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Introduction

2.1 This Chapter outlines the process undertaken in selecting the Site area within the application boundary as a potential and suitable location for renewable energy development, provides a description of the Site and surrounding area, and discusses the design evolution process.

2.2 For the purposes of this Environmental Impact Assessment, "the Site" comprises all land within the Proposed Development boundary, as shown by the red line on **Figure 1.2** (Site Location Plan). The Site extends to 122ha and is located 3km west of Gretna, within the administrative boundary of Dumfries and Galloway Council (D&GC), Scotland.

2.3 The Site includes for all land required for the construction, operation and maintenance of the Proposed Development. This comprises:

- wind energy infrastructure - including turbine locations, crane hardstandings, access tracks and underground cabling;
- solar photovoltaic (PV) arrays including panel mounting structures, inverter stations and associated internal access tracks;
- electrical infrastructure – including on-site substation, control building and grid connection infrastructure within the application boundary;
- temporary construction area, including site compound and proposed material storage areas; and
- ancillary works including drainage features in support of surface water management systems, and proposed landscape planting/ecological mitigation areas.

2.4 The principles of the EIA process; that site selection and project design should be an iterative constraint-led process, have been followed as part of the West Scales Energy Park ("the Proposed Development"). This has ensured that potential significant adverse impacts, as a result of the Proposed Development, have been avoided or minimised as far as reasonably possible through the design process.

2.5 This Chapter draws on issues considered in more detail in the relevant technical chapters (**Chapters 7 to 16**). This Chapter does not pre-empt the conclusions of the latter chapters but explains how potential environmental effects have informed the design of the Proposed Development.

2.6 The design for the Proposed Development is described in **Chapter 3: Description of Development** and is shown on **Figure 3.1**. This Chapter is supported by **the Design and Access Statement** (**DAS**) which is submitted separate from the EIA Report in support of the application.

Site Selection and Consideration of Alternatives

2.7 National Planning Framework 4 ("NPF4") was adopted by the Scottish Government on 13 February 2023 and sets out the overarching spatial strategy for Scotland to 2045. The foundations for the spatial strategy as a whole are the global climate emergency and the nature crisis. NPF4 supports a large and rapid increase in electricity generation from renewable sources to meet Scotland's net zero emissions targets. It identifies that onshore wind energy development proposals will be supported in principle except for where located in National Parks and National Scenic Areas.

2.8 As noted in **Chapter 4: Renewable Energy and Planning Policy**, NPF4 states that within the South of Scotland (where the Site lies), development proposals should protect environmental assets and stimulate investment in natural and engineered solutions to climate change and nature restoration. The Proposed Development aligns with national policy objectives to expand low-carbon infrastructure.

2.9 Regulation 5(2)(d) of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 requires that an EIA report should include: *"a description of the reasonable alternatives studied by the developer, which are relevant to the development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment."*.

2.10 The main alternatives including design, turbine specification, location, size and scale have been considered for the Site. This Chapter explores these options and explains how the final design of the Proposed Development has evolved. As the purpose of the Proposed Development is to provide low carbon renewable energy and meet renewables and decarbonisation targets, a 'no scheme' alternative has not been considered further.

Site selection

2.11 A number of factors were considered when selecting the Site for a renewable energy development, including:

- The Site is not located in a National Park or National Scenic Area (and therefore NPF4 is supportive of the location for renewable energy in principle);
- Initial desk-based studies and wind monitoring on Site suggest that there is a very good wind resource and the Site is available for renewable energy development;
- The Site is currently used for agriculture and does not support any statutory ecological or landscape designations;
- The closest residential properties were open to being financially involved in the Proposed Development;
- The Site benefits from existing access options via the A75 trunk road and local road network;
- The Site is located within an area which has considerable existing electrical infrastructure, with there being viable options to connect to the national grid (final connection route to be confirmed via a separate application);
- There Site has within it, and surrounding it, a dense expanse of existing trees and hedgerows, which help with the screening of some proposed infrastructure (e.g. Solar photovoltaic (PV) arrays, tracks, substation compound etc.); and
- The Site is relatively flat, indicating minimal earthworks would be required during construction.

Technology, Size and Scale

2.12 In order to maximise renewable energy generation and contribute meaningfully to decarbonisation targets, the Proposed Development includes wind turbines of up to 200m to blade tip height. This scale reflects current industry trends toward larger, more efficient machines capable of delivering higher energy yields.

