

ENVIRONMENTAL STATEMENT VOLUME 3: NON-TECHNICAL SUMMARY OAKLANDS SOLAR FARM AND BATTERY ENERGY STORAGE SYSTEM

LAND OFF FIVE MILE LANE | NEAR BONVILSTON | VALE OF GLAMORGAN



PREPARED BY



PREPARED FOR



REPORT NUMBER
SRE1113/NTS

REPORT STATUS
FINAL

REVISION
-

REPORT DATE
September 2022

WRITTEN & PREPARED BY

Dan Elvin | Senior Planner MRTPI

REVIEWED & APPROVED BY

James Cook | Principal Planner MRTPI

AUTHORISED BY

Sirius Planning

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1. INTRODUCTION

1.1 INTRODUCTION

- 1.1.1 This Non-Technical Summary (NTS) presents, in a simplified form, the results of a detailed assessment of the potential environmental effects of a proposal to construct and operate a solar farm and Battery Energy Storage System (BESS) across a total area of approximately 127ha. The proposed development encompasses three parcels of land (known as Development Areas) which are located to the west and east of A4226 (Five Mile Lane), approximately 750m to the south of the village Bonvilston and circa 950m southwest of the village of St Nicholas. The Application Site lies c. 12km to the west of Cardiff and is situated within the administrative area of The Vale of Glamorgan in South Wales.
- 1.1.2 The solar farm will generate enough electricity to power over 20,400 homes per year and offset approximately 20,200 tonnes of CO₂ every year, the equivalent of taking over 5,000 cars off the road¹.
- 1.1.3 The BESS will deliver significant environmental benefits, enabling technology for renewable generation, replacing the required for gas fired power generation and providing rapid response power to satisfy peak demand. In performing these roles, the development has the ability to reduce carbon dioxide emissions by over 20,600 metric tonnes annually whilst also providing electricity storage equivalent to supplying over 20,800 homes².
- 1.1.4 Climate change is generally considered to be the greatest existential threat to the environment, our way of living and humanity in general. Addressing this huge challenge requires a sea change in how we live our lives in the future and the decisions we make.
- 1.1.5 In order to address this challenge, the UK Government have set a target to decarbonise the power grid and ensure all cars are zero emissions capable by 2035 thus moving away from fossil fuels and replacing this capacity with renewable energy. This transition is predicted to result in an increase in electricity demand by 40%-60% all of which must be met from renewable energy sources.
- 1.1.6 In addition to this, recent months have brought into stark focus the need for the UK to improve its energy security to ensure both continuity of supply, reduced costs to the consumer and avoid future price spikes caused by geo-political events. In response to this additional challenge, the UK government has published The British Energy Security Strategy which commits to developing a low-cost net zero consistent electricity system, supported by large scale long duration electricity storage.

1.2 THE APPLICANT

- 1.2.1 The applicant, Sirius Renewable Energy is developing an expanding portfolio of low carbon energy projects throughout the UK, including solar, wind and battery energy storage systems.

1.3 WHY SOLAR?

- 1.3.1 In October 2021, the UK Government launched its Net Zero Strategy: Build Back Greener³ which includes the target for decarbonizing the electricity grid by 2035. To deliver the strategy overall electricity demand is expected to increase 40-60% by 2035, all met from low carbon sources.
- 1.3.2 Solar farms are a simple and established technology providing a source of safe and

¹ Internal calculations using OFGEM Typical Domestic Consumption Values and BEIS Carbon Conversion Factors

² Internal calculations using OFGEM Typical Domestic Consumption Values and BEIS Carbon Conversion Factors

³ <https://www.gov.uk/government/publications/net-zero-strategy>

clean energy which produce zero emissions when in operation. Solar development is temporary as the panels can be removed at the end of their lifetime, and also allows the agricultural use of the land to continue through livestock grazing. Solar energy is not only sustainable; it is renewable meaning that we will never run out of it.

- 1.3.3 In 2019 Solar PV accounted for 11% of renewable electricity generation in the UK⁴. In 2019 there was circa 13.3GW of installed capacity of solar energy in the UK⁵.
- 1.3.4 Solar farms are an effective and unobtrusive way of creating the electricity we all use – with the panels having a low visual impact on the local landscape and creating no noise, pollution, by-products or emissions. Additionally, solar farms result in minimal disturbance to the ground and can significantly enhance local biodiversity, for example through planting a species rich wildflower mix in field margins, creating a more diverse habitat.

1.4 WHY BATTERY STORAGE?

- 1.4.1 The electrical distribution network experiences a large fluctuation of demand throughout the day and throughout different times of the year. During periods of high demand, the aim to increase supply to maintain a 20% supply margin which is essential in eliminating, as far as possible, the risk of power shortages and blackouts, when there is an unexpected change in demand, or a sudden loss of supply. Historically, conventional power stations could be operated with some certainty. However, as the UK moves towards a more environmentally sustainable energy supply system, with an increase in renewable energy sources, there is an increased risk of electricity supply fluctuations, depending on prevailing weather conditions, and therefore an increased need for facilities to store energy, to try and match the supply to the demand. Such storage facilities include Battery Energy Storage Systems (BESS).
- 1.4.2 BESS do not create carbon emissions or generate electricity but provides a balancing mechanism drawing electricity (charging) when levels of the network are above that of demand. When levels of electricity on the distribution network are below that of demand the electricity stored in the batteries can be fed back (discharged) onto the network to meet the demand so that there is no loss of power to end users. Smooth grid operation relies on the provision of rapid reactive power services either by generation or dedicated facilities to enable frequency stabilisation. BESS provides sub-second response times, so offer a reliable solution to the distribution networks' balancing issues thus supporting the development and deployment of low carbon intermittent energy technologies upon which society must increasingly rely on to satisfy its energy requirements.
- 1.4.3 The Department for Business, Energy and Industrial Strategy stated in a press release in July 2020 that:

“...flexible technologies like batteries will form part of the UK's smarter electricity grid, supporting the integration of more low-carbon power, heat and transport technologies...”

The key to capturing the full volume of renewables is in ensuring homes and businesses can still be powered by green energy when the sun is not shining, or the wind has stopped blowing⁶”.

⁴ Digest of UK Energy Statistics (DUKES): renewable sources of energy
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/840014/Chapter_6.pdf

⁵ Capacity of, and electricity generated from, renewable sources (DUKES 6.4)
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/729373/DUKES_6.4.xls

⁶ [Battery storage boost to power greener electricity grid - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/battery-storage-boost-to-power-greener-electricity-grid)

1.4.4 The National Grid note:

“Battery storage technologies are essential to speeding up the replacement of fossil fuels with renewable energy. Battery storage systems will play an increasingly pivotal role between green energy supplies and responding to electricity supplies”⁷

1.4.5 Sirius Renewable Energy Limited seeks to support the increase in renewable energy generation and its transition to a lower carbon energy supply system through developing a solar farm and BESS on land off Five Mile Lane, near Bonvilston.

⁷ <https://www.nationalgrid.com/stories/energy-explained/what-is-battery-storage>

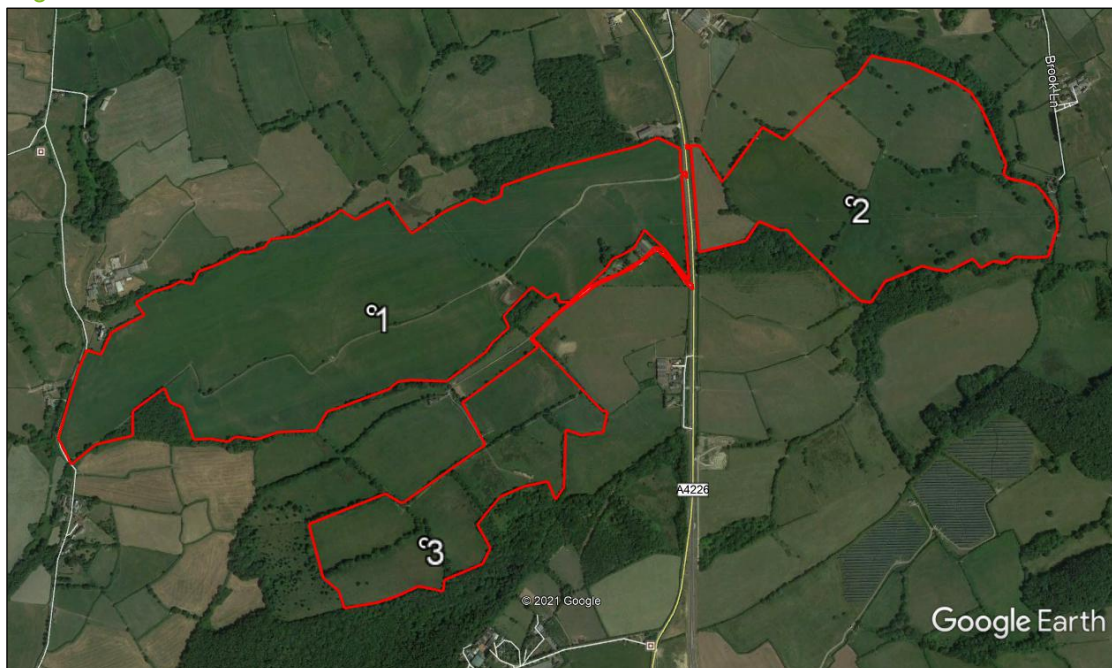


2. THE SITE AND SURROUNDINGS

2.1 LOCATION

- 2.1.1 The proposal is located c. 750m to the south of the village of Bonvilston and c. 950m to the south-west of the village of St Nicholas, within the administrative area of The Vale of Glamorgan. The proposal site is split into three Development Areas (number below), two are located to the west of A4226 (Five Mile Lane) and one to the east. The site location and extent of site boundaries is presented on Drawing No. **SRE1113/02/01** (Doc Ref. 2.01) and below in Figure 2.1.
- 2.1.2 The majority of the site to the west of Five Mile Lane is allocated under Policy MG30 of the Vale of Glamorgan Local Development Plan as a "Local Search Area for Solar Energy".

