual within the view. Visual impacts are therefore not predicted to be experienced in the long-term.

1.24 It is recommended that a detailed Landscape and Visual Appraisal (LVA) be undertaken to examine the potential impacts experienced by receptors as a result of the Proposed Development. The LVA would describe baseline conditions in addition to discussing potential levels of effect and any mitigation proposals which would aim to reduce those effects. For the sake of brevity, the assessment of landscape character will make use of the LCAs, taking cognisance of the individual LANDMAP layers as opposed to the individual layers themselves. Figures relating to the LCAs and individual layers will be included within an Appendix to aid understanding.

1.25 It is expected that mitigation proposals would 'soften' the appearance of the above ground elements of the proposed development over time through a combination of management of existing vegetation along watercourses, natural regeneration within areas affected by construction, and new planting, thereby reducing short to medium-term visual effects for the identified receptors, while restoring landscape character to some degree. A Landscape and Habitat Strategy Plan (or similar) which would accompany the LVA would outline the mitigation proposals and provide some rationale behind them.

Technical Note 6.2

To:	National Grid	From:	Ecology and Biodiversity Click or tap here to enter text.
Project/File:	Margam Port Talbot	Date:	19/03/25

1 INTRODUCTION

1.1 This Technical Note has been prepared by Stantec UK Limited (Stantec) to support an Environmental Impact Assessment (EIA) Screening Report, providing information regarding the ecological constraints and opportunities associated with National Grid's proposed development at Margam, Port Talbot. The 'Proposed Development' comprises an extension to an existing substation and associated cabling route. The Proposed Development red-line boundary encompasses both the substation extension, associated cabling route and proposed working areas, and is referred to in this Technical Note as 'the Site'. The ecological constraints associated with the substation extension and the cabling route elements of the Proposed Development are addressed separately in this Technical Note, with the mitigation and conclusion sections drawing together the key ecological issues. It is understood that National Grid intend to submit a planning application for the substation and to deliver the cable routes under Permitted Development. This Technical Note has been updated following meetings with Neath Port Talbot Council in January and February 2025.

2 METHODOLOGY

2.1 This Technical Note provides an overview of the Ecological Features within the Site and its zone of influence. Neath Port Talbot Council (NPTC) have highlighted their views about the ecological value of the Site in their pre-application response data 17th September 2024 and in written comments from NPTC and meetings between National Grid's project team and NPTC in January and February 2025. It is acknowledged that NPTC have noted the requirement of Planning Policy Wales (PPW) (Welsh Government, 2024) that planning authorities through their work must follow a step-wise approach to maintain and enhance biodiversity, build resilient networks and deliver net benefits for biodiversity, by ensuring that any adverse environmental effects are firstly avoided then minimized, mitigated, and as a last resort compensated for. Enhancement must be secured by delivering a net biodiversity benefit. The first step in the step-wise process is to consider whether the impacts of a proposed development can be avoided. NPTC have encouraged National Grid to consider whether the grid requirements can be provided in any other way, or location, than the Site. The consideration of alternatives to the Proposed Development is described in the Port Talbot Connection Substation Siting Study (Stantec, 2025).

2.2 This Technical Note first summarises the baseline ecological information for the Site, drawing on both desk study review and survey work undertaken within the Site, with surveys being undertaken over a number of years and by a number of different parties (on behalf of National Grid and on behalf of Tata Steel). Data taken from published sources are referenced and information is also provided regarding results from survey work recently completed, or currently being undertaken[1]. A 'reasonable worst-case' baseline is provided, as agreed with

[1] References are provided in the section below and a summary of additional desk study data reviewed, and surveys undertaken in 2024 are provided at Annex 1.

NPTC, where further update survey work has been requested by NPTC but has yet to be undertaken.

2.3 Subsequently, this Technical Note provides an overview of the mitigation built into the scheme design, and proposed compensation and enhancement measures, given the stage of the design and proposed construction information available at present, with consideration to the step-wise process and requirement to enable delivery of net biodiversity benefits. It should be noted that for the section of the cable route which falls into TataSteel Lane, NG would complete the cable route, restore the top layer of soil etc (and re-lay/reinstate the turf once works were complete). Once demobilised, TataSteel would commence the habitat creation and enhancement works proposed within their planning application document and would then also be subsequently responsible for the management and monitoring of that area within TataSteel land, as described in the Environmental Statement and associated documents submitted for the recently consented Electric Arc Furnace scheme (RSK Environment Ltd (RSK), 2024).

2.4 It should be noted that this Technical Note does **not** constitute a formal Ecological Impact Assessment (EcIA), following industry guidance (CIEEM, 2024) and an EcIA would form part of any future planning application submission.

3 MARGAM SUBSTATION CONSTRAINTS

3.1 This section describes the ecological baseline and ecological constraints associated with the proposed substation and associated working areas (the 'proposed substation site'), and its potential zone of influence[2]. The potential impacts and mitigation approach including consideration of net biodiversity benefits are set out in the Mitigation, Compensation and Enhancement section below.

Internationally Designated Sites within 10 km

3.2 The desk study found there were no Statutory Designated Sites within the Site. However, the desk study identified four European sites for nature conservation within 10 km of the Site; two nationally designated sites and two non-statutory designated sites were within 2 km. A summary of these sites and their locations are provided in **Annex 1**.

3.3 The presence of the European sites within 10 km of the Proposed Development warrants consideration of the potential for Likely Significant Effects within a shadow Habitats Regulations Assessment, in accordance with the requirements of The Conservation of Habitats and Species Regulations, 2017 (as amended). However, the consideration of the potential for significant effects is also relevant to this Technical Note in the context of EIA Screening. The furthest European site from the Site is the Crymlyn Bog / Cors Crymlyn Special Areas of Conservation (SAC) and Crymlyn Bog Ramsar site which are primarily designated for the Habitats it supports, including transition mires and quaking bogs, along with calcareous fens, and supports a diverse and rare plant assemblage. However, the SAC and Ramsar site lies around 10 km north of the Site and is separated from the Site by the River Neath and Port Talbot Town. Therefore, there are no direct or indirect effects on the features for which these areas are designated considered likely, as a result of the Proposed Development, due to a lack of potential source-receptor pathways which could lead to a potential adverse effect.

[2] The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities.

3.4 The other European sites are Kenfig /Cynffig SAC (around 2 km south of the Site), which is designated primarily for its habitats present which have formed around a sand dune complex and Glaswelltiroedd Cefn Cribwr / Cefn Cribwr Grasslands SAC which is a collection of sites, the closest of which lies more the 6 km to the south east of the Site and is designated primarily for its grassland interest but also due to the presence of marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*. Given the nature of the Proposed Development and that there are no possible source-receptor pathways between the Proposed Development and the interest features of these two European sites, no significant impacts are anticipated.

Other Designated Sites within 2km

3.5 Within 2 km of the proposed substation lies Eglwys Nunydd Reservoir Site of Special Scientific Interest (SSSI) and Margam Moors SSSI. Eglwys Nunydd Reservoir SSSI is designated for its wintering waterfowl and passage migrants associated with the open water of the reservoir including great crested grebe *Podiceps cristatus*, little grebe *Tachybaptus ruficollis*, mallard *Anas platyrhynchos*, gadwall *Anas strepera* and coot *Fulica atra,* some of which also breed at the SSSI. Margam Moors SSSI is designated as the remains of once extensive coastal levels and supports mesotrophic marsh, fen meadow and ditch communities and associated important invertebrates.

3.6 The Eglwys Nunydd Site of Importance for Nature Conservation (SINC) boundary lies closer to the Site than the SSSI boundary, around 0.5 km from the proposed substation site. In addition to the interest of the SSSI, the SINC is designated for its habitats and bird species including barn owl *Tyto alba* and Cetti's warbler *Cettia cetti*. Margam Country Park, lies 0.8 km to the east of the substation site, beyond the M4 and is designated for the habitats present and the range of important species including bats, brown hare *Lepus europaeus* and adder *Vipera berus*. Closest to, and most relevant to, the Proposed Development is the Junction 38 Wetland Complex SINC, designated for its complex of wetland habitats, woodland and the species associated with those habitats; the proposed substation site lies within this SINC.

3.7 The potential impacts and mitigation approach for these designated sites, including consideration of net biodiversity benefits, are set out in the Mitigation, Compensation and Enhancement section below.

Habitats

3.8 The National Grid land within which the substation is proposed comprises a complex of wetland habitats. The habitat survey work completed through the 2024 season (spring, summer and autumn 2024) mapped habitats using both UKHab2 and Phase 1 Habitat Survey classification. The former, with a view to satisfying National Grid's own internal policies with regards to delivery of Biodiversity Net Gain, as calculated using the English Statutory Metric. The JNCC Phase 1 Habitat Survey classification was also used to satisfy NPT requirements; this methodology also enables a comparison with the results of habitat survey work previously undertaken for the Site in 2008, for a prior application in 2009 and illustrates the changes in habitats within the substation site through time by comparison of the two. **Annex 2** shows the Phase 1 Habitat Survey plans for the proposed substation site from 2008 and 2024.

3.9 Based on survey work undertaken in 2024, the proposed substation site is currently dominated by the Phase 1 habitat type 'swamp' with common reed *Phragmites australis* forming a virtual monoculture within areas of reedbed. Other occasionally occurring species within the reedbed areas include yellow flag *Iris pseudacorus*, nettle *Urtica dioica*, reed canary grass *Phalaris arundinacea* and meadowsweet *Filipendula ulmaria.*

3.10 Other habitats within the proposed substation site and associated works areas (temporary construction compound adjacent to the proposed substation site that is currently anticipated to be required for pulling cable for the Horizontal Directional Drilling (HDD)) include: willow scrub and ditches, or former ditches (now obscured / overgrown by willow scrub) and an area attributed to marshy grassland. Regarding the areas of marshy grassland, this habitat classification was selected owing to the presence of a higher proportion of grasses and an abundance of meadowsweet which fits best into the Phase 1 habitat type 'Marshy Grassland' classification which includes "…vegetation with a greater than 25% cover of *Juncus acutiflorus, J. effusus, J. inflexus* [all rush species]*, Carex* [sedge] species or *Filipendula ulmaria* [meadowsweet] (JNCC, 2001)."

3.11 The comparison of the Phase 1 Habitat plans at **Annex 2** shows that habitats have changed through time, with the extent of reedbed (swamp) and willow scrub increasing since 2008 and the drier semi-natural grassland being replaced by marshy grassland and swamp, with encroaching willow scrub. However, the proposed substation site remains a complex of wetland habitat types, falling within the broad habitat category "Fen, Marsh and Swamp" as defined within the Wildlife Site Guidance Wales (Wales Biodiversity Partnership, 2008) and therefore continues to meet the SINC criteria on that basis. It is considered that the whole footprint of the proposed substation site and associated working area also falls under the definition of the Section 7 Priority Habitat[3] (Reedbeds). Whilst not all habitats are technically reedbed, the Priority Habitat definition (BRIG (ed. Ant Maddock) 2008, revised 2011) encompasses associated habitats with which reedbeds form a mosaic, stating that: 'They [reedbeds] tend to incorporate areas of open water and ditches, and small areas of wet grassland and carr woodland may be associated with them'.

3.12 The NPTC pre-application response indicates that in the absence of information to the contrary, the Council assumed the proposed substation site to comprise irreplaceable habitat – specifically a bog and active peat-forming habitats. Whilst peat has been confirmed at a variety of depths through the ground investigation work, there is no *Sphagnum* moss present within the Site which is the typical species seen in bog habitats and the ground investigation works have determined that the peat layers are buried deposits, sitting at various depths, 20cm-3.6m with variable thickness of peat deposits (50cm-4.7m). The peat layers lie beneath sandy organic clays at the surface described as Tidal Flat Deposits (Geotechnics, 2025; Baker Hicks, 2025). The peat is described as a spongy dark brown fibrous & pseudo fibrous peat, representative of peat which has undergone low to moderate decomposition (Geotechnics, 2025; Baker Hicks, 2025). Given these findings and the evidenced change in the habitats through the comparison of the 2008 and 2024 Phase 1 Habitat Survey plans, the habitats within the site are not considered to fall into the "irreplaceable" category, as defined in the PPW as "*Habitats, including the natural resources which underpin them, which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. Examples include, ancient woodland and veteran trees, ancient hedgerows, wet woodlands, sand dunes, peatland, species rich grassland, long undisturbed soils, blanket bog, salt marsh and lowland fen*." The habitats present have clearly changed over a relatively short timescale and whilst they undoubtedly remain Priority Habitat types of County value, the habitats outside the permanent footprint of works can be reinstated, given the right site conditions.

3.13 In relation to the presence of buried peat, RSK Environment have drafted a Peat Technical Note on behalf of Laing O Rourke, for National Grid (RSK Environment, 2024) which acknowledges the presence of peat at the Site. This confirms that none of the peat is present

[3] Priority habitats in Wales being those identified by Ministers as being of key significance to sustain and improve biodiversity in relation to Wales, in accordance with Section 7 of Environment (Wales) Act 2016.

at the ground surface, and there are no areas where the surface vegetation is classed as peat-forming or 'active' vegetation. As a result, it is considered that the peat deposits present are not 'active' in terms of carbon sequestration. However, it also acknowledges that buried peat such as this remains a carbon store while kept undisturbed, waterlogged and not in contact with oxygen in the atmosphere. As a result, the Peat Technical Note outlines measures that will safeguard peat and which will be further detailed in a Peat Management Plan, as described in the Mitigation, Compensation and Enhancement section below.

3.14 Protected and Notable Species Considerations

3.15 A range of species surveys have taken place within the Site through the 2024 season (see **Annex 3** for summary of survey work undertaken) and some follow-up surveys will also be undertaken in 2025. The protected or other notable species identified which will need to be taken into consideration in the Proposed Development include the following:

- Breeding bird assemblage, including the specially protected Cetti's warbler *Cettia cetti* of Local value (survey undertaken summer 2024).

- Wintering bird surveys of the proposed substation site and the land to the east of the railway line have been completed October 2024-February 2025. Whilst the report of the surveys has not yet been received, it is understood from the survey team that no bird species associated with statutory designated sites were identified. Cetti's warbler were recorded resident.

- Reptile population – The peak count of low numbers of common lizard was the only species identified during surveys in autumn 2024. This would typically equate to a low population of common lizard; however, due to survey limitations late season survey, combined with a review of the results from the desk study, this is considered likely an underestimation of population density for common lizard and it is likely that other common reptile species such as grass snake and slow worm, are also present within the Site boundary. NPT recommend assuming an exceptional population of reptiles is present in the absence of survey data from the core reptile survey season (update surveys programmed in core season in 2025).

- Water voles – low population of water vole assumed to be present, based on the identification of field signs (feeding signs and likely water vole burrows, no latrines) in 2024 (April and September surveys) and based on historical records of water vole from the Site (Jacobs, 2012).

- Harvest mouse – harvest mouse nests have been identified within the Site by Ecological Clerk of Works during the Ground Investigation works.

- Bats – no features suitable for roosting bats within the footprint of works understood at the time of writing this Technical Note. The site has the potential to supporting foraging bats and NPT have queried whether the site could form a Core Sustenance Zone for lesser horseshoe bats. Night-time Bat Walkover surveys and static bat detector recordings are proposed for the site for April/May 2025 to provide an initial review of bat activity within the site.

- Invertebrates – notable species of invertebrate were previously identified within the Site (Jacobs, 2012); given the site remains a wetland complex, the value of the Site for invertebrates is considered likely to remain the same, however an update invertebrate

scoping survey will be carried out by a suitably experienced invertebrate specialist in spring 2025 to confirm whether this is a reasonable assumption.

- Invasive and Non-Native Species (INNS) – Whilst no INNS were recorded from within the proposed substation site, Himalayan balsam *Impatiens gladulifera* was recorded within the land to the south of the proposed substation in the south-east corner of the Site, north of Heolcae'r Bont and a stand of Japanese knotweed *Fallopia japonica* has been identified to the south of Heolcae'r Bont.

4 CABLE ROUTE CONSTRAINTS

4.1 This section describes the ecological baseline and ecological constraints associated with the proposed cable route and associated working areas (the 'proposed cable route site'), and its potential zone of influence. Most of the ecological constraints associated with the proposed cable route site are similar to those identified for the proposed substation site, which is not surprising given the proximity of the areas. However, there are some additional ecological constraints which are highlighted below. These additional considerations for the cable route are summarised from field work undertaken to the east of the railway line in 2024 on behalf of National Grid and field work undertaken on behalf of Tata Steel, as presented in their EAF Planning Documents pack (RSK Environment Ltd, 2024), in addition to the desk study information reviewed for this Technical Note (**Annex 1**). The potential impacts and mitigation approach including consideration of net biodiversity benefits are set out in the Mitigation, Compensation and Enhancement section below and at **Annex 4**.

Designated Sites

4.2 The same designated sites and potential impact considerations, as described for the substation above, are also relevant to the proposed cable route site. However, the cable route red-line boundary passes closer to the Margam Moors SSSI and the Eglwys Nunydd Reservoir SSSI and SINC, with the track Heolcae'r Bont separating the SSSI and SINC from the cable route site.

Habitats

4.3 The habitats within the proposed cable route site south of the proposed substation site transition from the wetland complex of habitats described above for the substation into a swamp and marshy grassland complex with a network of wet and dry ditches and scrub. This habitat is considered to be former coastal floodplain grazing marsh, albeit it is understood to have been some time since the grassland has been managed through grazing, or the ditches managed, to the east of the railway line. To the west of the railway line within land owned by Tata Steel, the habitats within the Site are also dominated by former coastal floodplain grazing marsh (comprising poor semi-improved grassland within a network of ditches). Other habitats present include plantation woodland, scrub, ephemeral short perennial and bare ground. The mosaic of bare ground, ephemeral short perennial and scrub is identified as open mosaic habitat (OMH). Both the Coastal Flood Plain Grazing Marsh and OMH are Priority Habitats. The Coastal Flood Plain Grazing Marsh is considered to be linked to Margam Moors SSSI which lies immediately to the south of the Site, beyond Heolcae'r Bont. These habitats are considered to be of County value (RSK Environmental Ltd, 2024).

Protected and Notable Species Considerations

4.4 The proposed cable route site supports the range of species described for the proposed substation, albeit water vole are considered likely absent from the Tata Steel site. One

species not recorded within the proposed substation site but which was recorded within the Tata Steel land is badger. Tata Steel report that badger activity was recorded within their land including a single-hole badger outlier sett and several latrines, within the southern part of the Tata Steel site. This sett lies outside of the Red Line Boundary for the Proposed Development.

5 PROPOSED MITIGATION AND COMPENSATION AND ENHANCEMENT

Potential Impacts and Mitigation Proposed for Designated Sites and Habitats

5.1 As described above, the potential for impacts on the more distant designated Sites is considered unlikely. However, consideration has been given to potential issues that have a longer effect-distances including potential ecological effects arising from impacts of air pollution or deposition, potential ecological effects arising from impacts of noise and lighting, and potential effects on hydrology in the paragraphs below.

5.2 The Siting Study (Stantec, 2025) has demonstrated that avoidance of direct impacts on the SINC within the Site is not possible. National Grid with their design team (Baker Hicks) and Contractor (Laing O Rourke) have, however, been looking carefully at approaches which minimise the loss of the SINC and Priority Habitats and temporary impacts on the SINC, whilst also seeking opportunities to deliver mitigation, compensation and enhancement within the retained areas within National Grid ownership. The options being explored will also need to be mindful of future activities, for example operational and maintenance works required within National Grid land ownership.

5.3 The proximity of the Proposed Development to wetland systems, including the Eglwys Reservoir, the ditch network associated with Margam Moors SSSI and the wetland habitats associated with the retained area of the Junction 38 SINC results in potential for the Proposed Development to impact on these systems through affecting the hydrological balance of the retained areas of habitat and / or through pollutant impacts (e.g. through fuel spill run-off or through sediment / silt run-off). The scheme design is taking into account the hydrology of the Site, as described in the Margam Drainage Report (Baker Hicks, 2025a) and Margam Flood Consequence Assessment Report (Baker Hicks, 2025b), to enable maintenance of the network of wetland habitat types within the Site.

5.4 The Baker Hicks reports (Baker Hicks, 2025a and 2025b) describe how the land in the vicinity of the Site between the elevated railway line to the west and higher ground to the east, within which the Proposed Development is sited, is drained by a network of ditches to the central ‘Upper Mother Ditch’. The Upper Mother Ditch drains through a culvert beneath the railway line and the Tata Steel site, passing through a sluice 320 m to the northwest, to a reservoir at the western side of the Tata Steel site. The reservoir is then drained to the sea. It should be noted that hydrological impacts on Eglwys Reservoir or Margam Moors SSSI are not anticipated as both are located upgradient of the Site and there is no plausible hydrological or hydrogeological pathway that would result in impacts from the Proposed Development (Baker Hicks, 2025; Envireau Water, 2025).

5.5 The Baker Hicks Flood Consequence Assessment provides a review of the potential sources of flood risk at the Site to determine an appropriate design level for flood mitigation and concludes that the displacement of floodwater by the proposed flood defence associated with the Proposed Development will have a limited effect on the flood extent of existing development fpr the 1:100 and 1:1000 (plus climate change) predictions for flood extents (Baker Hicks, 2025b). The Baker Hicks report notes increased depth of flooding within the areas predicted to flood (Baker Hicks, 2025b). However, based on predicted flooding maps

from Natural Resources Wales for more frequent events (e.g. 1:30)[4] and in typical conditions, the proposed development will not have any impact on flood levels within the retained areas of the SINC.

5.6 Furthermore, the Preliminary Hydrogeological Impact Assessment undertaken (Envireau Water, 2025) has determined that groundwater levels along the proposed cabling route are typically within 1 – 2m of ground level and are controlled by surface water drainage and local topography. The general groundwater flow direction is north, towards the Upper Mother Ditch and then west towards the coast. During the cabling works, ground stabilisation techniques will extend up to 0.75mm either side of and below the trenches and will provide a low permeability (but not impermeable) barrier that will inhibit ingress of shallow groundwater. Once the cable is installed, the trenches will be reinstated with a 500mm permeable layer at surface to allow rainfall infiltration and lateral groundwater movement towards surface watercourses (Envireau Water, 2025)[5].

5.7 The preliminary hydrogeological risk assessment (Envireau Water, 2025) demonstrates that there are no significant hydrological or hydrogeological impacts associated with the planned trenching and ground stabilisation works. The impact assessment accounts for mitigation that is embedded or will be incorporated into the proposed construction works. The impact assessment shows that there may be minor adverse impacts to groundwater and the Junction 38 Wetland Complex. However, any impacts will be localised to the area of land immediately along the cable route and are not considered significant in planning terms, with no impacts identified on wider nationally or internationally designated sites (Envireau Water, 2025).

5.8 The Contractor (Laing O Rourke) has advised that to cross the numerous ditches along the cable route, temporary crossings will be installed, known as flumes. These localised flumes will maintain the flow of water within the ditches, whilst allowing the installation of cable trenches (where the cable sections are in open cut) and crossing of construction traffic. Once the activity is complete and crossing no longer required, the flumes will be removed and the ditch will be reinstated, including appropriate seeding/planting where required to reinstate suitable vegetation.

5.9 Laing O Rourke have also advised that the ditches directly impacted by the substation and associated temporary working areas during construction will either be diverted (in the case of the ditches within the footprint of the permanent substation development), or will be temporarily flumed, as described for the cable route above. All ditch works will comply with ordinary water crossing license requirements. Measures to protect water quality of the areas on and around the Proposed Development during construction are described by Laing O Rourke (Laing O Rourke, 2025b) this acknowledges that effective water management plans will be necessary to mitigate risks associated with construction activities and enable compliance with local regulations and protect water quality throughout the construction phase. Mitigation measures, monitoring of these and approaches to incident management and corrective measures are all described in the Surface Water Management Plan (Laing O

[4] https://flood-risk-maps.naturalresources.wales/?locale=en
[5] Note that for the section of the cable route which falls into TataSteel Land, NG would complete the cable route, restore the top layer of soil etc (and re-lay/reinstate the turf once works were complete). Once de-mobilised, TataSteel would commence the habitat creation and enhancement works proposed within their planning application documentation and would then also be subsequently responsible for the management and monitoring of that area within TataSteel land, as described in the Environmental Statement and associated documents submitted for the recently consented Electric Arc Furnace scheme (RSK Environment Ltd (RSK), 2024).

Rourke, 2025b) such that significant impacts on water quality in retained ditches around the Proposed Development works is not anticipated.

5.10 With regards to potential interface with peat along the cabling route, the Peat Technical Note (RSK, 2024) outlines measures that will be detailed within a Peat Management Plan to minimise the adverse impact which could arise from the disturbance of the buried peat. Primarily, the objective is to avoid peat horizons wherever possible. The HDD sections will mostly avoid interface with any of the peat horizons. The cable route that crosses the TataSteel land will not interface with any peat as the peat lies below the depth at which the cable route is to be placed. The cable route within the National Grid and BOC land, east of the railway line, may interface with some areas of peat in the open-cut sections (Laing O Rourke, 2025a). The Peat Management Plan will determine how this peat will be handled to minimise long-term impacts; this will include temporary above-ground storage of peat, handling and reinstatement / reburial to minimise the potential release of the carbon store (RSK, 2024).

5.11 With regards to impacts on peat arising from the proposed substation and associated temporary works, Laing O Rourke have confirmed that to avoid removal of significant volumes of peat they are reviewing the possible use of either Displacement Auger (DAP) or precast driven piles for the construction of the buildings and supporting structures required for the substation. Both methods will significantly reduce the impact and removal of the below surface peat. Whilst precast driven piles may have an element of noise disturbance, they have an advantage of not requiring wet concrete on site (minimising the potential for adverse effects from concrete use) (Laing O Rourke, 2025a)

5.12 The works themselves, including piling activities and the areas of trenched cable installation (including where soil stabilisation methods need to be employed) has the potential to generate sediment and silt which could run-off into nearby ditches and into watercourses. Furthermore, there is the potential for accidental spillage of pollutants, such as fuel from on-site activities. The Water Management Plan (Laing O Rourke, 2025) sets out control measures to avoid impacts arising from these construction activities. The drainage strategy for the finalised scheme is to be informed by the requirements of the Sustainable Drainage (Approval and Adoption Procedure) (Wales) Regulations, 2018. The Drainage Strategy will be developed in parallel to the Flood Consequence Assessment and hydrological modelling work and is anticipated to be developed to allow continued water movement through the habitats and ditch network within the Site. Surface water from the proposed development is anticipated to be addressed through attenuated discharge to the local drainage network.

5.13 The Contractor has also considered the impact of the activities within the Temporary Construction areas on soils. Within the Temporary Construction Areas, the Contractor has committed to manage the storage of materials and equipment so that unnecessary loading of an area is avoided, and any potential long-term impacts of compaction are reduced. This can be accomplished by a rigorous programme of works to ensure that only the required materials are brought to site when needed, along with the removal of items once complete.

5.14 Where temporary compounds and haul roads are required, Laing O'Rourke have advised they propose to use lightweight aggregates or trackway to mitigate long term compaction and impact to the ground. All temporary compound areas utilising lightweight aggregate will include a separation layer between the aggregates and ground to enable a clean removal and reinstatement of the area. The maximum duration of the compounds and trackway will be in place is anticipated to be 18 months. Where topsoil is removed to enable construction activities it will be appropriately stored for planned re-use. In addition, post completion of works and the temporary working area has been demobilised, a Landscape and Environmental plan will be put in place to assess the condition of the ground, potential areas

of over compaction and outline any recommend remediation actions that can be put in place, such as deep soil aeration, to restore the ground condition (Laing O Rourke, 2025a).

5.15 With regards the temporary haul roads, these will be laid on the existing ground and will need to be removed afterwards. In order to prevent long term damage to the flora of the area it is necessary that the amount of compaction of the existing Topsoil is kept to a minimum and the vegetation is allowed to 'breathe' throughout the works. This means providing haul roads (that not only exert low pressures on the soil itself but also spread concentrated loading from plant. The use of lightweight Track Matting will be first considered to provide access to working areas. These matts are laid on the surface to distribute the loading of pedestrian, vehicle, and heavy plant to avoid damage to the ground. Further details on potential options for the Track Matting is provided by the Contractor (Laing O Rourke, 2025a).

5.16 In terms of indirect effects that could have more distant impacts on ecological features, at this stage it is understood that additional potential air pollutant or deposition sources could arise from the Proposed Development due to traffic movements during site establishment and construction. Current guidance from Natural England and the Institute of Air Quality Management (IAQM) (Holman *et al.,* 2020) is that where the change in traffic is below 1,000 Average Annual Daily Traffic (AADT) (or 200 AADT for heavy duty vehicles) effects from traffic emissions to sensitive ecological receptors can be scoped out as any emissions below this level are widely considered to be imperceptible. The predicted "alone" traffic movements are 20 AADT heavy duty vehicles and it is expected that the in-combination AADT will fall below the 200 AADT screening threshold. Therefore, no significant ecological effects resulting from air pollution are anticipated as a result of traffic movements.

5.17 It is understood that generators may be used both during construction and operation, in case of loss of power from the wider National Grid network. The potential additional outputs from these generators in terms of air quality effects and noise generation will be taken into account in the Ecological Impact Assessment that will be submitted with the planning application, following completion of air quality assessment and noise modelling and assessment. However, as described in the EIA Screening Report, whilst a back-up diesel generator system will also be installed, in addition to the substation, the back-up generator will be used in circumstances of electricity supply outages to the substation, this may include an overhead line being down, tree on the line or planned outages. Based on historical data for the Margam substation supply, there have been approximately 15 hours of per year of down time when the back-up generator is assumed to have been used. Given this anticipated short period of usage, significant ecological impacts from the operation of this generator, either in terms of noise or air quality impacts on ecological features are not anticipated.

5.18 Deposition issues that may result from dust from vehicle movements have the potential to be an issue for designated sites in closer proximity to the Site. However, the detailed Construction Environmental Management Plan (CEMP) will include measures for control of dust-emissions during construction, both as a result of on-site activities and as a result of traffic movements. Outline measures are provided in the draft CEMP (Laing O Rourke, 2024). Therefore, no significant effects are anticipated, providing the CEMP is written and implemented effectively.

5.19 It is anticipated that impacts from noise on designated site features (particularly bird species associated with Eglwys Nunydd Reservoir SSSI) will not be significant during construction or operation due to the distance of the Site from the SSSI and intervening topography. However, noise modelling is being undertaken by RSK/Laing O Rourke, to provide confidence in this assessment. In the event that significant noise levels are considered likely at the sensitive receptor, addition mitigation measures can be agreed and deployed such that noise disturbance does not provide any significant adverse effects. Research into the behavioural

responses of birds to impulsive noise found a potentially costly response (flight response - which forces the bird to use up energy) was more likely at dB values at or greater than 69.9 dB (Wright et al., 2010) and so this level, or a slightly lower dB value, will be used as the maximum acceptable noise impact on the Reservoir.

5.20 With regards to lighting, the Construction Environmental Management Plan will describe the temporary lighting around welfare and working locations. The best available techniques will be implemented to avoid light glare and light spill, so as to minimise the effect of lighting on retained areas of the SINC and other nearby sites (Margam Moors SSSI). The lighting design of the permanent scheme will also need to be designed with reference to the guidance on Artificial Lighting at Night (Bat Conservation Trust and Institution of Lighting Professionals, 2023). Whilst written with reference to considerations of bats, following this guidance will also limit light spill and glare on other close-by ecological receptors, such as the retained areas of the SINC and the SSSIs.

5.21 A package of mitigation, compensation and enhancement measures will be required in order to achieve the net benefits for biodiversity required by the PPW, given the Proposed Development will result in the permanent loss of part of the SINC within the Site. One of the threats to reedbed and wetland habitat, for which the SINC is designated, is succession to woodland; this is a natural process that would eventually result in the willow scrub becoming dominant within the National Grid land. Habitat management within retained areas of the National Grid land will include targeted, rotational management of the reedbed and willow scrub habitat, with a view to maintaining and enhancing the mosaic of wetland habitats within retained areas. It is acknowledged that NPTC have a policy of replacement of trees at a two for one rate where they are lost to development. However, the tree planting needs to be in the right-place and in the right habitats; it is considered that tree planting in this habitat would be to the detriment of the wetland habitat and indeed that the willow within the site is best described from an ecological perspective as scrub in any case, given its growth form and size. A degree of willow scrub cover is appropriate, as an element of the wetland habitat mosaic, but this should be through management of natural regeneration rather than by the artificial introduction of new trees.

5.22 Management of retained habitat on its own will not compensate for areas of the SINC affected temporarily or permanently by the Proposed Development, given the remainder of the land in National Grid ownership already constitutes Priority Habitat. In the first instance, opportunities to create or enhance Priority Habitat areas within Neath Port Talbot should be explored.

5.23 The PPW states that biodiversity enhancement must be secured by delivering a biodiversity benefit primarily on site or immediately adjacent to the site, over and above that required to mitigate or compensate for any negative impact. It is understood that NPTC have a Biodiversity Compensation Scheme, in recognition that there may not be enough land available to enable the biodiversity interest to be maintained and enhanced on-site. However, it is understood from discussions with NPTC that there is currently not capacity in the Council's scheme for the delivery of further compensation. The PPW (6.4.9) recommends "collaborative arrangements" where it is not possible for planning authorities to identify opportunities for a net benefit for biodiversity within their own administrative boundaries and identifies that co-operation may be needed to identify, capture and monitor net benefits for biodiversity across larger areas, making use of existing regional mechanisms or setting up new voluntary arrangements.

5.24 Two main options are being investigated to enable delivery of compensation and overall net benefit for biodiversity, through habitat creation and commitment to ongoing management and monitoring. The primary focus of delivery of habitat creation and management is anticipated to be:

- Land owned by National Grid around the Proposed Development Site. This includes the retained area of SINC and contiguous habitats within National Grid's ownership immediately around the Proposed Development Site. The Compensation and Enhancement proposals will include the reinstatement of habitats[6] within temporary works areas, following completion of the Works, and habitat management within the wider National Grid landholding. The proposals will need to take account of future operational requirements of National Grid. However, it is anticipated that the target will be to create a mosaic of wetland habitats within the Site following completion of the works and manage habitats within the Site (as also described for water vole mitigation -see **Annex 4**) in order to deliver habitats for which the SINC was originally designated, or of equivalent value.

- Land owned by Tata Steel UK Ltd. Local specialist, Celtic Wildflower's ecologist, Barry Stewart, has recommended an area of existing dune habitats adjacent to the Margam Moors SSSI ('Margam Burrows') and part of the Margam Moors SSSI not currently in active management, which have the potential to be enhanced e.g. through the creation of dune slacks, control of trees and scrub invading dune habitats and opening up of the dune frontage to create mobility in the dune. For the section within the Margam Moors SSSI, this is a continuation of the grey dune which transitions to the Coastal Grazing Marsh, for which the SSSI is designated. Management of this area through rotation scrub management will contribute to maintaining and enhancing the ecological value of this area which is not currently in active management. These measures have been discussed and agreed in principle with Natural Resources Wales.