2.13 During the period leading up to a consent and ultimately the construction of the Proposed Development, it is expected that the design and manufacture of commercial wind turbines will evolve and result in a wider choice of turbines than is currently available. The ability to maximise the potential yield from the site through turbine choice at the point of procurement is important for the financial feasibility of the scheme in a time of increasing financial uncertainty. Without the ability to optimise the project in such circumstances, it may adversely affect the viability of the Proposed Development.

2.14 The wind turbine market continues to evolve, with manufacturers increasingly focusing on larger turbine models due to global demand. The availability of smaller turbines is diminishing, and the selection of larger turbines is now essential to ensure project viability and competitiveness.

2.15 Larger turbines offer improved efficiency and energy output, and their use can reduce the number of turbines required on site. This, in turn, can minimise associated infrastructure such as access tracks, crane pads, and foundations, potentially reducing environmental impacts.

2.16 Despite the continuing move towards larger turbines on the grounds of economic viability and available technology, it is also important to balance energy yield with environmental and technical constraints.

2.17 The design process is iterative and has been informed by environmental baseline studies, technical feasibility, and stakeholder consultation. Constraints such as noise limits, watercourses, woodland, and turbine separation distances have shaped the Site layout. Consideration has also been given to landscape and visual impacts, cultural heritage assets, and ecological sensitivities. This process has resulted in the layout of the Proposed Development presented in this EIA Report. This layout represents the optimum fit within the technical and environmental parameters of the Site and its surroundings.

2.18 In addition to wind turbine selection, other elements of the Proposed Development have been designed to minimise environmental effects. These include the siting of the solar PV arrays, siting and routing of access tracks, , crane hardstandings, construction compounds, anemometry mast, and the substation compound (including a battery energy storage system (BESS)). These components have been carefully considered to reduce land disturbance and avoid sensitive features.

2.19 Multiple factors were considered when determining the appropriate size and positioning of the proposed infrastructure, including:

- Proximity to ecological designations such as the Solway Firth SPA and Upper Solway Flats and Marshes SSSI;
- Landscape character and sensitivity;
- Cumulative context with other wind farms in the region;
- Views from the surrounding nearby settlements;
- Nearby residential properties and potential impacts regarding noise and visual amenity;
- The presence of nearby cultural heritage assets;
- Local bird populations and species type;
- The ability to get wind turbine components to Site;
- Potential glint and glare impacts on nearby road an rail infrastructure; and

- The availability of a viable grid connection.

2.20 Taking the above factors (from paragraph 2.17) and considering them alongside the desire to generate the maximum energy yield from the Site, it was concluded that the Site could accommodate wind turbines up to 200m to tip height and solar PV arrays focused on the western edge of the Site.

Site Location and Description

2.21 The Site, centred on National Grid Reference (NGR) NY 26918 67706, is located at West Scales Farm approximately 3km west of the settlement of Gretna in Dumfries and Galloway. The Site lies entirely within the administrative boundary of Dumfries and Galloway Council. The Site, which measures 122ha, is predominantly used for sheep grazing.

2.22 West Scales Farm (covering the farmhouse, and No's 1 - 2 West Scales) and Red Wood House are located within the Site boundary and are financially involved with the Proposed Development.

2.23 Access to the Site is proposed to be taken from the A75. The current expectation is that components of the Proposed Development (turbine blades, solar panels, etc.) would be delivered to Site via the King George V Dock in Glasgow, travelling south on the M8/M74/M6 to Carlisle, before doubling back and travelling north on the M6/M74 to Gretna, and then along the A75 to Site.

2.24 The Site is characterised by gently undulating agricultural land, with elevations gradually increasing from south to north. It includes areas of pastoral farmland, woodland (particularly in the south and northwest), and hedgerows. The Site is intersected by small field drains but contains no major streams or rivers.

2.25 The British Geological Survey (BGS) indicates that the Site is underlain by sandstone bedrock of the St Bees Sandstone Member, with superficial deposits comprising glaciogenic diamicton from the Gretna Till Formation. Peat deposits are largely confined to the south of the Site. The Site is located within the Gretna Coastal catchment, with surface water draining primarily to Kirtle Water and Dornoch Burn.

2.26 There are no statutory environmental designations within the Site boundary. There are no Core Paths that pass through the Site.