Figure 2.1: Site Location



2.2 SITE OVERVIEW

- 2.2.1 The site and surrounding areas are rural in nature, characterised by farmland and rough scrubland and is bounded by woodlands to the south, north (part) and north east of the site. The majority of the site is relatively flat, with the exception of the north-west which falls away to the north and the western end of Development Area one that falls away in a westerly direction.

2.3 DEVELOPMENT AREAS

- 2.3.1 The site is split into three by the A4226, one parcel to the east and two to the west:
- Development Area 1 (Pancross) – 66ha
 - Development Area 2 (Redlands) – 40ha
 - Development Area 3 (Oaklands) – 21ha
- 2.3.2 The majority of the site comprises agricultural fields of varying size enclosed by large hedgerows or tree belts and assessed to be Grade 3b or lower in terms of Agricultural Land Classification (ALC) Quality. None of the land within the application area is considered Best and Most Versatile (BMV) agricultural land.
- 2.3.3 Along the western boundary of the site to the west of Development Area 1 is an unnamed lane. Several farms are located adjacent to the site boundaries to the north and to the south of the proposal site. To the east of the A4226, approximately 500m to

the south of the site is a 6MWp solar farm that has been operational since 2018 (Planning Ref. 2014/00798/FUL).

- 2.3.4 The villages of Bonvilston and St Nicholas are the principal developed areas in proximity to the site. Bonvilston is approximately 750m north and St Nicholas, approximately 950m north-east of the parcel to the east of A4226.

2.4 IDENTIFIED RECEPTORS AND DESIGNATIONS

- 2.4.1 The majority of the site to the west of Five Mile Lane is allocated under Policy MG30 of The Vale of Glamorgan Local Development Plan as a "Local Search Area for Solar Energy". The whole site is located within a Special Landscape Area and mineral safeguarding area. Approximately 19ha of the western extent of the proposal site lies within a Registered Historic Landscape.
- 2.4.2 The nearest residential properties to the application site include seven properties along the unnamed lane bounding the western edge of the application site. There are also residential properties in the nearby villages of Bonvilston and St Nicholas, with the closest property being approximately 500m from the northern boundary.
- 2.4.3 Adjacent to the southern boundary of the proposal site to the west of Five Mile Lane is Nant Whitton Woodlands which is a Site of Special Scientific Interest (SSSI) and Sites of Importance for Nature Conservation (SINC). A SINC is identified adjacent to the west and north-east of the proposal site.
- 2.4.4 The nearest Listed Building is the Grade II listed Ty Mawr (Great House) located approximately 850m to the north of the site and a Scheduled Ancient Monument (Ty'n-y-Coed Castle Ringwork) is adjacent to the site's northern boundary. The westmost area of the site lies within a historic landscape.
- 2.4.5 From The Vale of Glamorgan County Borough Council Definitive Map there are no public right of way within or along the boundaries of the site.
- 2.4.6 A High-Pressure gas pipeline runs north to south within the western part of Development Area 2. Following discussions with Wales and West Utilities, regarding the stand-off requirements from their apparatus, the deployment of solar panels was removed from the field in which the pipeline runs.
- 2.4.7 There is a 132kV overhead power line that run across the site, parallel to the northern boundary in an east to west alignment with six existing electricity pylon towers located within the application boundary. In addition, there is a 33kV overhead power line running south-east to north-west and a 11kV overhead power line running south to north- within Development Area 1. Buffers were created between the solar deployment area and the power lines where applicable.
- 2.4.8 Risk of flooding was not deemed to be a constraint as Natural Resource Wales Development Advice Maps indicates the site is located within Flood Zone A which has a low risk of flooding.



3. THE PROPOSED DEVELOPMENT

3.1 INTRODUCTION

3.1.1 The proposal relates to the construction, operation, maintenance and decommissioning of a ground mounted solar farm and Battery Energy Storage System (BESS), plus ancillary equipment comprising the following main elements:

- Photovoltaic (PV) panels to a maximum height of circa 3m;
- Mounting frames - matt finished small section metal structure;
- BESS compound; containing c. 20 battery storage units set in bays of two surrounded by 3m high concrete firewalls, associated infrastructure, car parking and surrounded by c. 4m high acoustic fence and c. 2.4m high palisade fencing.
- Scheme of landscaping and biodiversity enhancement;
- Transformers and inverters will be housed in prefabricated containers;
- Substations (DNO and Customer) and associated cabling (below ground);
- Point of Connection;
- Stock fencing up to a height of circa 2m to secure the development areas;
- Infra-red CCTV (CCTV cameras would operate using motion sensors and would be positioned inward only to ensure privacy to neighbouring land and property);
- Temporary set down areas;
- Internal service roads; and
- Site access for the construction, operational and decommissioning phases.

3.1.2 Oaklands Solar Farm will have an export capacity of circa 50MW of electricity, enough to power approximately 20,400 homes per year and offset over 20,200 tonnes of CO₂ ever year, the equivalent of taking around 5,000 petrol / diesel cars off the road.

3.1.3 The panels will be arranged in rows in an east-west alignment across the plots and orientated south.

3.1.4 The Battery Energy Storage System (BESS) will have a capacity to charge, store and export up to 50MVA of electricity to the local distribution network. The BESS will deliver significant environmental benefits, enabling technology for renewable generation, replacing the required for gas fired power generation and providing rapid response power to satisfy peak demand. In performing these roles, the development will reduce carbon dioxide emissions by over 20,600 metric tonnes annually whilst also providing electricity storage equivalent to supplying over 20,800 homes.

3.1.5 The scheme will be operational for 40 years after which the development will be decommissioned and all equipment will be removed from site.

3.2 SITE DESIGN AND LAYOUT

3.2.1 The proposed layout is shown on Drawing No. **SRE1113/02/03** (Doc Ref. 2.03). Due to commercial constraints, potential changes in solar panel, inverter, transformer and substation manufacturer during the determination process, an element of flexibility is required in relation to their dimensions, appearance and arrangement. The submitted layout is therefore indicative as the detailed layout and phasing of construction will be agreed with the Local Planning Authority (LPA) by way of planning condition following grant of planning permission. This approach is commonplace in solar farm planning permissions.

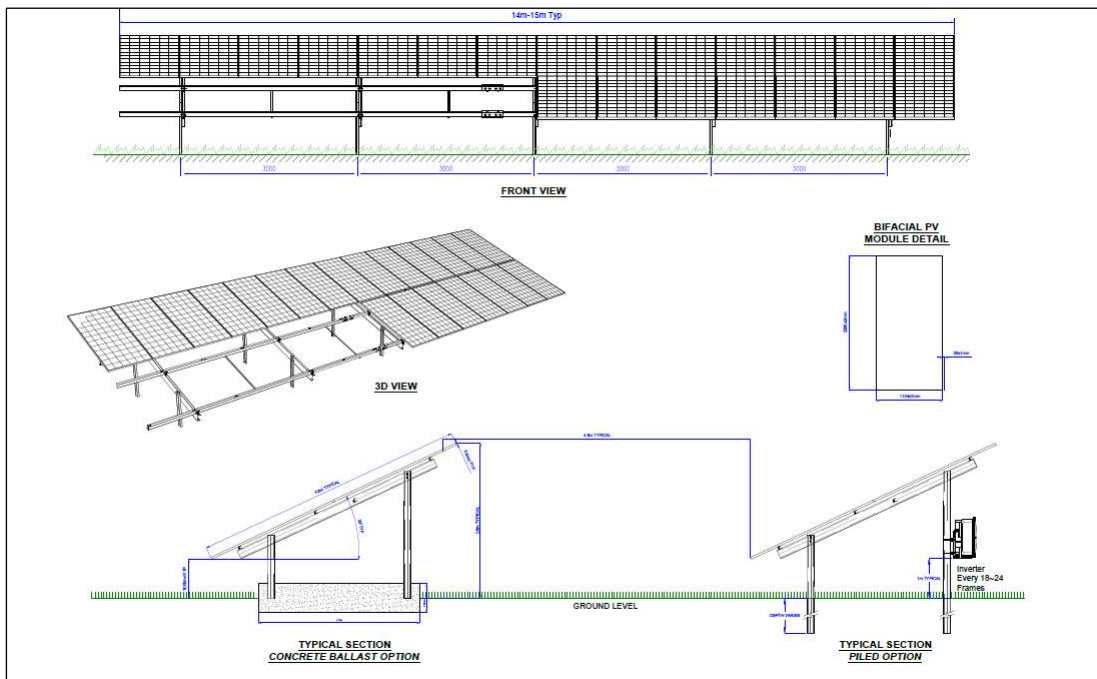
Solar

3.2.2 The panels will be arranged in rows in an east-west alignment across the deployment areas and will be angled between 10° and 30° to the horizontal and orientated with panels facing south. The height of the panels will be up to 3m above ground level; the lowest part of the panel will measure approximately 0.9m above ground level. The rows

of panels will be set approximately 3.2m apart to avoid shadowing and allow for scheduled maintenance, this will be dependent on local topography.

