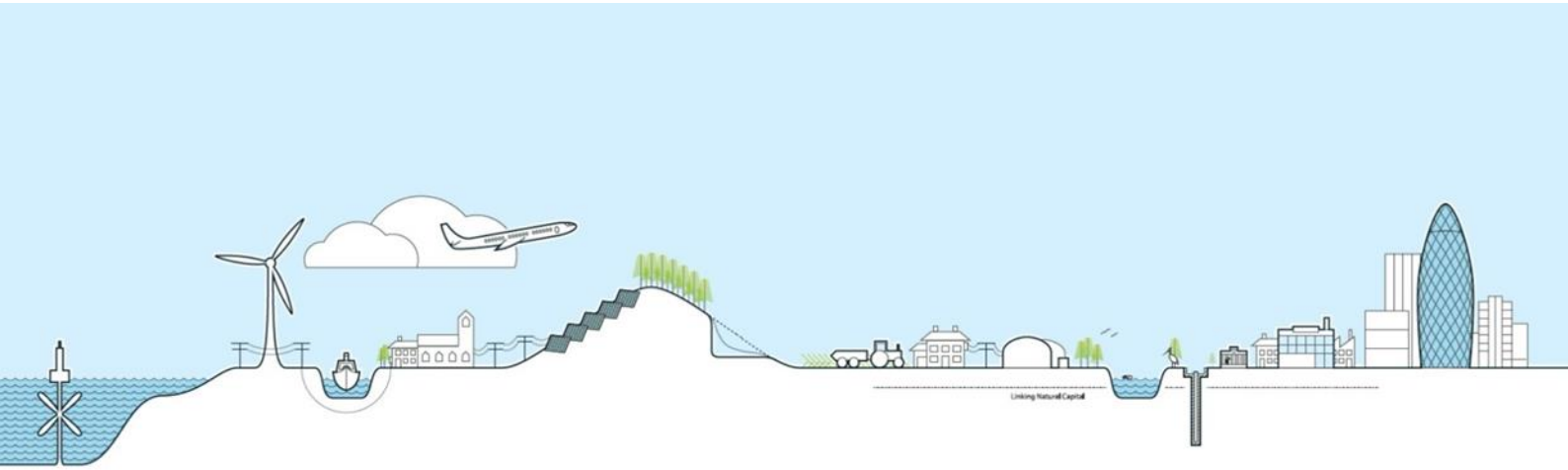
DESIGN & ACCESS STATEMENT

In support of a planning application for the installation of a Standalone Solar PV array, Associated Infrastructure and Landscaping on Land North of Hill Farm, Hill Farm Lane, Duns Tew, Bicester OX25 6JJ

November 2019

Prepared By

aardvark
environment matters



Project Quality Control Sheet

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Signature	[redacted]	[redacted]	[redacted]
Date	27/11/2019	27/11/2019	27/11/2019
Company	Aardvark EM Ltd	Aardvark EM Ltd	Aardvark EM Ltd

Location: Land North of Hill Farm, Hill Farm Lane, Duns Tew, Bicester OX25 6JJ

Grid Reference: NGR 446055; 229953

Project Manager: Nick Leaney

Report Author: Nicholas C Leaney BSc Hons MRICS FRGS

Kirsty Lodge

Report Number: 1939-R001

Report Status: **FINAL**

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Report Written and Produced By

Aardvark EM Limited, Higher Ford, Wiveliscombe, Taunton, Somerset, TA4 2RL

Telephone: 01984 624989, Facsimile: 01984 623912

Email: environment@aardvarkem.co.uk, Web: www.aardvarkem.co.uk

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1 Introduction

1.1 Site Location

Duns Tew Energy Park is located adjacent to the east of the operational Hill Farm solar farm at National Grid Reference (NGR) 446055; 229953, some 1.5km north of the village of Duns Tew, Oxfordshire, and approximately 1.6km southwest of the village of Deddington. The nearest main roadway is the A4260, 1.2km to the east. A location plan (ref PV-0446) is submitted with the application.

