One Earth Solar Farm

Preliminary Environmental Information Report [EN010159]

Volume 3 - Non-Technical Summary

May 2024

One Earth Solar Farm Ltd

The PEIR

The One Earth Solar Farm Project ('our Project') is a proposed solar farm with associated battery energy storage system (BESS) and infrastructure located at the border of Nottinghamshire and Lincolnshire, which will connect into the National Grid substation located at High Marnham, also in Nottinghamshire. We have secured an agreement to supply up to 740MW to the National Grid – enough clean, renewable electricity to meet the needs of more than 200,000 homes.

A National Significant Infrastructure Project, our Project is an 'EIA (Environmental Impact Assessment) development' for the purposes of the EIA Regulations. The Applicant has therefore produced a Preliminary Environmental Information Report ('PEIR') which contains preliminary information about the likely significant environmental effects of the Project, together with a non-technical summary of this information (this document).

This Non-Technical Summary has been prepared to enable consultees (both specialist and non-specialist, including the local communities) to gain an understanding of the likely significant environmental effects that may arise as a result of our Project, based upon preliminary work undertaken to date.

It should be noted that the design of our Project is currently being developed and will be informed by the ongoing process of gathering information and identifying how the environment might be affected by our Project. The design of the our Project presented in the PEIR does not represent the final design, but it is sufficiently defined to identify the likely significant environmental effects for the purposes of the PEIR. The information contained within this document will therefore continue to evolve and will be reported in our final environmental report, known as the Environmental Statement (ES), that will be submitted with the forthcoming Development Consent Order (DCO) Application.

The PEIR comprises the following volumes:

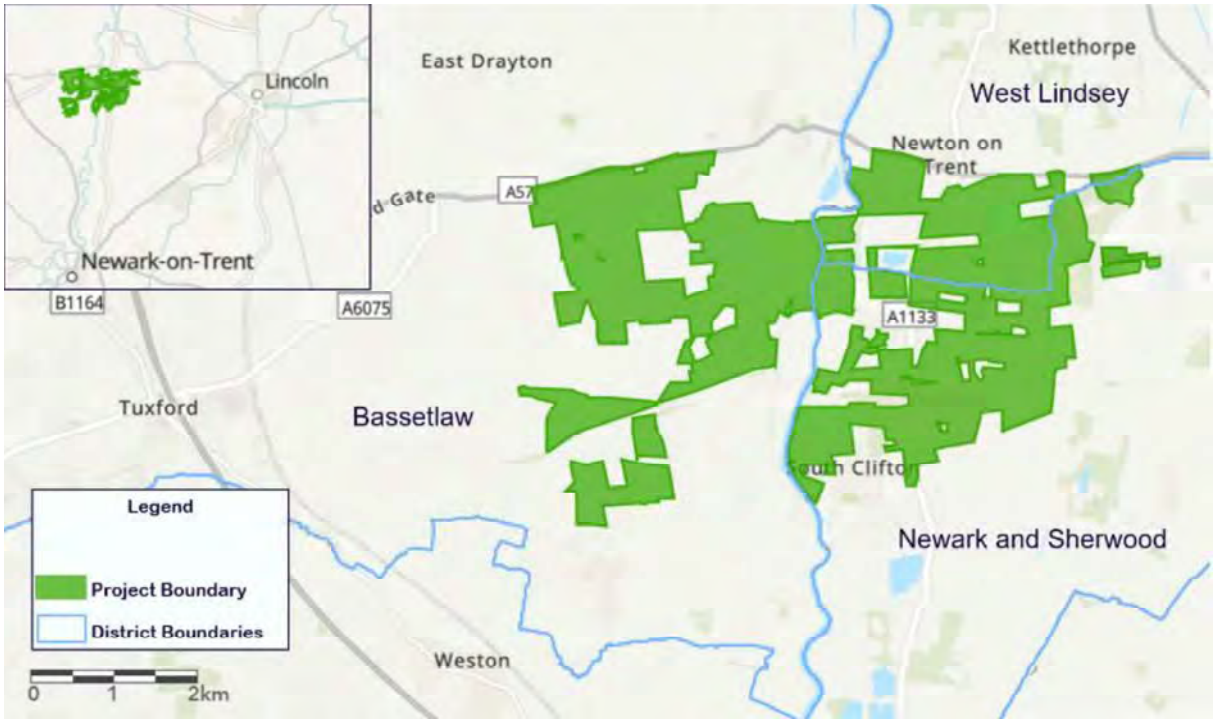
- Volume 1: Main Report
- Volume 2: Scoping Consultation
- Volume 3: Non-Technical Summary (this document).