- 3.2.3 During construction, operation and decommissioning a buffer zone where no development will take place will be established from the hedgerow, ponds and streams.
- 3.2.4 There will be two types of mounting frames used on site. The majority will be matt finished galvanised steel that will be fixed to the ground employing a pile mounting system, the piles will be pushed into the ground via a mobile piling rig. Where there is the potential presence of archaeological findings on some parts of the site, the panel frames will be mounted on ballast blocks to ensure stability of the panels and frames without penetrating the ground. Drawing **SRE1113/02/05** (Doc Ref. 2.05) and **Figure 3.1** below provide a specification of the panel and frames.

Figure 3.1: Panel and Frames Specification



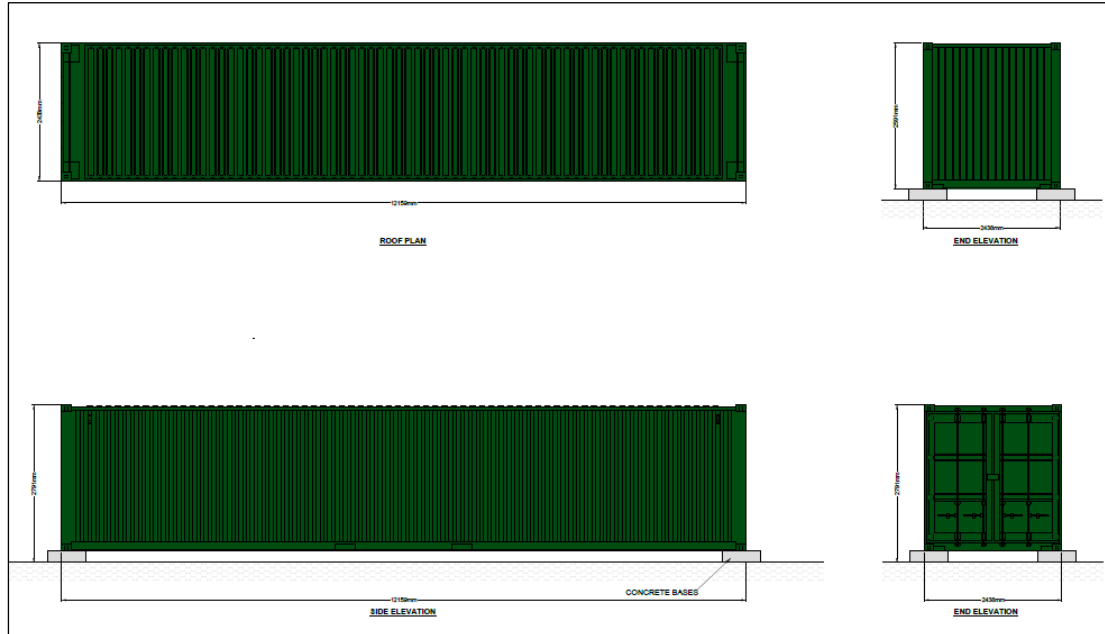
- 3.2.5 The solar panels will be connected to central inverter units. The inverters convert electricity from Direct Current (DC) to Alternative Current (AC). The inverters then feed the transformers which step up the voltage ready to export to the local distribution network via the substation buildings and connecting cables. Details of the proposed ancillary equipment within the site are provided on Drawing No's. **SRE1113/02/06 – 08** (Doc Ref. 2.06-08).
- 3.2.6 Cabling from the inverters to the substation for each deployment area will be below ground. An earth cable will likely be required around the perimeter of each deployment area. Trench depths will vary from 0.4m to 1.3m depending on whether they are for earthing or AC cabling.

Battery Energy Storage System (BESS)

- 3.2.7 The proposed Battery Energy Storage System (BESS) will have a capacity to charge, store and export up to 50MVA of electricity to the local distribution network. The facility will provide balancing services to distribution network to ensure the future security of the country's electricity supply. The facility will provide power to the local distribution network in a short space of time when demand is greater than available supply.
- 3.2.8 The BESS compound is located within deployment area one near the site access and will be surfaced in gravel. The BESS will comprise of c. 20 battery container units with

each battery container accommodating 2.5MW of capacity. The battery container units have a similar appearance to shipping containers and measure typically 18.6m in length (including the air cooling and heating units at either end), 2.44m wide and 3.1m in height. Drawing No. **SRE1113/02/11** (Doc Ref. 2.11) and **Figure 3.2** below provide a specification for the battery container units.

Figure 3.2: Battery Container Unit Specification



- 3.2.9 The batteries will sit in bays of two surrounded by 3m high concrete firewalls.
- 3.2.10 The BESS compound also comprises two switchgear cabins, two spare storage cabins and four containers, details of which are shown on Drawing No. **SRE1113/02/04** (Doc Ref. 2.04), along with 16 car parking spaces.
- 3.2.11 A c.4m high acoustic fence will surround the BESS compound, details of which are provided on Drawing No. **SRE1113/02/21**. (Doc Ref. 2.21)

3.3 POINT OF CONNECTION AND CABLE ROUTE

- 3.3.1 The proposed point of connection is located at one of the six onsite pylons situated within Development Area 1, immediately north of the proposed BESS compound. A customer substation is to be located within the BESS compound and from here a cable will connect directly to the existing onsite pylon. Development Area 2 and Development Area 3 will be connected to the main customer substation at Development Area 1 by underground cabling which will be located within the adopted highway or within land where a lease agreement is in place with the landowner.
- 3.3.2 The indicative cable routes are presented in **Drawing SRE1113/02/14** (Doc Ref. 2.14). The drawings show a 'corridor' within which the cable will be laid. The exact alignment of the route is to be confirmed at the detailed design stage via separate authorisation from the Local Highway Authority.

3.4 SITE SECURITY

- 3.4.1 Once operational, the solar farm deployment areas will be secured by a c. 2m high stock fence or similar. Infra-red (non-visible at night), inward facing pole mounted CCTV cameras (c. 2.5m – 3m in height) will also be provided at between 50m and 100m intervals along the boundary fence. These will enable remote surveillance of the site. Fencing and CCTV camera details are presented on Drawing No. **SRE1113/02/16**

(Doc Ref. 2.16). The CCTV cameras will be positioned to avoid views of any private property.

- 3.4.2 The BESS compound will be secured by an acoustic fence as illustrated on Drawing No. **SRE1113/02/21** (Doc Ref. 2.21).

3.5 CONSTRUCTION PROGRAMME

- 3.5.1 The construction of the proposed development is expected to last approximately 6 months and employ up to 80 staff over the construction period. An outline Construction Traffic Method Statement (CTMS) accompanies the application and can be found at **Appendix 12.2** (Doc Ref. 4.01.12b). This outline CTMS provides details of proposed access arrangements, the anticipated build programme, construction vehicle numbers and type, construction worker numbers and the proposed construction hours. The outline CTMS will be subject to final approval by the LPA post-consent under the terms of an appropriately worded planning condition.

3.6 SITE ACCESS

- 3.6.1 Access to the Development Areas will be achieved from Five Mile Lane (A4226). The A4226 provides a link between the main A48 trunk route to the north and Barry to the south. One site access point is proposed off Five Mile Lane for each Development Area providing a total of 3 access points.
- 3.6.2 The A4226 is a single-track, two-way road and is subject to the National Speed Limit. The topography of the A4226 in both directions of the site access points is predominantly flat, whilst the alignment of the road has a slight bend towards the west, north of the site. A vehicle swept-path analysis showing a large articulated vehicle entering and existing the proposed site access points in a forward gear is presented in the outline CTMS at **Appendix 12.2** (Doc Ref. 4.01.12b).
- 3.6.3 To minimise the number of vehicle movements crossing the A4226 between plots, temporary set down areas will be provided both sides of the A4226. Drawing No. **SRE1113/02/24** (Doc Ref. 2.24) identifies the locations of the temporary set down areas.
- 3.6.4 Within the site, internal service roads will be constructed to access all areas of the site. The roads will be approximately 4m wide and will be finished with compacted crushed stone.
- 3.6.5 After commissioning and once operational, the site will only be visited during routine monthly maintenance checks. The access during the operational phase will be as per the construction routes, and the entrance from the A4226 to Development Area 3.
- 3.6.6 The proposed development will have restricted public access. In designing the proposed development emphasis will be placed on security. The design ensures the site is secure and not readily accessible to the public through the installation of deer fencing and infra-red CCTV. Access to the site will be through invitation only.
- 3.6.7 Details of the proposed access arrangements during construction are presented in the outline CTMS (**Appendix 12.2**, Doc Ref. 4.01.12b). Once operational, the proposal will generate minimal traffic flow from monthly inspections and maintenance. The CTMS will be subject to final approval by the LPA post-consent under the terms of an appropriately worded planning condition.