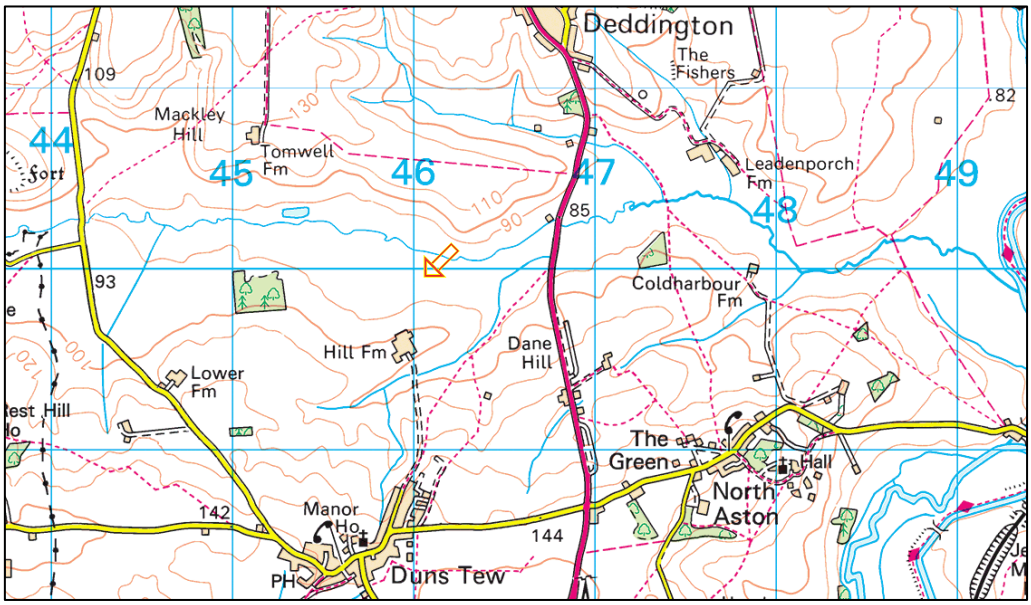

Figure 1 - Location

Hill Farm itself to the south of the site comprises a farm house and range of old and modern farm buildings. The site location in the context of its surroundings is shown in the red line area in Figure 2 below.

Figure 2 – Location Plan (Not to scale)

1.2 Site Description

The site is approximately 13ha in extent and its current use is as agricultural land in arable rotation, with the surrounding area also of agricultural land use (aside from the fields immediately to the west, which comprise the current solar farm). The site is bounded to the north by Deddington Brook, which flows eastwards towards the River Cherwell. To the southwest, adjacent to the current solar farm site, is a small woodland approximately 6.5ha in area.

The Site is wholly located within the jurisdiction of Cherwell District Council (CDC).

The red line area as shown on the submitted site plan (Ref: PV-0446-02 rev.28) is 12.82 hectares.

The nearest residential dwelling unconnected with the applicant and the proposal is situated approximately 0.8km to the north west of the site boundary.

2 DESIGN

The proposed development comprises of a ~8.92MWp solar photovoltaic (PV) array, with associated infrastructure and landscaping. The site will include several associated infrastructure buildings as shown on the layout plan (Drawing ref: PV-0446-02).

The total installed capacity is ~8.92MWp, based on a solar irradiation level of approximately 1,172kWh/m^2, the development is anticipated to generate approximately 8,482MWh per year (after anticipated system losses).

The scheme has been specifically designed to maximise the number of electrical hours of production per hectare. The design layout considers topography, orientation, appropriate hedgerow and watercourse buffer zones and any proposed landscape planting.

The industry standard allows for 1MW PV modules per 2.8 hectares, the design for this site has achieved a design criterion of ~8.92MWp into 12.82 hectares, the equivalent of approximately 1MWp/1.44 hectares, demonstrating efficient use of the land available to optimise generation.