5.25 The emphasis for both areas will be placed on creating or enhancing habitats, working with natural processes, resulting in a naturally functioning ecosystem. Furthermore, emphasis will be focussed on expanding or linking existing areas of wildlife-friendly habitat to increase carrying capacity for wildlife and creating green corridors. Note that where possible National Grid will seek to deliver the required mitigation, compensation and enhancement within Neath Port Talbot; in line with the PPW and NPT requirements.

5.26 **Annex 4** provides more detail on the anticipated avoidance, mitigation, compensation and enhancement measures which will enable Net Biodiversity Benefits to be delivered through the Proposed Development with regards to the SINC and habitats.

5.27 <u>Protected and Notable Species</u>

5.28 Impacts on protected species will be managed through the following processes:

- Avoidance[7] wherever possible, either through avoiding contact with the protected or notable species, or through timing of works (e.g. avoidance of habitat clearance during the bird breeding season);

- Where avoidance is not possible, mitigation measures[8] will be put in place to minimise and manage impacts;

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[6] The preceding paragraphs provides a summary of the mitigation measures being implemented to minimise impacts within the Temporary Works Areas and along the cable route corridor and with regards to restoration of soil conditions following completion of Works. Additional detail is provided by the Contractor (Laing O Rourke, 2025a).

[7] Avoidance is defined as: Prevention of impacts occurring, having regard to predictions about potentially negative environmental effects (e.g. project decisions about site location or design) (CIEEM, 2024)

[8] Mitigation is defined as: Measures taken to avoid or reduce negative impacts and effects. Measures may include: fencing off sensitive areas during the construction period, or timing works to avoid sensitive periods (CIEEM, 2024)

- Where mitigation measures are not sufficient to ameliorate impacts, identification and deliver of compensatory measures[9] will be required.

- The Proposed Development will also secure a net benefit for biodiversity for species within the Site, in line with the requirements of Planning Policy Wales (Welsh Government, 2024).

5.29 It is anticipated that mitigation, compensation and net benefit strategies will be described in the Ecological Impact Assessment for the Proposed Development, with reference to species-specific mitigation strategies and habitat management strategies, where required. It is considered that separate species-specific mitigation strategies will be required for reptiles and for water vole, the latter in support of a licence application to Natural Resources Wales (NRW). The water vole mitigation is required for the substation works due to the presence of a low population of water vole within the works footprint. The licence application for works affecting Water Vole has been secured as part of "Early Works" on the Site. A mitigation strategy will also be required to set out the measures to prevent spread of INNS.

5.30 The Contractor is committed to the production of a Construction Biodiversity Management Plan which will set out requirements to control the impact of the construction works on sensitive ecological receptors. This document will identify any relevant ecological consents and licences and methods of work to minimise the impact of the scheme on sensitive ecological receptors (Laing O Rourke, 2024).

5.31 **Annex 4** provides more detail on the species-specific anticipated avoidance, mitigation, compensation and enhancement measures which will enable Net Biodiversity Benefits to be delivered through the Proposed Development.

Assessment considerations – EcIA and shadow HRA

5.32 The planning application will be submitted with an EcIA, following guidelines from the Chartered Institute of Ecology and Environmental Management (CIEEM, 2024). Furthermore, the planning application will be submitted with a shadow Habitats Regulations Assessment (HRA); it is anticipated that the latter document is likely to be limited to a shadow HRA Screening Report since the potential for Likely Significant Effects on European sites is considered unlikely, as described in the Constraints section above. However, this will be confirmed through the HRA process.

Securing Mitigation, Compensation and Net Benefits for Biodiversity

5.33 The planning application will also be submitted with documentation which describes the mitigation, compensation and enhancement measures to achieve net benefits for biodiversity. Where the finer details are yet to be confirmed (e.g. in relation to confirmed programme, for example) it is anticipated that the documentation submitted with planning will provide principles and outline proposals, with a view to the details being secured through pre-commencement Conditions. It is anticipated that the EcIA will refer to or be accompanied by the following:

- Construction and Environmental Management Plan

[9] Compensation is defined as: measures to address negative effects which are residual, after avoidance and mitigation have been considered. It is this objective of compensation, and not its location, that distinguishes compensation from 'mitigation'. Depending on circumstances, compensation measures may be located within or outside the project site (CIEEM, 2024)

- Peat Management Plan
- Water Management Plan
- Mitigation Strategies for Water Vole and for Reptiles
- Mitigation Strategy for Invasive and Non-Native Species
- Landscape and Habitat Strategy Plan (Site)
- Landscape and Habitat Management Plan (Site)
- Biodiversity Management Plan (Off-Site Compensation and Enhancement).

6 CONCLUSION

6.1 It is acknowledged that in the absence of mitigation and compensation the Proposed Development would have adverse ecological effect significant at the County Level, primarily due to the permanent loss of an area of the Junction 38 Wetland Complex SINC and impacts on Priority Habitats outside the SINC boundary. In the absence of mitigation this would constitute a significant adverse effect at the County Level. The Proposed Development also has the potential to adversely affect protected or notable species, in the absence of mitigation these would likely constitute at least Locally significant adverse effects.

6.2 However, National Grid are committed to working with NPTC and local stakeholders and landowners to develop a package of mitigation within the Site. Furthermore, given the limited size of the Site and the nature of the Proposed Development resulting in permanent loss of area, off-site compensation and enhancement measures will be required to enable delivery of a net benefit for biodiversity. Such measures will be delivered within National Grid land, where compatible with National Grid operational and maintenance works requirements, and within other suitable land outside the Site, where these contribute to Local and Regional Net Biodiversity Benefit, thereby avoiding significant residual adverse effects in the long-term, in addition to the delivery of net benefit for biodiversity for both habitats and species.

6.3 National Grid remain committed to the application being submitted with an Ecological Impact Assessment and shadow HRA, along with supporting documentation to provide the necessary evidence of proposed mitigation, compensation and enhancement measures.

6.4 Such a package of mitigation, compensation and enhancement, along with commitments to ongoing monitoring, would necessarily need to be secured through Condition and / or suitable planning obligations (e.g. via a Section 106 agreement) to provide certainty of the delivery of Net Benefits, in line with Council and National Policy. National Grid are committed to working with NPTC, local landowners and managers (e.g. Tata Steel, NRW etc to meet the requirements of Local and National policy).

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ANNEX 1

Desk Study Information Reviewed

Internationally designated sites of nature conservation interest including Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites within 10 km of the Site obtained from MAGIC.

Nationally designated statutory sites of nature conservation interest including Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Locally designated statutory sites of nature conservation interest including Local Nature Reserve (LNR), Locally designated non-statutory sites of nature conservation interest including Sites of Nature Conservation Interest (SINCs) within 2 km of the Site from Aderyn (the Biodiversity Information and Reporting Database of Local Environmental Records Centres Wales).

Habitats of principal importance and ancient woodland within or adjacent to the Site obtained from DataMapWales. Records of protected and notable species within 2 km of the Site obtained from Aderyn.

Table A1: Designated Nature Conservation Sites Located within the Study Area

Designated Site	Distance and Direction from the proposed Substation/Proposed Cable Route	Reason for Designation
Internationally Designated Statutory Nature Conservation Sites		
Kenfig/ Cynffig SAC	Located around 2 km south of the cable route and 2.5 km south of the substation.	Annex I habitats that are a primary reason for designation include: • 2130 Fixed coastal dunes with herbaceous vegetation *Priority feature • 2170 Dunes with *Salix repens ssp. Argentea* (Salicion arenariae) • 2190 Humid dune slacks • 3140 Hard oligo mesotrophic waters with benthic vegetation of *Chara* spp. Annex I habitats present as a qualifying feature: • 1330 Atlantic salt meadows (Glauco- Puccinellietalia maritimae) Annex II species that a primary reason for designation include:

Reference: Margam

Designated Site	Distance and Direction from the proposed Substation/Proposed Cable Route	Reason for Designation
		• 1395 Petalwort *Petalophyllum ralfsii* • 1903 Fen orchid *Liparis loeselii*
Glaswelltiroedd Cefn Cribwr / Cefn Cribwr Grasslands SAC	Collection of sites located south and south east, with the closest 6.7 km from the Substation and 6.1km from the cable route.	Annex I habitats that are a primary reason for designation include: • 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae). Annex II species that a primary reason for designation include: • 1065 Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*
Crymlyn Bog / Cors Crymlyn SAC	Located approximately 10 km north of the substation and cabling route.	Annex I habitats that are a primary reason for designation include: • 7140 Transition mires and quaking bogs • 7210 Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae *Priority feature Annex I habitats present as a qualifying feature: • 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) *Priority feature
Crymlyn Bog Ramsar	Located approximately 10 km north of substation and cabling route.	Largest example of valley floodplain topogenous mire in South Wales, and one of the largest surviving fens in the west of Britain. Very few other sites are known to support a comparable complexity and diversity of vegetation. Habitats Directive Annex I features present on the SAC include: • H7140 Transition mires and quaking bogs • H7210 Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae • H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* Supports a substantial population of the nationally-rare slender cotton-grass *Eriophorum gracile*, and a rich invertebrate fauna including many rare and highly localised species. The site supports 199 vascular plant species including 17 regionally-uncommon and one nationally rare.
Nationally Designated Statutory Nature Conservation Sites		
Eglwys Nunydd Reservoir SSSI	Located 0.08 km south of the cable route and 0.7 km south of the substation.	The largest sheet of fresh water in the county. On the site of Margam Moors which, before being reclaimed for the Abbey Steel Works, were a notable site for wildfowl. The reservoir attracts large numbers of wintering waterfowl and passage migrants. Notable species including great crested grebe *Podiceps cristatus*, little grebe *Tachybaptus ruficollis*, mallard *Anas platyrhynchos*, gadwall *Anas strepera* and coot *Fulica atra* now breed.
Margam Moors SSSI	Located adjacent to part of the cable route and 0.7 km south of the substation.	The last remaining example of the once extensive coastal levels in West Glamorgan. Bounded to the seaward by dunes and to landward by high ground, the meadows provide an agriculturally-managed freshwater habitat which hosts many species of plant on the edge of their geographical range, and nationally important invertebrates. Mesotrophic marsh, fen meadow and ditch communities support flowering-rush *Butomus umbellatus*, frogbit *Hydrocharis morsus-ranae*, arrowhead *Sagittaria sagittifolia*, cyperus sedge *Carex pseudocyperus* and brown sedge *C. disticha* on the edge of their

Reference: Margam

Designated Site	Distance and Direction from the proposed Substation/Proposed Cable Route	Reason for Designation
		range, with others such as lesser water-plantain *Baldellia ranunculoides*, tubular water-dropwort *Oenanthe fistulosa* and marsh helleborine *Epipactis palustris* of local interest. The nationally rare beetle *Haliplus mucronatus*, the dragonfly *Sympetrum sanguineum* the regionally rare beetle *Anacaena bipustulata*, and the water-bug *Corixa panzeri* have all been found in the ditches.
Cynffig/ Kenfig SSSI	Located around 2 km south of the cable route and 2.5 km south of the substation.	Kenfig is of special interest for its extensive sand dune habitats and standing waters together with a mixture of associated coastal habitats including saltmarsh, intertidal areas, swamp, woodland and scrub. In addition, the site is of special interest for the assemblages of plants, fungi and invertebrates that are associated with the sand dunes and standing waters. The following individual species are also of special interest: petalwort *Petalophyllum ralfsii*, the medicinal leech *Hirudo medicinalis*, the fen orchid *Liparis loeselii*, the shrill carder bee *Bombus sylvarum*, the hairy dragonfly *Brachytron pratense* and a weevil *Pachytychius quinquepunctatus*.
Kenfig Pools and Dunes NNR	Located around 2 km south of the cable route and 2.5 km south of the substation.	Sand-dune reserve, with plants including fen orchids, birds and insects. Glamorgan's largest natural lake, Kenfig Pool, is set on the edge of the reserve with spectacular views across Swansea Bay to the Gower. The reserve is left over from a huge, rolling dune system that once stretched from the Ogmore estuary to the Gower Peninsular.
Locally Designated Statutory Nature Conservation Sites		
Kenfig Pools and Dunes LNR	Located around 2 km south of the cable route and 2.5 km south of the substation.	As above for NNR
Locally Designated Non-Statutory Nature Conservation Sites		
Junction 38 Wetland Complex SINC	The substation and part of the cable route are proposed within the SINC.	Reason for selection: • H1:3 Native woodland • H9:2 Lowland Fen • H9:3 Purple moor-grass and rush pastures Important species noted include: water vole, otter, grass snake *Natrix helvetica*, common lizard *Zootoca vivipara*, reed bunting *Emberiza schoeniclus* and Cetti's warbler *Cettia cetti*.
Eglwys Nunydd SINC	Located adjacent to the cable route and c.0.5km south of the proposed substation.	Reason for selection: • H9:4 Reedbeds • H13:4 Eutrophic standing waters • S2 Bird Additional qualifying features include: • H1:3 Native woodland • H1:4 Scrub communities

Reference: Margam

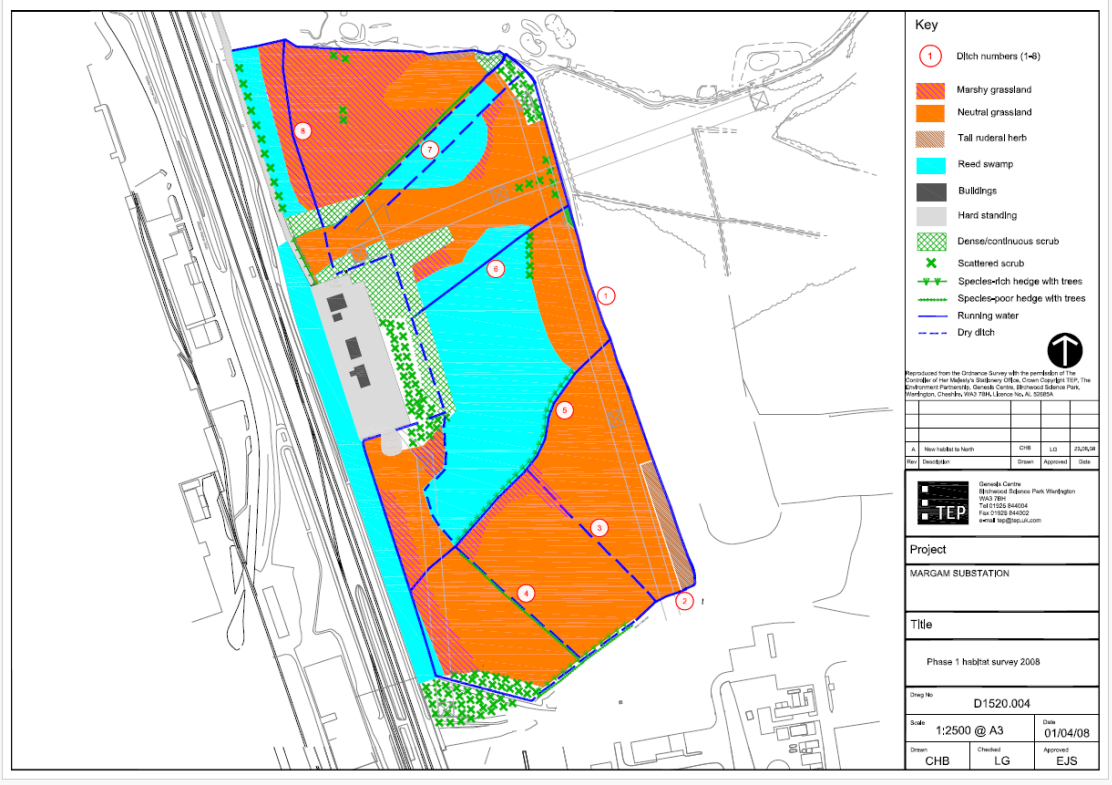
Designated Site	Distance and Direction from the proposed Substation/Proposed Cable Route	Reason for Designation
		• H9:2 Lowland Fen Important species noted include: barn owl *Tyto alba* and Cetti's warbler.
Margam Country Park SINC	Located approximately 0.8 km east of cable route and substation.	Reason for selection: • H1:2 Wood pasture and parkland • H13:2 Ponds • H16 Mosaic habitats (marshy grassland, woodland, scrub and neutral grassland) • S1 Mammals – bat roosts of 14 species. Important species noted include: lesser horseshoe *Rhinolophus hipposideros*, greater horseshoe *Rhinolophus ferrumequinum*, barbastelle *Barbastella barbastellus*, brown hare *Lepus europaeus* and adder *Vipera berus*.

Reference: Margam

ANNEX 2

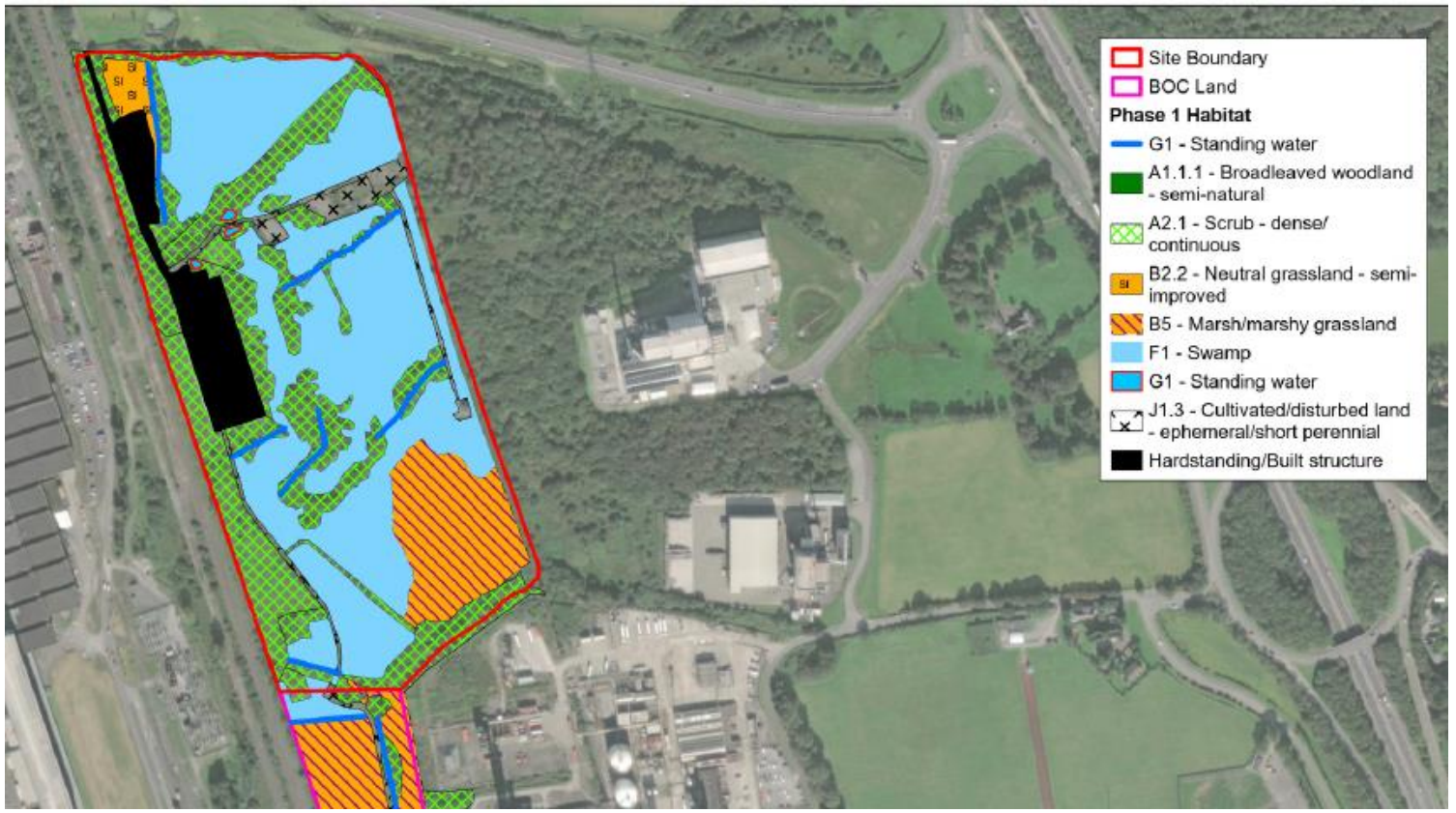
Habitat Changes in the Site (Substation Area) 2008-2024

Phase 1 Habitat Survey, 2008



Reference: Margam

Phase 1 Habitat Survey, 2024



Reference: Margam

ANNEX 3

Ecological Survey Work Undertaken/Being Undertaken in 2024-2025

Table A.3: Survey Areas, Scope, Limitations and Summary Results – 2024 and Update Survey Work Planned 2025.

Ecological Feature	Survey Area[10]	Survey Scope, Limitations and Summary Results up to November 2024	Further Update Survey Work 2025 Agreed with NPT 6th Feb 2025
Habitats	National Grid and BOC Land	Habitats have been mapped using the UKHab 2 Classification and Phase 1 Habitat Survey classification. Surveys were undertaken in March, June and November 2024, relating to land access restrictions to particular parts of the survey area and with a view to checking points relating to the UKHab 2 classification vs the Phase 1 Habitat Survey Classification. Habitat survey results are summarised in the main body of this Technical Note. Priority Habitats and complex of habitats likely of County Value.	National Vegetation Classification (NVC) survey of swamp habitats and adjacent marshy grassland within the Site in June 2025, to inform Ongoing site management and monitoring. Note the area of most potential botanical interest within the National Grid land falls mostly outside of the development footprint and its associated temporary works areas.
Breeding birds	National Grid	The survey was undertaken with reference to the Bird Survey Guidelines (Bird Survey & Assessment Steering Group (2022)). Six visits were undertaken between 10th June 2024 and 10th July 2024. All adult birds encountered were recorded while walking a single transect across the survey area at a slow and steady pace. Where possible, the following details were recorded: bird numbers, species, age and sex, habitat associations and bird behaviour. Registrations (either by sight or by sound) of birds were assessed to confirm their breeding status, these were categorised into four sections as defined by the European Ornithological Atlas Committee (now the	No further surveys planned in 2025, other than where ECOW support is required for the "Early Works" being implemented within the Site in Spring 2025 through National Grid PD rights.

[10] "National Grid Land" is the land owned by National Grid and the site of the proposed substation extension. "BOC Land" is the land south of the National Grid Land and the site of the proposed cabling route and associated working areas. NPT agreed that TataSteel surveys (Tatasteel surveys commenced in autumn/winter 2021 with majority of surveys undertaken 2022-2023, some completed in 2024). remain sufficient for assessment purposes (with the exception of badger – subject to pre-construction/works surveys only).

Reference: Margam

Ecological Feature	Survey Area[10]	Survey Scope, Limitations and Summary Results up to November 2024	Further Update Survey Work 2025 Agreed with NPT 6th Feb 2025
		European Bird Census Council). Birds were recorded using the British Trust for Ornithology (BTO) codes. Surveys avoided poor weather conditions where heavy wind, rain and fog etc. might reduce bird detectability. Due to land access permission restrictions, the surveys could not be completed when first proposed and the schedule of the surveys were condensed. There is the potential that some breeding bird species were missed during the survey, for example having completed breeding earlier in the year. However, taking into account desk study results and results of surveys undertaken by TataSteel of land adjacent to the site, the survey data is considered sufficient to enable an evaluation of the breeding bird assemblage (Local value). Similarly, the evaluation of the assemblage of breeding birds within the BOC land is considered likely to be similar to that recorded in the National Grid land due to the transition of habitat types from those within the National Grid land to those in the south of the BOC land but the two parcels of land effectively together form a wetland complex.	
Water vole and otter	National Grid landholding May 2024; National Grid and BOC land September 2024.	The water vole survey was undertaken with reference to the CIEEM guidance and good practice guidance (Dean *et al.*. 2016). Observations of otter activity were undertaken at the same time. The survey included a habitat suitability assessment and walkover search for water vole signs (burrows, latrines, feeding signs) and signs of otter (holts, feeding signs, spraint, footprints). The habitat suitability assessment for water vole included identification of water depth, flow, degree of vegetation growth (within and around the channel) and presence of foraging resources. The walkover search was undertaken on all banks and within the waterbody, where safe to do so. The survey recorded all evidence of activity, using field Maps GIS software and photographs. Several of the ditches on the Site were heavily overgrown with scrub or trees and therefore could not be accessed. Where possible, inspections from the bank were carried out at these locations. The second survey was undertaken following a	Given BOC land was only surveyed in autumn 2025, follow-up survey to be undertaken in BOC land in spring 2025.

Reference: Margam

Ecological Feature	Survey Area[10]	Survey Scope, Limitations and Summary Results up to November 2024	Further Update Survey Work 2025 Agreed with NPT 6th Feb 2025
		period of rainfall which means that signs may have been washed away. However, this survey identified likely burrows not identified in previous surveys and the low evidence of water vole activity was consistent with previous survey results (National Grid, 2009), indicating a low population of water vole within the National Grid land. No evidence of otter was identified during the surveys.	
Bats	National Grid and BOC Land	The PEA screened out the need for bat surveys on basis of lack of potential roosting features and small permanent land-take. The PEA acknowledged the need to consider foraging/commuting indirect effects in scheme design (especially with regard to lighting)	NPT require Night-time Bat Walkover and static surveys – April and May 2025 initially to be reviewed with NPT to determine the need to continue with the activity surveys, or reasonable to infer evaluation of the Site to bat populations from the first set of survey data. Note the implications of Early Works and need to devise NBW and static survey positions accordingly was also discussed with NPT, with agreement that value for the Early Works area could be inferred from survey work undertaken across the wider Site. Update/check of ground level tree assessment (GLTA) and building assessment Feb/March 2025 also being undertaken.
Badger	National Grid and BOC Land	No evidence of use of the Site by Badger was identified during the PEA survey.	Pre-construction check for badger activity recommended given recording of badger in TataSteel Land previously.
Great crested newt	Accessible water bodies within National Grid landholding (May 2024) and accessible water bodies in National Grid and BOC land (September 2024)	Samples were collected from three ponds and four ditches within the Site for eDNA analysis on 23rd May 2024 and 24th May 2024, during the peak GCN eDNA survey season. A further seven ditches were surveyed on 24th September 2024 within the BOC land, following access being granted, and were assessed using the GCN Habitat Suitability Index (HSI) assessment method. In addition, a further two ponds within the Tata Steel golf course to the north of the Site were assessed using the GCN HSI assessment method, based on observations from adjacent land. The eDNA results from the seven waterbodies sampled within the Site determined likely absence of GCN based on negative eDNA returns. The seven ditches within BOC land subject to HSI assessment concluded Below Average and Poor suitability scores for GCN. The two ponds located within the Tata Steel	Follow-up eDNA surveys of water bodies in BOC land and those within 250m of Site, where access is secured, to provide additional confidence in negative results so far.

Reference: Margam

Ecological Feature	Survey Area[10]	Survey Scope, Limitations and Summary Results up to November 2024	Further Update Survey Work 2025 Agreed with NPT 6th Feb 2025
		golf course to the north of the Site concluded Good and Average suitability for GCN. However, taking into account the negative eDNA survey results and the below average and poor suitability scores for water bodies within the Site and BOC Land, along with historical survey data for the Site (submitted with the 2009 planning application) also recording "likely absence" for GCN, and recent survey work undertaken on behalf of Tata Steel on land adjacent to the Site also recording "likely absence" for GCN, it is considered that GCN are likely absent from the Site and BOC land.	
Reptiles	National Grid and BOC land	The reptile surveys were undertaken with reference to good practice guidance, including the Reptile Survey Guidance (Froglife, 1999), the Herpetofauna Workers' Manual (Gent & Gibson, 2003). 142 reptile mats were deployed in September 2024, with seven survey visits undertaken through October (4th-31st) in suitable weather conditions. The surveys recorded a peak count of two common lizard recorded on BOC land and one common lizard on National Grid land. This would typically equate to a low population of common lizard; however, due to survey limitations late season survey, combined with a review of the results from the desk study, this is considered likely an underestimation of population density for common lizard and it is likely that other common reptile species such as grass snake and slow worm, are also present within the Site boundary. NPT recommend assuming an exceptional population of reptiles is present in the absence of survey data from the core reptile survey season.	Update reptile surveys required by NPT in core season (April/May 2025) for NG and BOC land. Note that the surveys will take place outside the area proposed for the Early Works – associated with the water vole licensed works. Reptile Mitigation Strategy has been devised separately for the Early Works area (see Annex 4).
Invertebrates	All land within National Grid and BOC land	The Habitat survey determined that the habitats within the site remained a wetland complex – albeit with less diversity of habitats that during prior surveys. It was proposed in the PEA that this supported a view that the Site remained of importance for its invertebrate assemblage.	NPT require some update invertebrate surveys to be undertaken. It was agreed that scoping/update survey for invertebrates will be undertaken in Spring 2025 by invertebrate specialist, with a view to determining if further invertebrate surveys are required to inform an evaluation of the site with respect to its invertebrate assemblage.

Reference: Margam

Ecological Feature	Survey Area[10]	Survey Scope, Limitations and Summary Results up to November 2024	Further Update Survey Work 2025 Agreed with NPT 6th Feb 2025
Fish and Eels	All land within National Grid and BOC land	Habitat survey determined that the Upper Mother Ditch was the ditch that provided the most potential to support fish and eels. (Note no direct impacts on the Upper Mother ditch from proposed development but enhancement works are planned to this ditch for the benefit of water vole).	No further survey for fish and eels required. However, Precautionary Method of Work (PMW) with respect to avoiding pollution to Upper Mother Ditch and in the event fish/eels are found within works areas was agreed with NPT.
Wintering birds	All land within National Grid and BOC land	Surveys (6 visits spread evenly across the survey period) have been undertaken by RSK October 2024– February 2025, employing a walked transect methodology to record bird species present.	No further surveys planned; report not yet received from RSK but discussion of the results with the RSK team have confirmed that no bird species associated with statutory designated sites were identified. Cetti's warbler were recorded resident.

Annex 4

Summary Avoidance, Mitigation, Compensation and Net Biodiversity Benefit Considerations

The Siting Study provides a detailed review and rationale for the selection of the site for the Margam Substation (Stantec, 2025).

The design for the substation has considered various iterations of substation design and temporary construction footprints; this has resulted in the footprint of the proposed development within the Site being minimised as much as possible. The Contractor, Laing O Rourke, is also committed to continue to work to further reduce and minimise impacts within the Temporary Works areas indicated on current plans (see current sketch plan from Contractor drawing reference: MARPT-LOR-XX-XX-DR-R-090002 P01).

Table A4.1: Summary Avoidance, Mitigation and Compensation and Net Biodiversity Benefit Considerations.