Car Parking

- 3.6.8 During construction of the development, it is expected that the site will provide sufficient available land for temporary parking, storage and lay-down for the construction phase. See drawing **SRE1113/02/24** (Doc Ref. 2.24) for details. Employees will access site via minibus that will be arranged by the contractor.

3.6.9 Once operational, the site will be managed remotely offsite. However, the site will be required to have monthly maintenance checks.

3.7 PUBLIC RIGHT OF WAY

3.7.1 There are no Public Rights of Way which run either through or adjacent to the site. The nearest Public Right of Way is located approximately 130m to the north-east of the site and runs in a north-east to south-west direction.

3.8 BIODIVERSITY ENHANCEMENTS AND LANDSCAPING

3.8.1 Biodiversity and landscape enhancements are at the forefront of the Oaklands Solar Farm and BESS proposals. In addition to land between and beneath the panels, there will be some areas of non-development land located within the application site that will be brought under formal management for the life of the scheme.

3.8.2 All hedges are to be retained around the site, with infilling of the gaps of missing sections undertaken. In addition to benefiting landscape and screening any visual issues, the retention of hedges will ensure that foraging, refuge and hibernation opportunities, protection from predators, and connectivity between habitats for wildlife within the local area is maintained and enhanced.

3.8.3 The Landscape and Visual Impact Assessment (LVIA) and Ecology and Nature Conservation chapters (ES chapters 7 and 11 respectively) provide full details of the enhancement proposals, but in summary these include:

- Management of grassland within the solar deployment zones to create a diverse sward between and around the solar arrays, of tussock grassland;
- Management of grassland margins outside of the solar deployment zones for biodiversity, the grassland fringes (low maintenance perennial meadow mix) will provide enhanced habitat fringes and contribute to increasing biodiversity levels in the local area;
- Reinforce existing hedgerows to improve visual containment of solar deployment areas (gapping up and growth to a greater height) Where appropriate on the boundary adjoining receptors (residential, roads and footpaths) the hedge will be allowed to grow up to at least c.3m tall to help to screen visibility from publicly accessible areas to the solar farm;
- Improve landscape structure of Development Area 1 (Pancross Farm) with the reinstatement of some lost historic hedgerows to restore the historic field structure, for both landscape / visual and ecological benefits;
- Additional standard sized hedge trees to be planted along the new hedgerows within the western area of Development Area 1, the Llancarfen Historic Landscape Area at random spacings. The planting will increase local tree coverage, filter visibility from sensitive receptors and provide green links between existing woodland areas.

3.8.4 A Landscape Mitigation Plan is included as Drawing No. **SRE1113/02/18** (Doc Red. 2.18).

3.9 SITE WASTE MANAGEMENT PLAN

3.9.1 A Construction Environmental Management Plan (CEMP) will be prepared prior to the development works commencing on site. A Site Waste Management Plan (SWMP) will be prepared as part of the CEMP. The SWMP will detail:

- Actions to meet the waste hierarchy;
- Identify the person with responsibility for the SWMP;
- Details of the types and quantities of waste that will be produced by the Contractor as part of the construction phase; and

- Details of all consignments made for example a WRAP waste recording and reporting spreadsheet.

3.10 SURFACE WATER MANAGEMENT

- 3.10.1 Although the solar panels will divert the downward path of falling rain, being raised off the ground on frames, they will not reduce the permeable area where they are sited. Rainfall that does fall onto the site will, as now, infiltrate into the soil substrate. Therefore, the surface water runoff from the developed site will be no different pre and post-development. There will be no increase in surface water run-off or exacerbation of off-site risk as a result of the proposals.
- 3.10.2 A separate application for Sustainable Drainage Approval Body (SAB) will be made.

3.11 DECOMMISSIONING

- 3.11.1 After 40 years of operation, the panels and associated infrastructure will be removed from site. The outline CTMS presented in **Appendix 12.2** (Doc Ref. 4.01.12b) details the programme and anticipated vehicle movements associated with this phase of the development.



4. POLICY CONTEXT

4.1 INTRODUCTION

- 4.1.1 To understand why Sirius Renewable Energy are proposing a solar farm and BESS to generate and store renewable energy in this location, national and local policy (the 'Development Plan') must be considered. A detailed appraisal of Development Plan policy and material considerations is presented in a standalone Planning Statement submitted with the planning application.
- 4.1.2 Section 38(6) of the Planning and Compulsory Purchase Act 2004 (as amended) requires planning applications to be determined in accordance with the provisions of the Development Plan unless material considerations indicate otherwise. Given the primacy of the Development Plan in the decision-making process it is imperative that the application identifies which planning policies are relevant to the proposal.
- 4.1.3 Oaklands solar farm will have an export capacity of circa 50MW of electricity, enough to power approximately 20,400 homes per year and offset over 20,200 tonnes of CO₂ ever year, the equivalent of taking around 5,000 petrol / diesel cars off the road. The scheme will be operational for 40 years after which all equipment can be removed from site.
- 4.1.4 The Battery Energy Storage System (BESS) will have a capacity to charge, store and export up to 50MVA of electricity to the local distribution network. The BESS will deliver significant environmental benefits, enabling technology for renewable generation, replacing the required for gas fired power generation and providing rapid response power to satisfy peak demand. In performing these roles, the development has the ability to reduce carbon dioxide emissions by over 20,600 metric tonnes annually whilst also providing electricity storage equivalent to supplying over 20,800 homes.

4.2 ENVIRONMENTAL IMPACT ASSESSMENT

- 4.2.1 Sirius Planning Ltd was commissioned to co-ordinate an Environmental Impact Assessment (EIA) of the proposed solar farm and BESS. The findings of the assessment are presented in an Environmental Statement which accompanies the planning application, as required by the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017.
- 4.2.2 Specialist consultants in a wide range of disciplines have been employed to carry out environmental studies and assessments. Details of the independent studies and assessments are contained in the ES.

4.3 NEED FOR RENEWABLE ENERGY

- 4.3.1 Future Wales: The National Plan 2040 (adopted February 2021) sets the direction of development in Wales to 2040. Future Wales constitutes the development plan for Developments of National Significance (DNS) in line with s38(6) of the Planning and Compulsory Purchase Act 2004. It states:

“Wales can become a world leader in renewable energy technologies. Our wind and tidal resources, our potential for solar generation, our support for both large and community scaled projects and our commitment to ensuring the planning system provides a strong lead for renewable energy development, mean we are well placed to support the renewable sector, attract new investment, and reduce carbon emissions”.

- 4.3.2 As set out in legislation (Planning & Compulsory Purchase Act 2004 as amended by the Planning (Wales) Act 2015), applications for DNS must be determined in accordance with Future Wales, which is the national development plan for Wales.
- 4.3.3 Future Wales identifies 11 Outcomes to be achieved in 20-years' time. Outcome 9 seeks a Wales where people live in places that sustainably manage their natural

resources and reduce pollution. Outcome 11 seeks a Wales where people live in places which are decarbonised and climate resilient.

4.3.4 Future Wales states:

“Wales is abundant in opportunities to generate renewable energy and the Welsh Government is committed to maximising this potential. Generating renewable energy is a key part of our commitment to decarbonisation and tackling the climate emergency.”

4.3.5 Furthermore, Future Wales sets ambitious targets for the generation of renewable energy including for 70% of electricity consumption to be generated from renewable energy by 2030.

4.3.6 The National Plan includes Policies 17 and 18 which are strategic spatial and detailed criteria-based policies respectively and should be considered together in the determination of applications.

4.3.7 Policy 17 demonstrates the Welsh Government's support in principle for all renewable energy projects and technologies. Proposals should ensure there is no significant unacceptable detrimental impact on the surrounding natural environment and local communities and that the development delivers positive social, environmental, cultural and economic benefits. Policy 17 - Renewable and Low Carbon Energy and Associated Infrastructure states:

“The Welsh Government strongly supports the principle of developing renewable and low carbon energy from all technologies and at all scales to meet our future energy needs. In determining planning applications for renewable and low carbon energy development, decision-makers must give significant weight to the need to meet Wales' international commitments and our target to generate 70% of consumed electricity by renewable means by 2030 in order to combat the climate emergency...”

Proposals should describe the net benefits the scheme will bring in terms of social, economic, environmental and cultural improvements to local communities...”