Figure 3 overleaf, and the corresponding scaled drawing submitted with the application, sets out the proposed Site Plan (Ref: PV-0446-02).

Figure 3 – Extract from Site Layout Plan PV-0446-02 (Not to scale) – existing solar farm in grey, proposed scheme in blue.

3 LAYOUT & LANDSCAPING

3.1 Site Levelling and Landscaping Works

The site is the most appropriate in the locality as it is visually discrete from sensitive receptors, as described in the LVIA and illustrated by the topographic survey. Considering the existing operational solar park, the proposed scheme does not create unacceptable or significant adverse landscape or visual cumulative impacts.

It will not be necessary to undertake ground levelling works for the construction of the panels as they will be erected on driven posts and engineered to sit at the correct angle relative to the topography such that the panel mounting systems will account for any minor undulations across the field.

Minor re-levelling may be required for the construction of the ancillary structures.

All existing hedgerows and field margins on the site are to be retained and enhanced where appropriate within the landscape. This will be conducted in accordance with the approved landscape mitigation concept plans and specifications for the duration of the development.

3.2 Access Tracks and Paths

Access to the site will be via an existing agricultural track and field gateway from the A4260 that will not require alteration for the ingress and egress of site vehicles. Any upgrades to the access tracks will be created as part of the construction of the proposed development. The necessity for any temporary access tracks to extend the proposed internal tracks or load bearing plates on corners during construction will be decided based on the ground conditions at the time of installation.

During the operational period the access track will be retained as a maintenance track to facilitate access to the scheme. The tracks to the substation and transformer buildings, panels and inverter stations are shown on the development layout plan.

The local public highways will remain unchanged in terms of traffic volume during the operational phase of the proposed development.

Further detail is provided in the Construction Traffic Management Plan, submitted with the application.

There are no Public Rights of Way (PROW) on or across the proposed site.

3.3 The PV Modules

It is proposed to use the layout drawing reference PV-0446-02 as the basis for the application; however, it is proposed that the final layout is confirmed by way of a pre commencement condition.

The 350w module panels which will be mounted, orientated south on an aluminium frame system (mounted on driven posts measuring approximately 1.5m in depth, dependent on ground conditions on site) as shown on the submitted cross-section drawing (ref. 17010001). They will stand approximately 800mm off the ground at the front of the panel and 2270mm at the rear with an approximate gradient of approximately 20^{o} with the rows spaced approximately 2000-2500mm apart as shown in the cross-section diagram.

The lifetime of the panels, degradation and power generation depend on the environmental impact of an individual site; the effect of longevity on their performance is limited. Research by leading module manufacturers, suggests that a PV installation should produce electricity for 40 years and longer,

indeed they state that '*it is not at all unreasonable to believe that PV modules would still be producing economically viable kW of free electricity 50 years after they have been installed*'. This illustrates the high quality of the proposed panels.

The longevity of the proposed component parts means that there is anticipated to be minimal maintenance (other than routine performance checks and for general wear and tear) during the operational period of the scheme. Similarly, replacements will be due only to failure or third-party interference as opposed to a planned maintenance programme.

3.1 Electrical Buildings

3.1.1 Inverter Stations

The inverter stations will connect the solar arrays to the sub-stations. These will comprise metal clad containers on a concrete plinth with approximate dimensions as shown on drawings 1939-D003 and 1939-D004.

The inverters, switchgear, HV kiosk and arrays will be connected by underground cables laid in a trench excavated to standard dimensions approximately 450mm wide, 1200mm deep in accordance with best practice.

3.1.2 Grid Connection and Sub-Station

The arrays will be connected to the National Grid via a Point of Connection into the local electricity distribution network via the existing grid connection and DNO infrastructure for the existing solar farm to the west of the application site. The site will be connected to this connection point via an underground cable as shown on drawing ref PV-0446-02.

Cables connecting the substation to the Point of Connection will be laid underground in trenches excavated to standard dimensions approximately 450mm wide and 1200mm deep, in accordance with best practice and to Network Operators standard specifications. The trenches will then be backfilled with suitable material and the ground level reinstated allowing for a period of settlement.