Ecological Feature	**Summary Anticipated Avoidance, Mitigation and Compensation Measures and Net Biodiversity Benefit Considerations.**
Designated Sites outside of the Development Footprint	Avoid and mitigate for impacts through environmental protection measures to be described in detail in the Construction Environmental Management Plan and through scheme design. Including consideration of: noise and air quality impacts, impacts on hydrology and need to avoid prevention of accidental spillage or dust accumulations during construction or operation. Habitat enhancement measures under consideration (subject to agreement with relevant parties) includes enhancement to area of Margam Moors SSSI not under current active management (see below).
SINC and Habitats	As discussed above, the design for the substation has considered various iterations of substation design and temporary construction footprints; this has resulted in the footprint of the proposed development within the Site (and direct impacts on the SINC) being minimised as much as possible. The Contractor, Laing O Rourke, is also committed to continue to work to further reduce and minimise impacts within the Temporary Works areas indicated on current plans (see current sketch plan from Contractor below). Pending confirmation of footprint of permanent and temporary works and taking account of the current estimated 1.35ha permanent loss of SINC (mostly reedbed and willow scrub) habitats, there will also be temporary works impacts including approx. 2.16ha total of temporary impacts divided between the 6 HDD compounds. Furthermore, there will be temporary impacts from the four open-cut section of the cable route, with a total length of approximately 1,350m. These include:

Ecological Feature	Summary Anticipated Avoidance, Mitigation and Compensation Measures and Net Biodiversity Benefit Considerations.
	1. A ~200m section at Margam Substation (through the Junction 38 Wetland Complex); 2. A ~150m section between the two HDD drilling platforms east of the railway line; 3. A ~900m section between the two HDD drilling platforms west of the railway line; 4. A ~100m section at Port Talbot Steelworks. The habitat mitigation, compensation and enhancement strategy, including delivery of Net Benefits for impacts on the SINC and its associated habitats includes the following: 1. Restoration of habitats within Temporary Works areas and along the open cut sections of the cable route following completion of works, following Landscape and Habitat Strategy Plan relevant to the section of the Proposed Development. Landscape and Habitat Strategy Plan to also include delivery of positive measures within National Grid land which could include such measures as bat boxes, reptile refugia/hibernacula, Gabion basket "CO2 garden" made from clean slag and incorporating invertebrate "bee bricks", wildlife tower provision. 2. Positive management of the National Grid Land, following completion of works and delivery of the Landscape and Habitat Strategy Plan to enable delivery of biodiversity benefit, with reference to the SINC designation and local biodiversity priorities, as agreed with NPT. The management to be implemented will need to acknowledge and take into account potential future operational requirements within National Grid land and will be described in a Landscape and Habitat Management Plan. 3. Given the permanent loss of SINC area to the substation and that wider ecologically positive measures cannot be delivered within the BOC land, due to access agreements, off-site options for biodiversity measures, to enable net biodiversity benefit, have been sought. A parcel of land owned by Tata Steel UK Ltd (Margam Burrows) has been identified by local specialist, Celtic Wildflower's ecologist, Barry Stewart which has been offered to National Grid by TataSteel to use for compensation and Net Biodiversity Benefit delivery. This comprises an of existing dune habitats adjacent to the Margam Moors SSSI, in addition to part of the Margam Moors SSSI not currently in active management. The dune habitats have the potential to be enhanced e.g. through the creation of dune slacks, control of trees and scrub invading dune habitats and opening up of the dune frontage to create mobility/open sand habitats in the dune. For the section within the Margam Moors SSSI, this is a continuation of the grey dune which transitions to the Coastal Grazing Marsh for which the SSSI is

Ecological Feature	Summary Anticipated Avoidance, Mitigation and Compensation Measures and Net Biodiversity Benefit Considerations.
	designated. Management of this area through rotational scrub management will contribute to maintaining and enhancing the ecological value of this area which is not currently in active management. These measures have been discussed and agreed in principle with Natural Resources Wales and will be subject to a Biodiversity Management Plan which will be an adaptive management and monitoring plan to be agreed with NPT and all relevant stakeholders. A sketch of the area described is provided in Sketch Plan AS1 below. It is anticipated that the Landscape Habitat Management Plan for the National Grid Land and the Biodiversity Management Plan for Margam Burrows will be agreed with relevant parties (NPT, NRW, TataSteel, local Ecology Specialists), and secured by appropriate planning mechanism (such as through Condition and Section 106 agreement).
Birds	**Birds**: Avoidance relates primarily to the timing of works to avoid habitat clearance during the bird-breeding season (March-August inclusive, as a guide), noting particularly that the Schedule 1 bird species Cetti's warbler is present within the site and receives additional protection compared to other breeding birds. Where avoidance of the bird breeding season is not possible then a watching brief by a suitably qualified ecologist is required for all clearance works. In the event that a nesting bird is present (or in the case of Cetti's evidence of nest building activity) then a suitable stand-off for works is to be agreed and the nest monitored by the ecologist until the bird has fledged and works can continue. Mitigation, compensation and enhancement measures for birds pertaining to the habitats they use and the maintenance of opportunities for the breeding bird population relates to the ongoing management of habitats for birds which will be included as a consideration in the Landscape and Habitat Management Plan for the Site and in the Biodiversity Management Plan for the off-site compensation and enhancement area at Margam Burrows. This will take account of NPTs function to demonstrate they need to consider the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the UK (Conservation of Habitats and Species Regulations, 2017, as amended (Reg. 10(3)), as part of their decision-making process
Invertebrates	**Invertebrates –** Avoidance measures relate mainly to the approach to the design and the construction that minimise the footprint of the works and therefore permanent and temporary losses of habitat for invertebrates. Mitigation, compensation and net benefit measures will relate to the consideration of

Ecological Feature	Summary Anticipated Avoidance, Mitigation and Compensation Measures and Net Biodiversity Benefit Considerations.
	invertebrate requirements in the Landscape and Habitat Management Plan for the Site and the Biodiversity Management Plan for the off-site area at Margam Burrows, including measures such as the Gabion basket "CO2 garden" made from clean slag and incorporating invertebrate "bee bricks".
Water Vole	**Water vole:** Signs of likely water vole activity were identified within the Proposed Development footprint within the National Grid land during the survey work undertaken in 2024. This is consistent with previous records of water from this land and associated with the Upper Mother Ditch. A package of Early Works is being undertaken under National Grid's permitted development rights for operational works, for the purposes of water vole conservation within the National Grid land. This includes translocation of water voles and management of ditch habitats within the National Grid Land to provide enhanced habitat opportunities for Water Vole. National Grid submitted a Water Vole Licence Application to NRW which was approved by NRW in February 2025. Works to implement this licence began in early March 2025. The nature of the Early Works includes installation of water vole exclusion fencing around the perimeter of the Early Works area and above-ground clearance works to facilitate the capture of water voles. Given the findings of other survey work, the Water Vole Licenced Works implementation also needs to take account of the potential presence of breeding birds and reptiles (see above for breeding birds and below for reptiles). A copy of the Water Vole Method Statement Approved by NRW has been provided to NPT, along with a copy of the licence and associated conditions issued by NRW by National Grid.
Reptiles	**Reptiles –** During the Early Works, specifically the water vole capture exercise, there is a potential for these works to also affect reptiles, albeit the numbers within the Early Works area are anticipated to be low, given the dominance of reedbed monoculture and willow scrub within the Early Works area. A reptile translocation from the water vole exclusion area will take place in parallel with the water vole capture

Ecological Feature	Summary Anticipated Avoidance, Mitigation and Compensation Measures and Net Biodiversity Benefit Considerations.
	exercise. Reptiles will be captured and moved out of the water vole exclusion area into the surrounding National Grid landholding. The initial above-ground clearance would largely avoid any interface with potentially hibernating reptiles; the water vole fencing would need to be installed with Ecological Clerk of Works and using machinery with minimum disturbance footprint to avoid impact on hibernating reptiles. It was agreed with NPT that the Contractor would put in place enhancements for reptiles (2 x hibernacula) within the wider NG landholding outside the water vole/reptile exclusion area to increase carrying capacity within the wider landholding for reptiles and allow the reptiles to be translocated outside of the Early Works area into the wider NG landholding in spring 2025. This is considered sufficient given the nature of the habitats within the area subject to translocation and anticipated likely low number of reptile captures. Reptile captures will be kept under review and will be reported to NPT as captures progress, to determine number of capture days required. Low reptile capture numbers within the Early Works area are anticipated due to the nature of the habitats in this footprint (the majority being reedbed monoculture and willow scrub which is not habitat suitable to support an exceptional reptile population). In the absence of survey data from the core season, NPT require the reptile mitigation strategy for the Proposed Development to be progressed based an assumption of an exceptional population of reptiles being present within the remainder of the Site. An update survey for reptiles is being undertaken within the National Grid and BOC land in spring 2025. Meanwhile, preparations are being made to enable translocation of reptiles from the Proposed Development site to outside of the National Grid landholding, should the 2025 reptile survey confirm a good or exceptional population of reptiles. Receptor sites under consideration include Margam Moors SSSI, which has been discussed and agreed in principle with NRW, subject to agreement on details. Translocation of reptiles into this area would require delivery of measures to increase capacity such as consideration of availability of areas for foraging and shelter/hibernation e.g. through provision of edge habitats, connectivity and refugia/hibernacula.

Reference: Margam

Ecological Feature	**Summary Anticipated Avoidance, Mitigation and Compensation Measures and Net Biodiversity Benefit Considerations.**
Great Crested Newts	No constraints identified for great crested newts so far associated with the Proposed Development (all eDNA surveys negative and no known records nearby). It is noted that Great Crested Newts have been recorded in an existing dune slack at the Margam Burrows site proposed for off-site compensation (as described in the habitats section above) therefore the need for Precautionary Method of Work and/or Licensing for the habitat creation and management works will be discussed with NRW.
Bats	**Bats –** no roosting constraints identified so far. The anticipated measures for bats are therefore linked primarily linked to minimising impacts on foraging/commuting habitat during construction (e.g. by minimising the footprint of the working areas and minimising impacts from construction lighting). Furthermore, habitat provision post-development for bats will be considered (maintaining/enhancing foraging/commuting opportunities, lighting considerations) and potential enhancement which could include enhancing roosting provision for bats within the Site and/or surrounding area e.g. through the provision of bat boxes on trees, or through features such as a wildlife tower.
Fish/eels	**Fish/eels:** Fish populations are most likely focussed on Upper Mother Ditch (not directly affected by works). Eels passage not affected by works. Pollution prevention measures within CEMP (Laing O Rourke, 2024) and Water Management Plan (Laing O Rourke, 2025), along with Precautionary Method of Works (PMW) for Fish Rescue where works affect ditches potentially suitable for fish/eels. A PMW for fish/eels has been shared with NPT relating to the Early Works being undertaken under National Grid's permitted development rights for operational works for water vole conservation (as described above); the PMW for fish/eels has been prepared to ensure potential impacts to fish (which may be present within the ditches earmarked for habitat enhancement) are adequately mitigated. It is anticipated this approach will be extended to cover where ditches suitable for fish/eels are affected by the Proposed Development.

It is noted that the Net Biodiversity Benefit delivery is not just about ecological benefits and therefore the Green Infrastructure Strategy to be submitted with the planning application will also necessarily recognise and describe wider environmental and social benefits such as carbon sequestration, climate resilience etc, as required by Planning Policy Wales.

Reference: Margam



Sketch Plan AS1 showing proposed potential compensation and enhancement area within TataSteel Land approx. 4.8ha total black-hatched area. Pink wash shows the Margam Moors SSSI (~1.25ha of the 4.8ha falls outside SSSI boundary). (Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community. Contains Natural Resources Wales information. Powered by Esri)

Technical Note 6.3

To:	National Grid	From:	Hydrology and Flood Risk Click or tap here to enter text.
Project/File:	Margam Port Talbot	Date:	27/03/2025

1 INTRODUCTION

1.1 This Technical Note has been prepared by Stantec UK Limited (Stantec) and provides information and assessment around potential constraints relating to hydrology and flood risk for the proposed extension to the Margam substation and underground cable route (the Proposed Development') at Margam, Port Talbot, South Wales (the 'Site').

2 METHODOLOGY

2.1 This assessment is based on the site boundary for the proposed substation site and the preferred cable routing option (i.e. as shown in **Annex 1 to 3** as the Proposed Site Boundary), with the site boundary for the wider proposal shown in Figure 1 below. This assessment has been undertaken using freely available information only, including hydrological information provided by Natural Resources Wales (NRW). Furthermore, site specific flood level data from NRW, and results of any hydraulic modelling they have on record have been obtained from NRW through a data request.

2.2 A more detailed assessment into issues of flood risk has been carried out as part of a draft Flood Consequence Assessment (FCA) Report[1]. The FCA is informed by detailed fluvial flood level data (which has been provided by NRW, and outlined below). As National Grid requires that the development is not at risk of flooding in the 1 in 100 year + Climate Change event, one recommendation of the draft FCA is that a fluvial defence wall is constructed with a crest level at 5 m AOD in order to protect the substation from flooding in a 1 in 100 year + Climate Change event. Using the existing NRW modelling, this would result in displacement of floodplain storage, leading to a small increase in flood levels in undeveloped land in the vicinity of the site.

2.2.1 An enhanced hydrological model has been commissioned by National Grid, which will use newly commissioned site specific topographic data such as road levels and culvert dimensions. Details of this enhanced modelling will be confirmed in the final FCA, which will be submitted as the planning application of the substation is progressed.

2.3 A Drainage Strategy Statement has been produced[2], outlining how Sustainable Drainage features will be incorporated into the design, allowing for initial discussions to commence with the SuDS Approving Body (SAB). This document outlines that a more detailed Drainage Strategy Report will be produced in accordance with the requirements provided by the SAB.

2.4 A preliminary Hydrogeological Risk Assessment (HRA) Report[3] demonstrates that there are no significant hydrological or hydrogeological impacts associated with the planned trenching and ground stabilisation works, associated with the proposed cable route, and that any impacts of the proposed works on groundwater will be localised to the area of land immediately along the cable route and are not considered to be significant in planning terms.

[1] Margam Flood Consequence Assessment Report, Baker Hicks, Jan 2025
[2] Margam Drainage Report, Baker Hicks, Jan 2025
[3] Preliminary Hydrogeological Impact Assessment, Envireau Water, February 2025

3 SUBSTATION CONSTRAINTS

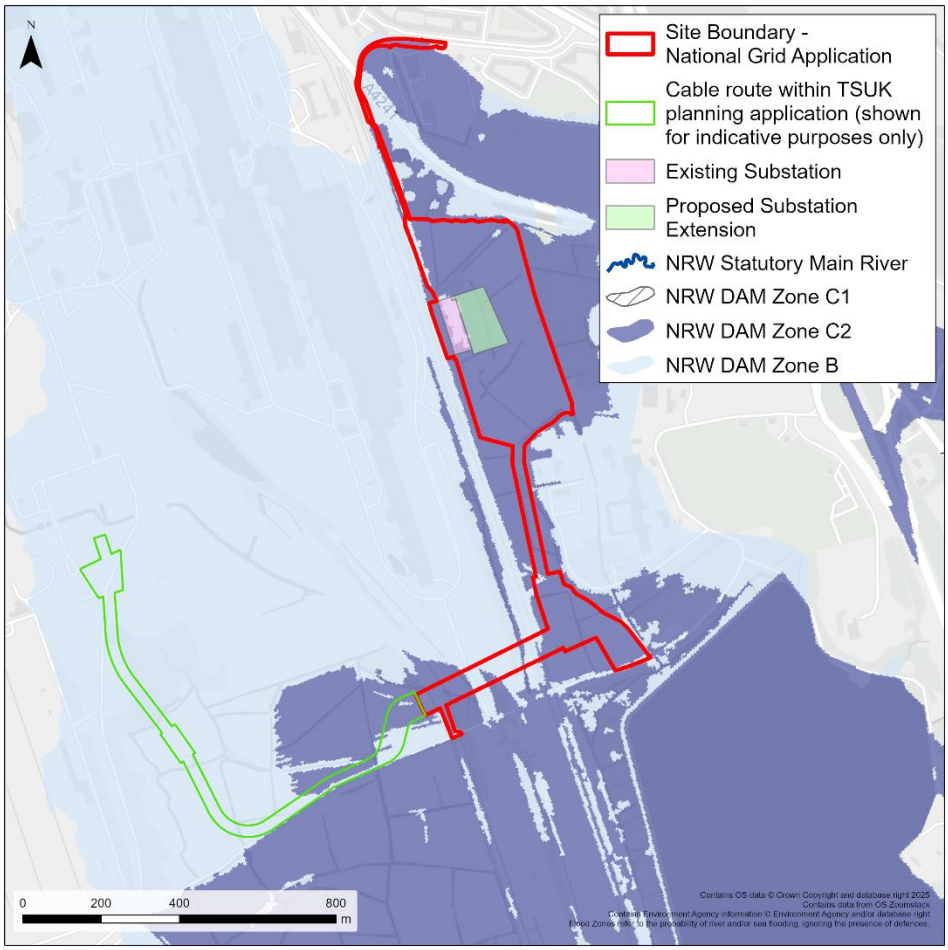
3.1 The proposed substation site is shown to be within Flood Zones 3 and 2 on the NRW Flood Map for Planning; Flood Zone 3 has a High Probability of flooding, whilst Flood Zone 2 has a Medium Probability of flooding, from both rivers and the sea (**Annex 1**). These zones are similar to Technical Advice Note (TAN) 15 Development Advice Map (DAM) Zone C2 (see Figure 1 below).

3.2 The proposed substation site is shown to be at risk of surface water flooding and from smaller watercourses. The site is Greenfield and shown to be traversed by a network of small field drains.

3.3 The site is not at risk of flooding from the sea (**Annex 3**).

3.4 The DAM indicates that the substation site is primarily in Zone C2, meaning that it does not benefit from defences (Figure 1).

Figure 1 Full site boundary and DAM Zones



3.5 The NRW flood level data will be used to ensure the resilient design of the substation over its intended design life, whilst taking climate change into account.

3.6 The Site is shown to be traversed by a network of local field drains. The development of the substation platform must ensure that the conveyance, flood risk, and existing habitat value of these watercourses is preserved.

3.7 The substation drainage system will need to be designed to not increase the rate of stormwater runoff or worsen the quality of runoff, so the site drainage system will need to be designed in line with Sustainable Drainage System (SuDS) principals and best practice. As the development area is >100m², the application will require approval from the SuDS Advisory Body (SAB) to ensure that the Proposed Development is designed and built in accordance with the national SuDS standards. The Drainage Report (2025) indicates how drainage is to be constructed at the proposed site, including through the use of a proposed detention basin to the north of the proposed substation site.

4 NRW FLUVIAL MODELLING RESULTS

4.1 Following a data request, NRW has provided the results of fluvial and tidal modelling carried out by JBA as part of the 2023 Margam Flood Map Challenge for Tata Steel;

4.2 Tidal modelling demonstrates that the proposed substation sites are not at risk of tidal flooding, as shown in NRW flood maps;

4.3 Fluvial modelling demonstrates that the Margam substation is at risk of flooding in the 1 in 1,000 year fluvial flood event (with and without Climate Change). The proposed substation Site is also at risk of flooding in the 1 in 100 year with Climate Change event. Flood extents and levels are demonstrated in Figure 2 and Figure 3.

Reference: Hydrology and Flood Risk

Figure 2 NRW Fluvial Flood Modelling Results - 1 in 100 year (uses year 2122 Climate Change epoch)

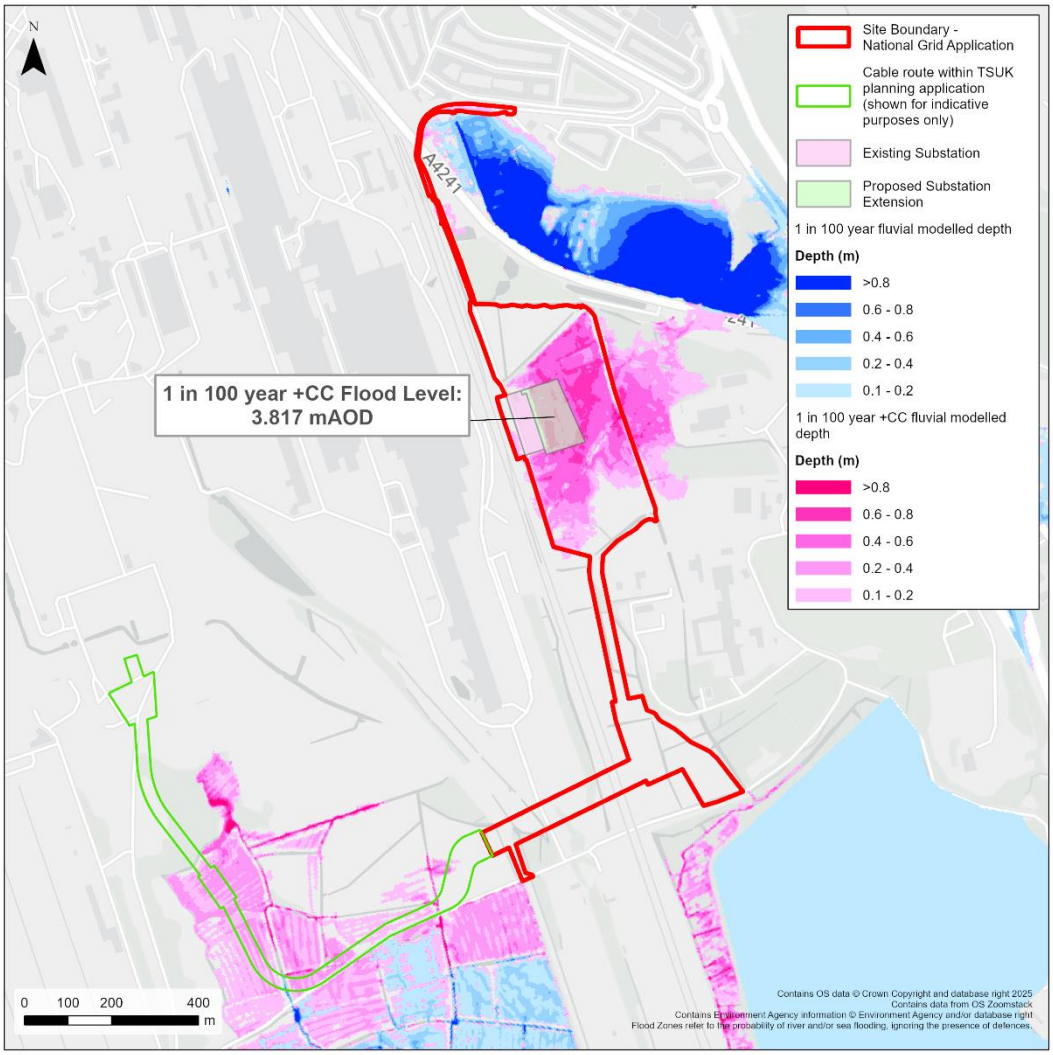
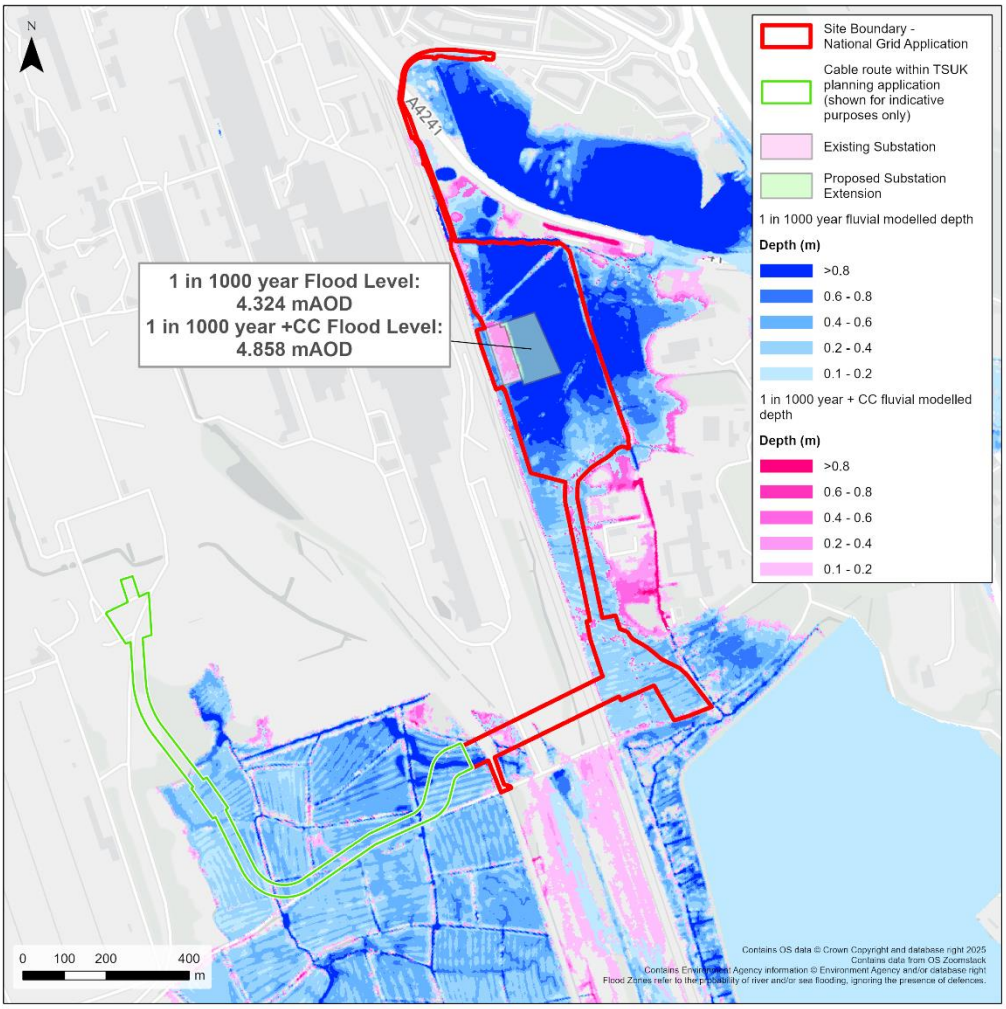


Figure 3 NRW Fluvial Flood Modelling Results - 1 in 1000 year (uses year 2122 Climate Change epoch)



4.4 The design of the substation and associated infrastructure would need to specifically consider a) loss of floodplain storage (and the associated provision of compensatory floodplain storage as required); b) measures to ensure that the conveyance, flood risk, and existing habitat value of local watercourses is preserved; c) pollution prevention and flood risk control measures during the construction phase; and d) an appropriate SuDS Strategy for the Site. The draft FCA (Jan 2025) and the Drainage Report (Jan 2025) address these issues, and recommends that the proposed substation site is defended through the inclusion of a 5.0 mAOD flood wall. Existing NRW modelling demonstrates that the floodplain displacement due to the inclusion of this wall will lead to a small increase in flood depths in the 1 in 100 year + Climate Change levels, which would affect undeveloped land in the vicinity of the site.

4.4.1 Further hydrological modelling has been commissioned by National Grid which includes site specific topographic data such as road levels and culvert dimensions. Details of this enhanced modelling will be confirmed in the final FCA, which will be submitted as the planning application of the substation is progressed.

4.5 The substation platform and associated infrastructure therefore has the potential to impact local water quality, conveyance, flood risk and watercourse habitat value, although it is expected that these impacts would be insignificant following the inclusion of industry-standard best practice mitigation measures.

5 CABLE ROUTE CONSTRAINTS

5.1 The cabling connecting the substation with the steel works will be placed underground and constructed through the use of a combination of open cut excavations and Horizontal Directional Drilling (HDD). Therefore, the proposed cable route will not be affected by, and will have no impact on, flood risk. There may be some above ground works necessary during the construction phase, and so it is recommended that the Construction Environmental Management Plan (CEMP) identifies the risk of flooding during the construction phase where these assets are located within land at risk of flooding.

6 MITIGATION

6.1 Mitigation measures for the risk of flooding from rivers have been outlined and assessed within the draft FCA (Jan 2025) and Drainage Strategy Statement (Jan 2025). This includes:

- Incorporating a flood defence wall at a level of 5 mAOD in order to ensure that the site is not at risk in the 1% AEP (100 year) event + Climate Change. This allows for a 300mm freeboard allowance
- Use of gravel compounds as permeable storm water runoff attenuation mechanism
- A detention basin to the north west which acts as the final attenuation mechanism before discharge at an attenuated rate via a HydroBrake flow control device
- Development of a Drainage Strategy Report in accordance with the requirements set out by the SAB

6.2 The FCA uses NRW fluvial modelling to demonstrate that the addition of a flood defence wall to protect the substation site in the 1% +Climate Change AEP would lead to a small increase peak flood level, which would impact some undeveloped third party land.

7 CONCLUSIONS

7.1 This Technical Note has outlined some of the basic hydrology and flood risk considerations for the Proposed Development. The Site is shown to be at risk of flooding from rivers, surface water and small watercourses, and is also shown to be within historical flood outlines. The site is not shown to be at risk of flooding from the sea.

7.2 Further site specific flood level data has been provided by NRW, and would be used to inform the substation design.

Annexes

Annex 1 - Flood Risk from Rivers, National Resources Wales Flood Map for Planning

Annex 2 - Flood Risk from Surface Water and Small Watercourses, National Resources Wales Flood Map for Planning

Annex 3 - Flood Risk from the Sea, National Resources Wales Flood Map for Planning

Stantec

Technical Note 6.3

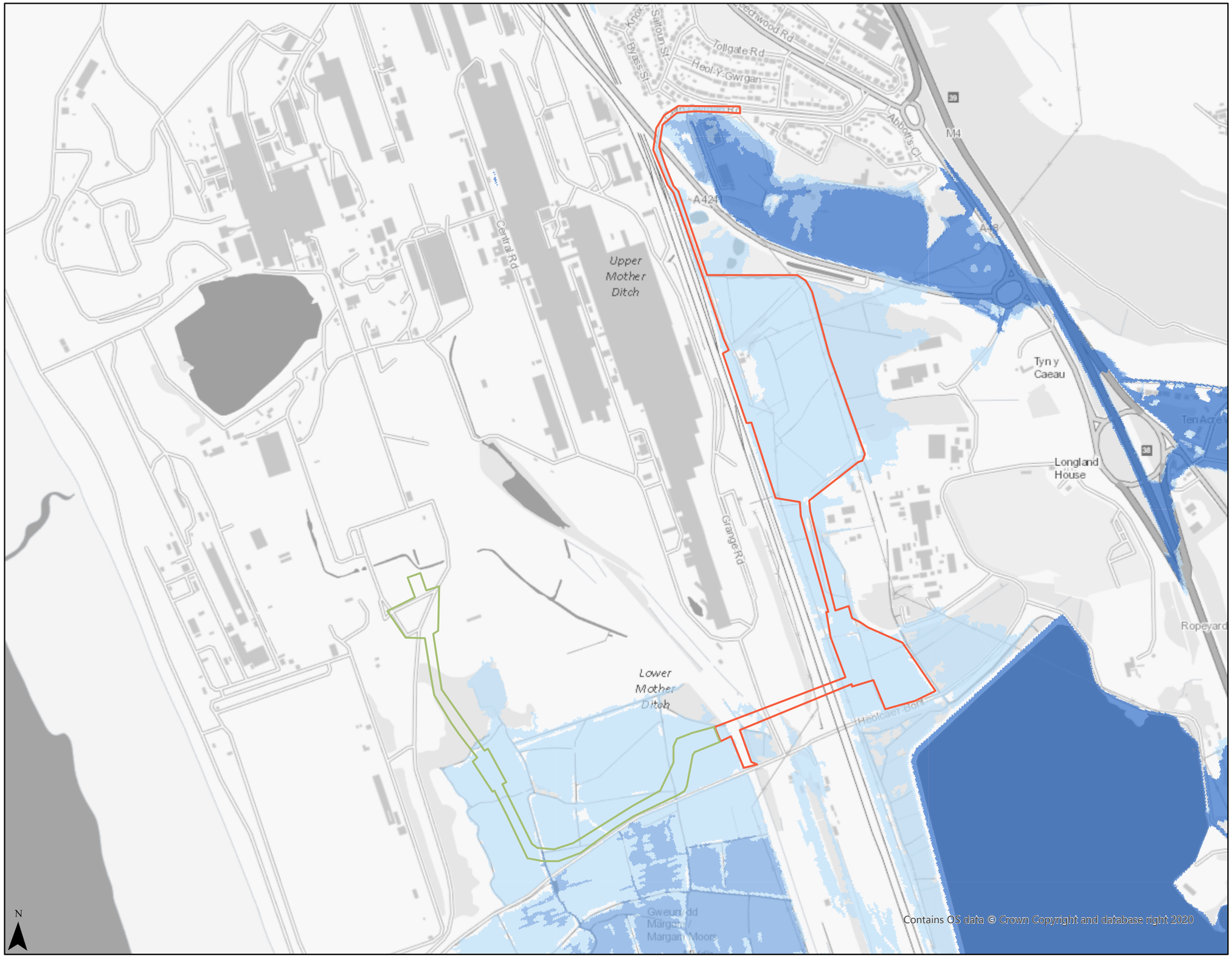
ANNEX 1

Flood Risk from Rivers, National Resources Wales Flood Map for Planning

Cyfoeth Naturiol Cymru
Natural Resources Wales

Flood Risk Maps

Flood Risk from Rivers



Legend

Flood Risk from Rivers

- High
- Medium
- Low
- Risk Level Under Review

Scale at A3: 1:10,000

Date: 01/05/2025

0.45 0.23 0 0.45

km

British National Grid

Disclaimer

https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en

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ANNEX 2

Flood Risk from Surface Water and Small Watercourses, National Resources Wales Flood Map for Planning

Cyfoeth Naturiol Cymru
Natural Resources Wales

Flood Risk Maps

Flood Risk from Surface Water



Legend

Flood Risk from Surface Water & Small Watercourses

- High
- Medium
- Low
- Risk Level Under Review

Scale at A3: 1:10,000

Date: 01/05/2025

0.45 0.23 0 0.45

km

British National Grid

Disclaimer

https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en

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ANNEX 3

Flood Risk from the Sea, National Resources Wales Flood Map for Planning

Cyfoeth Naturiol Cymru
Natural Resources Wales

Flood Risk Maps

Flood Risk from the Sea



Legend

Flood Risk from the Sea

- High
- Medium
- Low
- Risk Level Under Review

Scale at A3: 1:10,000

Date: 01/05/2025

0.45 0.23 0 0.45

km

British National Grid

Disclaimer

https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en

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Technical Note 6.4

To:	National Grid	From:	Cultural Heritage and Archaeology Click or tap here to enter text.
Project/File:	Margam Port Talbot	Date:	27/03/2025

1. INTRODUCTION

1.1 This Technical Note has been prepared by Stantec UK Limited (Stantec) and provides an overview of public domain evidence pertaining to historic environment assets relating to the proposed extension to the Margam substation and underground cable route (the Proposed Development') at Margam, Port Talbot, South Wales (the 'Site').

2. METHODOLOGY

1.2 While this Technical Note does not constitute a Historic Environment Desk-Based Assessment (HEDBA), consideration has been given to the content within Planning Policy Wales (Edition 11) (February 2021) and the following good practice and guidance documents:

- Chartered Institute for Archaeologists (CIfA) 'Standards and Guidance for Historic Environment Desk-Based Assessments (as revised 2020);
- CADW's 'Setting of Historic Assets in Wales (2017) Llwodraeth Cymru/ Welsh Government's Conservation Principles for the sustainable management of the historic environment in Wales (2011); and
- Llwodraeth Cymru / Welsh Government's Technical Advice Note (TAN) 24: The Historic Environment (May 2017)

1.3 Within this framework, this Technical Note presents a review of public domain heritage information (specifically excluding obtaining Historic Environment Record (HER) data) relating to designated assets or assets of similar value, and a review of public domain cartographic evidence to provide context to the above, in order to assess the relative merits of the preferred route option in the context of known historic environment assets (see **EIA Screening Report Figure 4**).

3. GENERAL SUMMARY

1.4 The Site comprises a low-lying area of pastureland, which is susceptible to waterlogging and lies at approximately 4 m Above Ordinance Datum (AOD).

1.5 The underlying geology of the Site is South Wales Middle Coal Measures Formation comprising Mudstone, Siltstone and Sandstone. A fault crosses the Site from its southeast corner to the northwest. The solid geology is overlain by superficial deposits of Tidal Flat Deposits comprising sand, silt and clay.

1.6 Geotechnical site investigations, including five boreholes and eight test pits, were carried out across the study site in November 2008 by Jacobs Engineering. Further investigations, comprising 12 boreholes and 20 test pits, were undertaken within Margam substation in August and September 2024 by Geotechnics Limited. These investigations confirm the presence of deposits of clay and silt overlying gravels, mudstone and coal. They also revealed the presence of peat deposits across most of the site. The top of the peat deposit varies between 0.66 m AOD and 2.77 m AOD (approximately 0.50 m to 2.4 m Below Ground Level (BGL)), although generally the top of the peat deposit is higher in the northern part of the study site than in the

south, including within the Margam substation site where peat deposits were recorded at 2.75m AOD (0.2 m BGL). The deposit varies in thickness from 0.3 m in the centre of the Site, 2.3 m in the south, to up to 4.7m at Margam substation..

1.7 The assessment has identified that the area occupied by the Site has a moderate potential for buried archaeological and paleoenvironmental remains to be present dating to the early Prehistoric period, with a low potential for remains of all other periods.

1.8 Such remains, if present, would be confined to the peat deposit identified by the geotechnical investigations. The boreholes and test pits indicate that the peat is closest to the surface along the northern edge of the Site where it is some 0.5 m to 0.8 m below the existing ground surface (TP06 and BH04). However, no piling is proposed for this area. At the site of the substation the top of the peat is deeper, some 1.5 m and 2.2 m below the existing ground surface (TP05 and BH03). Along the south side of the Site where the landing gantries will be, the top of the peat lies at c.1.95 m to 2.2 m below the existing ground surface (BH01, TP04 and TP07).

1.9 There is between 1.5 m and 2.2 m of deposits with low archaeological potential which could accommodate pile caps, ground beams and ground floor slab without directly impacting on any archaeological deposits.

4. SPECIFIC CONSTRAINTS

1.10 There are several high importance heritage assets in the surrounding area, which include Listed Buildings, Scheduled Monuments,a Grade I Registered Park and Garden and Registered Historic Landscapes (which are treated as equally important according to national policy). Given the existing modern activities in close proximity to this route, incremental change and therefore impact upon the setting of the Listed Buildings Scheduled Monuments, Registered Park and Garden and Registered Historic Landscapes is likely to be of no more than less than significant harm – if any – as a result of any groundworks and operation of the completed (reinstated) cable route and substation (which has also been assessed as being disturbed ground).

1.11 The route passes close to the recorded site of the small arms range – Lower Mother – at its southern extent. However, this is recorded by the Pillbox Study group as having been removed. Any remains are unlikely to survive to a high degree due to modern development and changes in land use.

5. MITIGATION

1.12 The content of a formal planning application submission would be subject to formal agreement with Heneb (GGAT region). However, it is anticipated that the content of the planning application would be:

- Historic Environment Desk-Based Assessment (HEDBA): a formally structured assessment to Chartered Institute for Archaeologist (CIfA) standards and guidelines to present and assess historic environment evidence.