4.3.8 Policy 18 provides a decision-making framework for renewable and low carbon energy technologies. Policy 18 - Renewable and Low Carbon Energy Developments of National Significance states:

“Proposals for renewable and low carbon energy projects (including repowering) qualifying as Developments of National Significance will be permitted subject to policy 17 and the following criteria:

1. outside of the Pre-Assessed Areas for wind developments and everywhere for all other technologies, the proposal does not have an unacceptable adverse impact on the surrounding landscape (particularly on the setting of National Parks and Areas of Outstanding Natural Beauty);

2. there are no unacceptable adverse visual impacts on nearby communities and individual dwellings;

3. there are no adverse effects on the integrity of Internationally designated sites (including National Site Network sites and Ramsar sites) and the features for which they have been designated (unless there are no alternative solutions, Imperative Reasons or Overriding Public Interest (IROPI) and appropriate compensatory measures have been secured);

4. there are no unacceptable adverse impacts on national statutory designated sites for nature conservation (and the features for which they have been designated), protected habitats and species;

5. *the proposal includes biodiversity enhancement measures to provide a net benefit for biodiversity;*
 6. *there are no unacceptable adverse impacts on statutorily protected built heritage assets;*
 7. *there are no unacceptable adverse impacts by way of shadow flicker, noise, reflected light, air quality or electromagnetic disturbance;*
 8. *there are no unacceptable impacts on the operations of defence facilities and operations (including aviation and radar) or the Mid Wales Low Flying Tactical Training Area (TTA-7T);*
 9. *there are no unacceptable adverse impacts on the transport network through the transportation of components or source fuels during its construction and / or ongoing operation;*
 10. *the proposal includes consideration of the materials needed or generated by the development to ensure the sustainable use and management of resources;*
 11. *there are acceptable provisions relating to the decommissioning of the development at the end of its lifetime, including the removal of infrastructure and effective restoration.*
- The cumulative impacts of existing and consented renewable energy schemes should also be considered.*

- 4.3.9 The Welsh Government published Planning Policy Wales Edition 11 (PPW) in February 2021. This provides the overarching national level source of planning policy for Wales and is a material consideration alongside Futures Wales. It has been updated to take into account Futures Wales and the Wellbeing of Futures Generations Act which incorporates 7 wellbeing goals. It seeks to support the requirement for sustainable development via the planning system whereby the presumption in favour of sustainable development forms the overarching role together with a firm view on improving population wellbeing.
- 4.3.10 PPW sets out the specific planning policies for achieving sustainable development across Wales. Figure 4 sets out the key planning principles of this national policy, stating that:
- "The planning system has a vital role to play in making development resilient to climate change, decarbonising society and developing a circular economy for the benefit of both the built and natural environments and to contribute to the achievement of well-being goals".*
- 4.3.11 Chapter 5 (Providing and Enterprising Places) of the PPW sets out the Welsh Government's policies regarding Enterprising Placemaking and Wellbeing across Wales. One of the key aims in relation to energy is for Wales to generate 70% of its electricity consumption from renewable generation by 2030;
- 4.3.12 Chapter 5 of the PPW outlines the importance of the planning system to deliver these targets, paragraph 5.7.15 states:
- "The planning system has an active role to help ensure the delivery of these targets, in terms of new renewable energy generating capacity and the promotion of energy efficiency measures in buildings."*
- 4.3.13 Paragraph 5.9.19 states that:
- "In determining applications for the range of renewable and low carbon energy technologies, planning authorities should take into account:*

- *The contribution a proposal will make to meeting identified Welsh, UK and European targets;*
- *The contribution to cutting greenhouse gas emissions; and*
- *The wider environmental, social and economic benefits and opportunities from renewable and low carbon energy development.*

4.3.14 Paragraph 5.9.20 continues stating:

"Planning authorities should also identify and require suitable ways to avoid, mitigate or compensate adverse impacts of renewable and low carbon energy development. The construction, operation, decommissioning, remediation and aftercare of proposals should take into account:

- *The need to minimise impacts on local communities, such as from noise and air pollution, to safeguard quality of life for existing and future generations;*
- *The impact on the natural and historic environment;*
- *Cumulative impact;*
- *The capacity of, and effects on the transportation network;*
- *Grid connection issues where renewable (electricity) energy developments are proposed; and*
- *The impacts of climate change on the location, design, build and operation of renewable and low carbon energy development. In doing so, consider whether measures to adapt to climate change impacts give rise to additional impacts."*

4.3.15 Chapter 5 also outlines that before an application is submitted "...developments should, where possible, consider how to avoid, or otherwise minimise, adverse impacts through careful consideration of location, scale, design and other measures". Furthermore, active engagement with the local community should be undertaken at pre-application stage.

4.3.16 Paragraph 5.9.15 of Planning Policy Wales Edition 11 confirms that the need for renewable energy generation is not a material planning consideration. It states:

"...planning applications for renewable and low carbon energy developments should be determined based on the merits of the individual proposal. The local need for a particular scheme is not a material consideration, as energy generation is of national significance and there is a recognised need to optimise renewable and low carbon energy generation."

4.3.17 Oaklands solar farm will have an export capacity of circa 50MW of electricity, enough to power approximately 20,400 homes per year and offset over 20,200 tonnes of CO₂ ever year, the equivalent of taking around 5,000 petrol / diesel cars off the road. The scheme will be operational for 40 years after which all equipment can be removed from site.

4.3.18 The Battery Energy Storage System (BESS) will have a capacity to charge, store and export up to 50MVA of electricity to the local distribution network. The BESS will deliver significant environmental benefits, enabling technology for renewable generation, replacing the required for gas fired power generation and providing rapid response power to satisfy peak demand. In performing these roles the development has the ability to reduce carbon dioxide emissions by over 20,600 metric tonnes annually whilst also providing electricity storage equivalent to supplying over 20,800 homes.

4.3.19 The proposed Oaklands Solar Farm and BESS will make a significant contribution towards meeting renewable energy targets, not only through the generation and

storage of renewable energy, but also through the considerable investment in the local economy during the construction phase.



5. SUMMARY OF TOPIC ASSESSMENTS

5.1 INTRODUCTION

- 5.1.1 To determine the extent (or 'scope') of environmental topics to be considered in the EIA and reported on in the ES, Vale of Glamorgan County Borough Council were requested to provide a Scoping Opinion. This Scoping Opinion (presented in **Appendix 1.2** to the ES) confirmed the information to be supplied in the ES. The ES has been prepared in accordance with the Scoping Opinion from the Council.
- 5.1.2 The following sections summarise the environmental topic chapters of the Environmental Statement, Volume 1. Each section includes a brief description of any identified potential environmental effects resulting from the proposed development and the ways, if necessary, to reduce such impacts.

5.2 LANDSCAPE AND VISUAL IMPACT

Landscape Character

- 5.2.1 Whilst the development would have an impact on the characteristics of the Special Landscape Area, it was concluded that due to the limited vertical scale of the solar arrays and the rolling farmland landscape, with hedgerow field boundaries and woodland blocks to adjoining slopes and valleys, the effects on the SLA are concentrated to the site and its immediate setting and defined areas of intervisibility. It is considered that the landscape effects upon the setting of the SLA, as a result of the development would be Moderate at Year 1 reducing to Minor at Year 10 (following successful establishment of mitigation hedgerows and tree planting) which are 'Not Significant' Landscape effects.
- 5.2.2 As effects on historic features would be localised and likely to be of a lower level than that which could potentially occur and that the historic field systems outside of the site would not be adversely affected it is considered that the landscape effects upon the setting of Llancarfan Historic Landscape Area, as a result the development would be Minor (in landscape terms)– a 'Not Significant' Landscape effect.
- 5.2.3 A 'Moderate' significance of landscape effect is concluded overall, this is a 'Not Significant' effect. Although not significant effects are stated, adverse landscape effects are acknowledged and the moderate effects are still of a level to form an important consideration (although not in itself material) in the overall planning decision making process.

Visual Amenity

- 5.2.4 The main residential visual receptors within c.500m of the site have been assessed. The visual assessment established that no residential receptors would experience effects of a 'Significant' nature.
- 5.2.5 The viewpoint assessment considered an extensive range of publicly accessible locations to illustrate the greatest (and representative) levels of visibility to the 3 solar Development Areas within the study area. All locations were agreed in consultation with Vale of Glamorgan County Borough Council. In total 17 no. viewpoint locations have been assessed, the viewpoints considered close range views to the DAs and also the potential visibility of multiple DAs distributed within the study area.
- 5.2.6 A single viewpoint was considered to experience visual effects of a 'significant' nature (VP 5). The slightly elevated (in relation to the site) close range viewpoint is located in the field c.300m from the northern site boundary in the small-scale pastures between the sites and A48 road corridor (Bonvilston).

Overall landscape and visual considerations

- 5.2.7 The LVIA demonstrates that the proposed Development Areas of Oaklands Solar Farm could be successfully integrated into the local landscape of the Vale of Glamorgan

(partially within an area identified as a 'Solar Area of Search') without causing significant and wide scale harm to the landscape character. No significant landscape effects are concluded upon the identified landscape receptors. The development allows for opportunities for enhanced mitigation, the reinstatement of lost historic field structure and management of the unused areas of the development site.

- 5.2.8 Whilst one 'significant' visual effect is noted, this is upon a near PROW and focussed to a particular location with the most open visibility. It should be noted that whilst an effect may be significant, that does not necessarily mean that such an impact would be unacceptable. Overall, the assessment has established that visual effects of the greatest magnitude (major/moderate) would be focussed upon a limited number of residential and recreational (PROW) receptors only, that are close to, or have views over, the site boundary. Outside of this near zone, visual effects reduce further, and continue to be of a 'Not Significant' level. It is expected that the extensive proposed planting mitigation and management of existing perimeter vegetation over time will further filter views to the 3 Development Areas and reduce the level of visual effects.