3.1.3 Other Buildings

In addition to inverter/transformer and substation buildings, the design layout allows for shipping containers to provide on-site spares/maintenance storage. These will comprise a standard steel shipping container as shown in drawings 1939-D003 and 1939-D004.

3.2 Security, Fencing and Lighting

In addition to the existing protection afforded by the hedges and trees a security fence and CCTV cameras will be constructed around the perimeter of the site.

The security fence is designed in terms of colour and height to assimilate into the visual landscape. It is proposed to use deer fencing, which is made of timber posts and high tensile steel mesh with a maximum height of 2.0m. Gates will be installed at the entrance to the site as set out in drawing ref 1939-D001.

As a requirement for insurance by the financial investors in the scheme, CCTV cameras will be erected at regular intervals around the perimeter of the site. The CCTV cameras will be mounted at an approximate height of 3m as set out in drawing ref 1939-D002.

3.1 Landscaping

The majority of the proposed development components are 3.5m or less in height; therefore, in general terms it is capable of being screened by the existing topography and mature hedgerows and trees surrounding the site.

The landscape mitigation proposals proposed therefore seeks to enhance the existing landscape character and reduce the visual prominence of the solar arrays in local views by enhancing the condition of several key field boundaries within the vicinity of the site. This is covered within the submitted LVIA which identifies areas which may require additional planting for biodiversity and screening.

Mitigation varies in scale depending on location and nature of development. In this case, the scale of development requires a small level of mitigation to assist with assimilation into the natural setting. In general the aspirations of the proposed mitigation can be summarised as follows:-

- During construction, protect existing vegetation
- No change to the existing levels of the site
- Ensure construction operations do not conflict with conservation interests such as the seasonal requirements of flora and fauna
- Reinforce any gaps in existing hedgerows with native species. This will enhance screening of the development, including low level activity on site, and create a visual foil for higher elements in the long term
- Consider the colour and texture of materials to be recessive against the backdrop of existing vegetation
- Fences and other ancillary items to be commensurate with the setting.

The proposed woodland/hedgerow planting and landscape management would produce trees and hedgerows of the specified height and provide effective screening towards the Proposal within 10 years (medium-term). The proposed hedge trees would enhance the local landscape character and provide additional screening towards the Proposal after 15 years (long-term).

A planting plan is submitted on drawing ref. PL401 rev.P04.

4 APPEARANCE

4.1 PV Modules

The general arrangement drawing submitted with the application shows the layout of the array and ancillary infrastructure relative the site context and the neighbouring exiting solar farm. The total number and dimensions of the solar PV modules may change from those used in the site layout provided, subject to the make and model of the solar PV modules chosen. The modules are typically no more than 45mm in depth. The module frame is aluminium, with the mounting system being galvanised steel (with matt finish), fixed to the ground by 1500mm (approximate) driven post ground fixings (geology and ground condition dependent).

Each module is dark blue-grey in colour. Modules will be chosen that have an anti-reflective coating and have a matt grey metallic trim, to ensure that glint and glare are minimised. The impact of both glint and glare is considered in further detail in the Glint and Glare Assessment submitted with this report. Care has been taken to determine the best angle of pitch (20^{o}) that will both optimise efficiency of absorption, whilst minimising visual impact.

4.2 Electrical Buildings

The ancillary infrastructure will comprise powder coated steel containers. The storage container will also be clad in powder coated steel. All these structures will be coloured in 14-C-39 green (BS4800).

4.3 Site/Construction Buildings

It is anticipated that the construction team will put in place a temporary work compound including site office and welfare facilities located within the field. All temporary works and protective fencing will be removed post construction during the operational phase. The anticipated location of the temporary construction compound is shown in the Construction Traffic Management Plan.

The following temporary building and structures will be in place during the construction period.