This document provides a non-technical overview of our Project as well as presenting the preliminary likely significant effects from the construction, decommissioning and operational phases. As above, further information on each of the technical assessments can be found within **Volume 1** of the PEIR.

The Site

The Site will be located primarily in Nottinghamshire and within the border of Lincolnshire. The Site also extends across three district boundaries within the County areas, these being Newark and Sherwood District Council, West Lindsey District Council and Bassetlaw District Council. **Figure 1** shows the location of our Site.

Figure 1: Location of the Site



The Need

The UK has committed to reducing carbon emissions to net-zero by 2050, and fully decarbonising the power sector by 2035. This means that as we phase out older forms of power generation, such as the former coal-fired power station at High Marnham, new renewable energy sources must be developed to replace them. At the same time, we are relying more and more on electricity in our daily lives, as petrol cars and gas boilers are phased out, increasing demand for electricity. To meet this growing demand for renewable energy, we need to develop a mix of renewable energy sources. Large-scale solar projects are now considered 'critical national priorities', as part of the goal to increase solar development by five-fold by 2035.

As above, our Project could make a significant contribution to meeting this need. We have an agreement to supply 740MW to the National Grid, which is enough to power more than 200,000 UK homes each year.

Alternatives

Alternative Locations

The primary driver for the location of our Project has been the availability of significant capacity at the National Grid High Marnham Substation. Our Project will be able to connect to the High Marnham National Grid Substation without the need for additional capacity improvements, therefore making efficient use of existing infrastructure. In addition, there is no need for a long connection cable to connect our Project to the National Grid. Any alternative site would unnecessarily increase the length of the grid connection cable which would likely result in greater associated environmental impacts from constructing the cable corridor.

A search of potential locations for our Project was undertaken within 10km (our Study Area) from the centre of the National Grid High Marnham Substation. This has identified our Site as being suitable for solar; some of these reasons include:

- The land is not constrained by environmental designations which typically seek to protect often unique or sensitive environmental features, for example the nearest Special Areas of Conservation (SAC) is the Birklands and Bilhaugh SAC located beyond the 10km Study Area (approximately 16km to the west of our Site);
- The 10km Study Area is located in the Trent and Belvoir Values National Character Area (NCA). However, our Site is already characterised by energy infrastructure, this includes the now decommissioned Marnham Power Station, which still includes remains of its industrial past within the local landscape such as metalled roadways and the former pump house. In addition, there are numerous pylons and high voltage overhead power lines within the localised landscape. The use of solar for energy generation is consistent with the historic energy uses in the local area;
- The land is relatively close to part of the Strategic Road Network (SRN) by virtue of the A57 and A1. As a consequence, the land has good accessibility via the road network for construction; operational maintenances; and decommissioning. It avoids construction traffic going through settlements further distanced from the SRN;
- Compared to other locations, the land of our Site has the potential to locate a large-scale solar development, due to the existence of large open areas of undeveloped land, which is made of relatively flat topography and generally sparse settlement patterns;
- Based on mapping from Natural England, our Site includes Best Most Versatile (BMV) land suitable for agricultural purposes, however this is common and consistent with the wider area which either has the same, or higher mapped BMV land grading; and
- Within the 10km Study Area flood risk is high across the middle portion, in a north to south direction. This is a result of the tidal nature of the River Trent, and its four main tributaries which feature in this middle portion of the Study Area. Furthermore it has been possible for the design of our Project to respond to flood risk with the inclusion of appropriate measures (in terms of the height of the bottom of the panels that will be installed) have been included within the design, as agreed with the Environment Agency.