5.3 NOISE AND VIBRATION

- 5.3.1 Four noise sensitive locations were identified within the vicinity of the site, including residential properties. Noise surveys were simultaneously carried out over four days at these locations to understand the local noise climate. These background levels were then compared with likely sound levels generated during the construction, operational and decommissioning phases of the proposal.
- 5.3.2 During the construction and decommissioning phases there would be a variety of noise sources from various operations at different times such as deliveries, trenching or constructing the arrays. The highest noise levels relative to nearest receptors are likely to occur during site preparation and infrastructure activities. However, the proposed mitigation will ensure noise levels are kept to acceptable levels. Such measures include:
- Restricting operation to current permitted hours during the daytime;
 - Regular maintenance of plant;
 - Where required, use of local screening where plant is being used in close proximity to sensitive receptor boundaries or around plant (e.g. within 30m of sensitive boundary) using temporary hoarding; and
 - Site management.
- 5.3.3 During the construction and decommissioning phases there is expected to be a negligible to slight impact at receptors as a result of on-site construction or decommissioning activities, resulting in a neutral to minor level of effect at receptors.
- 5.3.4 During the operational phase no significant levels of effect are predicted for all the plant in operation at full load with the mitigation measures implemented. The noise levels are expected to be well below the noise limit criteria and would therefore result in a negligible impact and a neutral level of effect. Operational phase noise impacts as a result of on-site activities are therefore not considered to represent a significant impact in noise terms.
- 5.3.5 The cumulative effect of the proposed development with other planned developments in the local area have been considered. It is concluded that there will be no cumulative environmental effects at noise sensitive receptors either during construction/decommissioning or the operational phase.
- 5.3.6 No significant noise or vibration impacts as a result of construction and decommissioning activities, and the operational phase are expected to occur following the implementation of appropriate mitigation.

5.4 HISTORIC ENVIRONMENT

- 5.4.1 There are 136 previously recorded sites of archaeological interest within a 1km study area and this includes eight Scheduled Monuments and ten Listed Buildings. The assessment undertaken has determined that fourteen of these sites are located within the site. Two of these comprise cropmarks of an enclosure and field system. Three new sites of archaeological interest were found as part of the assessment work (however one of these was found to be subsequently outside of the site boundary). The remaining two are made up of industrial and agricultural post-medieval sites.
- 5.4.2 No Conservation Area, Registered Historic Park & Garden or Listed Building will be directly impacted by the proposed development but they have the potential to be indirectly (visually) impacted. Bonvilston Conservation Area and the five listed buildings within it are visible from the site, but they are some distance from the proposed development and it is considered that it will have a minor indirect impact. The Registered Historic Park and Gardens of Dyffryn Gardens, Llantrithyd Place, Coedarhydyglyn and Wenvoe Castle lie within 3km of the site, but the indirect impact is considered Negligible due to the intervening landscape and topography.
- 5.4.3 The Registered Historic Landscape of Llancafarn will be directly and indirectly affected by the proposed development. Part of the site lies within the historic landscape and any construction within it will create a direct impact and will have an indirect (visual) impact on the remainder of the landscape. The overall impact on the landscape will be Moderate.
- 5.4.4 No Scheduled Monument will be directly impacted by the proposed development, but there is the potential for three to be indirectly (visually) impacted. Castle Ringwork 850m ENE of Ty'ny- Coed and Coed y Cwm Ringwork are located in close proximity of the proposed development site, and the potential indirect impact upon these monuments will be Moderate. The potential indirect impact on Castell Moel hillfort will be Minor due to the distance between the monument and the site.
- 5.4.5 Fourteen specific recorded sites of archaeological interest have been identified within the proposed development boundary. There is also a Medium potential for further unrecorded activity spanning from the prehistoric to the post-medieval period. Two of the specific recorded sites include the cropmarks of an enclosure (and a field system). These could possibly date to the prehistoric or medieval period. Given their potential date, these are features of Medium archaeological value, and development on this site may have a Major direct impact upon them. There is the potential for groundworks at these locations and they may have a Major direct impact upon these sites. All of the other sites of archaeological interest are industrial and agricultural sites from the post-medieval period. These sites are of Low archaeological value.
- 5.4.6 To minimise the direct impacts on the Registered Historic Landscape of Llancafarn, construction and any ground disturbance works should be kept to a minimum in this area. To mitigate any visual indirect impacts upon the landscape current field and wooded boundaries should be maintained. This is particularly true for Castle Ringwork 850m ENE of Ty'n-y-Coed and Coed y Cwm Ringwork as these will be the most affected designated assets due to the proposed development.
- 5.4.7 A Desk Based Assessment (DBA) and a geophysical survey have been undertaken for the application site. Three main areas of archaeological potential were identified. These areas have been investigated further through archaeological evaluation. These works largely encountered features relating to agricultural land use. Ditches and gullies, interpreted as field boundaries, were the most common feature type. Some of these were in the location of field boundaries depicted on historic mapping that had been removed in the latter part of the 20th century. Others likely date to earlier agricultural activity, possibly contemporaneous with the square enclosure excavated

In Development Area 1 which produced Roman pottery.

- 5.4.8 The most significant discovery was that of a Bronze Age cremation, found in Development Area 1, but no further cremations were found.

5.5 HYDROLOGY, FLOOD CONSEQUENCES AND DRAINAGE

- 5.5.1 The site is not at risk of flooding from a major source (e.g. fluvial and/or tidal). The majority of the site is located within Zone A with very small proportion of the site, to the west and east which is located within Zone B. However, it has been concluded that the site has not historically flooded.
- 5.5.2 The Flood Map for Planning (FMfP) shows that the site is located within Flood Zone 1 for rivers and sea flooding. The majority of the site is located within Flood Zone 1 for surface water and/or small watercourses however, a small proportion of the site is located within Flood Zone 3 with more than a 1 in 100 (1%) chance of flooding from surface water and/or small watercourses in a given year, including the effects of climate change. This is associated with small watercourses and it should be noted that the proposed built development will be located within Flood Zone 1. The floodwater is shown to be retained within the channel of the watercourses.
- 5.5.3 The proposed development is classified as 'less vulnerable', 'less vulnerable' uses are appropriate within Development Advice Maps (DAM) Zones A and B. There are no constraints relating to flooding from rivers or the sea, other than to avoid increasing risk elsewhere. The justification test is not applicable.
- 5.5.4 There will be no net loss in flood storage capacity or impact on movement of floodwater across the site. The overall direction of the movement of water will be maintained within the developed site and surrounding area. The conveyance routes (flow paths) will not be blocked or obstructed.
- 5.5.5 In conclusion, the flood risk to the site can be considered to be limited; the site is situated in DAM Zones A and B with a very low annual probability of flooding and from all sources.
- 5.5.6 There should be no perceivable changes to the upstream or downstream hydrology and to flood risk as a result of the proposals. In terms of surface water runoff, the proposals will not increase the impermeable area on the site, as the size of the inverter house and PV modules are considered to be negligible in the context of the site areas.
- 5.5.7 Research into the impact of solar farm panels on runoff rates and volumes indicates that solar panels do not have a significant impact on runoff volumes, peak rates or time to peak rates when the ground below the panels is vegetated. Therefore, with well-maintained grass underneath the panels, the solar panels themselves will not have a significant impact on the runoff volumes, peaks or time to peak.

5.6 ECOLOGY AND NATURE CONSERVATION

- 5.6.1 The study area or Zone of Influence (ZoI) includes a 10km search for European designated sites, a 2km search for nationally designated sites and a 2km search for non-statutory designated sites and legally protected and notable species.
- 5.6.2 There are no statutory or non-statutory designated sites for wildlife on the site.
- 5.6.3 There are six statutory designated sites for wildlife within 2km of the site, the nearest being Nant Whitton Woodlands Site of Special Scientific Interest (SSSI) which is considered to be of national importance. The SSSI comprises 22.2 hectares of a narrow strip of sloped woodland primarily comprising Ash and Oak trees. Works are not anticipated to affect this woodland either directly or indirectly and the magnitude of effect is therefore not applicable.
- 5.6.4 There are twenty-six non-statutory designated sites, the nearest located 20m south

west of the site. This is referred to as 'land along Nant Llancarfan Site of Importance for Nature Conservation (SINC)'. Whilst there are SINC sites located immediately adjacent to the site boundary of the scheme they are all designated for the presence of woodland and semi-improved grassland habitats which will not be affected by the installation of the solar panels either directly or indirectly. The magnitude of effect on these non-statutory designated sites is therefore not applicable.