Surrounding Area

2.27 The immediate surrounding area is rural in nature, comprising predominantly agricultural land with areas of native woodland and hedgerows. The Nutberry Moss Peat Works is located immediately north and west of the Site. Peat extraction operations ceased in November 2024 following refusal of a planning application to extend its operational life.

2.28 Several residential properties are located within 1km of the Site in all directions, the closest being West Scales Bungalow, immediately east of the Site boundary.

2.29 The Site is located approximately 1km north east of the settlement of Eastriggs, 3km west of Gretna, 5km east of Annan, and 2km south of Kirkpatrick-Fleming. The Scotland–England border lies approximately 5km east of the Site at its nearest point on land, and approximately 2km south east at its nearest point at sea (Solway Firth).

2.30 The A75 trunk road passes immediately south of the Site. The Annan–Gretna Green railway line runs parallel to the A75, approximately 320m south of the Site at its closest point.

2.31 The Chapelcross Nuclear Power Station, currently undergoing decommissioning, lies approximately 4.5km north west of the Site. A masterplan to redevelop the site into a green energy hub has been proposed.

2.32 The Site is located approximately 38km from the Eskdalemuir Seismic Array and falls within its 50km consultation zone.

2.33 The closest ecological designations within 5km of the Site include:

- Upper Solway Flats and Marshes SSSI – approximately 2km south;
- Solway Firth SPA, SAC, and Ramsar site – approximately 2km south;
- Raeburn Flow SSSI and SAC – approximately 3km north east.

2.34 The closest landscape designations within 20km of the Site include:

- Solway Coast Area of Outstanding Natural Beauty (AoNB) – approximately 3km south-east;
- Kinmount Garden and Designed Landscape (GDL) – approximately 10km west;
- Solway Coast Regional Scenic Area (RSA) – approximately 11km west;
- Langholm Hills RSA – approximately 14km north east;
- Nith Estuary National Scenic Area (NSA) – approximately 15.5km west;
- Torthorwald Ridge RSA – approximately 16km north west;
- Rickerby Park Registered Park and Garden – approximately 16km south east;
- Dalston Road Cemetery RP&G – approximately 17km south east.

2.35 Within 10km of the Site, there are approximately 483 designated cultural heritage assets, including one World Heritage Site (Hadrian's Wall), 429 Listed Buildings, 53 Scheduled Monuments, and one Conservation area.

2.36 The only operational or consented wind farm within 10km of the Site is Beck Burn Wind Farm, which is approximately 7.1km to the east and comprises nine operational wind turbines up to a blade tip height of 126.5m.

2.37 The only operational or consented solar farm within 10km of the Site is the consented Jockstown Solar Farm, which is approximately 5.2km to the north west and consists of 27.9MW of solar generation capacity, and 12MW of battery storage capacity.

Design Concept and Approach

Constraints Led

2.38 In EIA, constraint identification should continue throughout the design process in order to take cognisance of new, more detailed surveys revealing additional constraints to development. This allows the findings of technical and environmental studies to inform the design of a development and achieve a 'best fit' within the environment of the Site.

2.39 This approach has been adopted in respect of the Proposed Development; where potentially significant effects have been identified, efforts have been made to avoid these

by evolving the design of the Proposed Development. This is referred to within this EIA Report as mitigation embedded in the Proposed Development layout and design, or simply 'embedded mitigation' (avoiding the potential for impacts to arise through Proposed Development design). Information on embedded mitigation is explained further within each technical chapter of this EIA Report as appropriate. Several design principles have also been incorporated into the Proposed Development as standard practice.

2.40 'Embedded mitigation' includes, but is not limited to:

- Considering the size and scale of the proposed development appropriate to the location;
- Consideration of appearance, finish and colour of wind turbines and the control buildings in accordance with SNH Guidance - Siting and Designing Wind Farms in the Landscape;
- Sensitive siting of the proposed infrastructure incorporating appropriate buffer distances from environmental receptors (including nearby residential properties) to avoid or reduce effects;
- Potential for up to 75m micrositing of infrastructure during construction to ensure the best possible location is chosen based on Site investigations.