Alternative Renewable Technologies

As above, the primary driver for the location of our Project has been the availability of significant capacity at the National Grid High Marnham Substation. Tidal power, offshore wind, and hydroelectric storage were not considered possible due to the location of the High Marnham Substation approximately 70km from the coast, and within an area of low, flat topography.

The Site is not considered suitable for onshore wind due to the low wind yield relative to other parts of the UK, coupled with the proximity to residential dwellings which will be subject to risks associated with shadow flicker and wind turbine noise. It is considered that solar is the most suitable form of renewable technology for our Site.

Alternative Designs and Design Evolution

We conducted a period of 'early engagement' between 29th June and 20th September 2023. This included meeting with the host authorities, statutory consultees and members of the community, to introduce the emerging scheme, seek early feedback, and develop the scope and methodology for the non-statutory consultation. The design and extent of our Project has changed since our last consultation in response to feedback received, environmental surveys and ongoing design considerations. The changes are summarised as follows:

- All solar panels and associated infrastructure have been removed from land located between North Clifton and South Clifton to protect the setting of the villages and the visual amenity experienced by residents at home or approaching the villages;
- Further offsets from our Project are included from Hollow Gate Lane, extending beyond 150m in some locations, to protect the setting of Fledborough and resident's visual amenity;
- Additional offsets from our Project and new planting have been incorporated at the southern entrance to Ragnall to protect the sense of arrival into the village along Main Street;
- The field closest to Thorney has been removed from our Project to protect the setting of the village;
- Bespoke offsets from our Project, in some cases measuring over 400m, have been incorporated from individual residential properties located within, or close to, the site;
- Land found to be of the highest agricultural value has been removed from our Project wherever practical;
- New ecological and recreational enhancements have been added across our Project, including the creation of new habitats such as beetle banks and reptile refuge, an enhanced green infrastructure network through the planting of new hedgerows and trees, and a new network of permissive paths for public access; and

- The height of the proposed solar PV panels has been staggered across our Site, limiting their height wherever possible to reduce visual impact whilst responding to the potential level of flood water (now, and as a potential impact of climate change). Additional fields have now been incorporated in several places to allow us to remove fields in close proximity to villages and homes.

Further survey, assessment and design work will be undertaken which may influence the design of our Project. The final design of our Project will be reported within the ES submitted as part of our DCO Application.

Our Project

Operational Phase

Once built, our Project will include the following components as shown by **Figure 2**:

1. Solar photovoltaic (PV) panels **–** Ground-mounted solar panels will collect energy from sunlight and turn it into electricity in the form of low voltage, direct current (DC).

2. On-site cabling – Underground cables will connect the solar PV panels to other parts of the solar farm.

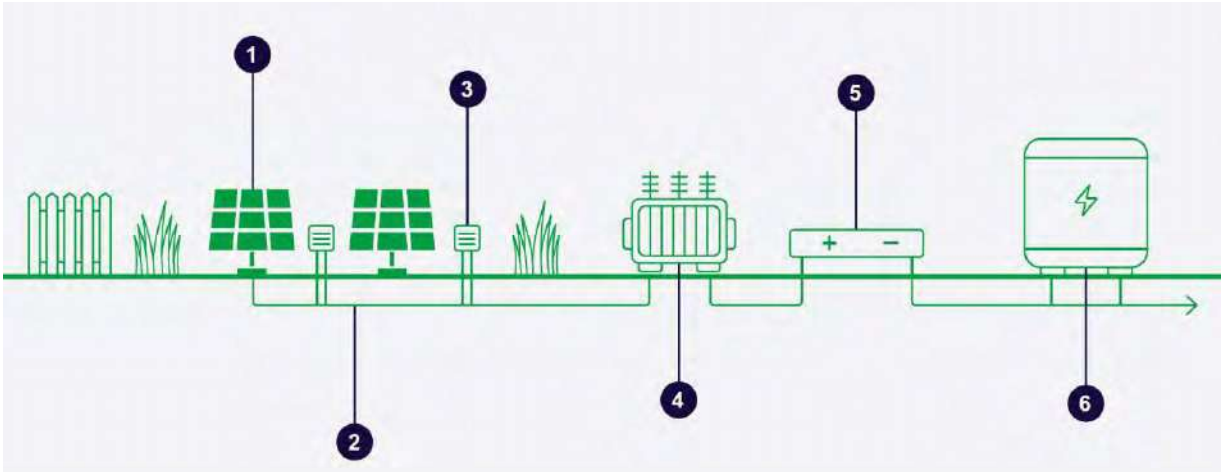
3. Power Conversion Stations – These stations will prepare the electricity to connect to the grid. They will include an inverter to convert the electricity from direct current (DC) to alternating current (AC), and a transformer to 'step up' the voltage.

