The Thorpe Estate Solar Park

Design and Access Statement

December 2021

Contents

Executive Summary

This Design and Access Statement (DAS) has been prepared to accompany a planning application for the installation of ground mounted solar photovoltaic park and ancillary development at land at The Thorpe Estate.

The site is located near Highfields Farm, either side of Clifton Lane, on land within the Thorpe Estate, situated to the west of Thorpe Constantine, near Tamworth. The site comprises approximately 71.6 hectares of agricultural land.

The UK is required under the Climate Change Act (2008) to reduce carbon emissions and through Renewable Energy Directive 2009/28/EC to increase electricity consumption from renewable resources. However, more recently on 1 May 2019, the United Kingdom ('UK') Parliament declared a climate change emergency and on 27 June 2019 the UK became the first major economy in the world to legislate a legally binding target of net zero emissions by 2050 ('net zero').

Additionally, both the National Planning Policy Framework (NPPF July 2021) and Planning Practice Guidance (PPG) is significantly in favour of renewable energy infrastructure.

The proposed development will comprise the installation of free-standing, static solar photovoltaic ('PV') panels for the purposes of generating electricity for connection to the local network. The proposed solar park comprises three separate elements as follows:

- Solar panel modules;
- Inverters; and
- Substation and POC mast infrastructure.

Overhead electricity lines cross the site and would be the point of connection to the electricity network.

The site would continue to be used for agricultural as sheep grazing alongside the panels together with additional biodiversity gains. If planning permission is granted, it would make the site dual-use and represent an efficient use of land in spatial and environmental terms. Furthermore, the site can be returned to other agricultural use following decommissioning.

The site presents an excellent opportunity for solar energy and as there is viable grid connection available, no statutory or local environmental designations, separation from residential properties (although solar and residential use are wholly compatible), good access for construction and would assist the estate's diversification to producing energy in addition to agriculture.

The DAS outlines the various design principles and access elements that have been considered in the layout selection, scaling and sizing of the proposed Solar PV Park. The final design for the scheme has been influenced by pre-application consultation with officers of Lichfield District Council and modified further following site assessments and public consultation feedback.

Section 14 of the National Planning Policy Framework (NPPF) 'Meeting the challenge of climate change, flooding and coastal change' addresses planning for climate change. Paragraph 152 states that the planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. This is further supported by Paragraph 158 which states local planning authorities should approve applications for renewable energy if the impacts are (or can be made) acceptable.

The Solar PV Park will be a sustainable and energy efficient form of development. It will utilise a natural renewable resource and offset requirements to use fossil fuel derived electricity. The Solar PV Park will produce a clean, renewable and sustainable form of electricity that will be connected to and feed into the local grid connection. It will provide a long-term, decentralised form of energy that will improve the sustainability and security of UK based electricity supplies.

1 Background Information

1.1 Solar Power

Renewable energy generation plays an important role in the transition from carbon-based electricity generation to more environmentally friendly sources of power.

Solar PV panels are made up of photovoltaic cells. The cells convert ultraviolet (UV) light from daylight into direct current (DC) electricity. This DC electricity then travels along connecting cables to an inverter where it is converted into grid compatible alternating current (AC), which is suitable for everyday use. The AC electricity is then sent via a primary substation to the local electricity distribution network.

The Climate Change Act 2008 committed the UK to an 80% reduction in greenhouse gases by 2050. However, more recently on 1 May 2019, the United Kingdom ('UK') Parliament declared a climate change emergency and on 27 June 2019 the UK became the first major economy in the world to legislate a legally binding target of net zero emissions by 2050 ('net zero').

In order to achieve 'net zero' National Grid (in its 'Future Energy Scenarios July 2021') has confirmed that in all scenarios, the demand for electricity increases; this is brought about by shifting away from high carbon fuels to hit the Government's net zero emissions target by 2050 and the predicted increase in electric vehicles ahead of the 2040 ban on petrol/diesel driven vehicles. Solar energy generation combined with 'smart charging' electric vehicles will be a key component of achieving the 2050 target.

National Grid anticipates annual electricity demand in the UK could more than double from 294 TWh in 2020 to up to 702 TWh by 2050. Similarly, peak demand in 2020 of 58 GW could almost double to up to 113 GW over the same period. There is therefore an urgent need to increase electricity capacity in the UK to ensure a secure and stable supply in the future and achieve renewable energy and net zero targets.

The site will have a total generating capacity of approximately 49.9MW. This system will generate in the region of 49,900,000 kilowatt hours (kWh) of electricity per annum, the equivalent average consumption of 14,000 homes or 17,000 electric vehicles per annum.