- 5.6.5 The following surveys have been carried out:
- Phase 1 Habitat Survey and further botanical surveys;
 - Badger Survey;
 - Bat Surveys;
 - Great Crested Newt Surveys;
 - Breeding Bird Surveys; and
 - Wintering Bird Surveys.
- 5.6.6 The field surveys confirmed the following information for protected and notable species.
- 5.6.7 Whilst no dormice were recorded on site their presence is considered highly likely given the extent of suitable and connected dormice habitat present.
- 5.6.8 No evidence of badger was detected during surveys. There are numerous mature trees across the site with low to high bat potential, with lines of trees, hedgerows and woodlands present. A stone building offered potential for bats to roost and this is to be retained. These are all to be retained and so no further assessment is deemed necessary.
- 5.6.9 9 protected species under Schedule 1 of the WCA were returned following consultation with SEWBRC within 2 km of the survey area. Of these species only one was recorded on the site during bird scoping surveys, red kite, with all records being flyovers. The species is known to breed locally in plantation and native woodland.
- 5.6.10 The site supports high suitability breeding and foraging habitat for birds including woodland, standalone trees, hedgerows, scrub, semi-improved meadows, waterbodies and structures including a ruined building and pylons. Overall, the intensively managed improved grassland fields at the site are of low suitability to breeding birds. 55 species were recorded across the bird scoping surveys of which 26 were amber or red listed species. Skylark were the only notable breeding species recorded in the proposed works areas.
- 5.6.11 The closest Great Crested Newt (GCN) record to the site in the last 10 years is 980m. The habitats in the site are considered sub-optimal for GCN.
- 5.6.12 Three records of grass snake were returned within 2km of the site. There is potential for foraging habitat during the active season for reptiles within the semi-improved grassland fields prior to cuts and within peripheral habitats on the edges of the fields, particularly where fenced. The habitat on site is sub-optimal for supporting a large and significant reptile population, however it is likely to support small localised populations.
- 5.6.13 The River Waycock lies adjacent to the southern boundary and the Nant Llancarfan is 31m west of the site. They are highly likely to support otter. Streams adjacent to the site and connecting watercourses to the east are also likely to form part of an otter territory. Otter are therefore presumed to be present on site.
- 5.6.14 Due to the size of the site, the habitats across it vary. There are large arable fields sown with a perennial ryegrass silage crop, improved grassland, semi-improved grassland, poor semi-improved neutral grassland, rush dominated marshy grassland, broadleaved woodland and wooded watercourse corridors including ash and oak. 27no. hedgerows run across the site, 18no. of which are considered to be of high value.

There is a centrally located fenced patch of bramble, elder and hawthorn scrub located within a damp sump, and other patches along tree lines on site. There are 6no. ponds on site and 2no, wooded streams.

- 5.6.15 All existing trees and hedges are to be retained.
- 5.6.16 Within the site, the following enhancement measures are recommended by the ecologists in the area referred to as Development Area 3 (Oaklands):
- The panel areas of the three most western fields which support the current higher levels of botanical interest will be placed into a conservation grazing regime, with low stock density utilising conservation sheep species such as Herdwicks.
 - Low interest panel fields will be grazed in rotation normally to form a tussocky grassland sward.
 - The buffer zones of the higher interest fields will be placed into a meadow management style regime, with two cuts annually, one in early April and the other in late August to preserve the existing botanical interest.
 - The remaining buffer areas of all fields will be sown with locally sourced native wildflower meadow seed mix or green hay in autumn and then be managed with a meadow cut regime.
 - A mix of 10 suitable bat and bird boxes should be placed on boundary trees to provide roosting and nesting opportunities for these species.
- 5.6.17 Within the site, the following enhancement measures are recommended by the ecologists in the area referred to as Development Area 1 (Pancross Farm):
- Areas with panels will be grazed normally with sheep, which will improve the diversity of the existing *Lolium* monoculture sward.
 - The external buffer zones between deer fencing and site boundary features will be cut and collected 5 times in the first year of creation and then be sown with locally sourced native wildflower meadow seed mix or green hay in autumn and then be managed with a meadow cut regime twice annually, once in early April and again in late August.
 - A total of 7 new native hedgerows with trees will be planted within the western half of the scheme to create new hedgerow habitat and provide additional connectivity with existing hedgerows and woodland along the site boundaries.
 - A mix of 25 suitable bat and bird boxes should be placed on boundary trees to provide roosting and nesting opportunities for these species.
- 5.6.18 Within the site, the following enhancement measures are recommended by the ecologists in the area referred to as Development Area 2 (Redlands Farm):
- Areas with panels will be grazed normally with sheep, which will improve the diversity of the existing *Lolium* monoculture sward.
 - New native hedgerow planting to achieve “gapping up” will be implemented on all existing hedgerows.
 - New native hedgerow and tree planting will be included to create hedgerows along existing lines of trees along the northwest boundary. This will create 2 new hedgerows providing additional habitat and connecting existing woodland and hedgerows.
 - Buffer zones around the site periphery will be enhanced through native scrub planting and higher diversity grassland creation. Native scrub species will be planted adjacent to boundary woodland and scrub and grassland will be sown with locally sourced native wildflower meadow seed mix or green hay in autumn and then be managed with a meadow cut regime twice annually, once in early April and again in late August. These areas will be fenced off from livestock.

- A mix of 25 suitable bat and bird boxes should be placed on boundary trees to provide roosting and nesting opportunities for these species.

5.7 TRAFFIC AND TRANSPORT

- 5.7.1 Construction is expected to last around 6 months, and this is expected to be the time when the highest level of trip generation will occur at the site. Following construction, it is expected that the only vehicle movements will be concerned with operational maintenance of the site.
- 5.7.2 Initial movements in months 1 and 2 would result from deliveries of plant and equipment and materials required to secure the site and to form the construction compounds and set down areas. There would also be deliveries of items such as panels, battery units, transformers, control room and the solar panel support frame in months 1 to 4 as well as cabling, equipment/infrastructure in months 2 and 3.
- 5.7.3 Approximately 280 deliveries (560 movements) to the site would be required to deliver the panels and 90 deliveries (180 movements) of the frames and associated infrastructure will be needed. Additional HGV movements will also be generated through the import of fencing, cabling, crushed stone for access tracks, plant, transformers and control cabins.
- 5.7.4 It is anticipated that the construction phase will generate approximately 740 deliveries to site, or 1,480 individual movements (in and out). The first month will see the highest deliveries to site at 225.
- 5.7.5 It is acknowledged that this development would rely upon HGV's during its construction and subsequent decommissioning periods. Both these periods will be relatively short, but it could potentially be perceived that the traffic arising as a result of the development could impact upon the adjacent highway network and surrounding areas and as such it is considered necessary to identify sensitive receptors along the access routes to the development site.
- 5.7.6 From the IEMA Guidelines several classes of receptor could be affected by the development traffic including pedestrians, cyclists and people at home. However, when viewing the predicted development traffic, which will be at its peak during the construction period against background levels, it is clear that the level of traffic associated with the development site at its peak activity during the construction and decommissioning periods is modest when compared to the existing traffic flows on the adjacent network. Therefore, any impact would be minor.
- 5.7.7 During the development site's operational period, traffic levels will be negligible as much of the maintenance and control of the solar equipment is to be undertaken remotely and as such the effect of that traffic upon the adjacent highway network and surrounding areas would be negligible.
- 5.7.8 A detailed Highway Safety Signage Strategy will be provided as part of a future detailed CTMS. This will include a Temporary Signage Strategy which will be implemented along the routes to the Development Areas, warning other road users of the presence of construction vehicles. This will be agreed in consultation with the Local Planning and Highway Authority.

5.8 CLIMATE CHANGE

- 5.8.1 In the UK, we expect to see warmer and wetter winters, hotter and drier summers and more frequent and intense weather extremes. Climate change will make these conditions more likely. More rainfall is expected to happen in winter storms. While the temperatures may be milder, winters will tend to be wetter, with more potential for flooding. If temperatures do increase as predicted, then this may impact on habitat which may affect the behaviour of animals such as birds. It could also affect the growth

rates and composition of plant communities, invertebrates and habitats.

- 5.8.2 From a climate change perspective, the development has embedded mitigation measures which will result in it being resilient to changes in temperature, extreme weather events (including flooding), changes in wind and shifting habitats.
- 5.8.3 Overall, a significantly positive impact is identified through the generation of renewable energy.
- 5.8.4 Fossil fuels emit high levels of greenhouse gas and carbon dioxide, contributing to global warming, climate change and degradation of air quality.
- 5.8.5 Solar proposals such as this, reduce our reliance on fossil fuels and help improve air quality. Solar is a clean sustainable source of energy.
- 5.8.6 The proposed development will contribute to achieving the UK Government's Net Zero agenda.
- 5.8.7 No additional mitigation measures are proposed with respect to climate resilience.

5.9 AIR QUALITY

- 5.9.1 Solar developments have no direct source of emissions to atmosphere during the operational phase. Possible impacts to local air quality only have the potential to occur during the short period of the construction phase through vehicular and plant emissions and through the creation of dust.
- 5.9.2 Without mitigation, there is a risk that the construction phase of the development will lead to dust soiling and elevated concentrations of PM10. These impacts may occur during demolition, earthworks and construction, as well as from track-out of dust onto the public highway, as vehicles leave the construction site.
- 5.9.3 The mitigation measures outlined below are proposed to ensure that adequate mitigation procedures are in place for dust mitigation during the construction phase:
 - Wheel washing equipment will be available and used on-site, as required, to prevent the transfer of dirt and debris onto the public highway;
 - Dust generating activities will be minimised during dry, windy conditions where possible;
 - Where required, loads into and out of the site will be sheeted;
 - Soil stockpiles will be covered when left for extended periods;
 - Where necessary a dust suppression / water spray system will be available; and
 - Implementation a dust monitoring scheme as required.
- 5.9.4 An outline Construction Environmental Management Plan (CEMP) is presented at **Appendix 6.3**. A detailed CEMP can be conditioned as part of the granting of planning consent to ensure these impacts are addressed.
- 5.9.5 It is considered that potential effects on air quality will not be significant.