Landscape and Visual

2.41 Throughout the design evolution of the Proposed Development layout, an important consideration has been the potential for landscape and visual effects and how the Proposed Development would relate to the existing landscape character of the Site and its visibility from the surrounding area. Although the Site is relatively small and flat, and so the options available with regards to mitigating landscape and visual effects relatively limited, due attention was given to the scale, individual location and number of wind turbines proposed. With regards to the solar PV arrays and substation compound (including BESS), consideration was given to utilising screening from existing vegetation and proposing additional screening where appropriate. The landscape and visual effects potentially caused by the Proposed Development have been considered extensively from key receptors, and the resulting analysis has been an important input into the design evolution process of the Proposed Development.

2.42 In order to address any potential landscape and visual effects, good practice guidance such as NatureScot's Siting and Designing Wind Farms in the Landscape (Version 3a, August 2017) has been taken into consideration. The guidance helps to guide wind farms towards those landscapes best able to accommodate them and advises on how wind farms can be designed to best relate to their setting, and the setting of other wind farms and minimise landscape and visual impacts.

2.43 Using NatureScot's 2017 guidance, landscape and visual design objectives for the Proposed Development were developed. These are:

- To design a relatively small, compact wind farm that would not be perceived in views to and from Criffel to markedly impinge upon the character of the hill itself or the surrounding 'coastal flatlands' landscape to the east of the hill, primarily encompassing the Nith Estuary, which forms the principal parts of its landscape setting.
- To design a relatively small, compact wind farm that does not markedly impact upon how the perceived naturalistic character of upland parts of the National Scenic Area

(NSA) and the traditional farmed, settled and designed landscapes around the Nith Estuary are experienced from across the NSA.

- To design a relatively small compact wind farm that does not have a markedly adverse impact upon the contribution of key landmarks, such as *"the summits of Criffel and Ward Law, the ruins of Caerlaverock Castle and Sweetheart Abbey, and the policy woodlands around the big houses"* to the character of the NSA.
- To design a relatively small, compact wind farm that when viewed from within the National Landscapes (also known as Areas of Outstanding Natural Beauty (AONB)) can be accommodated by the expansive landscape surrounding the Solway Firth. To ensure the composition of the wind turbines generally reflects the simplicity of large parts of the view, while being mindful that it is difficult to achieve this balance from every direction. To ensure the vertical scale of the turbines is subsumed by the larger scale of the surrounding landscape.

2.44 The layout and design of the Proposed Development was considered as part of an iterative design process. An iterative design approach works in tandem with the EIA process and allows a receptive design process aimed at reducing the potential landscape and visual effects of the Proposed Development whilst taking into account other Site constraints and commercial requirements. Several layouts were considered during the design process.

2.45 It is considered that the Site layout of the Proposed Development respects the form of the underlying landscape and its scale. The final layout has been optimised with regards to landscape and visual considerations as far as possible, on balance with other environmental constraints, technical constraints and commercial viability.

Efficiency Modelling

2.46 Throughout the constraints led design process, wind, solar and yield analysis was undertaken to ensure changes made to the Site layout did not adversely affect the output and efficiency of the Proposed Development. The average prevailing wind direction experienced at the Site is from the south west and as such, the wind turbine separation distances are larger at this orientation.

Stakeholder Consultation

2.47 Public Exhibitions were undertaken in June 2025 and November 2025 which allowed members of the local community to comment on the design proposals. Feedback from both rounds of consultation events were incorporated into the design evolution process where possible. Further details of the public consultation process can be found in the Pre-Application Consultation (PAC) Report accompanying this application.

2.48 Statutory consultees were invited to become involved in and input to the design process for the Proposed Development via the EIA Scoping process (see **Chapter 6: Scoping and Consultation** for more detail), and subsequent consultation.

Constraints and Identification Mapping

2.49 The design of any Energy Park is driven by the key objective of positioning wind turbines and solar PV modules so that they capture the maximum energy resource possible within a suitable area, which is informed by environmental and technical constraints.

2.50 The designations in the area surrounding the Site were identified as the first part of the constraints mapping process. These are shown on **Figure 2.1**. The known environmental and technical constraints within the Site were also identified as part of this early stage constraints mapping. It is important to note that the identification of a constraint does not necessarily result in the exclusion of that area from the potential development envelope; rather it means that careful thought and attention was paid to the constraint and the design altered appropriately. The key constraints which were taken into account during the design process included:

- Topography and ground conditions (including peat);
- Identified landscape and visual sensitivities;
- Presence of birds, protected habitats and species;
- Presence of watercourses, private water supplies and related infrastructure;
- Presence of cultural heritage features;
- Noise; and
- Aviation and radar constraints.