At the end of the proposed 40 year operational period, the solar park and its ancillary equipment will be decommissioned, dismantled and removed. The site will be fully reinstated to the satisfaction of the planning authority. Alternatively, an application may be made to extend the operational life of the solar park depending on the energy and climate situation in 2060.

Pre-Application discussion and Community Engagement

Both the Local Plan and NPPF promote the use of pre-application advice. Paragraph 39 of the NPPF states that early engagement has significant potential to improve the efficiency and effectiveness of the planning application system for all parties. Good quality pre-application discussion enables better coordination between public and private resources and improved outcomes for the community.

Pre-application advice was sought from Lichfield District Council in November 2019 and a written response was received on 23rd December 2019.

The advice focussed on the principle of the development, measured against the NPPF and the Lichfield District Council Local Plan (policies specific to the countryside and sustainable development.

From an environmental perspective, the advice assessed the impact on heritage, landscape biodiversity, conservation and arboriculture. The impact of the proposal on the existing highway network and residential amenity was also assessed.

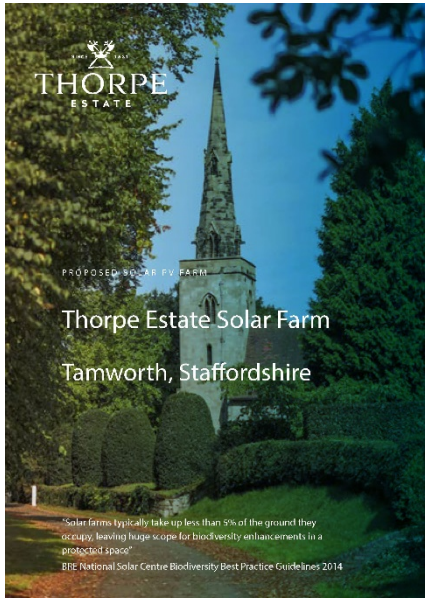
The advice recognised the site's proximity to a listed building and concluded that the overall harm to the Designated Heritage Assets and its setting cannot be outweighed by the benefits of the scheme.

It was also considered that the scheme is likely to be harmful to the character and appearance of the rural area and visual amenity. The proposal would also cause material harm to the nearby public rights of way, therefore negatively impacted their users.

Therefore, the advice made the following requests for the planning submission:

- A Heritage Impact Assessment, Landscape and Visual Impact Assessment and a Glint and Glare Assessment;
- Strongly recommended that you submit a request for a screening opinion to enable the Local Planning Authority to determine whether the proposed development is EIA development.

It should be noted that the pre-application considered a considerably larger site and scaled development than what has eventually been submitted due to continued dialogue with the Council and their advisers.



Community Consultation

During the pre-application process a public consultation event was considered suitable for a project of this scale.

Public Consultation Event

Due to COVID restrictions it was not possible to hold an in-person public consultation event. Therefore, a leaflet was produced which detailed the site and the solar park proposals. This was sent out to 38 interested parties within the vicinity of the site on the 15th September 2021, inviting them to view the details of the solar park on a dedicated website.

www.thorpeestatesolarfarm.co.uk

A notice was also posted within the Tamworth Herald on Thursday 16th September. The consultation ran until 3rd October 2021.

Unfortunately, the applicant did not have any response and as such a further letter was sent out on the 8th October 2021 this time by recorded delivery and the website remained open for comment until 2nd November 2021.

From this second round of consultation the applicant only had 5 responses.

The consultation responses showed that whilst most people supported the principles of renewable energy and the use of solar, there was not a clear indication of whether they favoured it at the application site. It is unfortunate that the response level was so low and most of the negative responses related to landscape and visual impact, the loss of agricultural land for food production and traffic. These matters have been duly addressed in the final proposal to their relative degrees of impact.

2 Development Proposals

2.1 Site Description

The site is located near Highfields Farm, either side of Clifton Lane, on land within the Thorpe Estate, situated to the west of Thorpe Constantine. The site comprises approximately 71.6 hectares of agricultural land enclosed by mature hedgerows, crossed by an overhead electricity lines and pylons surrounding but excluding the building complex associated with Highfields Farm, which is grade II listed.