- Pre-determination archaeological fieldwork: the form (and need) of this stage would be subject to the conclusions of the HEDBA and discussion with Heneb (GGAT), and could include archaeological monitoring of intrusive activities or trial trench evaluation

- Post-determination archaeological mitigation: the form (and need) of this stage would be subject to the conclusions of the HEDBA and discussion with Heneb (GGAT), and could include archaeological monitoring of construction related activities or specific areas of archaeological fieldwork prior to construction

6. CONCLUSIONS

1.13 In summary, the route reviewed does not represent or would result in a strong likelihood of unacceptable impacts to archaeological and heritage assets. While assets of local importance may be present, both professional judgement and the response from GGAT to the planning application for Margam National Grid Substation (dated c.2009) support the conclusion that mitigation can be established to minimise impacts to a level acceptable to the LPA.

Technical Note 6.5

To:	National Grid	From:	Ground Engineering Click or tap here to enter text.
Project/File:	Margam Port Talbot	Date:	18 March 2025

1 INTRODUCTION

1.1 This Technical Note has been prepared by Stantec UK Limited (Stantec) and provides information and assessment around potential geotechnical and geo-environmental constraints relating to the proposed extension to the Margam substation and underground cable route (the Proposed Development') at Margam, Port Talbot, South Wales (the 'Site').

2 METHODOLOGY

2.1 This assessment has been undertaken using site-specific desk study information and ground investigation data, where available, as well as freely available geological and historical information provided by the British Geological Survey (BGS) and the National Library of Scotland, respectively. In addition, aerial imagery provided by Google has been utilised.

2.2 This assessment has been undertaken in accordance with current guidance and best practice, including, but not limited to:

- Environment Agency guidance Land Contamination Risk Management (LCRM) (Environment Agency, 2020);
- BS 10175 (Investigation of potentially contaminated sites – code of practice) (British Standards Institution, 2011); and
- CIRIA C552 (Contaminated land risk assessment – a guide to good practice) (CIRIA, 2001).

3 SITE HISTORY

3.1 Earliest available mapping, dating from the 1870s, indicates most of the Site to be undeveloped as part of the Margam Moors, comprising fields separated by a network of drainage ditches. The Port Talbot Railway is shown in its current location. Morfa Colliery is shown approximately 160 m to the north of the Site (Baker Hicks Limited, 2024).

3.2 By the mid-1900s, the Site largely resembles its current appearance, with the Abbey Works (Steel) and associated railway sidings dominating the area. The Margam Substation area remains undeveloped. A coal depot is shown in the southwest of the Site. A disused rifle range (Lower Mother) is shown in the west of the Site.

4 PUBLISHED GEOLOGY

4.1 BGS information (BGS, 2024) (BGS, 1970) (BGS, 2011) indicates the Site to be underlain by bedrock deposits of the Carboniferous South Wales Lower and Middle Coal Measures Formations, which are described as grey coal-bearing mudstones and siltstones, with seatearths and minor sandstones. The coal measures are likely to be several hundred metres in thickness and dip by approximately 10° to the north-northeast.

4.2 The bedrock deposits are overlain by superficial Quaternary Tidal Flat Deposits, which are described as comprising a mix of clay, silt and sand, with layers of peat. 'Submerged forests' are also recorded. These deposits may be up to several metres in thickness.

4.3 Superficial Quaternary Blown Sand deposits are shown within approximately 100m of the western Site boundary, described as sand that has been transported by wind, or sand consisting predominantly of wind-borne particles.

4.4 Devensian Glaciofluvial ice contact deposits are recorded within approximately 100 m of the eastern Site boundary, which are described as sand and gravel.

4.5 The natural geology in the northwestern area of the proposed cable route is shown to be overlain by Landscaped Ground, described as an area where the land surface (natural or artificial) has been extensively remodelled, but where it is impracticable or impossible to delineate separate zones of Made Ground (described as an area where the pre-existing (natural or artificial) land surface is raised by artificial deposits), Worked Ground (described as an area where the land surface (natural or artificial) has been lowered as a result of man-made excavations), or Disturbed Ground (described as area of ill-defined surface disruption associated with surface or near-surface development or collapse). Landscaped Ground is also shown in the southeast of the route, at the location of the proposed cable route railway crossings.

4.6 The Site is shown to be underlain by several geological faults, including three thrust faults, one each beneath the southwestern and southeastern areas of the proposed cable route, and the Margam Substation area. The faults trend roughly west-northwest through east-southeast, with the hanging wall on the north-northeastern side. In addition, the Morfa Fault, a strike-slip fault trending roughly northwest through southeast, runs through the Site at the approximate location of the proposed cable route railway crossings. The faulting may have resulted in localised variation in ground and groundwater conditions.

4.7 The Site is also shown to be underlain by a number of inferred coal seams, likely worked as part of the Morfa Colliery located to the north of the Site, which operated between approximately 1849 and 1913 (Northern Mine Research Society, Undated). The colliery has three associated shafts; the Abbot Pit, formed of two adjacent shafts, is located approximately 250 m to the north of the proposed cable route. The Grange Pit, formed of a single shaft, is located some 500 m to the north of the proposed cable route. The presence of other, unrecorded, workings across the Site should be anticipated.

5 HYDROLOGY AND HYDROGEOLOGY

5.1 Surface water features across the Site and surrounding area generally comprise a series of interconnected drainage ditches, including the Mother Ditch system (comprising the Upper, Middle and Lower Mother Ditches). The Eglwys Nunydd Reservoir is located approximately 230 m to the southeast of the Site.

5.2 Based on the Site being relatively low-lying, at an elevation of approximately 5 m Above Ordnance Datum (AOD), groundwater is anticipated to be relatively shallow. The superficial deposits beneath the Site are classified as a Secondary Aquifer (Undifferentiated), described as aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type, with only a minor value. The bedrock deposits beneath the Site are classified as a Secondary A aquifer, described as comprising permeable layers that can support local water supplies, and may form an important source of base flow to rivers.

5.3 The Site is not located on or within 250 m of a Source Protection Zone (SPZ). Five groundwater abstraction points are present within 250 m of the Site, comprising three located approximately 85 m to the east of the proposed cable route, and a further two located approximately 235 m to the east of the proposed cable route, all associated with supplying process water to BOC Margram (Baker Hicks Limited, 2024) (Envireau Limited, 2025). The boreholes abstract from the superficial deposits and are located upgradient of the proposed cable route.

6 EXISTING GROUND INVESTIGATION INFORMATION

6.1 The area of the proposed Margam Substation was the subject of a ground investigation undertaken by Jacobs Engineering UK Limited (Jacobs) in November 2008 (Jacobs Engineering UK Limited, 2008), comprising five boreholes and eight trial pits. The ground conditions encountered generally comprised soft, locally firm or stiff, silt or clay with layers of peat to depths of between 3.75 m and 4 m Below Ground Level (BGL), underlain by medium dense, dense, or very dense gravel of mudstone, sandstone, and quartzite, to depths of between 6.1 m and 9.5 m BGL, underlain in turn by stiff becoming very stiff gravelly clay, to depths of between 9.5 m and 14.5 m BGL, underlain by very weak to moderately strong mudstone and sandstone locally with bands of coal, to the base of all of the boreholes (depths of between 15 m and 22 m BGL). Artesian groundwater conditions were recorded from depths of between 4.1 m and 5 m BGL.

6.2 An Environmental Report was issued by National Grid in March 2009 relating to the area of the proposed Margam Substation (National Grid, 2009). The report references the above Jacobs ground investigation, providing the logs and laboratory testing data within the appendices. The report also references two earlier ground investigations undertaken by Central Electricity Generating Board Group, in 1966, and Celtic Technologies, in 2000, but does not provide either report in part or full. A coal mining report obtained from the Coal Authority is also referenced but not included. The study area is within the likely zone of influence of coal workings at depths of between 200 m and 470 m, last worked in 1913, with no known mine entries on or within 20 m of the Site. Any ground movement associated with these coal workings should have taken place and ceased. The Environmental Report indicates that the area had not been previously developed and no significant on-site potential sources of contamination were identified. However, the presence of drainage ditches and peat within the ground profile were identified as potential sources of ground gas. Identified potential off-site sources of contamination included various industrial land uses, railways lines, and an infilled quarry. Geo-environmental laboratory testing undertaken as part of the 2008 Jacobs ground investigation and compared to assessment criteria relating to the protection of human health and controlled waters did not identify significant contamination of the ground or groundwater in the study area.

6.3 Various areas of the Site were the subject of a wider ground investigation undertaken by RSK Environmental Limited (RSK) in January 2022 (RSK Environmental Limited, 2022a). Trial pit TP22, located at the northwestern end of the cable route immediately to the south of the proposed Port Talbot Substation, and trial pits TP28 and TP30, located approximately 200 m to the south of the proposed Port Talbot Substation and approximately 80 m to the east of the proposed cable route, encountered Made Ground to a depth of 2.20 m BGL in TP28 and to the base of TP22 and TP30 (depths of 2.60 m and 2.80 m BGL, respectively). The Made Ground was described as predominantly gravel, locally clay or sand, with slag, brick, and / or concrete, locally with a hydrocarbon odour. In TP28, the Made Ground was underlain by stiff clay to the base of the trial pit (a depth of 3.30 m BGL). Groundwater was encountered at a depth of 1.6 m BGL. Borehole BH10, located close to the southwestern corner of the proposed cable route, encountered soft becoming firm silt or clay, with occasional layers of medium dense sand, to a depth of 20.5 m BGL, underlain by weak to moderately strong coal to the base of the borehole (23.5 m BGL). Groundwater was not recorded during drilling but was measured at a depth of 2.64 m BGL during monitoring. Trial pits TP42 to TP48, located along the southern extent of the proposed cable route and to the west of the railway crossing, generally encountered soft, locally firm, clay, to the base of all of the trial pits (depths of between 3 m and 3.5 m BGL). Where recorded, groundwater was encountered at depths of between 1.5 m and 1.7 m BGL, generally rising to ground level. Borehole BH13, located close to the proposed cable route area immediately to the west of the railway, encountered very soft or soft clay or silt with local peat bands to a depth of 9.7 m BGL, underlain by interbedded soft to firm clay and dense or very dense gravel to a depth of 15.9 m BGL, underlain by weak becoming strong mudstone, to the base of the borehole (16.90m bgl). Groundwater was encountered at depths of 3.5 m and 5.7

m BGL during drilling and 1.38 m BGL during subsequent monitoring. Samples of Made Ground and natural material were recovered as part of the investigation and subjected to a suite of laboratory testing which included asbestos, heavy metals, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPHs), and / or semi-volatile and volatile organic compounds (SVOCs and VOCs, respectively). The results were compared against human health acceptance criteria for a commercial end use. The report does not identify any exceedances of the assessment criteria at the locations of the abovementioned exploratory holes; however, laboratory reports have not been provided for review, and it is therefore not possible to confirm at what locations and depths samples were recovered and tested. In trial pits TP28 and TP30, asbestos was identified within samples of Made Ground recovered at depths of 0.20 m and 1.00 m BGL. The report states that quantification testing was being undertaken, the results of which would inform further risk assessment.

6.4 A ground investigation undertaken by RSK in October 2022 (RSK Environmental Limited, 2022b) included borehole BH208, located immediately to the north of the northwestern end of the proposed cable route. The borehole encountered Made Ground to a depth of 4.1 m BGL, described as clay, sand and gravel with slag, brick, and concrete, locally with a hydrocarbon odour. The Made Ground was recorded as being underlain by soft or firm peaty clay, with layers of soft peat, to the base of the borehole (15 m BGL). Groundwater was not recorded during drilling but was measured at depths of between 2.43 m and 2.75 m BGL during subsequent monitoring. Geo-environmental laboratory testing did not identify elevated concentrations of metals, PAHs, TPHs, SVOCs, and/ or VOCs within soil or groundwater recovered from BH208, when compared against assessment criteria relating to the protection of human health and controlled waters. In addition, asbestos was not identified in the samples tested.

6.5 A ground investigation was undertaken by Geotechnics Limited in 2024 at the location of the proposed Margam Substation and a Factual Report subsequently issued (Geotechnics Limited, 2024). The investigation comprised the formation of twelve boreholes and twenty trial pits, generally encountering ground conditions comprising topsoil, underlain by very soft or soft, occasionally firm or stiff, clay, with bands of fibrous peat between 0.8 m and 4.7 m thick, to depths of between 3.8 m and 7.3 m BGL. The clay was underlain by medium dense, dense or very dense gravel, to depths of between 6 m and 10.2 m BGL, underlain by stiff or very stiff clay, to depths of between 11.7 m and 13.3 m BGL, underlain in turn by extremely weak to very strong mudstone, siltstone and / or sandstone with occasional coal bands, between 0.25 m and 0.4 m in thickness, to a maximum proven thickness of 49.5 m BGL. Locally, Made Ground, described as clay, sand or gravel with ash, concrete, brick, coal, wood, glass, and / or slag, was encountered, to a maximum proven depth of 2.3 m BGL. Artesian or sub-artesian groundwater strikes were recorded at depths of between 0.2 m and 21 m BGL. Groundwater was recorded at depths of between 0 m and 0.10 m BGL during three subsequent monitoring rounds. As part of the investigation, a total of 42 No. soil, 1 No. groundwater, and 6 No. leachate samples were recovered and tested for a range of determinands, including heavy metals, PAHs, TPHs, and/ or asbestos.

6.6 The above ground investigation was used to prepare an interpretive Ground Investigation Report issued in February 2025 by Baker Hicks Limited (Baker Hicks Limited, 2025).The results of the soil laboratory testing were compared against assessment criteria for a commercial end use, with no exceedances identified. In addition, no asbestos was identified in any of the samples tested. The results of the groundwater and leachate testing were compared against relevant assessment criteria for the protection of human health and the environment, with no exceedances identified. Ground gas monitoring was undertaken at 2 No. borehole locations. Due to the presence of shallow groundwater, the response zones were flooded during monitoring and the collection of representative data was not possible. Due to the presence of peat beneath the Site, a classification of Characteristic Situation 2 (low hazard potential) was considered appropriate, typically requiring the installation of a gas proof membrane across floor

slabs. The report also concluded that, due to the poor ground conditions encountered, ground improvement and piled foundations are required to support the proposed structures at the Site.

6.7 Further ground investigation was undertaken in 2024 by RSK across the wider electric arc furnace (EAF) site. The investigation included BH320, located immediately to the north of the northwestern end of the proposed cable route. The borehole encountered Made Ground to a depth of 3.0 m BGL, described as clay, sand, gravel, and cobbles with ash and slag. The Made Ground was recorded as being underlain by very soft to soft or soft organic clay, with a layer of firm peat at a depth of 6.3 m BGL, identified as Tidal Flat Deposits, to a depth of 14.0 m BGL. The clay was underlain by medium dense gravel of sandstone, siltstone, and mudstone, identified as weathered South Wales Middle Coal Measures Formation, to a depth of 20.0 m BGL, underlain by weathered siltstone, to a depth of 26.8 m BGL, underlain in turn by extremely weak to very strong sandstone, siltstone, and mudstone, with occasional coal bands, identified as the South Wales Middle Coal Measures Formation, to the base of the borehole (58.0 m BGL). Groundwater was encountered at a depth of 2.6 m BGL. Three samples of Made Ground were recovered and tested for a general suite of contaminants including heavy metals, total petroleum hydrocarbons, and asbestos. The results were compared against generic assessment criteria for a commercial end use, none of which were exceeded. In addition, no asbestos was identified.

6.8 Available information indicates there to be no surface exposures of peat. To the east of the railway line, the top surface of the peat is present at a minimum depth of 0.2 m BGL, extending to a maximum depth of 5.80m BGL, with thicknesses ranging between 0.50 m and 4.70 m. To the west of the railway line, peat deposits are thinner, ranging between 0.6 m and 1.5 m in thickness, present at depths of between 4.6 m and 8.0 m BGL.

6.9 A provisional unexploded ordnance (UXO) risk map prepared by 1st Line Defence Limited for RSK encompassing the Site area to the west of the railway indicates the northern and southern areas to generally be low-medium risk, with the central area being medium risk. Mitigation measures include awareness briefings and a UXO risk management plan for the low-medium risk areas, and borehole magnetometer surveying by a UXO specialist in medium risk areas.

6.10 A Coal Mining Risk Assessment undertaken by Baker Hicks Limited in 2024 (Baker Hicks Limited, 2024) concludes a low risk of coal workings at a depth that would affect the proposed development.

6.11 A Construction Environmental Management Plan prepared by Laing O'Rourke in 2024 (Laing O'Rourke, 2024) references a UXO Desk Study and Risk Assessment undertaken by Zetica Limited. The assessment concludes the risk to excavations, boreholes, piling and horizontal direction drilling to be low. UXO awareness briefings are recommended for workers involved in excavations.

7 CABLE ROUTE CONSTRAINTS

7.1 With the exception of the northwestern area of the proposed cable route and the area around the railway, natural ground conditions of soft clay are likely to be encountered along the route. A desiccated crust of relatively higher strength material may be present at the near surface. Groundwater is likely to impact excavations deeper than approximately 1.5 m BGL and may be under sub-artesian or artesian pressure requiring groundwater control. Although the risk of coal workings impacting the proposed development has been assessed as low, the presence of unrecorded features should not be discounted.

7.2 The Horizontal Directional Drilling (HDD) required beneath the existing railway lines may be impacted by low strength materials causing collapse of the bore. Obstructions may be also

present within Made Ground that may impact progress. The potential presence of artesian and / or sub-artesian groundwater conditions should also be considered during design.

7.3 In undeveloped areas of the proposed route, the risk of significant contamination of the ground and / or groundwater is considered to be relatively low. However, in the northwest of the route, where Made Ground is likely to be encountered, the risk of contamination, including the presence of asbestos, is considered to be higher. Contamination may also be present along areas of the route that follow roads, due to the likely presence of Made Ground and the presence of fuels, heavy metals etc. from road use. The area of the proposed railway crossing is also considered to be at a relatively higher risk of contamination based on the presence of the former coal depot and likelihood of historical leaks and spills of fuels, oils, lubricants, various cargo etc. Historical mapping shows a rifle range in the northwestern area of the route, which may have resulted in lead contamination of the ground and groundwater due to the possible high concentration of shot fired in the area. Notwithstanding the above, the area is located in close proximity to heavy industry, including steel works, coal depots, railway infrastructure etc. The likelihood of wider contamination migration from these sources should not be discounted.

8 MARGAM SUBSTATION CONSTRAINTS

8.1 Existing ground investigation and assessment indicates the ground conditions at the proposed Margam Substation location to be poor, and that deep foundations and / or ground improvement will be required to support structures. Sub-artesian or artesian groundwater conditions are also anticipated from depths of around 0.2 m BGL, which may require groundwater control during excavation beneath this depth.

8.2 Existing ground investigation information and assessment indicates that the risk of significant contamination to be low.

9 PROPOSED MITIGATION

9.1 An intrusive ground investigation has been undertaken at the location of the proposed Margam Substation, which has informed an interpretive report prepared by Baker Hicks Limited. The assessment has indicated the risk of contamination to be low, and no specific mitigation or remediation measures to be required. An assessment of geotechnical risks has indicated the ground conditions to be poor, with mitigation measures including the adoption of piled foundations and / or ground improvement.

9.2 Along the remaining proposed cable route, further ground investigation is to be undertaken to confirm the ground and groundwater conditions. An assessment of land quality will be undertaken based on the results of the investigation, and mitigation measures will be provided, as appropriate. The investigation will also inform geotechnical design, including requirements for the HDD crossing beneath the railway.

9.3 A Peat Management Plan is to be developed in order to minimise the disturbance of peat during the works. As part of the strategy, the excavation of buried peat would be minimised. Where excavation was unavoidable, peat would be appropriately stored then reburied in order for it to continue acting as a carbon store. At the location of the Margam Substation, piled foundations are proposed, which will result in less peat disturbance than traditional foundation excavations.

9.4 In addition, consideration will be given to the appropriate reuse of site-won materials as part of the works. Where this is not possible, imported material will be used for structures including working platforms and haul roads, which will be appropriately designed so as avoid impacting underlying soils as much as possible. Impacts will also be reduced by the avoidance of loading particular areas where possible, in order to avoid compaction. Following completion of the works, a Landscape and Environmental Plan will be put in place as a means of assessing the

condition of the underlying soils, and the requirement for remedial measures, such as deep soil aeration, will be reviewed (Laing O'Rourke, 2025).

10 CONCLUSIONS

10.1 Ground investigation and assessment at the location of the proposed Margam Substation have confirmed the risk of contamination to be low. Ground conditions have been identified as being relatively poor, with piled foundations and / or ground improvement required to support the proposed structures.

10.2 A ground gas risk assessment undertaken for the proposed Margam Substation has indicated a classification of Characteristic Situation 2 (low hazard potential). Further risk assessment is proposed across the remainder of the Proposed Development.

10.3 Ground conditions are anticipated to be relatively poor across the remainder of Site, with anticipated low and variable strength near surface deposits and shallow groundwater. Significant thicknesses of Made Ground are anticipated at the proposed locations of the railway crossing and the northwestern end of the proposed cable route. Further ground investigation and assessment is required to confirm ground conditions and inform the design of the proposed development in these areas.

10.4 Based on existing information, the risk of significant contamination of the ground and groundwater in undeveloped areas of the Proposed Development is considered to be relatively low. However, relatively higher risk localised conditions may exist in areas where development has occurred in the past, including the northwestern area of the proposed cable route, the railway crossing, and the historical rifle range, which has not been previously investigated based on information reviewed as part of this assessment. Further ground investigation and assessment is required to confirm current Site conditions and potential impacts on human health and the environment.

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APPENDIX 7 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

LAING O'ROURKE

Margam and Port Talbot Substations and Interconnector

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Prepared by: Laing O'Rourke
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Construction Environmental Management Plan
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P01	E.Hutchings	M.Wisdom	R.Jones	20.12.2024	First issue

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This version of the Construction Environmental Management Plan has been issued to:

National Grid Electricity Transmission
Local Authority Planning Authority

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Introduction

This Environmental & Energy Management Plan (EMP) describes the high-level processes followed to fulfil the requirements of the Laing O'Rourke Environmental and Energy Management Systems / ISO 14001 and 50001 standards.

The context of the organisation and the scope of both Management Systems are addressed online within the iGMS.

Both Environmental and Energy Management within Laing O'Rourke is a Business wide issue and is part of the Group's Sustainability strategy - it does not start and stop at the gates of a construction site or office. It affects all our employees and crosses all departmental boundaries at all locations.

The sustainability philosophy adopted by Laing O'Rourke is to ensure that the environmental and energy impacts resulting from its operations are effectively controlled and minimised, to ensure compliance with all relevant legislation and other requirements and to continually improve its environmental and energy performance and processes.

1. Scope of Plan

This document is a summary of the main requirements of the ISO14001 and 50001 standards, Client and stakeholder obligation and location specific goals. The main operational controls sit as appendices to it, but are the critical and live aspects of the EMP.

This Environmental & Energy Management Plan (EMP) covers the environmental and energy impacts relating directly to the construction activity within the site boundary, but also within the local area that may be affected by the development/activity. The following documents all constitute the EMP, these are discussed in later sections, see Figure 1.

- Environmental Risk Assessment
- Site Waste Management Plan
- Construction Noise and Vibration Report
- Construction Biodiversity Management Plan
- Environmental Emergency Plan
- Water Management Plan
- Peat Management Plan



1.1 Scope of works

The contract is a two-stage, collaborative process to develop the project, including design and planning for construction before the main construction phase. The development will establish a new 33kV connection to TATA Steel UK from a new 275/33kV substation at TATA Steel UK Ltd, along with an associated cable interconnector route linking both substations. The new substation, owned and operated by NGET, will be named Port Talbot 275kV. Additionally, the existing Margam 275kV substation will be extended and reconfigured with new GIS, while existing overhead line circuits and SGT HV connections will be modified and diverted to new bays within the GIS.

1.1.1 Deviations from minimum EMP templates/process

There are no deviations identified at this location from the minimum requirements of the Laing O'Rourke Environmental and Energy Management Systems.

2. Environmental & Energy Policy (ISO 14001 Clause 5.2)

The Environmental and Energy Policy relevant to the Laing O'Rourke European Business are signed by the Chairman. Policies are held on the policy section of the Laing O'Rourke integrated management system iGMS.

The policies which currently include: the Environmental & Energy Policy and Sustainability Policy are available on iGMS. The Environmental & Energy Policy is displayed on noticeboards and communicated to staff and to those organisations working for or on behalf of Laing O'Rourke as appropriate. Any of the policies are available to external parties including the general public, on request.

3. Planning (ISO 14001 Clause 6)

This Environmental & Energy Management Plan has been developed and will be implemented and maintained during all phases of the project including pre-construction phase (including design stage and enabling works); construction stage and post construction as appropriate.

Post-construction EMP activity will include: closing out actions related to the Resource Management Plan, recording and archiving any relevant documentation/calibration records; closing down of any permits acquired for the project; and ensuring lessons learned are captured centrally for discussion in the annual management review.

3.1 Environmental Aspects (ISO14001 Clause 6.1.2)

The environmental aspects of our activities have initially been identified during design and bid stages and then are assessed with a 3-6 month look ahead against our activity/programme of works. To align with the rest of the business and to simplify, we do not refer to "aspects and impacts" in the traditional sense. Instead we use language our people understand i.e. "risk". These are recorded in the **Environmental Risk Assessment (ERA)** which considers the location and activity specific risks and impacts. The ERA is an integral part of this EMP although held as an appendix due to complexity.

The **main** environmental risks and energy issues (not all) associated with our activity at this location are in the table below. The detailed review of our aspects is held and managed through the **ERA**.

Risk issue (Aspect/Impact)	Mitigation
Ecology – protected species and habitats	Habitats determined to be of high value are identified within the Margam Substation site. In addition to this, surveys have identified the presence of reptiles, Water Vole and Badger. A consent is required from Natural Resource Wales for disturbance of Water vole,

	however Badger surveys have confirmed no interaction with proposed development
Existing watercourses	Diversion of existing watercourses and watercourse crossings are required. Protection from pollution impacts are required.
Groundwater	The Groundwater table is at or near to ground level and is at risk of environmental impact. Consent will be sought from the regulator and the controls detailed within this document shall be adhered to.
Peat	Peat is a naturally occurring carbon sink. Impacts arising from the works to peat shall be controlled via the Peat Management Plan.
Noise and vibration	Best practicable means shall be implemented to minimise noise and vibration impacts.

3.2 Legal and Other compliance obligations (ISO14001 Clause 6.1.3, 6.1.4)

All legal and contractual (client/planning) requirements are incorporated as appropriate into the **Environmental Risk Assessment (ERA)** with appropriate controls and mitigation measures detailed. All permits, licences and consents that may be required during construction have been, and will continue to be, identified and applied for accordingly, ensuring that sufficient time is allowed. These are recorded in the project specific Licences, Permits and Exemptions Register.

A Group Environmental Legal Register is maintained and held on the LOR iGMS. The Legal Register includes legislation that directly impacts our business, but also that that may be indirectly related (items we have no control over but may impact on the developments we work on) and legislation that may be of interest/provides context. Any significant changes to the Group register that may impact on the organisations operations will be communicated internally, through the HS&E Bulletin, Environmental Information Notes and leadership meetings where appropriate.

At this location, the key environmental legislation or legislation related issues that have been considered and addressed are predominantly around the following aspects:

- Water quality
- Air quality
- Waste
- Noise
- Ecology & habitats
- Land quality

3.3 Client /Planning Specific Requirements

Margam Substation Planning consent

The project between the Margam substation and the Tata site is subject to planning approval from Neath Port Talbot Council. Planning approval is a primary consent that will be discharged by National Grid Energy Transmission. A number of planning requirements will be required to be discharged. These are detailed below.

A planning conditions tracker is maintained within the LOR SharePoint system. Specific conditions relevant to the effective environmental management of the project are detailed below.

Planning application reference	tbc
Condition number and requirement	How this is addressed

This section will be updated upon receipt of planning conditions	

Port Talbot Substation Planning consent

The works within the TATA site are subject to a separate planning application. This application is sought by TATA and considers the works within the boundary of the TATA site. This application is in outline for the NGET associated works and will require discharge of reserved matters. These will remain the responsibility of TATA with the support of NGET, LOR and relevant consultants.

Planning application reference	P2024/0711
Condition number and requirement	How this is addressed
This section will be updated upon receipt of the planning conditions/reserved matters	

3.4 Stakeholders and Interested Parties (ISO14001 Clause 4.2)

At this location we have a number of local stakeholders and community groups that have an acute interest in the development and our business.

Stakeholder	Issues/Concerns/Goals	How they are addressed
Neath Port Talbot Council	Protection of the retained areas of ecological interest Planning consent approval body	Implementation of the CEMP and discharge of relevant conditions
NPT: SUDS Approval Board	Approval of matters relating to drainage	Obtain consent from the SAB for drainage design and ordinary watercourse consents where required
Natural Resource Wales	Prevention of pollution to surface and groundwater. Prevent impacts to the adjacent Margam Moors SSSI	Implementation of the CEMP Obtain necessary consents for ground and surface water measures.
Tata Steel	Land ownership and right of way	Implementation of the CEMP and approved construction methodologies for development
BOC	Land ownership conflict with cable route – direct crossing	Client National Grid to obtain necessary requirements for Laing O'Rourke to conduct works in line with methodologies
Local Residents	Logistics and transportation of plant and machinery, increase in traffic, prior notification	Communication to public through letter drops and other various forms to be confirmed with client and updated
Network Rail	The direct crossing of rail assets will be carried out in association with Horizontal Directional Drilling (HDD) works for the interconnection cable route.	Engagement in the Bridge and Asset Protection Agreement (BAPA) assessment is used to manage the risks associated with construction activities near rail infrastructure.

3.5 Objectives and Targets (ISO14001 Clause 6.2)

The project has developed specific environmental and energy objectives which align as appropriate with our environmental risk profile and any particular client/planning requirements. These are recorded in the Objectives and Targets table below which lists location specific or Client environmental and energy objectives and targets.

Objective	Actions	Responsibility	Evidence / Progress	Target/Time Constraint
Objectives/Targets				
Carbon Intensity	Determine the carbon baseline and set a reduction target	LOR – Carbon Manager	Carbon interface Tool	Update on completion of the detailed design
Landfill Diversion – 100% non-hazardous waste diverted from landfill		Construction Leader Senior Environmental Advisor	Project Certainty / Enviro Dashboards	Monitor through project duration. Target to be met and maintained by end of project
Waste recycling – 80%		Construction Leader Senior Environmental Advisor	Monthly environmental performance report	Reported monthly, project certainty metric provided monthly
Potable water use – target to be set m3/100k	Water minimisation consumption activities within ERA	ES Lead	Project Certainty / Enviro Dashboards	Monitor through project duration. Target to be met and maintained by end of project
Timber Procurement	All timber must be from chain of custody certified sources (FSC, PEFC or GIB) or reclaimed.	Project Manager	Monthly environmental performance report	Reported monthly, Target to be achieve at PC.

3.6 Energy Reduction – EnPI's, Target and Approach

3.6.1 EnPI and Reduction Target

The project has opted for an Energy Performance Indicator (EnPI) kWh per 100k turnover.

Advice from the Carbon Trust suggests that a saving of 5-10% can be achieved through the implementation of an awareness campaign but this was not particular to a construction project that changes on a daily basis. After a review of the SEUs, 2.5 - 5% has been assessed as appropriately stretching reduction target range, to be realised by the end of the project. The baseline period against which this reduction target will be measured covers the first 3 months following the site's connection to the electricity grid.

The energy reduction target is based on total estimated savings from the following specific planned action(s) for this project. Performance will be monitored and measured based on the metric above.

The energy reduction target will be established prior to the commencement of works.

Specific Target	How it will be Monitored/Measured	How will it be Achieved	Time-frame

3.6.2 Methodology

A review of all current energy-using equipment on site and the planned large consumers (Significant Energy Use, SEU) will be undertaken at the point of completion of the EnMS Site Energy Review Checklist. The following schedules and programmes will be used to identify the appropriate SEUs to target areas for possible energy reduction:.

- A plant location report (issued monthly) which details all plant onsite (appendix location TBD) – this will be reviewed on a six monthly basis
- Supply Chain tracking document (e.g. TORPS Schedule) – much of the works completed by our supply chain is carried out on site using the project's energy, and therefore play an important role in achieving our reduction target; the responsibility for which is communicated in our sub-contractor package information and at our pre-start meetings
- Projected labour supply information

The following people will be involved in the review:

Name	Role	Name	Role
	Project Leader		
	Construction Manager		
	Environmental Sustainability Advisor		

3.6.3 Energy Review Outputs

The Energy review will include:

- Location-specific considerations/opportunities
- Allocation of responsibilities where EAPs (Energy Action Plans) have been instigated – listed in next section
- Any other actions to be undertaken to keep energy use as low as possible

Effectiveness of this EAP and how performance is developing (positively or negatively) is evaluated during the six monthly review of energy performance and the Energy Review Checklist. Progress will be monitored as part of the mandatory KPI monitoring.

4. Implementation and Operation (ISO14001 Clause 5, 7, 8)

4.1 Roles and Responsibilities (ISO14011 Clause 5, 7.1)

The European Hub Director has overall accountability for the effectiveness of the Environmental and Energy Management Systems. Day to day responsibility has been delegated to the Head of Sustainability (Europe) and Environmental Sustainability Leader (Europe).

The European Environmental Sustainability Leader will ensure that effective environmental sustainability management is provided, staffed by competent personnel and ensure that each Business operates within the Group Policies. The Head of Sustainability reports to the executive board.

The Project Leader is accountable for the Environmental and Energy Management Plan and its implementation, but day to day maintenance of the EMP documentation and any reports will be carried out by the appointed Environmental Sustainability Advisor.

The environmental and energy management structure and main personnel with key EMP responsibilities are listed in the table below.

Role	Name	Contact details
Project Leader	Richard Skone	rskone@laingorourke.com
Project Manager	Robert Jones	r.jones@laingorourke.com
Construction Manager	TBC	TBC
Environmental Sustainability Advisor	Elliot Hutchings	elliothutchings@laingorourke.com
Logistics Manager	Rob Carter	rcarter@selectplanthire.com
Project Technical Lead	Ali Sehat	asehat@laingorourke.com
Health & Safety Manager	Gareth Williams	
Carbon Lead	Monisha Anandan	manandan@laingorourke.com

4.2 *Competency* (ISO14001 Clause 7.2, 7.3)

Staff will be appointed to roles with responsibilities for managing environmental and energy issues based on their knowledge, training and experience of the relevant topic area.