2.51 The identification of constraints continued throughout the design evolution process as more detailed surveys refined the development envelope.

2.52 A description of how the various environmental and technical disciplines have contributed to the design through detailed assessment is described below. Information in respect of the survey work undertaken is provided in the technical chapters of this EIA Report.

Topography and Ground Conditions (including Peat)

Topography

2.53 The Site is relatively flat, with a shallow incline from the north to south. Steep areas within the Site (greater than 14% slope gradient) have largely been avoided for the siting of wind turbines, solar PV modules and other infrastructure. This is to facilitate the safe and efficient construction of the energy park.

2.54 Slope stability has been taken into consideration to understand whether infrastructure could be located within certain areas of the Site. Due to the relatively flat topography on Site, no slope stability issue have been identified.

Peat Depth

2.55 According to the Carbon and Peatland Map (Scotland Soils, 2016), there are some areas of the Site that have small areas of ‘Class 1’ peatland which are nationally important carbon rich soils with deep peat and priority peatland habitat, and areas of ‘Class 5’ peatland which are areas of peatland soil but with no peatland habitats recorded. The majority of the Site has no peatland present according to the Carbon and Peatland Map.

2.56 Peat probing was undertaken in February 2025 and September 2025. A review of this data allowed areas of deep peat (typically greater than 1.5m) to be avoided, at an early stage in the design process. The peat data is discussed in **Chapter 10: Hydrology, Hydrogeology and Geology**.

Landscape and Visual

2.57 No international or national landscape designations occur within the Site. However, within the 45km LVIA study area there are six national level designations (This does not including the Hadrian's Wall World Heritage Site, however does include National Parks despite not being solely a landscape designation):

- Solway Coast National Landscape – approximately 3km from the nearest turbine;
- The Nith Estuary NSA - approximately 16km from the nearest turbine;
- Lake District National Park – approximately 26km from the nearest turbine;
- North Pennines National Landscape – approximately 29km of from the nearest turbine;
- Northumberland National Park – approximately 36km of from the nearest turbine; and
- East Stewartry Coast National Scenic Area – approximately 33km of from the nearest turbine.

2.58 The Nith Estuary NSA (~16km) and Solway Coast National Landscape (~3km), are the only national landscape planning designations considered to have potential to be significantly affected as a result of the Proposed Development.

2.59 There are a number of further locally designated landscapes within the 45km Study Area, the closest of these (within 15km) is the Solway Coast Regional Scenic Area.

2.60 Landscape and visual effects are assessed within **Chapter 7: Landscape and Visual**.

Ecology and Ornithology

2.61 Ecological surveys, including a UK Habitat Classification (UKHab) survey, a National Vegetation Classification (NVC) Survey and protected species surveys, were carried out across the Site during 2025, in order to identify broad areas of constraint to the Proposed Development. Constraints mapping included the identification of sensitive ecological features, including habitats present within the Site and species which use the Site.

2.62 A distance of at least 50m between turbine blade tip and the nearest woodland has been established, as per current bat guidance (SNH, 2019).

2.63 Ornithology surveys have been carried out across the Site over 2024 and 2025, including vantage point watches, and , breeding raptor surveys. The surveys recorded flights from a number of priority species including: Red Kite, Golden Plover, Whooper Swan and Pink Footed Goose.

2.64 Standard best practice measures would be implemented during construction (including timing felling works outwith the breeding season) to ensure compliance with relevant legislation protecting all breeding wild birds.

2.65 Ecology effects are assessed within **Chapter 8: Ecology** and an assessment of ornithological receptors is presented in **Chapter 9: Ornithology**.

Hydrology and Hydrogeology

2.66 A 50m buffer zone has been applied around the drainage watercourses which traverse the Site. These buffers were used to ensure that as much of the proposed infrastructure as

possible, other than tracks, is not located in close proximity to hydrological features, in accordance with wind farm construction best practice guidelines (GPP 5, 2018). This reduces the risk of run off and water pollution into existing watercourses.

2.67 Data on private water supplies (PWS) was obtained from land owners and supplemented with data from a PWS survey conducted in October 2025.