2.2 Amount and Use

The development will have a generating capacity of 49.9 MW and will produce grid compatible electricity for exporting to the local distribution network. This is approximately enough to power 14,000 homes or 17,000 electric vehicles per annum. The development has been designed to allow livestock grazing to continue around and underneath the solar panels, maintaining agricultural use. The grazing of livestock in this manner reduces the need to mow the fields using agricultural machinery. Once the solar park has reached the end of its generating life, all infrastructure will be removed, and the site will be reinstated to the satisfaction of the planning authority. There would be a net gain in biodiversity of the site and the surrounding area during the operational phase of the proposal through its removal from arable agriculture practices and the planting of additional landscaping.

The proposed scheme redline boundary covers an area of approximately 39.7 hectares. The scale of the proposal ensures that a viable generation output from the solar park can be achieved.

2.3 Proposed Development

The planning application seeks permission for the erection and operation of a subsidy free, ground mounted solar farm which has the generating capacity of approximately 49.9 megawatts (MW) of renewable energy.

The solar panels would be arranged in a series of east to west rows, spaced approximately 2 to 6 metres apart, up to a height of 3 metres at the highest point and tilted southwards (towards the sun) at between 10 and 25 degrees, typically, from horizontal. The solar panels will be secured to the ground via a static table and post systems to minimise ground disruption and the amount of concrete and hardstanding required and ensure that ground conditions remain relatively unchanged. The panels will generate electricity every day for duration of the project lifespan. However, at the end of its lifespan, the project would be fully reversible so that any impacts associated with it would be temporary in nature only, with the land being able to be returned to its former agricultural use following relatively minor decommissioning works.

Inverters are required to convert the DC generated by the photovoltaic (PV) panels to grid compatible alternating current (AC). Cabling from panels and inverters are routed to the substation via a network of shallow backfilled trenches. The DNO substation with Point of Connection (POC) mass will be located next to existing DNO infrastructure Pylon within the north eastern part of the site.

2.4 Scheme Evolution

September 2019

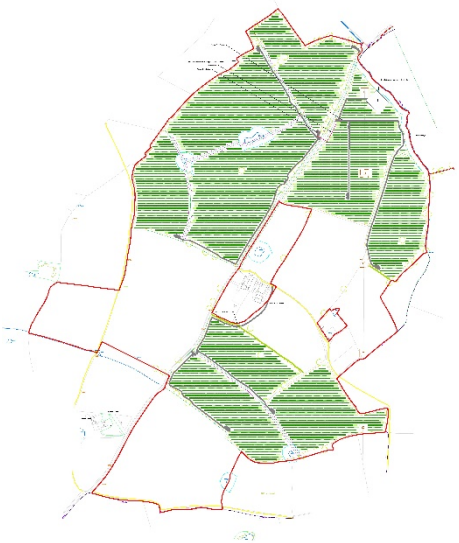
The original scheme was prepared Sept 2019.

October 2019

The red line was reduced, with the north eastern area being removed.

October 2020

Following ecology and heritage assessments the areas in which panels were to be accommodated reduced considerably.



November 2020

Revised red line boundary and removal of panels from southern boundary.

2.4 Scheme Evolution cont.

December 2020

Removal of access point to the east of Highfields Farm house and introduction of Winter Bird Food Seed Mix areas

February 2021

Red line boundary amendments and scheme name change together with the movement of the substation further south, away from surface water flooding area.

Summer 2021

Amendments to increase buffers from water features. Red line amendments to accommodate private wire to connect the northern and southern parts of the eastern area and resultant relocation of winter bird mix area.

November 2021

Layout amendments following topographical and tree survey results, BNG and Habitat Regulations Assessments. Additional river offsets added.

2.4 Scheme Evolution – Final Layout

December 2021

2.3 Layout and Design

Solar Panels and Mounting Frames

The solar panels will be laid out in equal spaces facing south in rows known as ‘arrays’ across the site. Arrays are made up of banks or tables of panels typically containing 24 to 48 solar panels. Each array will be mounted on metal frames and extend from approximately 0.8 m above the existing ground levels to a typical height of 3 m. The rows will be spaced approximately 3 to 6 m apart to minimise overshadowing effects.

The solar panels will be installed at approximately 10-25 degrees to the horizontal and orientated south to optimise daylight capture. The panels will be fixed in place and will not move to ‘track’ the sun. The panels will be coated to maximise daylight absorption and minimise reflection and glare potential.

The frames upon which the solar panels will be mounted will either be ‘pile’ driven or screw anchored into the ground to a typical depth of approximately 1.5 metres. If ground conditions are particularly poor this depth may need to be increased in specific locations, but this is expected to be unlikely.