Environmental and energy management training courses will be offered to the staff as required to complete their roles. The primary objectives of training are to ensure that:

i. personnel are fully aware of the Environmental & Energy Policy and their respective roles and responsibilities;
ii. personnel are fully aware of the potential environmental and energy impact of their work and associated environmental and energy issues;
iii. individually and collectively, personnel are committed to the provision of a sound environmental and energy performance;
iv. activities of personnel do not expose and Laing O'Rourke company to criticism or legal/financial liability;
v. effective communication in respect of environmental and energy issues exists within the corporate body;
vi. the potential consequences of not complying with the EMS, EnMS and legal requirements.

Whilst the training pattern adopted is holistic in application, i.e. from managers to operatives, to be effective in ensuring environmental and energy performance improvements it must be targeted, i.e. relevant and appropriate to the receiving individual/group, in form, depth and content.

Significant environmental and/or energy risks are communicated during induction

Site operatives and staff will attend additional specific environmental and/or energy presentations/ raining as identified by the Environmental Advisor and Project Manager.

Relevant Environmental and Energy Efficiency Toolbox Talks (TBTs) will be given to site operatives (including subcontractors) and emergency incident training shall be undertaken

At this location records of all environmental and energy-related training including Spill Drill/Emergency condition drills will be maintained on the LOR project SharePoint.

5. Communication (ISO14001 Clause 7.4)

Internal Communication:

The Environmental and Energy Management Systems are communicated through the Laing O'Rourke's management system iGMS. Internal communication shall include:

- Significant risks and opportunities
- Environmental incidents, hazards, near misses and complaints
- Changes to the Environmental and Energy Management System
- Audit Results and Trends
- Results of Management Review
- Objectives and Target Results
- Receiving, distributing and responding to communications from interested parties

These will be communicated via HS&E or Environmental meetings on site or through Information Notes or HS&E Learning Bulletins, email communications, relevant Yammer groups; and site visits, inspections or audits.

In addition environmental and energy issues are communicated through a variety of means. Environmental Risk Assessment engagement; collective insights, inductions, tool box talks, Daily Activity Briefings, weekly progress meetings and sub-contractor tender meetings, will all be used on the Project on a regular basis to communicate and discuss the environmental and energy aspects and impacts on the project. Communications from Group or Business Unit environmental and energy leadership will be passed on to site staff/operatives through postings on notice boards, email and face to face meetings as appropriate.

Good and best environmental and energy management practice shall be captured and communicated on site and into the functional lead as a driver for continuous improvement.

5.1.1 External Communication:

All Laing O'Rourke companies will engage with all relevant stakeholders to ensure effective communication with regards its operations. For example, local residents that may be affected by construction works could be notified by letter drops, newsletters or through a project specific website.

Communication with environmental regulators and all enforcement visits or letters shall be formally recorded on the LOR sustainability reporting tool.

The Laing O'Rourke Group has taken the decision not to communicate externally regarding its significant environmental and energy aspects, unless there is a legal requirement to do so.

Laing O'Rourke, with the client's approval, aims to deliver relevant information to all stakeholders through various communication methods. These options will be presented to the client, and upon formal agreement, this section will be updated to reflect the finalised communication strategy. The proposed communication methods include:

- **Public consultation**, including meetings and workshops:
- **Digital engagement** via websites and social media
- **Informational materials**, such as letter/leaflet drops
- **Community partnership** through collaboration with local vendors
- **Public displays** and information notice boards
- **A feedback mechanism** providing clear channels for queries and responses.

5.1.2 Contact by the Media

In the event of any contact being made any member of the media [e.g. press, radio or television], immediate reference should be made to:

Laing O'Rourke press office
Anchor Boulevard
Dartford
DA2 6SN
pressoffice@laingorourke.com

+44 (0) 20 8720 6631

6. Documented Information (ISO14001 Clause 7.5)

The main documents that form this Environmental & Energy Management Plan (EMP) include as appendices:

- ERA – Environmental Risk Assessment
- EAP – Energy Action Plan
- RMP – Resource Management Plan
- Licences, Permits and Exemptions Register
- Checklist – EnMS Site Energy Review
- Construction Noise and Vibration Report
- Construction Biodiversity Management Plan
- Peat Management Plan

These are held electronically in an Environmental Management File on the project SharePoint site.

Other documentation that relates to environmental sustainability matters may be produced and will be held in paper and/or electronic format as available includes:

- Environmental Emergency and Contingency Plan
- Actual Licences, Permits, Exemptions or Consents (NRW/Welsh Water/Local Authority/waste contractor)
- Responsible sourcing certification
- Equipment calibration certificates
- Product EPDs (Environmental Product Declarations)
- Test results or monitoring (e.g. water/ground/air)
- Surveys and reports (e.g. ecology, noise, air quality)
- Audit or Inspection (internal or external)
- Client or Project Dashboards /Monitoring reports
- Waste transfer notes

Where it applies, physical waste transfer notes are held by the project Office Manager. Electronic copies of the waste transfer notices/consignment notes are held on the project SharePoint.

6.1 *Control of Documents* (ISO14001 Clause 7.5.2 and 7.5.3)

This Environmental & Energy Management Plan shall be reviewed and updated as and when required (e.g. responsibility changes) or as a minimum, annually. The Environmental Risk Assessment (ERA) and Resource Management Plan (RMP) will be reviewed and updated (as necessary) **every three months**

Licence and permit requirements shall be identified and monitoring implemented against these. Expiry dates should be reviewed and appropriate measures implemented to ensure required permits and licences do not expire.

6.2 *Control of Records* (ISO14001 Clause 7.5.2, 7.5.3)

All records related to this the EMP and environmental and energy management processes will be identified, maintained, controlled and disposed in accordance with the processes within the Environmental Management section of iGMS.
The EMP, supporting plans, documentation, environmental training records are held within the project SharePoint folder. Data relating to water use, waste, and energy use along with incidents will be recorded via the LOR environmental reporting portal. Physical waste tickets will be held by the project Office Manager and electronic copies retained on the project SharePoint.

The types of EMP related records kept will include but are not be limited to: –

- Information on applicable environmental and energy legislation or other requirements
- Inspection and test reports (e.g. water/air quality/noise)
- Inspection, measuring and test equipment maintenance and calibration
- Records of any visits from enforcing bodies or interest parties (environmentally related)
- Environmental management plan and file including associated documentation and data
- Environmental consents and permits
- Information on emergency preparedness and response
- Information on significant environmental and/or energy aspects
- Incident reports
- Pertinent contractor and supplier information
- Audit results
- Management review
- Complaints
- Training
- Process Information
- Product Information
- Waste management records
- Energy management records

7. Operational Control (ISO14001 Clause 8.1)

The Laing O'Rourke Project Leader will ensure that appropriate environmental and energy controls are fully implemented. In particular, they will:

i. Ensure the project is designed and programmed, where possible, with a view to having minimum effect on the environment and energy consumption during construction and after completion of project;
ii. Ensure that environmental and energy management requirements are controlled through appropriate risk assessments, method statements, and work instructions including those of organisations working on behalf of any Laing O'Rourke company;
iii. Ensure that procured material minimises harm to the environment and ensures safe movement;
iv. Ensure that materials are stored to prevent pollution;
v. Encourage all project personnel (including consultants and sub-contractors) to recycle material, to conserve energy and water, to reduce waste and to protect / enhance biodiversity.
vi. Ensure site-specific operational and maintenance controls, records and procedures for any significant energy-consuming equipment provided by third party suppliers are maintained locally where provided, and shared with the Energy Management Team upon request.

Where evidence of company operational and maintenance planning procedures are required further guidance and information is available on our iGMS.

7.1 Documented Procedures

The main documented procedures for Environmental and Energy Management are as follows:

- **EMP** – EMP Summary document (this document)
- **ERA** – Environmental Risk Assessment
- **SWMP** –Site Waste Management Plan
- Licences, Permits and Exemptions Register
- Construction Noise and Vibration Plan
- Construction Biodiversity Management Plan
- Peat Management Plan
- Water Management Plan

Further guidance is available in the Environmental Management Manual and the Energy Management Manual.

7.1.1 Environmental Risk Assessment

This procedure is completed to identify environmental aspects and their impacts.

A risk rating is assigned before any control measures or mitigation have been considered and then once these measures have been applied as residual risk rating remains. These are assigned as Red for high risk, Amber for medium risk and Green for low or minimal risk. Not all residual risk will revert to Green. Anything remaining at Amber once all reasonable mitigation has been applied, will need particular care and attention and therefore actions relating to items like this will require more consideration by Supervision.

The **Energy Action Plan** is contained within the ERA document and identifies any opportunities or risks to reduce energy consumption.

7.1.1.1 Licences, Permits & Exemptions

A consents register (e.g. pollution control, exemption certificates, discharge, works near watercourses, random licence checks etc.) will be maintained. A monthly review will be undertaken to identify compliance and ensure any expiration dates are captured early.

7.1.1.2 EnMS Six Monthly Review

This is used to record the review required of progress against EAPs and energy related objectives. This is submitted to the Energy Management Team on a six monthly basis.

7.1.1.3 Construction Noise and Vibration Plan

These set out requirements expected through different stages of the project and also different times of year. It will include any baseline data and methods to be used to monitor and record exceedance, complaints or conversely, best practice.

7.1.1.4 Construction Biodiversity Management Plan

These set out requirements to control the impact of the construction works on sensitive ecological receptors. This document will identify any relevant ecological consents and licences and methods of work to minimise the impact of the scheme on sensitive ecological receptors.

7.1.1.5 Peat Management Plan

The peat management plan identifies how the project will manage known interfaces with peat across the scheme including steps taken to remove impacts on peat and mitigate any impacts that cannot be avoided.

7.1.1.6 Water Management Plan

The water management plan will identify how the project shall be managed to reduce the risk of surface water runoff and drainage systems causing flooding to off-site areas and stakeholder, and protect the quality of surface water and groundwater, ensuring risk identification, evaluation and mitigation to both surface water drainage and the management of dewatering of excavations.

8. Environmental and Ecological Challenges: Constraints and Mitigation Strategies

The current footprint for the new development presents several critical aspects regarding potential ecological impacts resulting from the necessary construction activities. These important considerations have been highlighted through recent engagements with the local authority, specifically Neath Port Talbot Council, as well as findings from early and prior site investigations.

Challenge	Description
Interface with adjacent statutory and non-statutory designated sites	The project is located near the Margam Moors and the Eglwys Nunydd Reservoir, which are designated as Site of Special Scientific Interest (SSSI) due to their significant biological features. The project is also designated as a site of Important Nature Conservation at Local Authority level.
Interface with existing protected species	Legally protected species present within the proposed development footprint include common reptiles, breeding birds (including potential for wintering birds), Water Vole and Badger
Interface with ecologically valuable habitats	Impacted ecological habitats may pose challenges to the Margam Moors and the established peat features throughout the development, as well as to the irreplaceable habitats highlighted by local authorities.
Existing Watercourses / groundwaters	Notably, several watercourses have been identified in the area, including Mother Ditch and several small brooks/reens, which require consideration. Early investigations also indicate that groundwater levels throughout the footprint vary in depth.
Geo-Environmental considerations	Ground investigation reports, comprising both desk studies and site investigations, have identified the potential presence of coal seams near or adjacent to the development site, at depths greater than 15 meters below ground level (bgl). Borehole data logs confirm a significant displacement of peat at various depths. These findings are essential for assessing geological risks and informing future investigations or mitigation strategies.

Other environmental issues identified include:

- Pollution or damage from the previous land uses on surface and groundwater resources and important geological/ecological sites
- Pollution or damage from proposed construction activities on surface and groundwater resources and important geological/ecological sites
- Potential disruption of groundwater flows within underlying aquifers
- Waste generated during the construction of the proposed development.
- Notable increase for noise and vibration for construction of the development.
- Temporary diversions of Public Rights of Way (PRoW)
- Transversing of privately owned land for associated cabling activities
- UXO aspect here

8.1 Statutory and non-statutory designated sites.

The development has been identified in the early phases as being on land considered by the local authority to be of high ecological and environmental importance known as a Site of Important Nature Conservation (SINC. The local authority has indicated that the proposed development site contains irreplaceable habitat, which holds significant ecological and environmental value and cannot be restored or replaced if lost or damaged.

To the south of the development lies a statutory designated site, namely Margam Moors SSSI and Eglwys Nunydd Reservoir. It is understood that the development will require cable routes running close to the border of the SSSI; however, it is anticipated that there will be no direct interaction with the segmented land and no direct linear ship with the associated reservoir.

8.1.1 Mitigation Strategy

Further investigations and ecological studies will be conducted by habitat specialists to confirm the types of habitats present and assess their ecological and environmental significance. Upon completion of these studies, appropriate mitigation strategies will be formulated to ensure that best available techniques are utilised to prevent any harm or damage to the habitat.
Note: Once these studies are completed any further mitigation measures will be identified and this management plan and its associated documents shall be reviewed and updated as required.

Early engagement with regulators regarding the SSSI aspects of the development and associated cable works has been initiated and based on the current GIS mapping of the development area, it is currently considered that there will be no impact to the Margam Moors SSSI that would warrant assent under section 28 of the Wildlife and Countryside Act.

8.2 Protected Species and Habitat Management

Current studies indicate that the site and surrounding areas have the potential to support several protected fauna and flora species, including:

- Breeding birds (including wintering birds)
- Common lizards
- Water voles

Given that activities involving certain protected species are regulated by Protected Species Licences and tailored management plans, specific method statements and detailed plans will be developed for each protected species as needed. These documents will outline control and mitigation measures to ensure compliance with regulatory requirements and protect the identified species.

8.2.1 Nesting Birds Mitigation Strategy

This section will be updated upon reflect of pre-construction walk overs.

All wild birds, their nests, and eggs are protected under the Wildlife and Countryside Act 1981. Therefore, all site clearance and tree felling activities will be scheduled to occur outside the bird nesting season, which runs from March 1st to August 31st. In localized areas where this timing is not feasible due to other constraints, each specific area will be inspected by an ecologist. If nesting birds are confirmed or suspected, no vegetation removal will take place. All site clearance and tree felling will be conducted in accordance with approved method statements and under the supervision of the Ecological Clerk of Works (ECoW). Breeding bird surveys have been conducted for each land ownership parcel, with Stantec carrying out the surveys under the instruction of National Grid, and RSK under the instruction of Tata. The Margam substation, which is part of the National Grid aspect of the development, has significantly more tree coverage compared to the other land parcels affected by the development. The survey has confirmed the presence of successful breeding pairs of Schedule 1 protected species.

- Breeding Bird Survey Report, November 2024, 331201497, (prepared by Stantec for National Grid)
- Breeding Bird Survey Report, June 2024, 2487033, (prepared by RSK for Tata Steel)

Note: A wintering bird survey is in progress and the results will be submitted to Laing O'Rourke (LOR) and findings and recommendations shall be incorporated into this Management Plan and its associated documents.

8.2.2 Common Lizards Mitigation Strategy

Wales is home to six native terrestrial reptile species, including various snakes and lizards, all of which have experienced population declines due to habitat loss. Under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), all British reptiles are protected from intentional killing, injury, and sale. This legislation makes it illegal to:

- Disturb reptiles while they occupy places of shelter or protection.
- Obstruct access to these places.

Currently, there is a significant presence of common lizards projected across the development area, as outlined in survey reports. Laing O'Rourke in association with RSK shall develop a reptile mitigation and method statement strategy that shall be employed throughout the delivery phase of the development.

- Reptile Survey Report, November 2024, 331201497 (prepared by Stantec for National Grid)
- Reptile Survey Report, May 2024, 2487033, (prepared by RSK for Tata Steel)

Best practice guidelines will be implemented during enabling works and throughout the development:

- Install temporary, secure reptile fencing to prevent reptiles from entering hazardous areas.
- Displace reptiles by making habitats unsuitable, such as by cutting vegetation in stages during the active season (March – September)
- Create links to other habitats.
- Develop new habitats.
- Enhance existing habitats.

8.2.3 Water Vole Mitigation Strategy

This section will be updated upon reflect of pre-construction walk overs.

Under Section 9 of the Wildlife and Countryside Act 1981 (as amended), it is illegal to:

- Intentionally kill, injure, or take any wild water vole.
- Intentionally or recklessly damage or destroy any structure or place that a wild water vole uses for shelter or protection.
- Intentionally or recklessly disturb any water vole while it occupies a structure or place used for that purpose.
- Intentionally or recklessly obstruct access to any structure or place that a wild water vole uses for shelter or protection.

Ecological survey report provided by Stantec to Laing O'Rourke (Water Vole and Otter Report, 331201497, November 2024) has confirmed the presence of water voles within the footprint of the proposed development. Current survey data from April and September 2024 includes:

- April: Confirmation of feeding remains only.
- September: Confirmation of feeding remains and burrows.

Laing O'Rourke (LOR) has appointed RSK to assist with technical matters related to water vole licensing with the regulator. LOR has provided survey reports to RSK, who will consult as a subject matter expert and prepare a technical note for submission to Natural Resource Wales to obtain a protected species license to enable further mitigation or potential translocation. Any works impacting water voles will be licensed with an appropriately qualified person.

8.2.4 Badger Mitigation Strategy

This section will be updated upon reflect of pre-construction walk overs.

Badgers are a protected species under the Protection of Badgers Act 1992, which makes it illegal to harm, capture, kill, or disturb badgers or their setts without proper authorization.

Following Tata's appointment, RSK conducted the Badger Survey report 2487033 on 20.05.2024, confirming that the overall development site provides suitable habitat for badgers, with one active outlier sett identified. The report concludes that the proposed development at Tata will not directly impact the sett, and Laing O'Rourke has also received confirmation that the Margam and associated cable route developments will not affect the sett based on the development's footprint.

8.2.5 Survey Validity and Potential Risks

It is anticipated that the validity of the surveys conducted on Tata land will extend to a 24-month period. These surveys will require an element of pre-construction due diligence to confirm the continued absence of nesting birds, badgers, great crested newts, water voles, otters, and bats from the site. The appointment for this will be made by RSK under the direct instruction of Tata Steel.

8.3 Findings for each aspect will be incorporated into the relevant ecological factor. Habitat Management and Earthworks Constraints & Mitigation

The current footprint for the new development presents several critical considerations regarding the potential for habitat management and earthworks activities necessary for construction. These aspects have been highlighted in recent Ground Investigation reports, specifically the Geotechnical Desk Study: Margam FEED (30004240-BHK-XX-XX-RP-C-0003).

Challenge	Description
Interface with valuable habitats	Impacted ecological habitats may pose challenges to the Margam Moors and the established peat features throughout the development, as well as to the irreplaceable habitats highlighted by local authorities.
Interface geology aspects referring to coal mining – seams	Envirocheck report obtained for the desk study, show Morfa Colliery including Abbot Pit and Grange Pit to the north of the proposed TATA Substation. Further Coal Risk Assessment compiled.
Potential for discovery of contaminated lands	It is considered due to the locality and nature of the site for development in relation to Port Talbot Steel works ground contamination is likely.

8.3.1 Peat Management

Peat has been identified across the proposed development site at varying depths. In Wales, Natural Resources Wales (NRW), as the regulator, manages peatlands under the National Peatland Action

Programme, which focuses on restoration efforts aimed at supporting biodiversity and combating climate change. Key priorities of the programme include:

- Erosion and drainage prevention
- Sustainable management
- Afforested peatland restoration (where applicable)
- Protection of high-carbon peatlands
- Ongoing monitoring

To ensure compliance and effective management, Laing O'Rourke has appointed RSK to support the development of a Peat Management Plan (PMP) for the entire construction phase. This plan aims to identify and implement best practices to ensure that peatlands and peat deposits across the development are either undisturbed or managed appropriately.

The Peat Management Plan will serve as a framework for the construction process, aiming to minimise or mitigate the impacts on identified peat hotspots. The plan will include the following key components:

- Peat Surveys: Detailed mapping of peat depths and quality
- Impact Mitigation: Strategies to reduce the impact of construction activities on peatlands.
- Excavation and Storage: Guidelines for peat extraction, storage, and potential reuse
- Restoration: Plans to restore disturbed areas and maintain ecological balance post-construction

This approach ensures that peat management is integrated throughout the construction phase to meet environmental and regulatory requirements.

8.3.2 Invasive Non-Native Species (INNS)

It is understood that, at present, there are no known sources of Invasive Non-Native Species (INNS) within the development parcel of land. However, INNS have been identified outside the development area, and therefore, careful consideration must be given when ground-disturbing methods are employed. To prevent the spread of INNS, the following methodology shall be followed if any invasive species are suspected:

INNS Mitigation Methodology:

1. Check, Clean, and Dry: Inspect, clean, and thoroughly dry all equipment before moving it across different areas of the site to prevent the transfer of potential INNS.
2. Dedicated Equipment: Use separate equipment for each site or ensure equipment is thoroughly cleaned between sites to avoid cross-contamination.
3. Limit Soil/Water Movement: Avoid the movement of contaminated soil or water to other areas to prevent the spread of invasive species.
4. Control Site Access: Limit access to sensitive areas to prevent the accidental spread of INNS from outside the development site.
5. Early Detection: Continuously monitor the site for the presence of new invasive species and rapidly address any findings to mitigate their spread.
6. Proper Waste Disposal: Safely dispose of any invasive materials in accordance with appropriate protocols to prevent their reintroduction or spread.
7. Biosecurity Training: Provide biosecurity training for staff to ensure awareness of and compliance with the necessary protocols for preventing the spread of INNS.
8. Waterway Precautions: For water-related projects, install barriers to prevent the spread of aquatic species, ensuring they are contained within designated areas.

By adhering to these protocols, the risk of spreading INNS during construction activities will be minimised, helping to protect local ecosystems and biodiversity.

8.3.3 Arboriculture Assessment

This section will be updated upon receipt of the ecological survey report.

A survey was conducted by RSK on behalf of Tata Steel (Stage 1 and 2 Arboricultural Impact Assessment 2483055, 16.09.2024). The survey report outlines the need for the retention of certain trees and scrub land. However, upon further clarification at an early design stage, it has become apparent that the area identified for retention to the west of the Margam site may conflict with the cable route design. As a result, further clarification has been sought from Laing O'Rourke to the client, so that corrective action measures can be designed or mitigated.

- Email Clarification, *Potential Conflict Between Tata Works and HDD Requirements [19.11.24, 08:54am]*

8.3.4 Coal Mining Risk Assessment

Coal mining in Wales was a major industry during the 19th and early 20th centuries, particularly in the South Wales Valleys. Due to the region's rich history of industrial coal processing, any new development in South Wales requires a Coal Mining Risk Assessment. The Coal Mining Risk Assessment for the proposed development has been generated under the reference number 30004240-BHK-XX-XX-RP-C-0004. This report evaluates both historical and current coal mining activities in the area, with a primary focus on assessing the risk posed by these activities.

The assessment, based on a desk study and information from Enviroreport, identifies several coal mining features in the vicinity of the site. Specifically, the report highlights the presence of the Morfa Colliery, including the Abbot Pit (200 meters north of the site) and the Grange Pit (450 meters north of the site) in reference to the proposed development within Tata boundary. Further analysis, using the Coal Authority's interactive map, shows that the site is intersected by nine coal outcrops, which are classified as high-risk areas for development.

In conjunction with these findings, Tata Steel commissioned Wardell Armstrong to develop a Coal Mining Risk Assessment (Project EAF – Port Talbot, 0001 V2.0 09/2024). Based on both assessments, it was determined that of the nine identified outcrops within the Baker Hicks assessment, the development and associated cabling routes could potentially cross the following seams: Amman Rider, Yard, Middle Seven, Upper Five Feet, and Gellidg

Despite the substantial evidence of past coal extraction in and around the site, the Coal Mining Risk Assessment in accordance with Baker Hicks classifies the overall risk as low. This conclusion is based on the depth of previous coal extraction, which is reported to be at least 85 meters below ground level. However, Laing O'Rourke will continue to engage with the Local Coal Authority and other relevant parties to gather further guidance on mitigation strategies. While the current assessment deems the risk low, there remains a potential for unrecorded shallow mine workings that could pose future challenges.

8.3.5 Earthworks Controls and Mitigation

Excavation will be a significant component of the development, particularly for cable routes and the foundations of primary structures. These activities will involve substantial ground disturbance and excavation. To minimise environmental impact, the following best practices will be implemented on-site:

- Erosion control (to prevent runoff) is more effective than sediment control in reducing water pollution.
- Minimise disturbed areas: Preserve natural vegetation as much as possible, and avoid disturbing topsoil or other layers unless absolutely necessary.
- Phase works: Where feasible, avoid breaking new ground unless required. This will help reduce the total quantity of runoff requiring management at any given time.
- Install drainage and runoff controls: Implement drainage systems, sediment traps, ditches, and other runoff controls before starting site clearance and earthworks.
- Limit exposure of bare ground: Reduce the size and duration of exposed bare ground to minimise erosion risk.

- Prevent runoff from entering the site: Divert clean runoff around the site and into surface water drains, while managing site runoff appropriately.
- Maintain control measures: Ensure that appropriate erosion and sediment control measures are installed and maintained throughout the project.
- Ongoing monitoring: Regularly monitor and maintain erosion and sediment control measures to ensure continued effectiveness.

Materials to be stockpiled on-site, such as residue soils from excavations, have the potential to pollute both water and air through the generation of silt and dust. Stockpiles can cause dust pollution when dry materials are windblown or create silt runoff during wet weather. To mitigate these risks, best available techniques (BAT) will be followed when handling and stockpiling materials:

- Location: Stockpiles should be placed away from watercourses, ditches, and drains to prevent contamination.
- Ground conditions: Ideally, stockpiles should be located on level ground. If this is not possible, ensure that the slope is stable.
- Runoff control: Prevent any stockpile runoff from entering drains, ditches, or watercourses.
- Contaminated materials: Stockpile contaminated material on an impermeable surface within a bunded area, at least 10 meters away from any watercourse. These stockpiles should be covered to prevent runoff.
- Disposal: Any contaminated runoff from stockpiles must be contained and disposed of in accordance with legal requirements.

During dry weather, additional measures will be taken to prevent dust and material loss:

- Dust control: To prevent stockpiles from drying out and generating dust, cover or dampen down materials as needed.
- Height control: Ensure stockpiles do not exceed the height of the site boundary, preventing the possibility of windblown dust escaping.

Further controls and mitigation measures for silt-laden runoff are detailed in the Water Management Plan.

8.3.6 Continuous Flight Auger (CFA) / Auger Displacement Piles (ADP)

Laing O'Rourke, as part of the development works, will need to conduct piling for structural foundation support and assurance. At this early stage, the exact piling method to be employed has not yet been engineered. However, given the nature of the environment and the presence of naturally occurring peat within the formation layers, Laing O'Rourke intends to use the best practicable means to minimise disruption to these layers. As such, displacement piling methods will be considered. Drilled displacement piles, a type of augered pile, that do not remove material but displace the surrounding soil laterally, creating a similar profiled regular shaft pile.

Mitigation measures will include controlling water through an abstraction and discharge system, designed and permitted under appropriate consent, with remaining water within the pile being managed in accordance with the Water Management Plan.

8.3.7 Horizontal Direction Drilling

As part of the development, which will involve a significant use of Horizontal Directional Drilling (HDD) in connection with the cable route between Margam and Port Talbot, the following outlines the drilling process and the required mitigation measures for drilling fluids to stabilise the ducting:

1. **Pilot Bore**: A small-diameter bore is initially drilled along the desired route, before being enlarged for the installation of ducting or pipes.
2. **Reaming**: The bore is expanded using bentonite and other additives to ensure stability during the process.
3. **Pullback**: The duct or pipe is pulled through the reamed hole, completing the installation

During the reaming stage of HDD, a rotary head with jets flushes the bore with drilling fluids, similar to high-pressure water used in drainage works. The fluids are pushed back up the bore and collected in a catchment pit at the entry point. A pumping system then returns the water, slurry, or muck to the recycling plant located at the launch site.

The water used in the HDD process is part of a closed-loop system. If groundwater reduces the bentonite's viscosity, the water will no longer be recyclable and will be removed off-site for disposal. The contractor has expressed management of all water transportation and disposal on-site.
The contractor has stated that all aggregate recovered from the recycling system will undergo Waste Acceptance Criteria (WAC) testing and be removed from the site as required. If necessary, a soil stabilising chemical will be added to stiffen the material for transport, but this process will only take place after the WAC testing is completed and the material is approved for handling.

Emergency procedures can be found within the Environmental Emergency Plan, and further controls on water management within the Water Management Plan

8.3.8 Discovery of Contaminated Land

This section will be updated upon receipt of formal Land Contamination Surveys.
Embedded within the Geotechnical Desk Study: *Margam FEED (30004240-BHK-XX-XX-RP-C-0003)* provided to Laing O'Rourke, Section 2.6 outlines the land quality desk study, which includes an Envirocheck report. This report offers insights into industrial land use and potential contaminative processes within 500 meters of the proposed development. As the development is divided into three areas, the following findings for each aspect have been concluded thus far:

8.3.8.1 Development – Margam Substation

The site designated for the Margam Substation is currently undeveloped. It is noted that the Tata Steel plant is situated to the west, separated by the Network Railway, which runs to the north-south. Should any contamination be identified on this site, it is likely to be associated with historical railway development.

8.3.8.2 Development – Tata Substation

The Tata Substation development site is currently used as a storage area for materials from the nearby steel plant. Prior to the establishment of the Tata Steel plant, the land was undeveloped. However, it has been confirmed by Tata to Baker Hicks that as recently as 2004, the site contained the Grange Coke Ovens. Any contamination found in this area is likely to be related to industrial activities associated with Tata Steel, as well as demolition works, which may have involved asbestos-containing materials.

8.3.8.3 Development – Cable Route

The cable route required to connect the two substations will traverse a variety of land types. The majority of the route passes through undeveloped land, though it also intersects infrastructure belonging to Network Rail. Ultimately, the route will return to the Tata Substation land, which is expected to be the primary source of potential contamination, linked to the steel plant's industrial activities and the surrounding infrastructure.

This preliminary overview will be updated once formal land contamination surveys have been completed and further analysis is conducted.

8.3.9 Archaeology

This section will be updated upon receipt of further discussion with Local Planning Authorities and requirements.

Laing O'Rourke has received an archaeological desk study report (P21-268, ver 1.3) from Headland Archaeology, which was generated in February 2022 following Tata's appointment. Currently, this survey is the only available assessment for determining the presence of archaeological features in the development area. The report identifies two known historic assets within the project area—Morfa

Colliery and Margam Warren—that could potentially be impacted by the proposed works. It assesses the potential for archaeological remains as follows: low potential for remains from the Early Medieval period and earlier, medium potential for Post-Medieval and Modern remains likely linked to Morfa Colliery and the steel works, and high potential for Medieval remains within the development land parcels.

Based on the likelihood and significance of buried archaeological remains, the report concludes that the direct impacts on known historic assets are unlikely to pose a significant constraint to development consent. However, Laing O'Rourke will implement mitigation measures to protect any unidentified archaeological features discovered during construction. These measures may include:

- Mitigation Excavations: If significant remains are identified, detailed excavation will be considered.
- Watching Briefs: For other areas, watching briefs will be implemented in locations requiring open cuts or trench works.

Further clarity will be sought as the development progresses, and appropriate actions will be taken to minimise any potential disturbance to archaeological features.

8.3.10 UXO

A UXO study has been completed for the land associated with the proposed development, and a report has been compiled by Zetica UXO, titled UXO Desk Study and Risk Assessment P14160-24-R1. The study identified a historical firing range, the Margam Sands Range Complex, dating back to 1939. However, the study found no records indicating any bombing activities associated with the range complex that would encroach on the development site's land parcels. As a result, the parcels of land making up the site development are considered to present a low UXO hazard level. The report also includes recommendations for precautionary measures to be undertaken during the construction phase to ensure safety.

Proposed Works	UXO Risk	Recommended Mitigation
Excavations	Low	UXO awareness briefing – an UXO awareness briefing is prudent for staff involved in excavations
Boreholes/Piling	Low	Proceed with works
HDD	Low	Proceed with works

8.4 Nuisance Compliance

8.4.1 Noise and Vibration

This section will be updated upon receipt of the Noise Modelling Assessment

The construction phase of the project may introduce additional sources of noise and vibration, including construction activities, and the operation of construction traffic, plant, and equipment. Laing O'Rourke has appointed RSK Acoustics to conduct a noise assessment, covering baseline noise surveys, operational noise evaluations, and construction noise assessments.

Appendix E outlines mitigation measures for managing noise and vibration during construction, which will be further updated following further assessment and ongoing consultations with Local Authorities.

8.4.2 Air Quality Management (Delivery Phase)

Construction activities, including demolition, excavation, ground works, cutting, material storage, and the movement of vehicles both on-site and on local roads, can contribute to fugitive dust emissions throughout the construction phase. These emissions may arise from the disturbance of dust particles on-site and the re-suspension of dust from highway surfaces due to vehicle traffic.

Appendix D outlines measures for managing dust on-site during construction and will be updated in the detailed Construction Environmental Management Plan (CEMP).

8.4.3 Lighting Impact

This section will be updated following further discussions with local planning authorities and additional ecological surveys.

During the construction phase of the development, it is anticipated that temporary lighting will be required to ensure the safety of personnel working on-site. Laing O'Rourke will provide temporary lighting at welfare and working locations. Although lighting is not a permanent design element for the construction phase, the best available techniques will be implemented to avoid light glare and minimise other associated impacts.

Lighting Mitigation Measures:

- Use of Appropriately Designed Luminaires: Only luminaires specifically designed for the required task will be used to ensure adequate lighting without excess spill.
- Minimisation of Light Break-Out Above the Horizontal: Lighting will be designed to reduce light spill above the horizontal by using 'low cut-off' and 'full cut-off' lighting systems.
- Louvres and Shields: Where appropriate, louvres and shields will be employed to prevent undesirable light break-out and minimize light pollution.
- Visual Screening: Visual screening measures, such as on-site spoil or hoardings, will be used to shield construction lighting from sensitive visual receptors.
- Reducing Lighting Levels Outside Working Hours: Lighting levels will be reduced to suitable levels during non-working hours to maintain safety and security. Lighting will be dimmed when not required for operational purposes. Security lighting will be kept to the minimum necessary for protection.
- Automated Lighting Controls: Automated systems will be used to switch lights on and off according to activity and ambient light levels. Where appropriate, infrared floodlighting and CCTV systems may be considered to reduce the need for visible lighting outside working hours.
- Directional Lighting: Construction lighting will be directed to ensure that it does not intrude outside the immediate working area. Lighting will be designed and installed to minimize intrusion onto sensitive habitats, such as hedgerows, mature trees, and woodlands.
- Appropriate Number of Lighting Units: Sufficient lighting units will be used to avoid the need for large, tall lighting fixtures, which could create wide, unnecessary light spill over large areas.

These measures will be implemented to reduce the environmental and visual impact of temporary lighting during construction, ensuring compliance with both safety requirements and environmental sensitivities.

9. Water Management Mitigation Strategy

This section will be updated upon receipt of further factual GI reports.

As part of this overarching document, a separate Water Management Plan (WMP) will be established to address all key aspects of mitigating both surface and groundwater, including drilling waters. The

WMP will detail the necessary controls and consents required to meet regulatory discharge requirements.