4. On-site substations – Cables will bring electricity from across the solar farm together at substations, which will combine the power sources together and 'step up' the voltage again, so that the energy is ready to enter the National Grid.

5. Battery Energy Storage System (BESS) **–** The primary purpose of the BESS will be to store the energy generated by the PV panels at times when it is not needed by the National Grid and then release it to the grid when it is needed most. Additionally, the BESS will also provide vital grid services by taking energy from the National Grid, storing it during periods of low demand (when it could otherwise be wasted) and releasing it to the National Grid when homes and businesses most need it.

6. Grid connection – The electricity will enter the National Grid at the High Marnham substation, and then go on to power homes and businesses locally and nationwide.

Figure 2: Schematic of Our Project Components



Other associated infrastructure includes, fencing, security and ancillary infrastructure; internal access tracks; and landscape planting.

Project Parameters

As with other projects of this type, the exact design details of our Project cannot be confirmed at the point a DCO application is made. This is to allow for flexibility to take advantage of technological advancements. For example, the exact enclosure design may vary depending on the contractor selected and their specific configuration and selection of the technology.

To ensure a robust environmental assessment is made, the environmental assessments (set out in the PEIR and ES) are based on the principles of the 'Rochdale Envelope' in accordance with Planning Inspectorate (PINS) Advice Note 9: Rochdale Envelope.

The Rochdale Envelope involves specifying parameter ranges, including details of the maximum, and where relevant the minimum, size (footprint, width, and height above ground level), technology, and locations of the different elements of our Project, where flexibility needs to be retained. These parameters are listed in **Table 1** below.

Table 1: Key Parameters of our Proposed Solar Infrastructure

Solar Infrastructure	Parameters
Solar PV modules	Minimum height of the lowest point of panel as 0.7m above ground level. Maximum height of the lowest point of panel as 1.8m above ground level.
Solar PV modules	Minimum height of the highest point of panel as 3.5m above ground level. Maximum height of the highest point of panel up to 3.8m above ground level.

Solar PV modules	The solar modules will face south at 10 - 25 degree pitch.
Mounting Structure	Minimum pile depth as 1.5m deep. Maximum pile depth as 3m.
Cabling	Cables within the solar arrays will be secured to the PV mounting structure or buried underground up to 1m deep. Medium Voltage distribution cables to be buried in trenches alongside access tracks or between arrays up to 1.2m deep.
Power Conversion Station (PCS)	Maximum dimensions as 13m x 3m (length x width). Maximum height as 6m above ground level.
Substation	Substation located on the west of the River Trent - dimensions as 250m x 190m (area as 47,500m^2) x height of 13.5m. Lightning rods up to 25m in height may be required. This will be located adjacent or near to the west BESS compound. Substation located on the east of the River Trent - dimensions as 170m x 140m (area as 23,800m^2) x height of 13.5m. Lightning rods up to 25m in height may be required. This will be located adjacent or near to the east BESS compound.
BESS Compounds	BESS compound located on the west of the River Trent - 11.2 hectares and maximum height of 3.5m height. This will be located adjacent or near to the west substation compound. BESS compound located on the east of the River Trent - 8.5 hectares and maximum height of 3.5m. This will be located adjacent or near to the east substation compound. Buildings within each BESS compound will be up to 8m