2.68 Effects upon hydrology are assessed within **Chapter 10: Hydrology, Hydrogeology and Geology**.

Archaeology and Cultural Heritage

Cultural Heritage Features

2.69 There are no designated heritage assets of regional or national importance within the Site.

2.70 There are a large number of nationally important designated heritage assets (including scheduled monuments, listed buildings of relevant class, gardens and designed landscapes, and a World Heritage Site buffer zone) within 10km of the Site.

2.71 Effects upon archaeological and cultural heritage assets are assessed within **Chapter 11: Cultural Heritage and Archaeology**.

Noise

2.72 For the purposes of early constraints mapping, avoidance buffers of 700m for wind turbines, and 500m for the substation compound (including battery storage) were applied to residential properties in the vicinity of the Site.

2.73 Operational noise from the Proposed Development has been considered further in **Chapter 13: Noise**.

Aviation

2.74 Aviation, covering all relevant radar installations, all navigational aids, air-ground-air communications stations and low flying activities, were an important consideration in the design of the Proposed Development.

2.75 Early consultation was held between the applicant and NATS Safeguarding in relation to the Proposed Development and if there were any specific constraints around the height of turbines or their geographical spread within the Site.

2.76 Further to direct consultation with NATS Safeguarding, and the Defence Infrastructure Organisation, has been carried out during the EIA process, particularly at EIA Scoping stage.

2.77 The design of the Proposed Development has considered turbine tip heights in combination with ground level (AOD), in order to ensure that there would be no negative effects on aviation assets.

2.78 As the proposed turbines are in excess of 150m to blade tip height, it is understood that visible aviation lighting would be required.

2.79 Aviation is considered further in **Chapter 14: Aviation**.

Design Evolution

Design Iterations

2.80 The initial potential development area within the site boundary was refined using constraints mapping. These constraints (comprised of various environmental, technical and landscape and visual constraints) were used to inform the evolution of the location of the proposed turbines, solar PV arrays, and associated infrastructure. The design optimisation process was iterative, involving review of multiple layouts and related wirelines from key landscape and visual receptor locations in the study area, to minimise potentially adverse landscape and visual impacts insofar as possible, whilst also taking into consideration energy generation (e.g. wake loss) and other environmental, technical and economic considerations.

2.81 Two of the key design iterations are shown on **Figure 2.2** and comprise the Scoping layout (Layout A), and the Design Freeze Layout (Layout B: the Proposed Development). These two iterations represent key stages of the layout evolution, however several further 'interim' layouts were considered throughout the refinement process.

2.82 The factors that were considered as part of the design evolution process to achieve the final layout are described in the following paragraphs.

Wind Turbines and Solar

Layout A (Scoping Layout): 4 Turbines at 230m tip height and 44ha of solar

2.83 A four turbine, 230m to tip height layout, including an indicative area of 44ha for solar PV arrays, was submitted to Dumfries and Galloway Council in March 2025 as part of an EIA Scoping request. At this stage, only a limited amount of design work or environmental assessment work had been conducted, particularly with regards to the solar PV arrays.

2.84 Following responses from Dumfries and Galloway Council and other consultees (including feedback from the public following the first round of public exhibitions), as well as further environmental and landscape feasibility work, it was considered appropriate to reduce the wind turbine blade tip heights from 230m to 200m, which would reduce the scale of the Proposed Development. The reduced wind turbine height was considered beneficial with regards to noise impacts on, and the visual amenity of, nearby residential receptors.

Layout B (Design Freeze – The Proposed Development): 4 Turbines at 200m tip height and 11.1ha of Solar

2.85 The Design Freeze layout was produced, taking into account the Scoping request responses, comments from the public, the final environmental and landscape and visual assessment work, and the further analysis on wake loss and yield.

2.86 In order to try and reduce the scale of the Proposed Development, the tip heights of the proposed wind turbines were reduced from 230m to 200m to reduce visibility of the Proposed Development on closest residential and landscape receptors – with a focus on residential amenity. The extents of the solar PV arrays were also reduced from 44ha to 11.1ha for the same reasons of residential amenity.