Laing O'Rourke (LOR) has received the Geotechnical Desk Study: Margam FEED (30004240-BHK-XX-XX-RP-C-0003), which concludes that groundwater was encountered during recent surveys conducted by Jacobs and RSK GI at depths ranging from 0 to 11 meters below ground level (bgl). This indicates that groundwater is highly likely to be encountered during excavation works, especially since the development site contains various bodies of surface water; ; it is also noted that the Jacobs report from 2009 indicated groundwater values exceeded the EQS values for Lead, Zinc, and Ammonia.

LOR will engage a specialist water management consultant to assist with the management of surface and groundwater controls and has initiated communications with the Lead Local Flood Authority to consult on water crossings and diversions and to obtain SUDS Approval Body (SAB) consent. This consultation aims to obtain the necessary consents for both the temporary and permanent phases, in accordance with the Margam Drainage Report (MARPT-BHK-01-XX-RP-C-000001). Laing O'Rourke will be responsible for all secondary consent only.

- Ordinary Watercourse Consent
- Sustainable Urban Drainage Systems
- Ground water abstraction
- Surface water discharge

As the development advances into the detailed design stage, the mitigation measures will become clearer, facilitating the creation of the Water Management Plan.

9.1 Flood Risk

For direct associated management of flood risk during phase of construction, please refer to the Water Management Plan

A flood screening study (MARPT-BHK-01-XX-RP-C-000003) has been conducted for the development site at Margam by designer Baker Hicks and consultant SLR. The study identified several potential sources of flooding, including:

- Flooding from rivers and surface waters
- Flooding from groundwater
- Flooding from sewers
- Flooding from reservoirs, canals, and other artificial sources

The assessment concluded that the site is potentially at risk from multiple flooding sources, particularly fluvial flood risk.

In conjunction with the flood screening study for the development of Margam substation and associated cable route, the Geotechnical Desk Study: Margam FEED also highlights flooding potential is likely during construction. According to the Natural Resources Wales Flood Map for Planning, the site is categorised as:

- Flood Zone 2: Areas with a 0.1% to 1% (1 in 1000 to 1 in 100) chance of flooding from rivers or surface water and small watercourses in a given year, including the effects of climate change.
- Flood Zone 3: Areas with more than a 1% (1 in 100) chance of flooding from rivers or surface water and small watercourses in a given year, including the effects of climate change.

Source	Risk Category	
	Flood Zone 2	Flood Zone 3
Rivers	Margam Substation Option 2 Cable Route Ch. 550m-1125m Cable Route Ch. 1325m- 1425m (B&C) Cable Route Ch. 1450m-1650m (B) Cable Route Ch. 1450m-1600m (C) Cable Route Ch. 1750m-1875m (C)	Cable Route Ch. 50m-550m Margam Substation Option 4 Cable Route Ch. 1600m-1750m (C) Cable Route Ch. 1650m(B) – 2410m Cable Route Ch. 1875m(C) – 2410m
Surface water & small watercourses	Central area of Margam Substation Option 2 Some areas of Margam Substation Option 4 Small area of TATA Substation associated with existing watercourse.	Some areas of Margam Substation Option 4 Most of Cable Route Ch. 50-450m

Subsequently, JBA Consulting conducted a separate report (Flood Consequence Assessment: Land at Port Talbot Steel Works, September 2024, Rev D) upon appointment by Tata for the wider development, which concluded, based on historical reporting, that the land designated for development, including the Tata Substation and associated cable route, has no known recorded flood events.

Laing O'Rourke has engaged with the regulator, Natural Resources Wales, which has confirmed that the activity does not require a Flood Risk Activity Permit.

- Email Ref: *FRAP enquiry; National Grid – Margam Substation extension, 04.09.2024, 0838am*

10. Emergency Preparedness and Response (ISO14001 Clause 8.2)

It is recommended that the Environmental Emergency Plan be read in conjunction with this chapter, as the plan outlines the emergency response procedures that site operatives must follow in the event of an environmental incident. Additionally, the plan highlights the key principles of avoidance to prevent such incidents from occurring in the first place.

All Environmental and/or Energy-Related incidents, however small, will be recorded on the Laing O'Rourke sustainability reporting tool. They will also be reported to the client as required.

Site plans indicating the location of drainage and also of spill kits will be kept in the Environmental Management File, but where risk is significant, will also be displayed as appropriate on the noticeboards on site with the Fire & Emergency plans.

It is imperative that the emergency response is tested. Training how to deal with spills is not the same as testing the effectiveness of the planned response. As a minimum, spill drills (other types of drill could be simulated) will be carried out at least annually if no incidents have occurred on site in the interim period.

11. Checking (ISO14001 Clause 9)

11.1 Monitoring & Measurement (ISO 14001 Clause 9.1)

This document identifies how the applicable environmental and energy aspects of the project will be monitored (e.g. visual inspection, tests or reports, metering) and the frequency that such monitoring will be undertaken.

All operations and activities having a significant impact on the environment and energy performance are regularly monitored and measured.

Any equipment used to monitor or measure shall be checked and calibrated to ensure results are reliable. Records of maintenance and calibration shall be retained and kept in the Environmental Management folder on the server.

Minimum Inspection/Monitoring/Activity

Activity	Weekly	Monthly	Quarterly	6 Month	Annually	As & when required
Waste data monitoring		X				
Water benchmark monitoring (data on Impact)		X				
Energy consumption monitoring (data on Impact)		X				
Environmental Inspections	X					
Environmental Incidents						X
Review of permits, licences and legislation			X			
Review of permit monitoring requirements		X				
EMS Audit and EnMS Audit (carried out by HO Team / Lead Auditors)					X	
Noise Monitoring						X
Dust/Air Quality Monitoring						X
Calibration Certification					X	
Environmental NCR's (to be reviewed to maintain corrective action)						X
Waste procedure re-briefs (WTN completion/checking AND mgmt.))			X			
Sub-contractor Environmental Audits/Info gathering						X
ESG Target Tracking (incl Sustainable Procurement)		X				

11.2 Visit by Statutory Bodies / Interested Parties

During the lifetime of the project there may be a number of visits from statutory bodies including water authorities, Natural Resource Wales, local authorities, HSE etc. Some visits will be scheduled and part of ongoing monitoring against consents or permits. Other visits may be a response to a perhaps a concern from that body or in response to a complaint from the public or another party.

All visits, both unscheduled (responsive= Incident Reporting) and scheduled (monitoring = Visits) will be recorded on LOR's Environmental Reporting Tool. All records/documents/emails relating to these visits will be retained with the record of attendance on the project SharePoint.

11.3 Evaluation of Legal Compliance (ISO14001 Clause 9.1.2)

The Laing O'Rourke group Legal Register is maintained and held on the EMS. On this project legal compliance is evidenced through fulfilment of the permitting, consents and licence (and sometimes planning conditions) requirements applicable, as well as testing and related records and inspection/audit. Permits applicable to particular activities should be referenced in the ERA and RMP as applicable. Evaluation is carried out at:

Operational level:

- Regular or mandatory inspections and/or tours as defined in the monitoring routine above.
- The monitoring and testing that is required to comply with any consents or permits and related record keeping (e.g. ph testing, notch gauge readings, noise monitoring, meter readings)
- Potentially audit or inspection of the location or of any supply chain that contribute to compliance with consents, licences or permits.
- External visits from issuing bodies or contractual parties (e.g. water authorities, local authorities, EA, Client etc.

Function or Business Unit level:

- Audits, in accordance with the EMS and EnMS
- Management Review in accordance with the iGMS and Environmental/Energy Management review processes.

All records of evaluation will be maintained, controlled and disposed of in accordance with EMS and EnMS requirements.

The validity of environmental licences and permits within Wales can be verified from the Public Register which can be accessed from the Natural Resources Wales website:

Natural Resources Wales / Check for a permit, licence or exemption (Public Register)

11.4 Non-Conformance, Corrective & Preventative Action (ISO14001 Clause 9.1.2)

Non-conformances can be raised as part of any internal or external inspection, audit or informal visit or tour in order to raise the profile and importance of a particularly significant environmentally or energy related issue on site.

All environmental and energy non-conformances raised during an Internal EMS/EnMS Audit or external accredited audit body (e.g. BSI/Achilles) will be closed out within good time (generally no later than one month). Failure to comply with the timescales for closing out actions will be notified to the Environmental Sustainability Leader with persistent issues being reported to the Head of Sustainability and Operations Leader.

Environmental incidents (events) are recorded on the LOR Environmental Reporting Tool database. The categorisation of environmental incidents is:

11.4.1 PC1 (Potential Class 1)

An environmental event which could have caused major (as defined in Class 1 event) property, ecological, watercourse, land or reputational damage as determined by the central Environmental Sustainability Leadership team. It is subject to a full investigation. Examples: to overcome pump failure pumping (temporarily) heavily silty water into drain as assumed to be sewer but found to be overflow pipe to river

11.4.2 Class 1 - Major Event

Caused actual major environmental impact requiring clean up or substantive action or a legislation breach. It is likely that the event has resulted in involvement with an environmental regulator and may result in prosecution. The impact from a category 1 incident is likely to extend beyond the boundaries of a project and may generate interest from the press as well as regulators. e.g. diesel or large silt discharge into river. A full investigation involving all relevant parties is required and will be recorded against the record on the LOR sustainability reporting tool.

11.4.3 Class 2 - Significant Event

Caused actual significant environmental impact with more limited clean up/action; possible legislative breach. It is an incident that impacts the environment and requires remedial action beyond the site boundaries or is a significant 'non compliance' with the EMS, environmental permits e.g. Section 61, ecological licensing. A full investigation involving all relevant parties is required and will be recorded against the record on the LOR sustainability reporting tool.

11.4.4 Class 3 – Minor Event

Caused actual localised impacts that can readily be controlled by site operatives and site management, e.g. small spills and leaks that do not contaminate the ground, surface water or groundwater. (examples: hydraulic hose burst on tarmac; noise complaint where no restrictions)

PC1s, Category 1 & 2 incidents are communicated to Environmental Sustainability Leader and will be investigated, actions assigned and close out required.

In the event of a significant pollution incident, it is essential that the Project Leader and Environmental Sustainability Leader be informed immediately, so that they can contact the relevant regulator if required.

12. Internal Audit (ISO14001 Clause 9.2)

The number of internal audits against the Environmental and Energy Management Systems implementation depends (see EMS/EnMS Manuals) on the risk, size and duration of the project. The Central Environmental Sustainability team ensures that all projects are at least annually audited against the EMS and EnMS (where applicable).

The Environmental Sustainability Assurance Lead has supplied an audit schedule identifying the locations provisional auditing dates. All environmental and energy audits are carried out in accordance with the EMS and EnMS audit process.

Results of audit are shared with the project team and any significant findings (positive or negative) and best practice shared with the Sustainability or BU Leadership as appropriate.

13. Management Review (ISO14001Clause 9.3)

There are no actions for projects except to provide any information requested. It is the responsibility of the Environmental Sustainability Leader to ensure that the effectiveness of the environmental and energy management systems is reviewed so that they continue to reflect accurately the organisation and environmental and energy management practices as applied to all Laing O'Rourke businesses.

Management Reviews will be carried out in the group headquarters and communicated out as appropriate.

Results of these reviews will be analysed by the Central Environmental Sustainability and Energy Management teams and any resulting actions or amendments to the EMS, EnMS or related policy or procedures will then be signed off by the Environmental Sustainability Leader on an annual basis.

Actions arising from Management Review will be communicated to projects as appropriate as they may affect or require changes to the EMP and related objectives, targets or controls measures.

APPENDICES

APPENDIX A - ENVIRONMENTAL RISK ASSESSMENT

APPENDIX B - Site Waste MANAGEMENT PLAN

APPENDIX C - LICENCES, PERMITS AND EXEMPTIONS

APPENDIX D - AIR QUALITY MANAGEMENT PLAN

In accordance with applicable local, regional, and national legislation, construction activities for the development will adhere to key objectives aimed at managing the impact on air quality. The primary objectives are as follows:

- Ensure Early and Continuous Collaboration: Engage with both the client and local authorities from the outset to ensure effective communication and compliance with regulations.
- Minimise Air Quality Impact: Implement construction methodologies that follow the latest best practices and legal requirements to reduce the impact on local air quality.
- Monitor Effectively: Undertake suitable air quality and dust monitoring to ensure the proper implementation of control measures.
- Record and Address Complaints: Document any complaints related to dust or air quality, along with the necessary corrective actions or measures taken.

All work will adhere to recent best practice guidelines and relevant legislation, including:

- Institute of Air Quality Management Guidance
- The Air Quality Standards Regulations 2010
- Pollution and Control – Construction Site Handbook, April 2018

To reduce environmental impact, the following mitigation measures will be planned and implemented:

- Site Layout: Where practicable, machinery and dust-generating activities will be located away from sensitive receptors, such as residential areas.
- Dust Barriers: Hoardings or other barriers will be erected around the site perimeter, where necessary, to prevent dust dispersion.
- Water Management: A water management system will be put in place to control dust, including the use of rainwater harvesting, mechanical storage units, and standpipe draw-offs.
- Appropriately Sized Equipment: Construction plant will be chosen based on the required tasks, with preference given to non-diesel equipment where feasible.

By adopting these measures, the project will minimise its impact on local air quality and ensure compliance with the latest air quality standards.

APPENDIX E - NOISE AND VIBRATION PLAN

This section will be updated upon receipt of the Noise Modelling Assessment

BS 5228 provides guidance on noise and vibration controls during construction. Below is an outline of the noise and vibration mitigation measures Laing O'Rourke will implement during the construction phase of the development:

Noise Mitigation

1. Selection of Equipment: Use quieter, modern equipment that is regularly maintained. Where possible, select equipment with noise suppression features, such as enclosures.
2. Barriers and Enclosures: Install physical barriers (e.g., walls or acoustic screens) between the noise source and identified receptors. Barriers should be made of sound-absorbing materials to prevent an echoing effect.
3. Timing of Works: Schedule noisy activities during less sensitive times, avoiding early mornings, evenings, and weekends where possible. Further details on specific working hours will be provided as the development progresses.
4. Site Layout: Position noise-generating equipment away from sensitive receptors or designated zones to reduce exposure.
5. Training and Awareness: Ensure operatives are trained on the impact of noise and encourage the adoption of best practices when operating machinery.
6. Monitoring and Reporting: Conduct regular noise monitoring at the site boundaries, particularly near sensitive receptors. Record findings and modify methodologies if necessary to meet noise control targets.

Vibration Mitigation

1. Equipment Selection: Choose equipment with lower vibration emissions, such as hydraulic equipment over impact or vibratory tools, to minimize vibration levels.
2. Minimizing Vibration-Intensive Work: Reduce vibration by adopting non-percussive techniques or quieter, less vibration-intensive methods wherever possible.
3. Isolating Sensitive Structures: For vibration-sensitive structures, implement isolation measures or temporary damping materials to minimize vibration transmission.
4. Distance from Sensitive Receptors: Position vibration-intensive equipment as far away from sensitive structures as possible to reduce the potential for damage or disruption.
5. Monitoring and Measurement: Conduct pre-work surveys to establish baseline vibration levels. Regularly monitor vibration levels during construction to ensure they stay within prescribed limits.
6. Communication and Advance Notification: Inform nearby residents and businesses about upcoming vibration activities in advance, helping them prepare for any potential disruption.

By implementing these measures, Laing O'Rourke aims to minimise the impact of noise and vibration on the surrounding environment and community throughout the construction phase.

APPENDIX 8 PEAT MANAGEMENT PLAN

Margam Substation: Peat Technical Note

The Proposed Development comprises a new substation, and associated infrastructure, extending from the existing Margam substation into the new electric arc furnace in Port Talbot. This upgrade will facilitate new network connections within the local area. The purpose of this technical note is to address initial concerns over peat disturbance, as peat has previously been identified at the Margam Substation site. This information will be included as part of an Environmental Impact Assessment screening application, with further documents to be provided during the planning phase.

Policy Background

Under Planning Policy Wales Edition 12 (2024[1]), peat is recognised for its significant role as both a carbon sink and a long-term carbon store. In accordance with the Step-Wise Approach, the first intention is to avoid the disturbance of peat. Where it is not possible toavoid all peat as a result of key environmental or engineering constraints, the design must then seek to minimise the impacts to peat soil and commit to mitigating any impacts to deliver successful restoration at the end of the construction phase. This applies particularly to peat soils with active surface vegetation, as a result of its combined carbon sink/carbon store status.

Peat layers which are buried below the ground surface no longer have an active vegetation layer but, despite no longer functioning as a carbon sink, will still remain a carbon store. These peat deposits have a lower sensitivity than peat at the surface. A key management strategy would therefore be to avoid all areas of surface peat, regardless of the quality or status of their vegetation layer, and minimise the excavation of buried peat. A peat management strategy would detail plans for reburial of peat that requires excavation, including identification of expected volumes of peat and suitable on-site locations for reburial in order to maximise the carbon stored within the peat deposit.

Peat at the Site

The peat at the Margam Substation site, as recorded in recent ground investigations, is buried at depths between 0.2 m and 6.1 m below ground level. The shallowest record of peat was identified at 0.2 m, beneath a layer of clay with a surface vegetation layer of grass. Other ground investigation records identified peat at depths of 0.4 m and 0.8 m below ground level in parts of the site, although the majority of peat deposits are located more than 1.0 m below ground level.

None of the peat is present at the ground surface, and there are no areas where the surface vegetation is classed as peat-forming or ‘active’ vegetation. As a result, it is considered that none of the peat deposits present can be considered to be ‘active’ in terms of carbon sequestration. Buried peat such as this remains a carbon store while kept undisturbed, waterlogged and not in contact with oxygen in the atmosphere.

Piling will be required on the project for foundations of the buildings, related equipment and associated infrastructure. At this stage, both rotary drilled continuous flight auger and driven

[1] Welsh Government (2024). Planning Policy Wales. Edition 12. Available at: https://www.gov.wales/planning-policy-wales

piles are being considered as techniques for piling installation. Rotary drilling requires boring of the pile locations, resulting in limited excavation of the substrate which would be stored and reburied at a later stage in construction. Driven piling methods do not require any excavation. Both techniques offer advantages in terms of ground disturbance when compared with traditional excavated foundations. A detailed piling design will be produced at a later stage that would follow the Step-Wise Approach of avoiding peat disturbance in the first instance followed by minimising excavation where it has to take place. At this stage we believe that the total volume of peat disturbed would be minor within the context of peat present at the site.

Horizontal directional drilling (HDD) will be required for installation of project infrastructure, such as cable routes. HDD methods will be employed in preference to open trenching in order to minimise the disturbance to peat deposits in these areas. This technique uses a drill to create a narrow bore path, causing less surface disruption and reducing soil disturbance making it more suitable to preserve the integrity of buried peat deposits.

Peat Management

Where possible, peat will be left undisturbed and in situ to retain its long-term carbon storage capacity. Phase 2 site investigations will be cross-referenced with the proposed site layout to determine the level of disturbance of buried peat, which is anticipated to be minimal.

Should localised excavation be required, the following peat management protocols will help to minimise the effects on the peat and its carbon store capacity:

- Where possible peat will be left in situ.
- Any peat that requires to be excavated will be stored carefully such that it does not dry out and lose its carbon.
- Peat will be stored for as short a time as possible, in stockpiles of no more than 1 m in height. Stockpiles should be covered to minimise drying. Water sprays may be required in hot weather to prevent the peat from drying out.
- All excavated peat would be reburied in suitable locations within the site as part of the site reinstatement process. Where possible, the peat should be placed below the normal water table level to ensure it remains waterlogged and as a carbon store in the long term.
- A designated area for peat re-burial will be identified during development of construction layout and will be designated on plans and in the Peat Management Plan

A Peat Management Plan (PMP) will be developed for the project and will set out measures to preserve and conserve peat. The plan will include, but is not limited to:

- details of the peat condition on site;
- an estimate of the total peat excavation volumes; and
- best practice guidance on temporary above ground storage, handling, reinstatement and restoration.

APPENDIX 9 PRELIMINARY HYDROGEOLOGICAL IMPACT ASSESSMENT

Preliminary Hydrogeological Impact Assessment

Prepared for NGET

April 2025



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REV04					

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1 INTRODUCTION

1.1 Background

National Grid Electricity Transmission (NGET) is developing a new electrical cable to provide electricity to Port Talbot steelworks (the Site). The cable route will run underground from Margam Sub Station to the Site (see Figure 1).

NGET has undertaken a draft EIA screening request with Neath Port Talbot Planning Authority for the works. Comments have been made around potential impacts to the local surface water and groundwater environment from the proposed cable trenching and ground stabilisation works, as follows:

> *Comment 23: The paragraph 2.2.13 continues on to state that the cable lines would have to cross the existing high pressure BOC gas main, the railway line and sidings and cross an area of suspected contaminated land (made ground) and areas of peat. This is concerning given earlier statements under contaminated land (Points 8 and 9 above) which state that no significant contamination was found. Similarly, crossing the BOC High Pressure BOC gas main could result in a potential major incident and will require consultation with the HSE. Network Rail will also have to be consulted on the potential impact to a nationally significant railway connection.*
>
> *Comment 24: Para. 2.2.14 states that the works will commence with a period of vegetation clearance and ground stabilisation works (which involves soil mixing with cementitious material) along the sections of open cut trenching. This could have a massive adverse environmental impact. The submitted plan appears to suggest that this would include the path across the TATA green fields area, which is TATA's Biodiversity compensation, mitigation and enhancement area for the EAF Project. Details of how the cementitious material will be removed from the ground would have to be detailed or the area would have to be compensated for the loss of these area, which would impact both National Grid and TATA's project.*

1.2 Scope of Work

This report assesses the potential hydrological and hydrogeological impacts of the cable development (specifically the trenching and ground stabilisation works) to the local water environment. A preliminary impact assessment has been carried out using established methodologies to consider the effects of the development, requirements for mitigation and inform a subsequent EIA screening request.

1.3 Data Sources

The information and assessments in this report are based on (but not limited to):

- Cable route layout descriptions and plans provided by NGET and their consultants/contractors;
- Phase I and Phase II Geo-Environmental Appraisals (RSK Geosciences, Jan 2022); (RSK Geosciences, Oct 2022); (BakerHicks, Jan 2025);
- Flood Consequence Assessment (SLR Consulting, Jan 2025);
- British Geological Survey (BGS) and Ordnance Survey (OS) mapping; and
- Data on designated sites from Natural England and National Resources Wales (NRW).

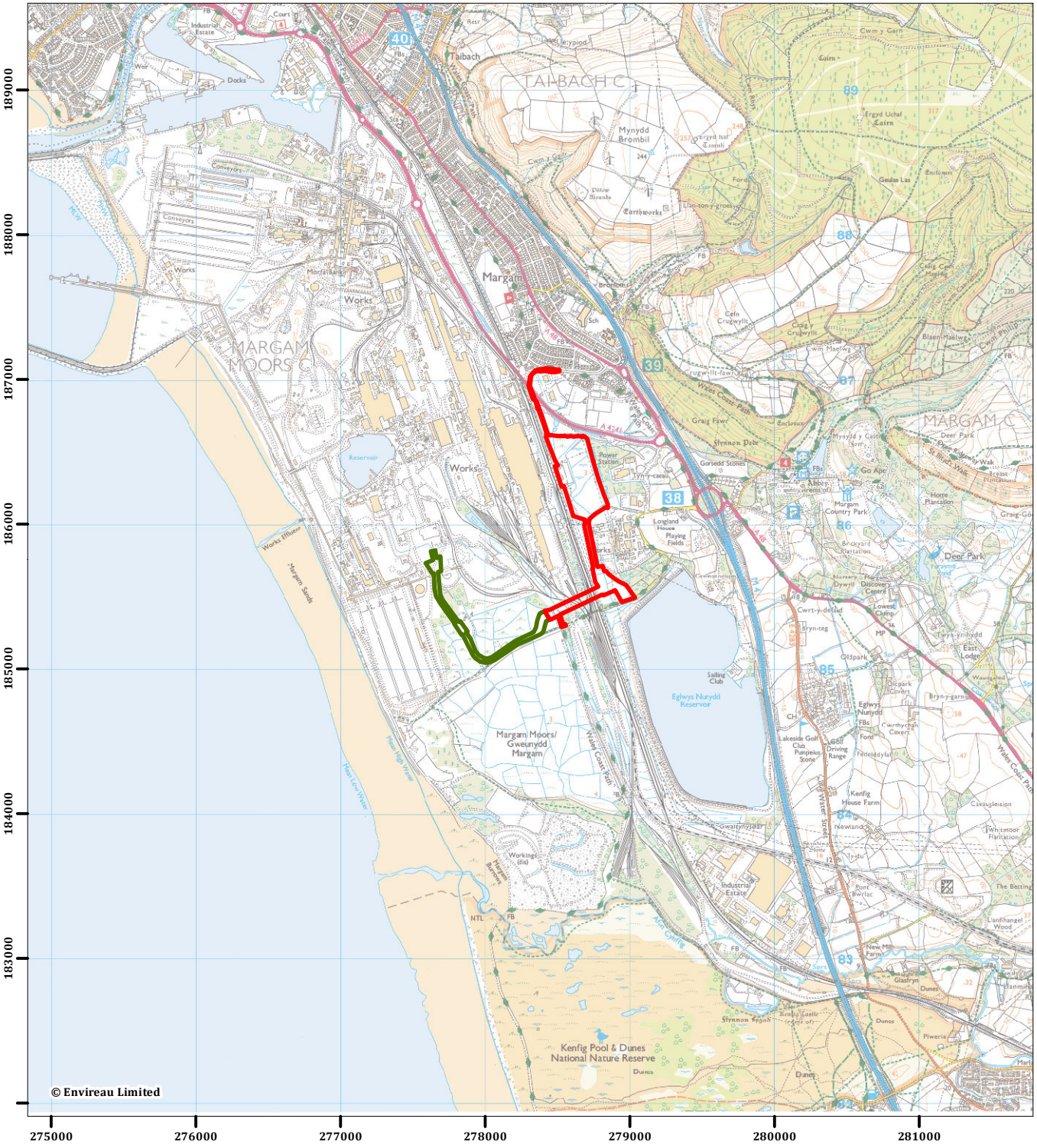


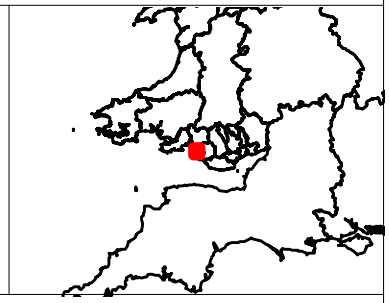
Figure 1: Site Location

Margam, Neath Port Talbot

Site Boundary (for screening purposes)

Cable route within the TSUK planning application P2024/0711

Notes:



0 400 800 1,200 1,600 Meters

Scale: 1:40,000 at A4

25 April 2025

NGR: 278,314 E / 185,755 N

Project No.	3491183
Client:	NGET
Drawn by:	LMM
Ref:	FIG Site Location

envireau WATER

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2 PROPOSED DEVELOPMENT

2.1 Overview

A new cable route comprising two high voltage circuits is proposed to run underground from Margam Substation to Port Talbot Steelworks (the Site). The cable route is displayed on Figure 2.

Note that the full cable route extends beyond the defined site boundary for EIA screening purposes into an area covered by Tata Steel UK planning application P2024/0711. For completeness, the impact assessment has considered the full cable route.

2.2 Cable Trench Design

The cables will be installed using a combination of methods of open cut trenching and horizontal directional drilling (HDD), as shown on Figure 2.

There will be four open cut sections, with a total length of approximately 1,350m. These include:

1. A ~200m section at Margam Substation (through the Junction 38 Wetland Complex);
2. A ~150m section between the two HDD drilling platforms east of the railway line;
3. A ~900m section between the two HDD drilling platforms west of the railway line;
4. A ~100m section at Port Talbot Steelworks.

The trenches will nominally be 1.5m wide and 1.3m in depth. The construction tolerance is +/- 150mm. Construction depths will reach an average maximum depth of 3.25m where the cables pass below the surface water drainage network or due to local variations in topography. There is only one surface water crossing required east of the railway line and the requirement for deeper trenching is mainly to the west of the railway line. Surface water drainage routes will be maintained through the installation of temporary culverts above the cables and reinstated on completion.

There will be three HDD sections, totalling approximately 2km length. The depth of drilling will be up to 15m below the railway line on the southeast section of the cable run.

2.3 Ground Stabilisation

The open cut sections will require ground stabilisation to minimise the risk of collapse/erosion due to groundwater levels and ground conditions. The stabilisation technique will involve mixing lime based cementitious products with the soils that are exposed along the trench excavation. The stabilised ground will extend up to 750mm either side of and below the trench, and will provide a low permeability (but not impermeable) barrier that will inhibit ingress of shallow groundwater and reduce the requirements for construction dewatering.

The cables will be laid in a 400mm thick granular bedding material above which the trenches will be reinstated with excavated materials. The top 500mm of stabilised ground will be broken out during reinstatement and a permeable layer emplaced at surface, to allow infiltration of rainfall and lateral movement towards surface watercourses.

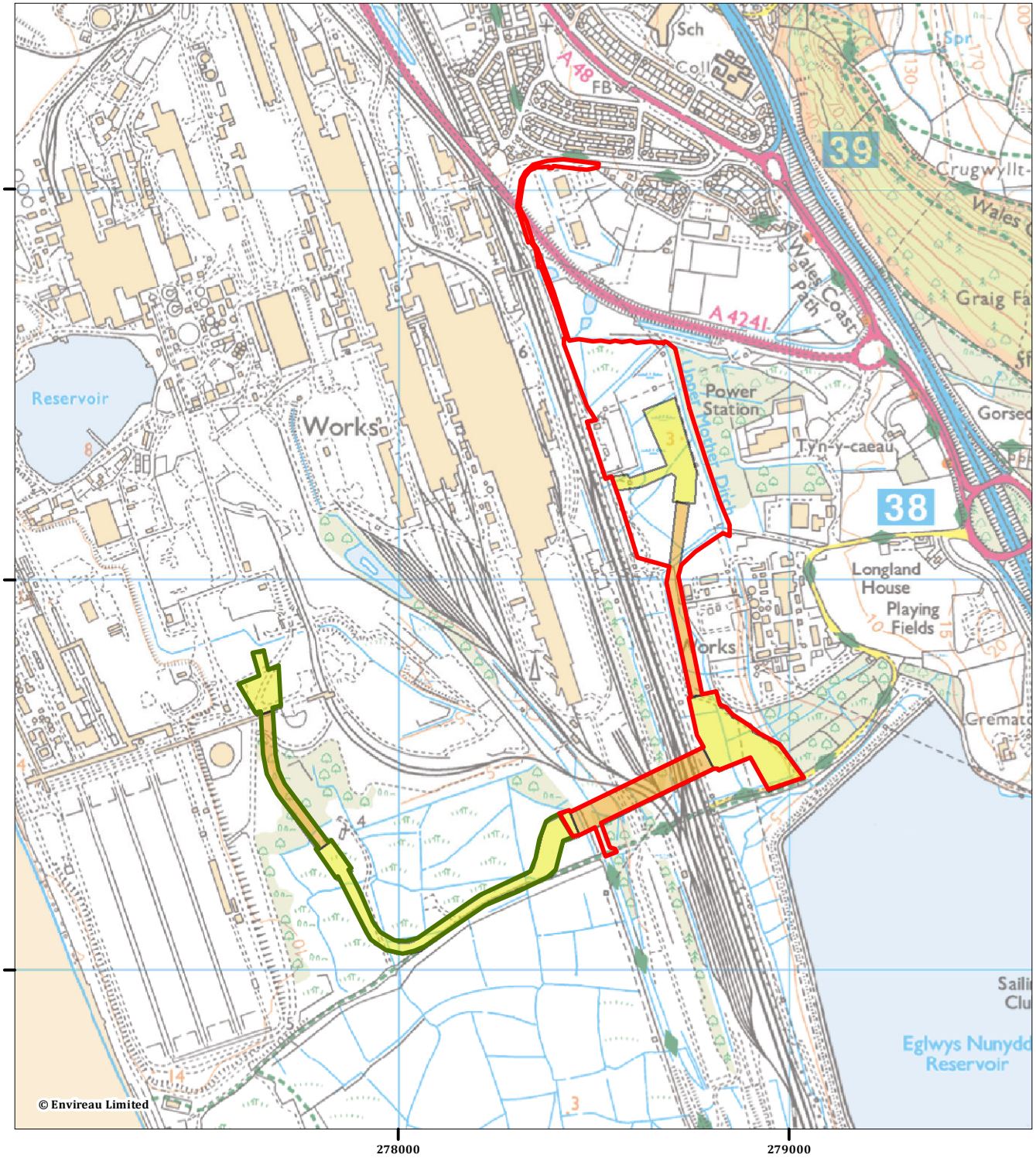
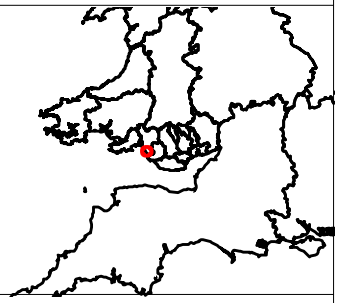


Figure 2: Proposed Cable Route

Margam, Neath Port Talbot

- Site Boundary (for screening purposes)
- Cable route within the TSUK planning application P2024/0711
- HDD
- Open Cut

Notes:



0 150 300 450 600 Meters

Scale: 1:15,000 at A4

25 April 2025

NGR: 278,320 E / 186,035 N

Project No.	3491183
Client:	NGET
Drawn by:	LMM
Ref:	FIG Proposed Cable Route

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3 BASELINE CONDITIONS

3.1 Topography

The elevation across the cable route is generally flat and averages 4.35m OD, with some local variability close to Margam Substation, the railway line and Port Talbot Steelworks.

3.2 Hydrology

The Flood Consequence Assessment (SLR Consulting, Jan 2025) details the local hydrological regime. The land along the cable route east of the railway is drained by a network of ditches to the central 'Upper Mother Ditch', which passes through a culvert beneath the railway line and feeds a reservoir on the western side of the steelworks, before draining to the sea.

The land around the cable route west of the railway receives surface flow from Margam Moors and drains northwards to join the Upper Mother Ditch where it enters the steelworks.

A large part of the cable route falls within Flood Zone 2 & 3, with predicted flood depths in the order of 1m or more.

3.3 Geology

3.3.1 Superficial Geology

The entire cable route is underlain by tidal flat deposits comprising clay, silt and sand. Borehole records indicate the tidal flat deposits are predominantly clay with interbedded sand, silt and peat deposits. This unit is underlain by glaciofluvial deposits which are present predominantly as gravels and clays. The thickness of the superficial deposits is typically in the region of 12 – 14m.

The presence of peat is a key consideration for the Planning Authority. Data from site investigation carried out along the cable route (RSK Geosciences, Jan 2022) (RSK Geosciences, Oct 2022) (BakerHicks, Jan 2025) demonstrates that:

- There are no exposures of peat along the cable route.
- East of the railway line, 2.3m of peat is typically present at depths between 1.1 and 3.9m bgl (geomeans).
- West of the railway line, peat deposits are thinner (in the order of 1m) and present at depths > 4.5m bgl.