Both the driven and screw anchored installation systems do not involve any change in ground levels and do not require concrete foundations, allowing the site to be easily restored to agricultural use once decommissioned.

The mounting frames will be made of either galvanised aluminium or steel with a matt finish.

Security Fencing and Cameras

For security purposes the site will be enclosed by a high tensile wire deer fence with wooden posts. This perimeter fencing will be approximately 2.45 metres tall. The entrance to the site will be fitted with a security gate of similar design as the perimeter fencing. The fences are designed to have small gaps of approximately 10 centimetres along the bottom to allow for the continued movement of small mammals, so as not to cut off foraging routes across the site.

Where hedgerows exist or where hedgerow planting is proposed, the perimeter security fencing will allow a 5 m ecology buffer on the internal side of the hedgerow.

Additionally, in order to monitor the site and to detect any unauthorised access, motion sensor CCTV cameras will be erected around the site perimeter on posts of approximately 3 m tall. They will use passive infra-red (PIR) technology which will avoid the need for lighting.

Access and Internal Access Tracks

The proposed development will be accessed via three separate access points off Clifton Lane. Clifton Lane routes from the crossroads with Smithy Lane and Chestnut Lane in the north to the priority junction with the B5493 in the south. It bisects the site, forming the western boundary of the southern and north-eastern sections and forming the eastern boundary of the north-western section of the site. The B5493 connects to the wider highway network through its junction with the M42, which also connects the site to the A42 and A444.

The installation of internal access tracks will be kept to an absolute minimum as agricultural vehicles including tractors, quadbikes and four-wheel drive vehicles will be capable of servicing the facility once operational. However, some permeable crushed stone access tracks or EVE TUFF track temporary road system is proposed throughout the solar park to enable exchange of inverters and replacement of heavier machinery. These will be located to utilise existing access tracks on the site as far as possible and may require some drainage ditch crossings

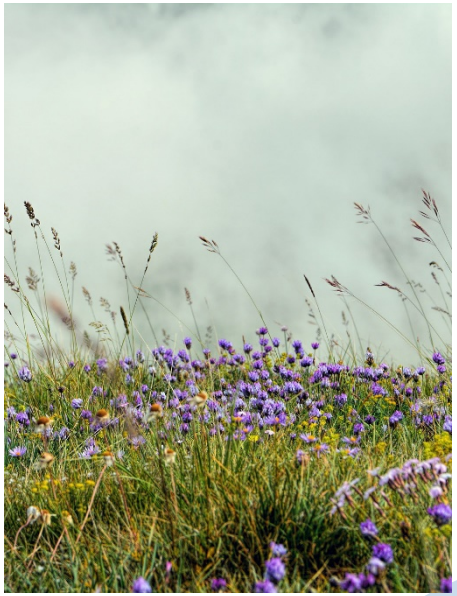
Temporary Construction Compound

A secure temporary hardcore construction compound will be required during the construction period. The temporary construction compound will house site offices and welfare facilities for contractors. The area will also be used for refuelling, tools and materials storage. The temporary compound will be constructed on a geogrid base, or similar, to facilitate removal and reinstatement.

Substation and Grid Connection

The DNO substation with Point of Connection (POC) mass will be located next to existing DNO infrastructure Pylon within the north eastern part of the site. The POC will enable the solar farm to connect into the 132 kV overhead line that crosses the site.

This element of the proposal is design and built by an Independent Connection Provider (IPC) on behalf of the DNO and is built to their specification and as such there are no confirmed details or dimensions available.



Construction of the Proposed Solar PV Farm

Construction is estimated to take approximately 16 weeks and will consist of the following principal operations:

- Erection of security fencing and gate;
- Construction of the temporary construction compound;
- Delivery of solar panels, mounting frames, and centralised inverters;
- Installation of mounting frames foundations;
- Cable trenching, ducting and backfilling;
- Installation of mounting system and solar panels;
- Installation of centralised inverters;
- Installation of primary substation control building POC Mast and associated infrastructure;
- Commissioning of the panels and grid connection;
- Site reinstatement and ecological enhancement; and
- Demobilisation from site.

The key materials required for the construction of the solar park are set out below:

- Small quantities of concrete for the substation control building base, fence posts and security camera posts;
- Coarse granular sand and/or fine gravel for the centralised inverter stations and cable trenches;
- Crushed stone for access tracks; and
- Electrical and communication cabling.

The temporary construction compound will be removed once all construction activity is complete. As already mentioned, the construction compound will be installed on a geogrid base to facilitate easy removal and reinstatement.