Site Office

- 3 containers 6/2.4/2.4m
- The container will be delivered and hooked on hardcore surface

Toilets

- 2 containers 6/2.4/2.4m
- The container will be delivered and hooked on hardcore surface

Storage containers

- 1 container 12/2.4/3m
- The container will be delivered and hooked on hardcore surface

Open Storage area for plant and equipment

- The area will be partly covered with hardcore

Temporary Hardcore areas

- Parking for workers/staff/visitors for up to 10 cars/vans

- Unloading and turning area for HGV deliveries

Security Fence

- Heras Fence at the entrance, in front of office and welfare containers as well as around car park. The Fence will be placed according Heras specifications.

All the above will be removed on completion of the construction works.

4.4 Lighting, CCTV and Security

External lighting will be used during the construction period if required and only between the hours of 07.30 and 19.30. There is no requirement for external lighting during the operational period except for an emergency light on the outside of the DNO sub-station and the private switchgear containers.

The CCTV poles and camera casings (as shown on drawing ref 1939-D002) will be 14-C-39 Green.

5 ACCESS

5.1 Access to site

The designated route for HGV construction traffic would be via Junction 10 on the M40 via the B430 and B4030 to the A4260, Oxford Road turning left into the site. HGVs would turn left out of the site on to the A4260 and travel northwards to Junction 11 on the M40 at Banbury.

Access to the site would be via an improved access track from Oxford Road. Drivers would be instructed to call the site to give their expected time of arrival and to get clearance to deliver their load. An experienced banksman with radio communication to the site would be employed, to manage the movement of delivery vehicles.

The access from Oxford Road will be improved by widening the existing farm access, reducing the gradient and providing adequate visibility splays.

The application is accompanied by a Construction Traffic Management Plan which details the proposed construction phase route for the delivery of component parts including the predicted timescales. An overview of the construction traffic is given below.

5.2 Construction Traffic

The peak construction rate of the project would be during the delivery of modules, mounting systems and electrical balance of plant. These deliveries would take place over a period of around 12 weeks of the installation and construction phase of the project. There will be minimal impact on the local traffic network during the construction phase of the proposal (the additional traffic movements for the duration of the construction period would represent an increase of about 0.2% in the 5-day average traffic flows), and no impact during the operational phase of the proposed development.

Delivery of the components would be by standard HGVs as the panels are palletised and the switchgears/transformers do not require abnormal loads. Construction traffic would not require additional escorting to site and the delivery schedule will be coordinated to minimise impact on the local highway network and impact on the local residents' amenity and businesses. The delivery schedule can be agreed in advance with the Local Authority's Highways Team.

It is not anticipated that delivery, construction, maintenance or decommissioning vehicles would contribute to significant increases in local traffic.

If there are any periods of wet weather during the construction period, a temporary wheel wash will be located on site for all vehicles exiting on to the public highway to avoid depositing mud onto the road. Similarly, in excessively dry periods the public highways immediately adjacent to the site entrance will be swept if there is excessive dust.

A detailed Construction Traffic Management Plan has been submitted with the application.

5.3 Operational Traffic

Post construction, site traffic will be minimal comprising cars and small commercial vehicles periodically accessing the site for maintenance or operational purposes.

5.4 Transport Assessment

In addition to the above HGV movements, there will also be several construction staff on site which will vary over the construction period depending on the activity that is taking place. Most staff will travel in crew buses. In addition, there are expected to be a small number of managerial cars/vans.

It is anticipated that the number of vehicles will be limited to no more than 30 vehicles at peak construction periods. It is proposed that provision will be made for enough parking spaces on site for typical construction vehicle numbers.

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6 USE

The proposed use of the site is for the generation of renewable energy from solar PV panels, to be exported to the Irish Electrical Grid.

The design allows for the option of grazing of livestock on the site throughout the operation of the modules.

Following decommissioning of the modules, the proposal is fully reversible and as there are no significant physical changes made to the land in terms of earth removal or levelling, there will be no constraints on returning the site to its current condition.