The data demonstrates that peat is present at depth, which is consistent with their being no mapped deposits at surface. Whilst there is some potential for trenching to intersect peat deposits east of the railway line it is unlikely that a significant thickness of peat will be excavated.

3.3.2 Bedrock Geology

The Site is underlain by the South Wales Middle Coal Measures Formation and the South Wales Lower Coal Measures Formation. Both units comprise shales and mudstones, with subordinate sandstone and quartzite horizons. The bedrock is generally present between 12 – 14m bgl along the cable route and will not be encountered during trenching or HDD.

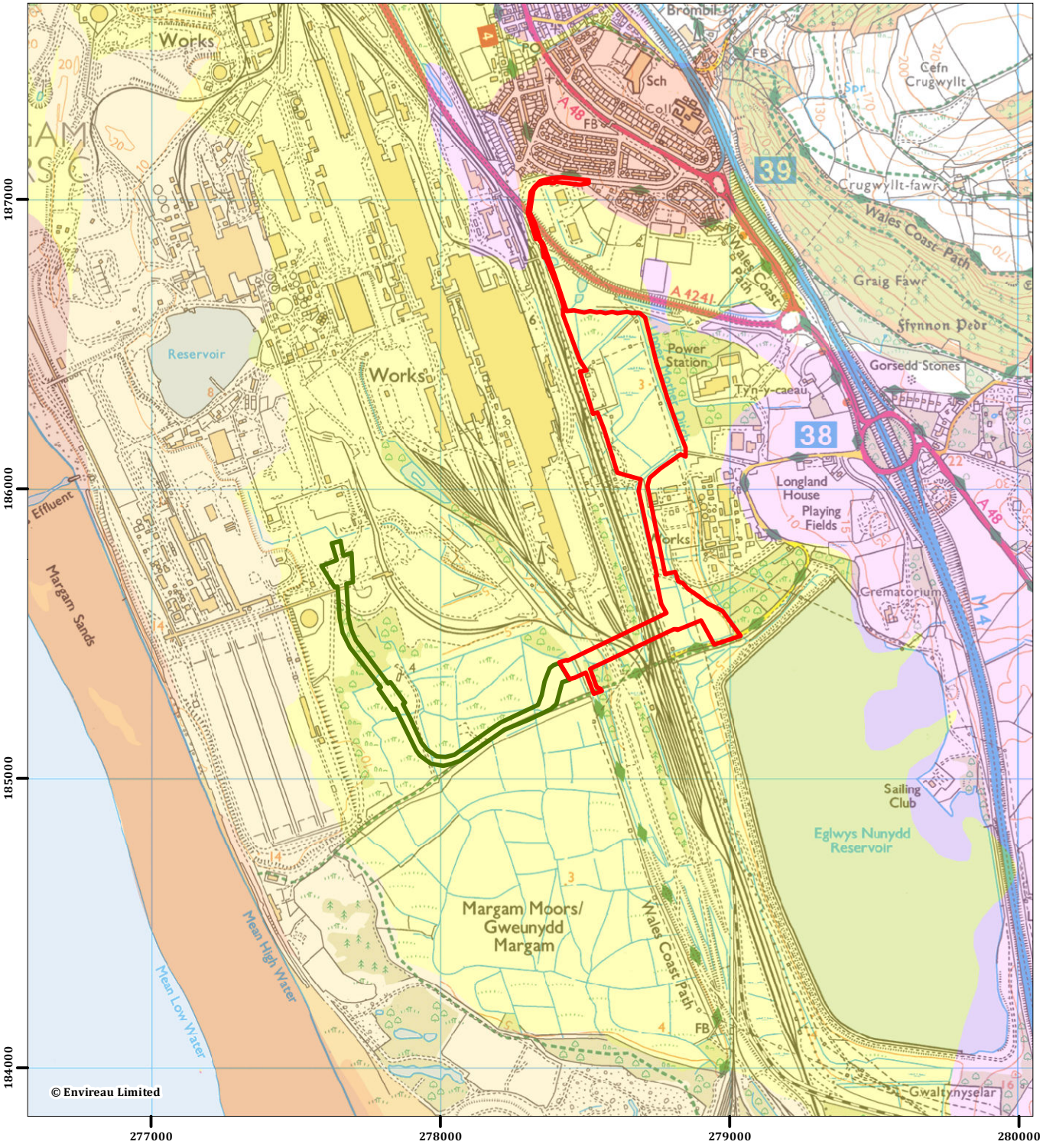


Figure 3: Superficial Geology

Margam, Neath Port Talbot

Site Boundary (for screening purposes)

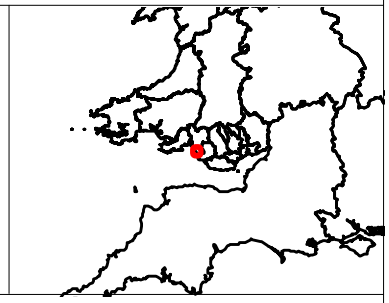
Cable route within the TSUK planning application P2024/0711

Superficial Geology

- Glaciofluvial Deposits - Sand and Gravel Alluvial
- Sand Deposits - Sand and Gravel Tidal Flat
- Deposits - Clay Silt and Sand
- Blown Sand - Sand
- Storm Beach Depoists - Gravel
- Marine Beach Deposits - Sand and Gravel

Notes:

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0 200 400 600 800 Meters

Scale: 1:20,000 at A4

25 April 2025

NGR: 278,312 E / 185,755 N

Project No.	3491183
Client:	NGET
Drawn by:	LMM
Ref:	FIG Superficial Geology

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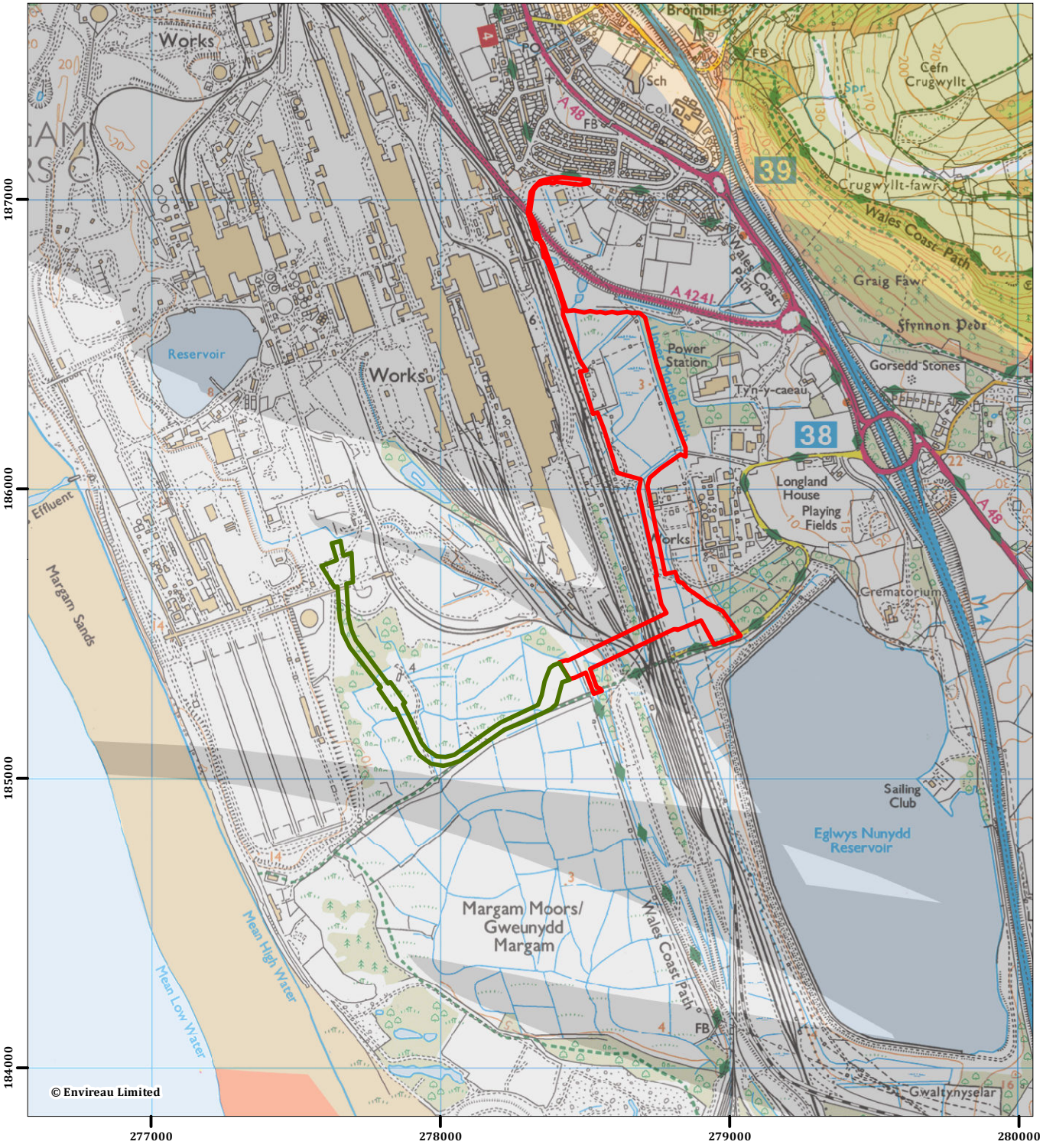


Figure 4: Bedrock Geology

Margam, Neath Port Talbot

Site Boundary (for screening purposes)

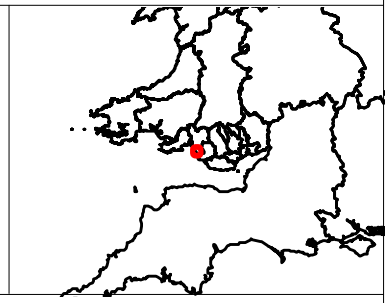
Cable route within the TSUK planning application P2024/0711

Bedrock Geology

- Llynfi Member - Mudstone, Siltstone and
- Llynfi Member - Sandstone
- South Wales Upper Coal Measures Formation - Mudstone, Siltstone and Sandstone
- South Wales Upper Coal Measures Formation - Sandstone
- South Wales Middle Coal Measures Formation - Mudstone, Siltstone and Sandstone
- South Wales Lower Coal Measures Formation - Mudstone, Siltstone and Sandstone
- Mercia Mudstone Group - Mudstone, Siltstone and Sandstone

Notes:

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0 200 400 600 800 Meters

Scale: 1:20,000 at A4

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Project No.	3491183
Client:	NGET
Drawn by:	LMM
Ref:	FIG Bedrock Geology

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3.4 Hydrogeology

The tidal flat deposits and underlying glacial fluvial deposits form a heterogeneous aquifer. Groundwater movement will be greatest in the more permeable (sand/gravel) layers, particularly towards the base of the superficials. Lower permeability clays and silts offer little potential for groundwater storage and will generally inhibit groundwater flow.

Ground investigations carried out as part of a groundwater (borehole) supply project at BOC Margam in 2008 proved that the tidal flat deposits had limited groundwater potential, and that the greatest groundwater storage and flow was within the underlying glaciofluvial deposits (JDIH Envireau, 2008). Those findings are consistent with observations from the more recent site investigation along the cable route.

Well formed layers of peat within the superficial deposits will contain some groundwater although this will diminish with depth, given the compressible nature of peat. The peat will exhibit a low vertical permeability and, where present, will act as a barrier for vertical movement of groundwater through the superficial deposits.

Groundwater levels will be close to surface and site investigation data demonstrates these and typically in the region of 1 – 2m bgl but will be controlled by surface water drainage and the local topography. The overall groundwater flow direction within the superficial deposits will be west towards the sea but will be influenced locally by surface water drainage patterns and significant manmade structures, such as the railway line, which will exhibit local controls.

3.5 Water Dependant Features

Water dependent features in the vicinity of the cable route have been identified.

3.5.1 Site of Special Scientific Interest (SSSI)

Eglwys Nunydd Reservoir

The reservoir is located approx. 0.2km north west area of the cable route and is the largest fresh water body in the county for wintering and migrating birds. The reservoir is man made and was constructed in the 1960's to provide cooling water for the steelworks. It is fed by surface water drainage from the upstream hydrological catchment.

Margam Moors

Margam Moors is located adjacent to the southern boundary of the cable route and is an agriculturally managed freshwater habitat bounded by dunes to the west and elevated land to the west. The habitat is primarily supported by rainfall.

3.5.2 Sites of Importance for Nature Conservation (SINC)

SINC's are sites which are areas of land recognised for their importance for wildlife and are designated by local authorities in cooperation with local wildlife trusts and other local stakeholders. The following are relevant to the cable route:

Junction 38 Wetland Complex

This site is described as a cohesive wetland site comprised of wet woodland, reed beds, ditches, and marshy grassland and covers the area to the east of Margam Substation. The SINC is supported by rainfall and surface water drainage that collects in the Upper Mother Ditch.

A short (<150m) length of cable trench is proposed within the SINC.

Eglwys Nunydd

This site is also a SSSI (see Section 3.5.1) although the boundary of the SINC is slightly larger than is designated for the SSSI (see Figure 5). The cable route does not cross the SINC.

3.5.3 National Peatland Action Programme (NPAP)

The National Peatland Action Programme is a 5-year plan of peatland restoration in Wales targeting peatland erosions and drainage, peatland management and restoration of peatlands. The restoration programme for Wales was launched in 2020 by the Welsh Government and is being delivered by Natural Resources Wales (NRW).

Peat soils are defined (Welsh Government, Mar 2022) as:

- more than 40 cm of organic (O horizon) material within the upper 80cm, excluding fresh litter and living moss; or
- more than 30 cm of organic (O horizon) material resting directly on bedrock or skeletal material.

The Peatlands of Wales Map does not identify any peatlands along the cable route. This is consistent with the observations from site investigations along the cable route, which show peat is only present at depth. As such, the peat will be compressed and will not act as an active carbon sink.

3.5.4 Groundwater Abstractions

Two groundwater abstraction boreholes are present at BOC Margam. The boreholes target groundwater within the superficial deposits, upgradient of the cable route. The locations of the boreholes are shown on Figure 5.

A review of the British Geological Survey (BGS) borehole records database suggests there are no other abstraction boreholes in use locally.

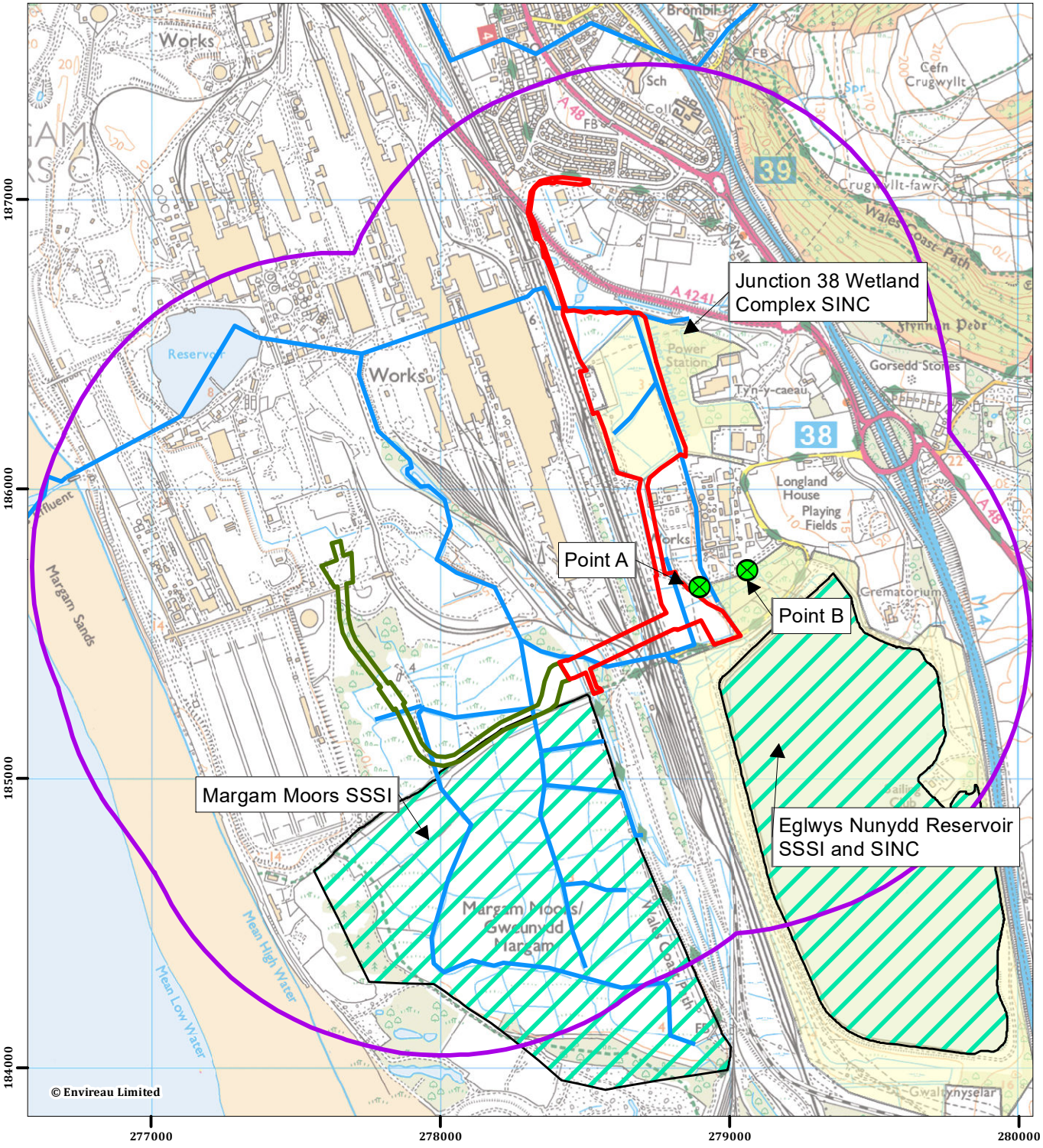


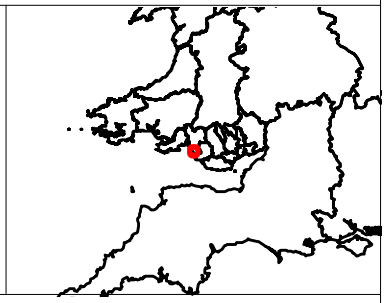
Figure 5: Environmental Setting

Margam, Neath Port Talbot

- Site Boundary (for screening purposes)
- Cable route within the TSUK planning application P2024/0711
- 1km Buffer
- Production Boreholes
- Watercourse
- Site of Special Scientific Interest (SSSI)
- Site of Importance for Nature Conservation (SINC)

Notes:

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0 200 400 600 800 Meters

Scale: 1:20,000 at A4

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Project No.	3491183
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Drawn by:	LMM
Ref:	FIG Environmental Setting

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4 CONCEPTUAL MODEL

The cable route between Margam Substation and Port Talbot Steelworks is approximately 3km in length and will be developed using a combination of open cut trenches and HDD. The trenches will nominally be a depth of 1.3m but may extend up to 3.25m average depth where cables pass below surface water drains and depending on local topography. The excavated trench walls will require ground stabilisation.

The cable route will cross low lying-land and a network of surface water drains that convey water northwest towards the sea. Where trenched sections intersect drainage routes, they will be maintained through the installation of temporary culverts.

The superficial deposits along the cable route extend between 12 – 14m bgl and comprise a heterogeneous mixture of predominantly low permeability clay and silt layers with more permeable layers of sand and gravel towards the base. The superficial deposits also contain some peat with a typical thickness between 1 – 2.3m. The peat is not exposed at surface but is present at depth, ranging from 1.1 – 3.9m bgl (geomeans) east of the railway line to >4.5m bgl to the west of the railway line. Consequently, there is potential for trenching to intersect peat east of the railway line although it is unlikely that any significant thickness will be encountered.

Groundwater levels within the superficial deposits are typically within 1 – 2m of ground level and are controlled by surface water drainage and local topography. The general groundwater flow direction is west, towards the coast.

Ground stabilisation techniques will extend up to 0.75mm either side of and below the trenches and will provide a low permeability (but not impermeable) barrier that will inhibit ingress of shallow groundwater. Once the cable is installed, the trenches will be reinstated with a 500mm permeable layer at surface to allow rainfall infiltration and lateral groundwater movement towards surface watercourses.

5 HYDROGEOLOGICAL IMPACT ASSESSMENT

5.1 Methodology

An impact assessment has been carried out based on the principles for assessment and management of environmental risk set out in Green Leaves III (Defra, Nov 2011) and NRW/Environment Agency technical guidance for hydrogeological risk assessment. The local hydrogeology and ground conditions are well understood and a Tier 1 (qualitative) assessment is therefore appropriate to consider the potential impacts in this case.

The conceptual model has been used to identify plausible Source-Pathway-Receptor (S-P-R) linkages. The potential effects and impact of a hazard occurring has then been considered, taking account of mitigation that is embedded or will be incorporated into the works.

5.2 Hazard Identification

In this case, there are two primary hazards to groundwater receptors associated with trenching and ground stabilisation. These are potentially permanent in nature and include:

1. Reduction in shallow groundwater flows close to trenches and disruption to established flow paths. This could lead to localised increases/reductions in groundwater levels either side of the trench; and
2. Creation of new groundwater pathways following trenching (e.g. through granular the cable bedding material) and reinstatement; and HDD.

Secondary hazards, which would likely be temporary in nature, include:

3. Reduction in groundwater quality if contaminated soils are encountered and mobilised during trenching; and
4. Reduction in groundwater quality due to pollution from construction plant and machinery.

5.3 Receptor Identification & SPR Linkages

The receptors associated with the hazards above, which could be impacted by changes in groundwater flows, levels and quality, include:

- Groundwater within the superficial deposits, including buried peat where it is at shallow depth (i.e. to the east of the railway line);
- The surface water drainage network and associated ecological habitats that are in hydraulic connection with the shallow groundwater system;
- Land and property in the vicinity of the cable route; and
- The Junction 38 Wetland Complex (SINC) and associated ecological habitats.

Eglwys Nunydd Reservoir (SSSI) and Margam Moors (SSSI) are not considered to be receptors as both are located upgradient of the cable route and there is no plausible hydrological or hydrogeological pathway that connects them to the proposed development. Consequently, they are not considered as receptors in the impact assessment.

Likewise, the BOC Margam water supply boreholes have not been considered as receptors because they are located upgradient of the cable route and there is no plausible hydrological or hydrogeological pathway that connects them to the proposed development.

5.4 Tier 1 Assessment

A qualitative impact assessment has been carried out and is presented in Table 1. The assessment shows that with the implementation of defined mitigation measures there will be no significant impacts to the local hydrology, hydrogeology and related ecological features as a result of the trenching and cabling works.

Table 1 Impact Assessment

Hazard	Receptor	Potential Effect	Mitigation	Impact, taking account of mitigation	
Reduction in shallow groundwater flows close to trenches and disruption to established flow paths, on account of ground stabilisation along trenches	Groundwater within the superficial deposits, including shallow peat encountered in the trenches Junction 38 Wetland Complex (SINC) and associated ecological habitats	Temporary/permanent increases/reductions in groundwater levels either side of the trench. This could result in wetter ground upgradient of the trench and drier ground on the downgradient side. Potential to dewater peat, where present.	Tidal Flat deposits are primarily low permability. Trench depth will be minimised to reduce the depth of ground stabilisation. Most trenching will be c. 1.3m in depth. Some short sections up to 3.25m in depth where cables pass below surface water drains (primarily west of the railway line). Top 500mm of stabilised ground will be removed to allow infiltration and maintain horizontal groundwater flow paths upon reinstatement.	Shallow trenching is unlikely to significantly impact groundwater flows and/or result in development of a significant head gradient either side of the trench. Peat is only expected to be encountered during trenching to the east of the railway. It is highly unlikely that trenching will encounter a significant thickness of peat and will not lead to dewatering.	Minor adverse
	Surface water drainage network and associated ecological habitats that are in hydraulic connection with the shallow groundwater system	Localised changes to surface water flows, potential reduction in value of associated ecological habitat .	As above	No significant change to surface water flows or associated ecological habitat.	Negligible
	Land and property in the vicinity of the cable route	Localised increase/decrease in flood risk.	Cable route falls within defined flood zone. Construction works will be managed to prevent increase in flood risk/conveyance. Land will be reinstated to current form on completion.	No significant change to flood risk.	Negligible
Creation of new groundwater pathways following trenching (e.g. through granular the cable bedding material) and reinstatement; and HDD	Groundwater within the superficial deposits, including shallow peat encountered in the trenches Junction 38 Wetland Complex (SINC) and associated ecological habitats	Cable bedding could act as a preferential drainage route, permanently changing groundwater flow paths and passively dewatering ground around the trench, including peat where present. HDD drilling could create pathway for groundwater in the more permeable sand and gravels below the lower permeability tidal flay deposits to move to surface.	Cable bedding will incorporate low permeability cut off zones every 20m, to prevent bedding material acting as a French drain. Ground stabilisation will remain intact either side of the cable bedding, inhibiting flows into the bedding material. Tidal flat deposits comprise primarily low permeability clays. These are likely to swell and anneal around the cable that will be installed using HDD.	No new pathways for groundwater transmission created	Negligible
	Surface water drainage network and associated ecological habitats that are in hydraulic connection with the shallow groundwater system	Permanent changes to surface water flows and conveyance routes as a result of the above.	As above.	No significant change to surface water flows or associated ecological habitat.	Negligible
	Land and property in the vicinity of the cable route	Localised increase/decrease in flood risk.	As above.	No significant change to flood risk.	Negligible
Reduction in groundwater quality if contaminated soils are encountered and mobilised during trenching; Reduction in groundwater quality due to pollution from construction plant and machinery	Groundwater within the superficial deposits, including shallow peat encountered in the trenches Junction 38 Wetland Complex (SINC) and associated ecological habitats	Deterioration in groundwater quality due to trenching through contaminated land and/or accidental spillage of pollutants during construction works.	Site investigation will identify potential to intersect contaminated soils, which can be treated/contained as part of the trenching works. Best practice approach to construction works will be adopted. Plant and machinery will be routinely inspected and regularly maintained. Fuels will be stored in bunded areas. Implementation of a CEMP to aid with implementation of the above, with controls on surface water runoff and groundwater discharges.	A temporary deterioration in water quality may occur.	Minor adverse
	Surface water drainage network and associated ecological habitats that are in hydraulic connection with the shallow groundwater system	As above, plus mobilisation of sediment during trenching works that could smother bed substrates/ecology.	As above.	No significant change to surface water quality or associated ecological habitat.	Negligible
	Land and property in the vicinity of the cable route	Deterioration in land quality/value.	As above.	No significant change to land quality/value.	Negligible

6 CONCLUSIONS

A preliminary hydrogeological risk assessment demonstrates that there are no significant hydrological or hydrogeological impacts associated with the planned trenching and ground stabilisation works, associated with the proposed cable route. The impact assessment accounts for mitigation that is embedded or will be incorporated into the proposed construction works.

The impact assessment shows that there may be minor adverse impacts to groundwater and the Junction 38 Wetland Complex. Any impacts will be localised to the area of land immediately along the cable route and are not considered significant in planning terms. The cable route does not cross any nationally or internationally designated sites.

The cable route does not cross any peatland; however small quantities of peat may be encountered at depth in the two small (2 x ~150m) sections of open cut trenches east of the railway line. The peat will be compressed and the construction works will not remove any peat that is acting as an active carbon sink.

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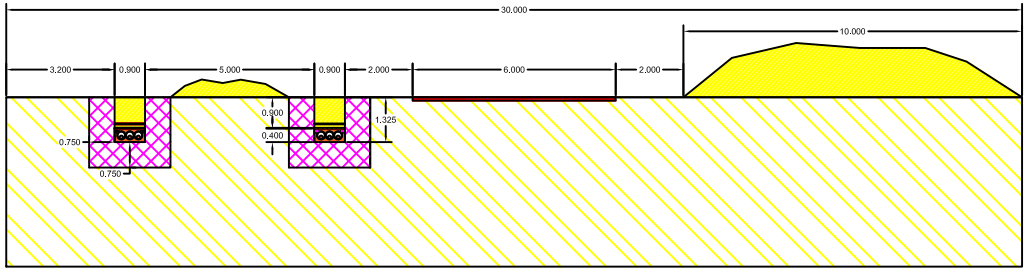
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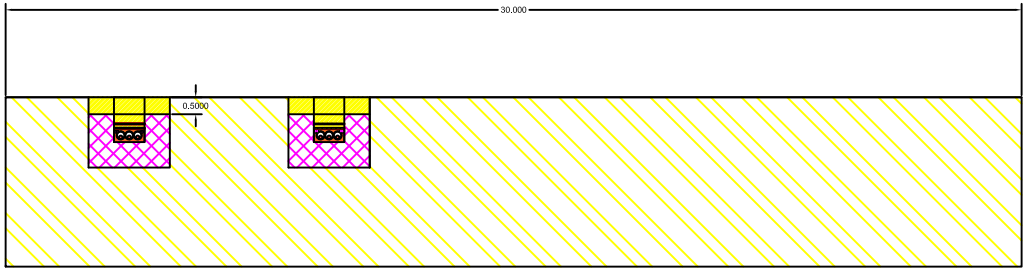
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APPENDICES

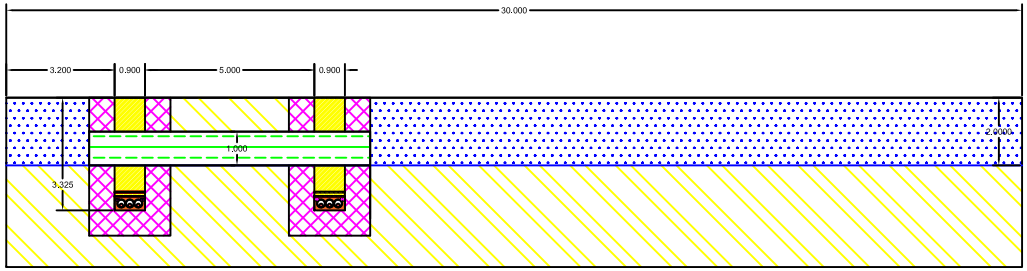
Appendix A Cross Sectional Drawings



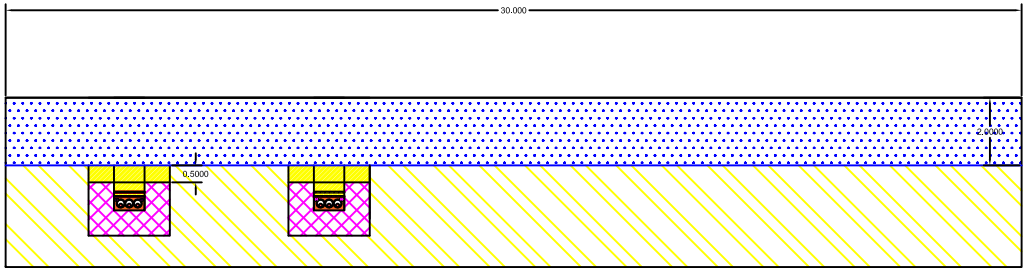
Typical Open Cut Cross-Section



Typical Open Cut Cross-Section - Reinstated



Typical Open Cut Cross-Section @ Ditch Location



Typical Open Cut Cross-Section @ Ditch Location - Reinstated

APPENDIX 10 GEOTECHNICAL CONSIDERATIONS

MARGAM SUBSTATION – GEOTECHNICAL CONSIDERATIONS

MARGAM & PORT TALBOT SUBSTATIONS

MARPT-LOR-XX-XX-RP-R-090004

Rev P01

24/04/2025

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Scope

This document has been produced by the Laing O'Rourke Central Civil & Geo Engineering Leader and the Margam & Port Talbot Substation Project Delivery Team. The purpose of this document is to provide our review of the Margam Site Ground Investigation report **(MARPT-BHK-01-XX-RP-G-090001)**, undertaken by BakerHicks. This document outlines the geotechnical considerations for the Margam Substation area, focusing on ground conditions, groundwater levels, and the suitability of materials for construction. Important factors considered are the variability in soil strength, the presence of soft and organic clays, and the high compressibility of Tidal Flat Deposits.

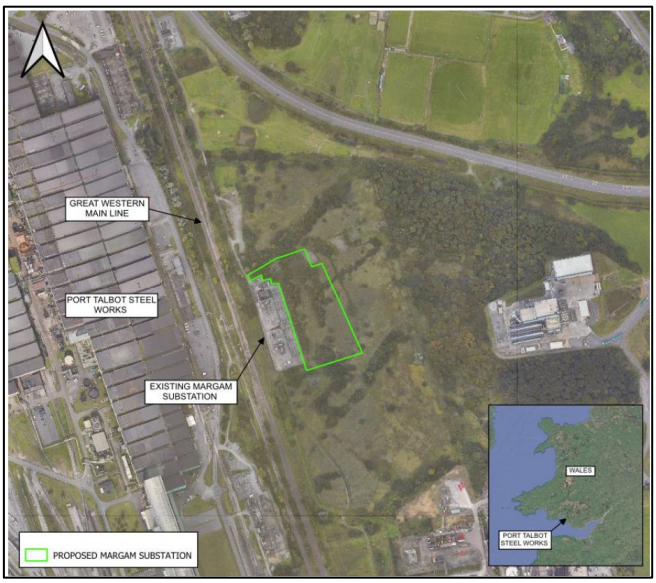


Figure 1: Margam Site Location Plan



Figure 2: Layout taken from MARPT-LOR-XX-XX-DR-R-090002

Ground Conditions

Seven boreholes (BHs 105-111) and seven trial pits (TPs 108-114) were formed within the new substation site and included in the Geotechnics Factual Ground Investigation Report at Phase 1 [101677 Margam TATA Steel Connection], Project No. PC248745, dated October 2024 (Draft). The remaining boreholes (BHs 101-104) and trial pits (TPs 101-107, 115-118) were located to the north, west and south of the new substation site.

The sequence of strata revealed in the exploratory holes was as follows: Topsoil, soft Clay (absent in two exploratory holes), very soft organic Clay / Peat, firm to stiff gravelly sandy Clay (absent in four boreholes), medium dense to dense sandy Gravel, stiff to very stiff gravelly sandy Clay, Mudstone/Siltstone Bedrock. The soft superficial deposits are Tidal Flat Deposits (TFD), the stiff clays and gravel layer are Glaciofluvial Deposits (GFD) and bedrock is South Wales Middle Coal Measures (MCM). A Peat Management Plan (PMP) is to be prepared and maintained to ensure the correct management and to mitigate the impacts of the construction activities on the surrounding landscape.