5.10 MAJOR ACCIDENTS AND/OR DISASTERS

- 5.10.1 The solar panels will generate enough electricity to power over 20,400 homes per year and offset approximately 20,200 tonnes of CO₂ every year, the equivalent of taking over 5,000 cars off the road⁸.
- 5.10.2 The BESS will deliver significant environmental benefits, enabling technology for renewable generation, replacing the required for gas fired power generation and

⁸ Internal calculations using OFGEM Typical Domestic Consumption Values and BEIS Carbon Conversion Factors

providing rapid response power to satisfy peak demand. In performing these roles, the development has the ability to reduce carbon dioxide emissions by over 20,600 metric tonnes annually whilst also providing electricity storage equivalent to supplying over 20,800 homes⁹.

- 5.10.3 Due to the nature of the proposed development, it is unlikely to release pollutants or any hazardous, toxic or noxious substances to air or land and are unlikely to have a significant effect in terms of pollution and nuisance.
- 5.10.4 A detailed Construction Management Plan will be prepared and implemented by the appointed contractor during the construction period and will include the requirement for all construction activities to be undertaken in accordance with statutory requirements and best practice methods.
- 5.10.5 When operational, a concentration of electrical infrastructure will be located within the site in the form of inverters, transformers, substations and cabling all of which will be subject to routine maintenance such that it is not considered to pose a significant risk of creating an accident or disaster. Risks associated with fire are also considered low as electrical systems have cooling mechanisms and automatically shut down should any overheating occur.

5.11 HUMAN HEALTH

- 5.11.1 The proposed development is unlikely to release pollutants or any hazardous, toxic or noxious substances to air or land. Potential health impacts are therefore related primarily to construction and operational related impacts.
- 5.11.2 A detailed Construction Management Plan will be prepared and implemented by the appointed contractor during the construction period and will include the requirement for all construction activities to be undertaken in accordance with statutory requirements and best practice methods.
- 5.11.3 Once operational, the generation and transmission of electricity produced by the development can be safely managed. The panels themselves are inert, tracking structures with there being no issues relating to the release of light, heat energy or electromagnetic radiation likely. The power generated by each array would be transmitted through insulated cables buried below the ground. The associated electrical equipment would be housed in sealed containers mounted above the ground. In addition, the scheme can be controlled remotely so that the transmission of electricity could be quickly disabled if any immediate health and safety concerns should arise.

5.12 CUMULATIVE IMPACTS

- 5.12.1 Of the environmental topic areas considered as part of the EIA, the significance of impacts from the proposed operations considered to be greater than negligible are limited to:
 - Landscape and Visual;
 - Noise and Vibration;
 - Historic Environment;
 - Ecology; and
 - Climate Change.
- 5.12.2 In terms of assessing the interactive impacts from the proposed development in isolation, it is considered that the following topics will have an adverse effect:

⁹ Internal calculations using OFGEM Typical Domestic Consumption Values and BEIS Carbon Conversion Factors

- Moderate impact to landscape character and up to major impacts for some nearby visual receptors during the operational phase;
- Minor impacts to nearby receptors on noise and vibration levels during the temporary 6-months construction period;
- Moderate impacts on the Registered Historic Landscape of Llancarfan during both the construction and operational phase and minor impacts on several Scheduled Monuments during the operational period; and
- Minor impacts to certain habitats and species during the 6-months construction / decommissioning phase.

5.12.3 It is considered there is no synergistic characteristics between temporary impacts to certain site-based habitats and species, landscape character/visual amenity, heritage assets and known archaeology during the construction and decommissioning phases.

5.12.4 During the operational phase potential impacts to nearby visual receptors and landscape character were assessed, as were potential impacts to historic landscape areas and heritage assets. It is considered that opportunities for synergistic effects to increase the impacts on identified receptors beyond that assessed individually are negligible given the different sensitivities of the identified receptors.

5.12.5 In terms of cumulative impacts with development from beyond the application site boundary, no potentially significant effects were identified.

5.13 ENVIRONMENTAL CONSIDERATIONS NOT SIGNIFICANTLY AFFECTED BY THE PROPOSALS

5.13.1 The following environmental considerations are unlikely to be materially affected or give rise to significant environmental effects as a consequence of the proposed development. Following the headings, a justification is provided as to why these assessments have been scoped out of the EIA.

Soils, Geology and Agricultural Land

5.13.2 The site is noted as comprising a mixture of shallow and deeper fine loamy soils and fine loams over clays. Land quality is a mixture of subgrade 3b and grade 4 agricultural quality due to wetness constraints. The surveyed area forms part of a wider (127ha) site proposed for a solar installation. The remainder of the land was subject to a Welsh Government survey in 1990 and was also found to be a mixture of subgrade 3b and grade 4 quality.

5.13.3 The land is therefore not considered to be Best and Most Versatile (BMV) land.

Glint and Glare

5.13.4 Analysis of the site has revealed that for the most part reflected light is of low intensity and scattered and is generally reflected upwards away from roads and residential properties. There exist conditions however when reflected sun rays can travel in a direction parallel to the ground. These conditions exist in early and late summer when the sun is low in the sky and when air mass index is high (reducing intensity) and when the sky in this region is clear. Under these specific conditions rays, which are scattered at the surface of the module, will, for drivers, be caught by hedgerow. Drivers proceeding North on the A4226 are likely to be aware of minor reflections to the West but the sun itself will be by far the brightest object. There exists a hedgerow which acts both as screening and as a barrier to any glint or glare. It is the opinion of the author that, even without this hedgerow, the development will not give rise to any additional hazardous or troublesome reflections beyond those that exist in the natural environment such as from house windows or greenhouses. It is documented that solar panels produce glare no brighter than standing water.

5.13.5 In terms of Cardiff and Bro Tathan (St. Athan) airports, the report concludes that there

are at least 8 closer pre-existing solar farms to the airport and that there are no conditions where the proposed solar farm would pose a hazard to aircraft.

Socio Economic

- 5.13.6 The Proposed Development could potentially generate numerous socio-economic and economic benefits throughout the 40-year lifespan.
- 5.13.7 The Proposed Development will deliver multiplier economic and socio-economic benefits throughout its lifecycle. The solar farm will generate enough electricity to power over 20,400 homes per year and offset approximately 20,200 tonnes of CO₂ every year, the equivalent of taking over 5,000 cars off the road¹⁰.
- 5.13.8 The BESS will deliver significant environmental benefits, enabling technology for renewable generation, replacing the required for gas fired power generation and providing rapid response power to satisfy peak demand. In performing these roles, the development has the ability to reduce carbon dioxide emissions by over 20,600 metric tonnes annually whilst also providing electricity storage equivalent to supplying over 20,800 homes¹¹.
- 5.13.9 The Development could employ 80 people in the initial 6-month construction phase, followed by approximately two maintenance staff over the 40 year lifespan.
- 5.13.10 Employment onsite would support local business through daily expenditure and also any accommodation required for the construction period. The Proposed Development could also allow local business to operate on clean energy. Allowing them to market themselves as low carbon businesses. It could be particularly attractive to investors, clients and the tourism market.
- 5.13.11 The Proposed Development offers the opportunity to build awareness of the energy sector and expand the knowledge network through potential collaboration with local schools. In addition to this the Applicant actively works with university research programs.

5.14 SUMMARY AND CONCLUSION

- 5.14.1 This Non-Technical Summary has outlined the findings of an Environmental Impact Assessment of the proposed solar farm, which are contained within the Environmental Statement that accompanies the planning application.
- 5.14.2 Overall, potential effects to a single visual receptor was assessed as being significant. However, it is considered that the benefits the scheme realises through the reduction in carbon emissions, the enhancements to local biodiversity and the positive effects to the local economy far outweigh the limited effects to visual amenity.
- 5.14.3 The potential effects have been fully assessed and where appropriate mitigated as a result of an iterative design process for the development, and through careful consideration of environmental control, abatement techniques, and high-quality process and landscape design.

¹⁰ Internal calculations using OFGEM Typical Domestic Consumption Values and BEIS Carbon Conversion Factors

¹¹ Internal calculations using OFGEM Typical Domestic Consumption Values and BEIS Carbon Conversion Factors



6. WHAT HAPPENS NEXT?

6.1 NEXT STEPS

- 6.1.1 Electronic copies of all documents submitted to PEDW in respect of the planning application are available at the following website:

<https://www.oaklands-solar.co.uk/>

- 6.1.2 Additional copies of the Non-Technical Summary can be obtained upon written request from the following address:

Sirius Planning
4245 Park Approach
Thorpe Park
Leeds
LS15 8GB