2.87 This layout incorporates necessary rotor spacing requirements, based on a prevailing south westerly wind.

2.88 The Design Freeze layout comprises four wind turbines of up to 200m to blade tip height, and 11.1ha of solar PV arrays. 12MW of battery storage is also included within the substation compound. This layout includes for and incorporates the necessary rotor spacing requirements, based on a prevailing south-westerly wind, and the turbines are positioned to minimise interaction with onsite constraints, including deeper peat, field drains and tributaries in the south extent of the Site. The layout incorporates infrastructure elements which were not present on the Layout A. This includes internal access tracks, substation compound, a temporary construction compound, proposed crane hardstandings and extents of proposed solar arrays.

2.89 This layout also comprises ancillary infrastructure that was not shown in Layout A, including temporary construction compounds, a met mast, and a substation compound.

Other Site Infrastructure

Site Access

2.90 Access to the Site would be via a new junction with the A75 (see **Figure 3.15**). In order to avoid construction traffic turning across oncoming traffic on the A75 in order to get to the Site, it is proposed that the Site entrance would be left-in, left-out only. An area of hardstanding immediately east of the new junction is proposed in order to accommodate abnormal load deliveries. Upon completion of abnormal load deliveries it is anticipated that the area of hardstanding would be closed off via bollards or other means (as agreed with relevant consultees).

2.91 The proposed abnormal load route required to transport turbine components to the Site is shown on **Figure 12.3** and would be from the King George V docks in Glasgow.

Site Tracks

2.92 The proposed access tracks have been designed to be as direct / short as possible, whilst attempting to avoid crossing watercourses, avoid deep peat and also taking slope into account to ensure viable for construction and use.

2.93 Access tracks have been designed to follow routes which do not exceed gradients of 14%. This gradient is specified by a number of turbine manufacturers in their technical specifications to permit safe delivery of turbine components and associated parts. In addition to this, initial infrastructure design has confirmed that using an appropriate and proportional amount cut and fill should allow access tracks to be constructed on gradients in line with manufacturers specifications.

2.94 Access tracks that would be utilised during the construction and operation of the wind turbines would be 6m wide (with an additional 3m on either side of the tracks for drainage and cabling). Access tracks that would be utilised for the erection and operation of the solar PV arrays would be 4m wide.

Borrow Pits

2.95 No borrow pits have been identified on Site, due to the Site geology and topography.

Temporary Construction Compounds

2.96 Two temporary construction compounds are proposed, one would be located at the north of the Site and one at the south of the Site (See **Figure 3.1**) These locations are considered appropriate as they:

- Have appropriate topography (gradient);
- Are located in areas of shallow peat; and
- Avoid sensitive habitat areas.

Substation Compound

2.97 The proposed substation compound would be located at the north of the Site (see **Figure 3.1**). The location is considered appropriate as it:

- Has appropriate topography (gradient);
- Is located in an area of shallow peat;
- Avoids sensitive habitat areas; and
- Is located in excess of 500m from the nearest residential property.

2.98 The substation compound is located at least topple distance (200m) from the proposed wind turbines. The internal Site grid connection cables would be undergrounded within the Site from each turbine, and solar PV array, to the control building, therefore avoiding visual impact. **Figures 2.5 - 2.7** show ZTVs for the proposed substation compound (the equipment / buildings within the substation compound (including the BESS) have varying heights, so for the purposes of the ZTV an indicative height of 5m has been used).

Micrositing

2.99 In order to be able to address any localised environmental sensitivities, unexpected ground conditions or technical issues that are found during detailed intrusive Site investigations and construction, it is sought that the consent includes provision for a 50m micrositing allowance for wind turbines, and a 75m micrositing allowance for all other proposed infrastructure. The technical assessments (presented in **Chapters 7** to **15**) have considered the potential for horizontal micrositing and it is considered that the proposed infrastructure could be microsited (except within watercourse buffers) without resulting in potential significant effects, except where notable deep peat is identified. During construction, the need for any micrositing would be assessed and agreed with the onsite Environmental Clerk of Works.

Conclusion

2.100 The design process for the Proposed Development has been an iterative one, so that constraints identified throughout the EIA and layout design process could be avoided, and potential impacts from the Proposed Development avoided or reduced. Various technical, and environmental considerations were established by a combination of baseline surveys, assessment, and consultation with stakeholders.

2.101 The final layout of the -Proposed Development is described in detail in **Chapter 3: Description of Development** and shown on **Figure 3.1**.

2.102 The assessment of potential impacts of the resulting layout is addressed in **Chapters 7** to **15** of the EIA Report.