The average levels and thicknesses from the exploratory holes are as follows:

Stratum	Geology	Top Level (mOD)	Thickness (m)
Topsoil	-	+3.05	0.35
Soft Clay	TFD	+2.70	0.92
Org Clay/Peat	TFD	+1.78	3.10
Stiff Sandy Clay	GFD	-1.32	0.60
Sandy Gravel	GFD	-1.92	2.74
V stiff Sandy Clay	GFD	-4.66	4.74
Bedrock	MCM	-9.40	-

Table 1: Margam Typical Earth Strata

This has been visually represented in the below diagram:

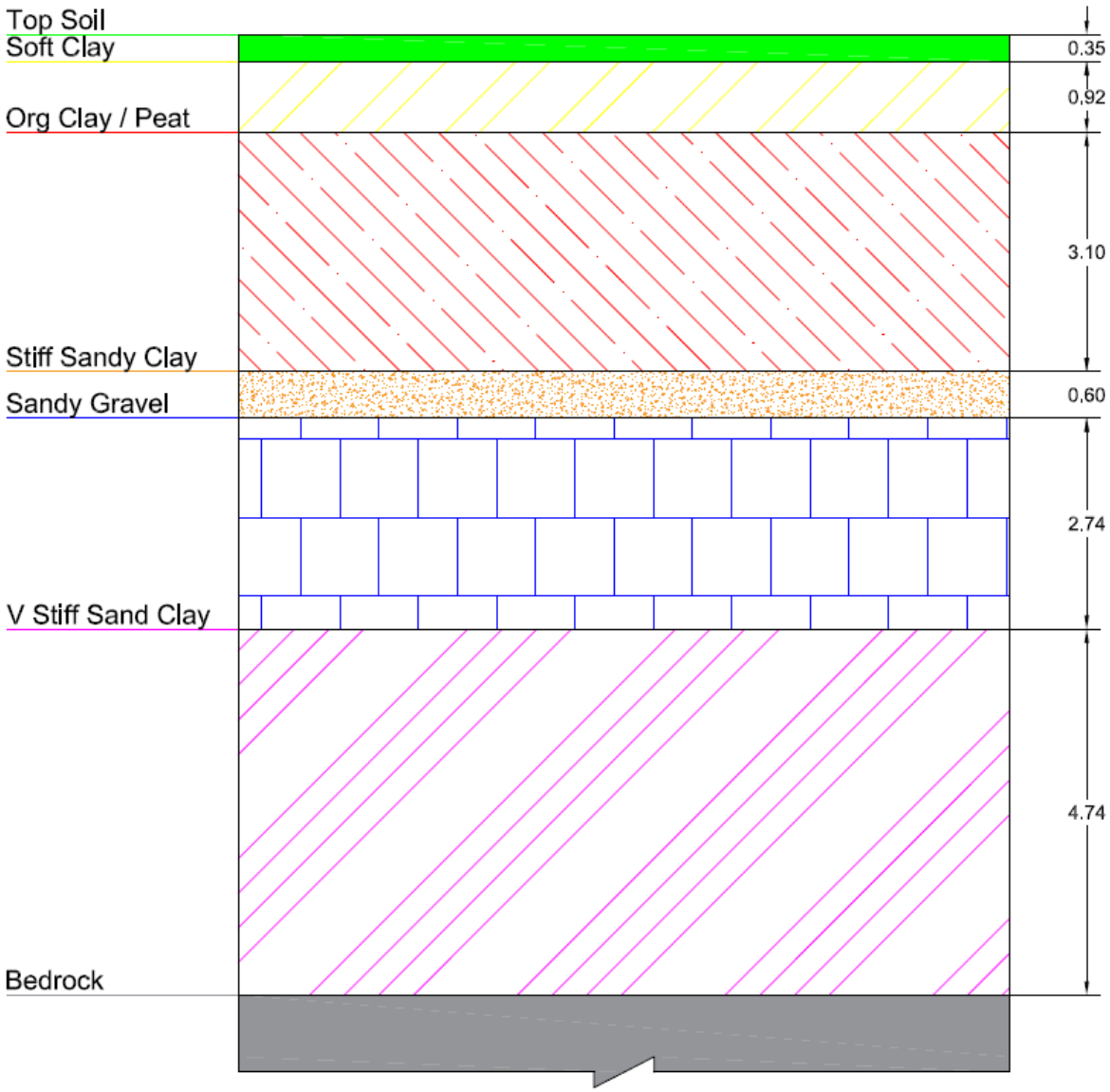


Figure 3: Margam Typical Earth Strata

Groundwater was encountered at shallow depth within the exploratory holes and saturates the sandy Gravel layer. Standpipes were installed in BH111 and BH112 and the water level was monitored on three occasions (20/09/24, 30/09/24 and 06/11/24). In BH111 groundwater was at ground level and in BH112 at 0.10m below ground level. Groundwater was also regularly encountered in the trial pits. Groundwater may then be assumed to be at ground level and at times the area may be anticipated to be flooded.

The undrained shear strength profile through the cohesive deposits is as shown below:

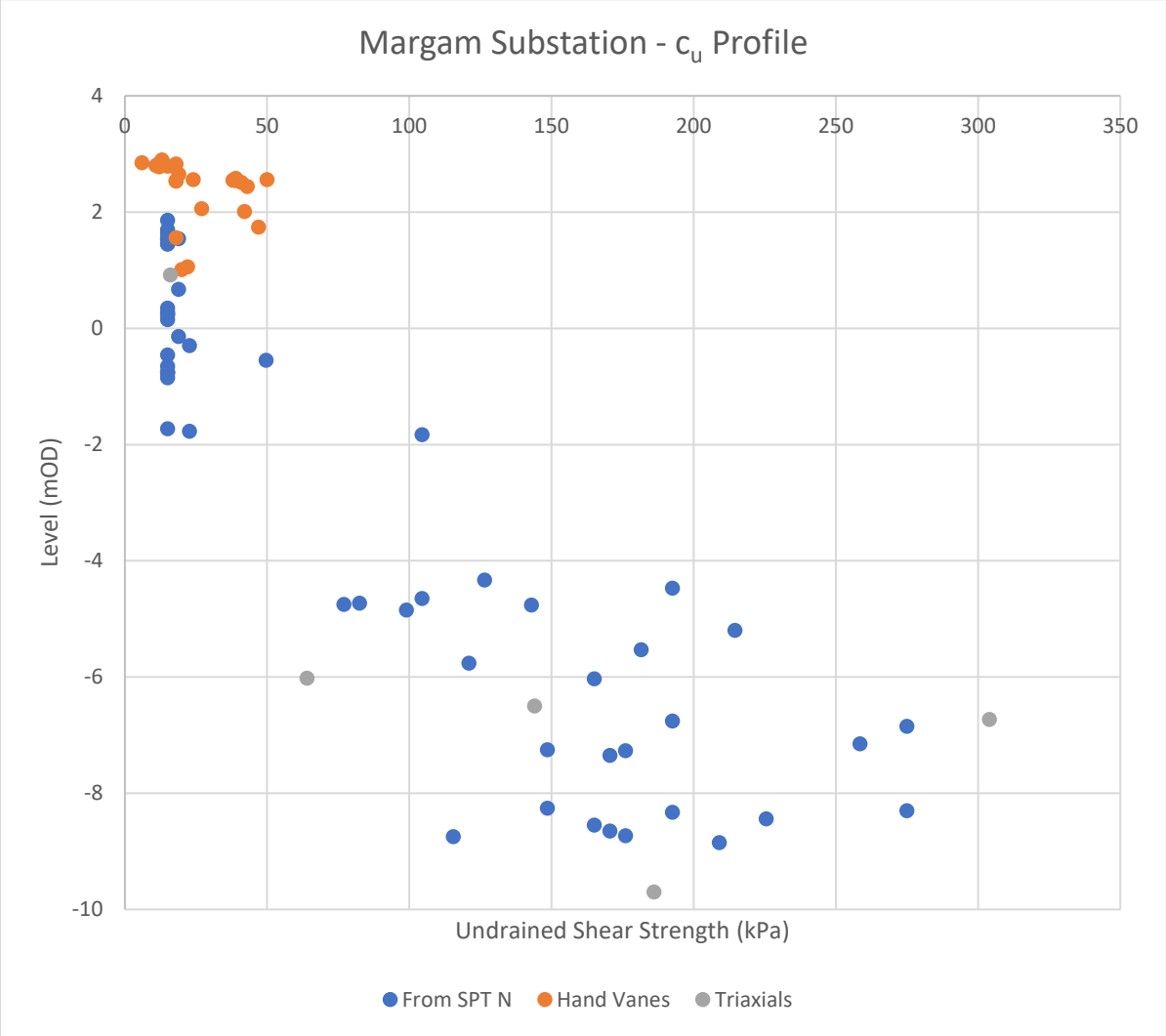


Figure 4: Margam Substation - Shear Strength Profile

The upper soft clay layer typically has strengths in the range 10-50kPa. The variation is likely associated with variable degrees of desiccation of the clay associated with the proximity of major vegetation to the exploratory hole. Groundwater was encountered at ground level at the time of the investigation (autumn 2024) but it may be anticipated that during prolonged dry periods the groundwater level may drop resulting in desiccation of the clay above the groundwater table. A design strength of 30kPa may be adopted for the soft Clay layer.

The underlying organic Clay / Peat appears to be consistently of low strength with inferred strengths from the SPT testing of about 15kPa, confirmed by similar hand shear vane and triaxial strengths, rendering it very soft. The Peat is typically described as 'spongey' meaning fibrous. It is a moot point as to whether such material should be assigned an undrained shear strength, but nonetheless the impression is given that the deposit is of low strength and of high compressibility.

The Tidal Flat Deposits are then of low strength and of high compressibility.

The underlying Glaciofluvial Deposits comprise both cohesive and granular layers, typically with the granular layer sandwiched between cohesive deposits above and below.

Two SPT inferred strengths from SPT testing in the upper cohesive layer gave values of 50 and 105kPa indicating it to be firm to stiff in nature. A design undrained shear strength of 75kPa may be assigned to it.

The lower cohesive layer appears to increase in strength from about 100kPa at the top to about 250kPa at the base. Alternatively, an overall design undrained shear strength of 175kPa may be assigned to it.

SPT N values (corrected for equipment efficiency to N_{60} values) through the sandy Gravel layer are shown plotted below:

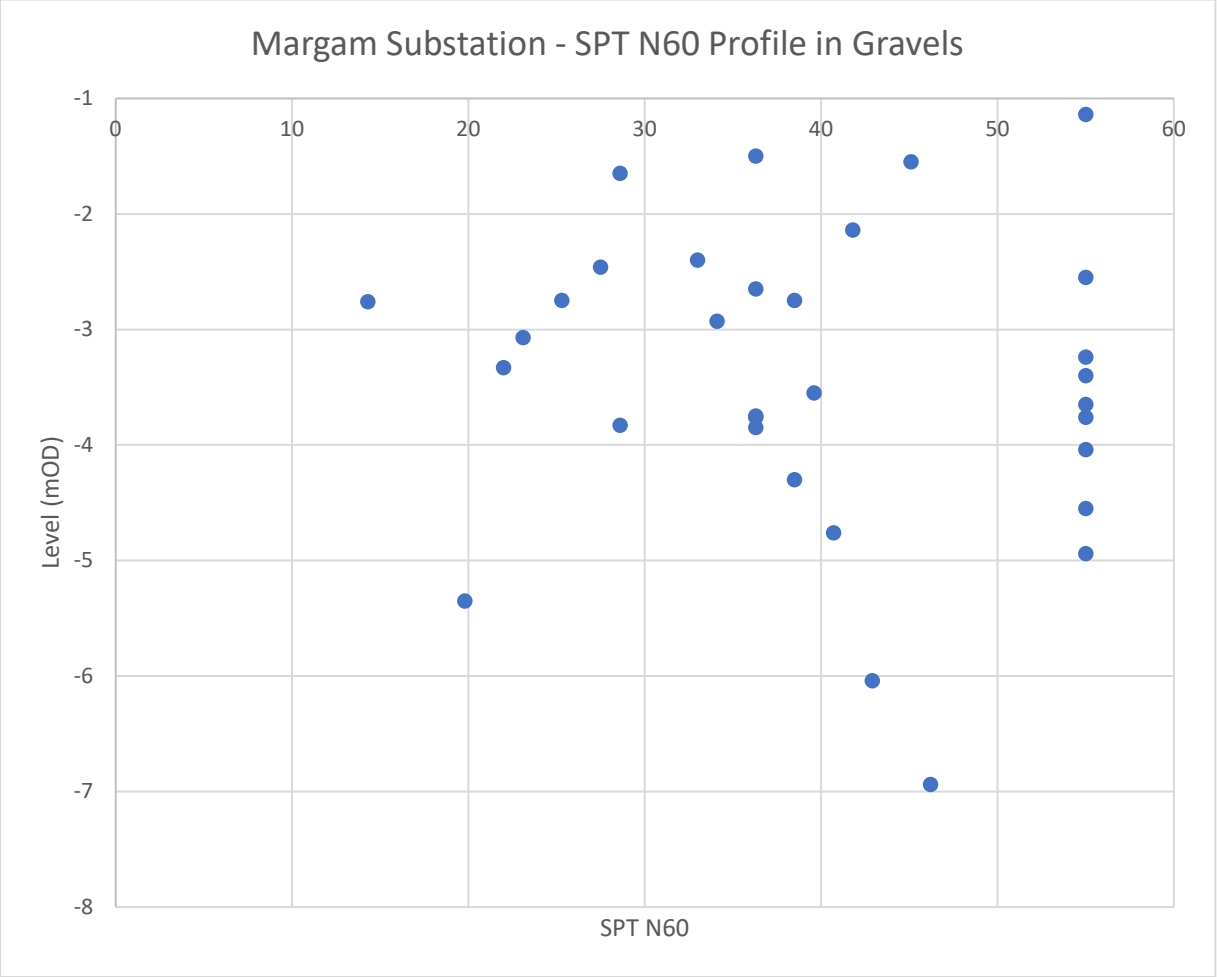


Figure 5: Margam Substation - SPT N Values

There would appear to be a slight increase in density with depth but overall, a design SPT N_{60} value of 35 (corresponding to dense material) may be assigned to it.

The Glaciofluvial Deposits are then of relatively high strength/density and of low compressibility.

Bedrock comprises alternating layers of mudstone and siltstone with mudstone predominating at the top and siltstone below. The mudstone is typically described as extremely weak to weak and the siltstone as medium strong to very strong. Two deep boreholes were formed on the site – BH107 to a level of -46.55mOD and BH109 to a level of -46.46mOD (so around 50m deep). Small carbonaceous (coal) deposits were regularly observed within the mudstone / siltstone layers, and three intact coal seams were recorded, 350mm thick in BH101 at 14.50m depth, 1400mm thick in BH104 at 15.70m depth and 250mm thick in BH109 at 42.55m depth. No worked coal seams were recorded, i.e. no voids. This means no grouting of the coal deposits will be required and there will be no problems forming bored piles into the deposits. Continuous flight auger piles are likely to be suitable though this will depend on the preference of the piling contractor. No direct strength (unconfined compressive strength or point load test) determinations of the rock were included in the Draft Factual Report, though the contents of the report indicates such tests were carried out. These would be helpful for pile design.

Bedrock is then of high strength and may be considered to be incompressible.

Earthworks

The new substation will have a final platform level over the majority of the area of +4.150mOD, some 1.1m above the current site level. This will raise the platform above the groundwater table and will prevent flooding of the substation platform.

It is first proposed to carry out a 150mm Topsoil strip which will lower the ground level to around +2.900mOD. The formation will then be raised by the placing of fill to a level of +3.775mOD, a raising of 0.875m on average. This material is required to have a minimum CBR of 3%. A 300mm thick Type 3 (permeable subbase) will then be placed and dressed with 75mm of stone chippings.

It is noted that the average Topsoil thickness on the site is around 350mm and therefore after removal of 150mm there is likely to remain a significant depth of Topsoil over the site. It is normal practice to remove all Topsoil before laying fill so this should be reviewed. Since the TFD contains extensive fibrous Peat deposits of no better properties than the Topsoil, it may be acceptable to leave remnants of the Topsoil in place.

Dynamic Cone Penetrometer (DCP) testing of the subsoil was carried out at fifteen locations within the new substation site. CBR values have been calculated for each blow increment to provide a profile of CBR values with depth and the calculated values are plotted below:

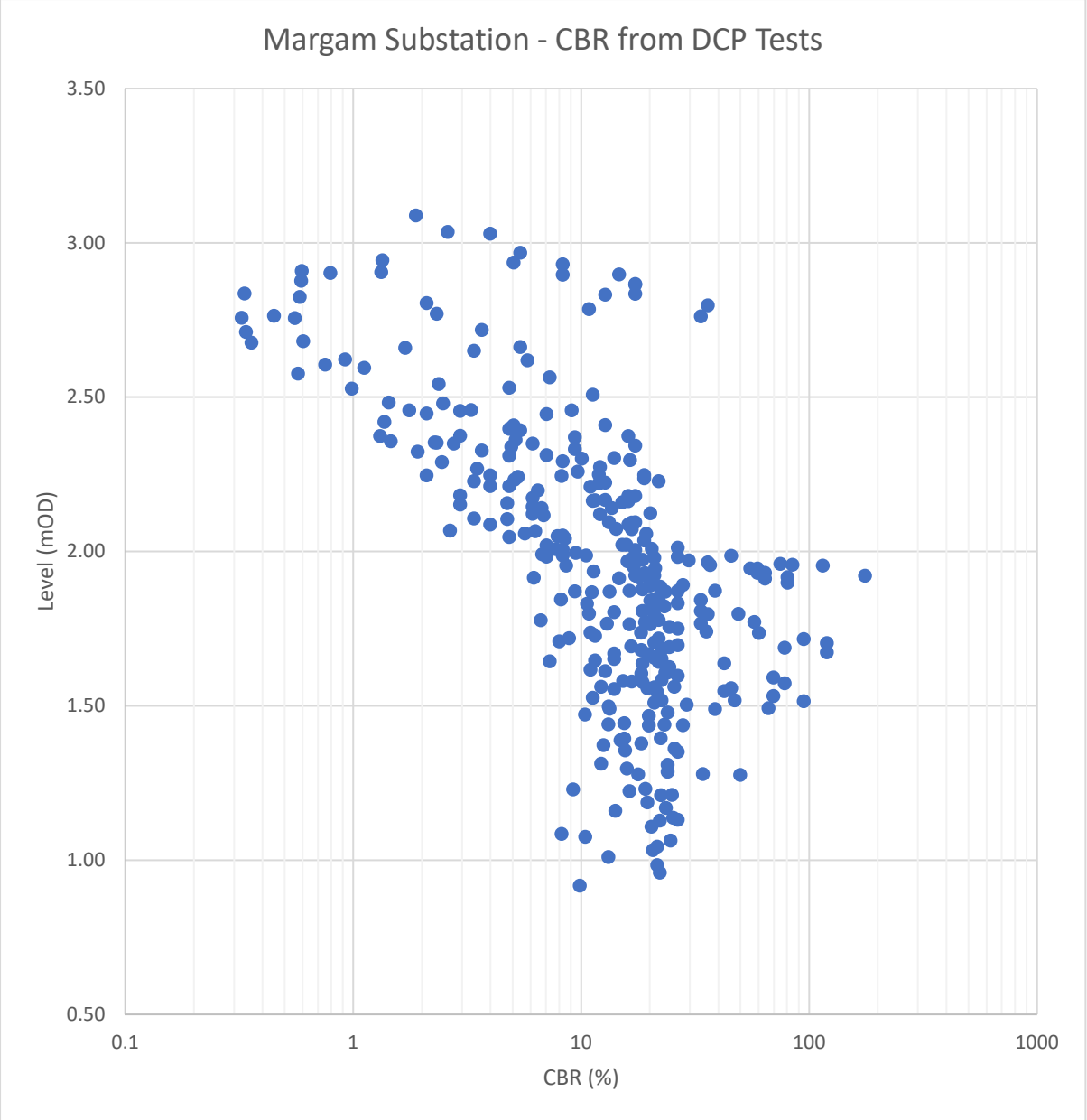


Figure 6: Margam Substation - CBR Test

The results have been plotted on a log scale as the range in CBR values is very large and the low values are unreadable on a linear scale. It can be seen that the CBR values apparently increase with reducing level from <0.5% near the surface to >10% below a level of about +2mOD. The low values near the surface are often within the Topsoil so would be anticipated to be low. However, with the TFD commencing at an average level of +2.70mOD it is apparent that some of the TFD at least would have a CBR <1%. This is anticipated as a correlation used by LO'R would convert a shear strength of 15kPa to a CBR of 0.66%.

The more unlikely finding is that the CBR value apparently increases rapidly with depth. Bearing in mind that the very soft organic Clay / Peat occurs at an average level of +1.78mOD, the DCP results would suggest this layer has a CBR value of at least 10%. This seems inconceivable, particularly in the light of laboratory CBR tests on recompacted samples of TFD which gave values of 0.25% and 1.4%. Remoulding the material will result in a reduction of CBR value but a reduction of this amount seems unlikely to say the least.

It is then considered that the CBR values obtained from the DCP tests are not accurate at depth. It is believed this is a result of the very soft material squeezing in on the rods increasing shaft resistance giving a false reading of penetration resistance and hence of CBR value. No significant increase in CBR value with depth should then be taken for the TFD and a design value no higher than 1% should be adopted.

The upshot of this is that excavated TFD will not achieve a CBR value of 3% and will therefore not be suitable as an earthworks material unless modified by the addition of lime and/or cement. Lime would be suitable for inorganic clay material and lime/cement for organic material. It is understood however that the use of such additives would unlikely be permitted as the alkalinity of the materials could change the pH of the groundwater and change the ecological environment of the surrounding marshes (which are typically around neutral now).

The GFD, both cohesive and granular materials, would achieve a CBR of 3%, but these are around 5m down making their extraction impractical. It may then be concluded that imported fill will be required.

Imported general fill may be either Class 1 granular or Class 2 cohesive material. Due to the environmental sensitivity of the area the imported material will need to be chemically inert, so natural material. Any natural granular material when compacted to a high degree of compaction within a narrow range of moisture contents will achieve a CBR >>3%, whilst a compacted cohesive material with a remoulded undrained shear strength of at least 50kPa will similarly achieve a CBR>3%.

Various potential fill materials should then be sourced for the project. For granular material the following tests should be carried out on the source material:

- Grading
- Natural moisture content
- BS Vibratory compaction test

The grading analysis will allow classification of the material (Class 1A, 1B, etc) which in turn will determine the method compaction in accordance with the Specification for Highway Works Series 600 Earthworks Tables 6/1 and 6/2. The compaction procedure (layer thickness and number of passes) may then be determined from Table 6/4 in relation to the compaction plant proposed.

The compaction test will provide the optimum moisture content at which the maximum dry density can be achieved. The placed moisture content should then be within a narrow range of the optimum value, the range being determined from the compaction test. The natural moisture content will indicate whether the material is

within this narrow moisture content range or whether it needs to be dried out or wetted to render it suitable.

A minimum of three suites of these tests should be carried out on each source material depending on repeatability. If repeatability is poor, then further suites and sub-division of the source material may be required.

For cohesive material the following tests should be carried out on the source material:

- Grading
- Natural moisture content
- Atterberg limits
- BS Standard compaction test with Hand shear vane at each compaction point
- Moisture condition tests with Hand shear vane on tested sample

The grading analysis together with the natural moisture content and Atterberg limit tests will allow classification of the material (Class 2A, 2B, etc) which in turn will determine the method compaction in accordance with the Specification for Highway Works Series 600 Earthworks Tables 6/1 and 6/2. The compaction procedure (layer thickness and number of passes) may then be determined from Table 6/4 in relation to the compaction plant proposed.

The compaction test will provide the optimum moisture content at which the maximum dry density can be achieved and with the Hand shear vane tests at each compaction point will provide a correlation between moisture content and undrained shear strength. This will allow the maximum moisture content that gives a remoulded shear strength of 50kPa to be determined.

Moisture condition tests should be carried out on each sample together with a Hand shear vane on the compacted sample to determine whether the material is achieving a remoulded shear strength of 50kPa. In addition to the single point moisture condition tests, correlation tests should be carried out by wetting/drying a combined sample to various moisture contents and determining the moisture condition value and Hand shear vane strength at each moisture content. This will give a separate indication of the maximum moisture content that gives a remoulded shear strength of 50kPa together with the minimum moisture condition value that this corresponds to. It is anticipated that the minimum moisture condition value would be around 8.

A minimum of three suites of these tests should be carried out on each source material depending on repeatability. If repeatability is poor, then further suites and sub-division of the source material may be required.

There are a number of factors that need to be considered in deciding whether to use granular or cohesive fill (apart from the cost per cubic metre of the material). These are considered below.

Ease of Placement

There is no doubt it is easier and faster to place, level and compact granular fill. After removal of 150mm of Topsoil, the formation is likely to be below the groundwater table. Seepage of groundwater up through the formation is then likely to occur. The immediate covering of the formation with a geotextile separator (Terram 1000 or similar) and placement of at least 150mm of granular material will then raise the formation level so that seeping groundwater will fill the voids of the granular material and permit further layers to be placed on dry ground. If cohesive material is placed, then the seeping groundwater will likely be displaced up by the clay fill and will tend to sit on the clay fill. This is also true when rain falls during the whole upfilling process; it will tend to be absorbed by the granular fill but will sit on top of the cohesive fill and will need to be drained away by falls on the clay fill surface. There will be a clay surface at the base of the granular fill, but a small gradient (1:500) could first be cut into this to encourage run-off during fill placement (and in the permanent condition). It is recommended the gradient is made from west to east across the approximate 100m width of the platform giving a fall of about 200mm. To limit the amount of seeping groundwater it would also be sensible to excavate to formation level over discrete squares of the platform area rather than over the whole area at once (perhaps 25m x 25m squares, but to be determined on site following observation of rates of seepage through the formation).

Amount of Testing

From the lists of laboratory testing on source material given above, it is apparent less testing is required for granular source material. Any granular material that is to be brought onto site should be subject to leachate testing for PH Values, for the purpose of mitigating the risk of cross contamination and long-term effects. It is also the case that less field testing would be required for granular fill during placement of the fill material. Both Class 1 and Class 2 material are placed according to a method specification, so in theory no density testing is required (though it is often carried out using a Nuclear Density Gauge) and only moisture content testing of the placed layers would be required to ensure compliance with the specification. Since the fill needs to have a minimum CBR of 3%, CBR testing of the finished subgrade level would also be required. For granular fill there would be no concern overachieving this, so testing only needs to be carried out at final subgrade level. For cohesive fill, the achieving of suitable placed material throughout its depth would need to be checked by testing each layer. Rather than CBR testing which takes time, this would be most easily carried out with a Hand shear vane (achieving a strength >50kPa). Whilst the material when sourced may be within specification, wetting of cohesive material during rainy periods could easily put it out of specification.

Working Platform and Haul Roads

Working Platform

A working platform will be required to support various items of heavy plant, including but not limited to Piling Rigs, Horizontal Directional Drilling (HDD) Rigs and crawler cranes. These will require properly designed working platforms, which for a founding layer of soft TFD clay are likely to be of significant thickness. Granular fill can then be used as part of the working platform and if the thickness of an unreinforced working platform is exceptionally large, geogrid reinforcement can be included within the granular fill. A layer of firm cohesive fill would also help to improve the ground's bearing capacity, but not to the degree a layer of granular fill would and would not interlock with geogrid. It is understood that the working platform level for the new substation site will be set at +3.775mOD. The thickness required for the working platform may then mean the whole depth of upfill (or the great majority of it) will need to be in platform stone, typically 6F5 stone and there will be little opportunity to use potentially site won clay fill.

In view of the considerations given above, it is apparent granular fill holds a number of benefits over cohesive fill. It is then recommended granular fill is used. In order to optimise its usage as working platform stone it is recommended its grading conforms to a minimum of Class 1A well graded granular fill with a maximum particle size of 125mm and potentially 6F5 capping material. It is likely the most suitable material in the area would be quarried stone.

Within the working platform, the storage of materials and equipment is to be managed so that unnecessary loading of an area is avoided and any potential long-term impacts of compaction are reduced. This can be accomplished by a rigours programme of works to ensure that only the required materials are brought to site when needed, along with the removal of items once complete.

After works are complete and the temporary working area has been de-mobilised, a Landscape and Environmental plan will be put in place to assess the condition of the ground, potential areas of over compaction and outline any recommend remediation actions that can be put in place, such as deep soil aeration, to restore the ground condition.

Haul Roads

Temporary haul roads will also be required to enable the construction of the new substation and cable route. The haul roads will be laid on the existing ground and will need to be removed afterwards. In order to prevent long term damage to the flora of the area it is necessary that the amount of compaction of the existing Topsoil is kept to a minimum and the vegetation is allowed to 'breathe' throughout the works. This means providing haul roads (and compound areas) that not only exert low pressures on the soil itself but also spread concentrated loading from plant.

The use of lightweight Track Matting should be first considered to provide access to working areas. These matts are laid on the surface to distribute the loading of pedestrian, vehicle, and heavy plant to avoid damage to the ground. A potential option and recommend to use is "GroundGuards Xtreme Mat". Designed for heavy-duty applications, this mat combines durability and versatility, making it ideal for constructing temporary roadways capable of supporting the weight of heavy machinery and vehicles. Its high-density polyethylene (HDPE) construction ensures exceptional strength, while its hard foam core adds buoyancy, allowing it to float and remain stable even in marshy, swampy, or waterlogged area, ensuring safe, stable access routes and reducing the risk of environmental damage in sensitive area. Thus, reducing the compressive strength exerted into the top soil and potential long term damage caused.



Figure 7: XtremeMat Option

An alternative to track matting is by the use of lightweight aggregates; however, the greater loading comes from the plant travelling on the haul road. An effective method of spreading such loading is to use geocells such as PRS Geoweb. The 3-dimensional geocells are opened up and filled with stone producing a very rigid structure that readily distributes loading. The cells are typically 200mm deep and are topped off with an additional 75mm of stone to protect them from plant. The cells are filled with a highly porous stone to enable air to circulate through them and reach the underlying soil.



Figure 8: PRS GeoWeb Option

Before works are to take place and haul road's established, a review of the Traffic Management Plan will take place with all relevant parties. By minimising the flow of traffic and assigning key routes for high loading items of plant, the long-term impacts can be reduced or localised to specific areas. This can then be identified in the Landscape and Environmental Plan post works completion.

Settlement of Substation Platform and Ground Improvement

The raising of the ground from the existing +3.05mOD to the proposed +4.15mOD will result in settlement of the underlying natural TFD and GFD deposits. An estimate of the settlement is given below.

Taking unit weights of 16kN/m^3 for Topsoil, 20kN/m^3 for the granular fill and 21kN/m^3 for the Type 3 and stone chippings, the net increase in vertical stress on the ground is 0.875x20+0.375x21-0.150x16=23kPa.

The upper clay layer of the TFD is lightly over consolidated for which LO'R take $E_U=100c_U$ and $E'=0.8E_U$. The lower organic layer of the TFD is normally consolidated for which LO'R take $E_U=25c_U$ and $E'=0.8E_U$. The cohesive layers of the GFD are heavily over consolidated for which LO'R take $E_U=400c_U$ and $E'=0.6E_U$. The granular layer of the GFD is heavily over consolidated for which LO'R take $E'=2000N_{60}$.

The parameters taken for the settlement analysis are summarised below:

Stratum	Top Level (mOD)	Depth to base (m)	Eu (kPa)	E' (kPa)	n'
Soft Clay	+2.90	1.12	3000	2400	0.25
Org Clay/Peat	+1.78	4.22	375	300	0.30
Stiff Sandy Clay	-1.32	4.88	30000	18000	0.20
Sandy Gravel	-1.92	7.62	-	70000	0.20
V Stiff Sandy Clay	-4.66	12.36	70000	56000	0.20

Table 2: Settlement Parameters

The substation platform has been taken to have dimensions of 110m x 160m.

The results of the computations are shown below, which indicates around 12mm short term settlement (which will occur during construction) followed by around 130mm of long-term settlement. Some of this will also occur during construction whilst the make-up is being used as a working platform for site plant. However, there will also be significant long term creep settlement of the peat increasing the above values.

SETTLEMENT ANALYSIS
Rectangular Loaded Area
(ref. HG Poulos & EH Davis (1974), Elastic Solutions for Soil and Rock Mechanics)

Project **Margam Substation**

Structure **Substation Platform**

Area dimensions (m):

Breadth 110 L/B= 1.455

Length 160

Applied Pressure (kPa) 23

GROUND CONDITIONS

Layer	Stratum	z base (m)	N_{60} or Cu (kPa)
1	Soft Clay	0.560	30
2	Soft Clay	1.120	30
3	Org Clay / Peat	2.670	15
4	Org Clay / Peat	4.220	15
5	Stiff Clay	4.550	75
6	Stiff Clay	4.880	75
7	Dense Gravel	6.250	35
8	Dense Gravel	7.620	35
9	Very Stiff Clay	9.990	175
10	Very Stiff Clay	12.360	175

Short Term		Long Term		n	A	B	Settlement (mm)	
E (MPa)	n	E (MPa)	n		0.670	0.000	Short Term	Long Term
3	0.50	2.4	0.25	0.010	0.670	0.003	0.03	3.37
3	0.50	2.4	0.25	0.020	0.670	0.005	0.08	3.39
0.375	0.50	0.3	0.30	0.049	0.669	0.012	3.79	64.26
0.375	0.50	0.3	0.30	0.077	0.668	0.018	6.87	66.25
30	0.50	18	0.20	0.083	0.668	0.019	0.02	0.32
30	0.50	18	0.20	0.089	0.668	0.021	0.02	0.32
70	0.20	70	0.20	0.114	0.667	0.026	0.34	0.34
70	0.20	70	0.20	0.139	0.666	0.031	0.34	0.34
70	0.50	42	0.20	0.182	0.663	0.039	0.14	1.01
70	0.50	42	0.20	0.225	0.660	0.047	0.18	1.02
						Flexible	**11.81**	**140.62**

Table 3: Settlement Analysis Calculations

It is understood the new substation platform is likely to have a limit of 25mm specified for it. It is clear this will be well exceeded if nothing is done to improve the compressibility of the TFD which provide the great majority of the calculated settlement.

It is understood various methods of ground improvement are being considered. These include mass stabilisation (deep soil mixing) of the TFD using lime/cement and the construction of a Load Transfer Platform (LTP). Mass stabilisation is likely to be of concern for ecological reasons, as mentioned before, and therefore the construction of an LTP is likely to be the best way of limiting settlement.

An LTP is supported by rigid inclusions taken down into the GFD, which are designed to support the whole weight above. The rigid inclusions could comprise either Controlled Modulus Columns (CMCs), Displacement Auger Piles (DAPs) or Precast Concrete (PCC) Driven Piles.

After installing the rigid inclusions, high strength geogrids are placed over the pile heads (often increased in size by the placement of pile caps over them) to span between the piles and stone laid and compacted over the geogrid to form the LTP. The stone would need to be of good quality, at least Class 1A and typically 6F5. This could then be the material laid up to a level of +3.775mOD before the 300mm of Type 3 and 75mm of stone chippings are laid.