Operation and Maintenance

Once operational, the development will be monitored remotely and will not require any permanent staff to be located on site. Occasional maintenance activities will be required for cleaning of the solar panels, in the event of damage and routine checks. Occasional site visits to the substation may also be required.

Vegetation will grow under the solar panels and will require maintenance. It is intended that sheep will graze the site to maintain the field vegetation at a low height, otherwise landscape contractors will visit the site to ensure vegetation does not overgrow the panels.

Decommissioning

At the end of the proposed 40-year operational period the solar park and its ancillary equipment will be decommissioned, dismantled and removed. The site will be fully reinstated to the satisfaction of the Local Planning Authority. Alternatively, an application may be made to extend the operational life of the solar park depending on electricity requirements and climate considerations in 2060.

It is estimated that decommissioning of the solar park will take approximately 4 to 6 months to complete.

Where possible, all of the components will be removed and reused or recycled. Where this is not possible, any waste generated during the decommissioning will be removed and transported by a certified and licensed contractor.

Landscape and Visual Impact Assessment

There are no designated sites of international or national importance within the site or study area. There are two small areas of Ancient Woodland located in the east of the study area around Thorpe Constantine and a further small area in the north-east in Clifton Campville.

The impact of the scheme will be localised due to the low-lying nature of the proposed development and local topography. Consequently, the overall effect on the landscape character is anticipated to be relatively minor.

Although there would be a loss of openness and change in character within the nine field parcels following development, the retention of the existing hedgerows, trees and woodland copse's around the edges, and additional new boundary hedgerows and management of hedgerows and trees would enable views to be directed over the new development whilst views to the surrounding landscape would be largely retained, limiting change to the perceived character of the rural landscape

The relatively well contained nature of the proposal in views from the west, south and east, within a landscape structure provided by hedgerows and trees, infilled where required and suitably managed long term, would limit the effects on the wider landscape. It is considered that there would be no significant effects on the landscape resource within the 5 km radius study area.

The proposed development has been designed to minimise impact on existing landscape features, the mitigation planting implemented as part of the scheme, would achieve its designed intention by summer Year 10 and together with improved hedgerow and tree management would provide beneficial effects and help to reduce the perception of change within the local landscape and wider study area.

Agricultural Land

An ALC was undertaken for a much larger site area. The survey identified three general soil types for the purposes of ALC grading;

1. Silty clay loams over silty clay to depth (Type 1)
2. Clay loam over clay to depth (Type 2)
3. Clay loam over clay to depth (Type 3)

Type 1, 2 and 3 soils are limited to ALC Grade 3b due to wetness limitations.

The agricultural land is of Low sensitivity, and therefore, considered negligible for the site. Soil resources on the site will be adequately managed in line with a Soil Management Strategy. The residual effect on soil resources during the operation phase is therefore Negligible (Table 5.). Soil function is expected to be fully retained or retained with some minor degradation which is easily redressed and hence the receptor sensitivity is classified as Negligible (Table 5.).

On the basis of the implementation of a Soil Management Strategy and less than 4 ha of land will be irreversibly lost it is concluded that the impacts on agricultural land can be classified as Negligible for Grade 3b land, with the impact on soil resources can be classified as negligible.

3 Summary

The design of the proposed solar park on land at Thorpe Estate has been refined through an iterative design process that seeks to maximise the renewable energy generating potential of the site, whilst utilising the established field patterns and vegetation screening to provide an appropriate layout design for this landscape.

Additionally, the ALC identified the site as not being Best and Most Versitile Agricultural Land. Furthermore, the LVIA establishes that the existing and proposed landscaping will ensure no significant landscape effects.

The proposed development allows for ongoing agricultural grazing use, whilst also securing biodiversity gains through the strengthening and improvement of hedgerows and woodland, as well as providing opportunities for wildflower growth and wildlife corridors.

Every effort has been taken in the design of the solar park to avoid unacceptable environmental and amenity effects, whilst ensuring that the project can make a considerable contribution to the UK's requirement for renewable electricity generation.

The UK is required under the Climate Change Act (2008) to reduce carbon emissions and through Renewable Energy Directive 2009/28/EC to increase electricity consumption from renewable resources. Additionally, on 1 May 2019, the United Kingdom ('UK') Parliament declared a climate change emergency and on 27 June 2019 the UK became the first major economy in the world to legislate a legally binding target of net zero emissions by 2050 ('net zero').

The proposed solar park would contribute towards local, national and international targets, is supported fully by planning and energy policy and supports the transition from fossil fuel to clean renewable electricity generation.