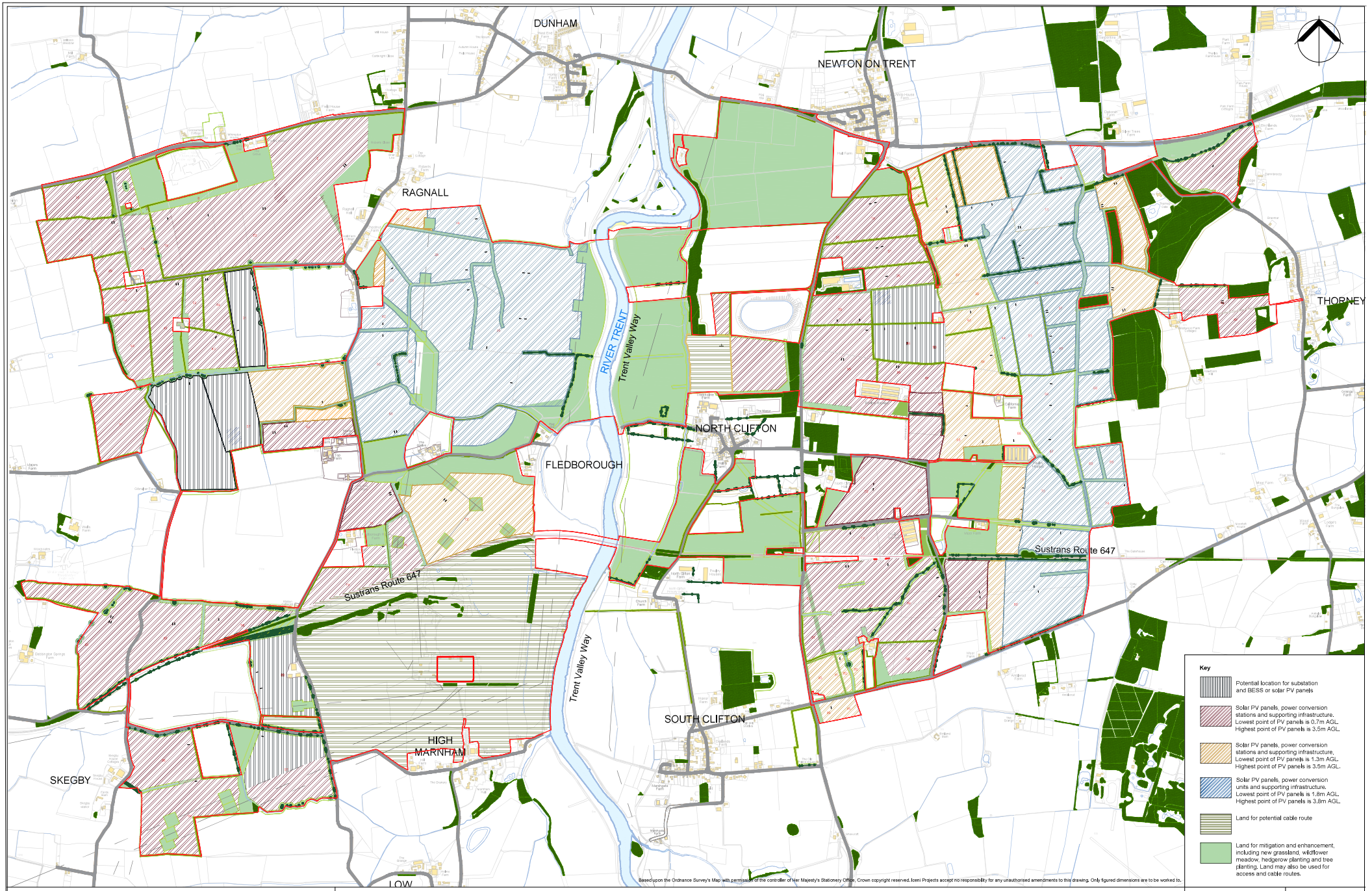
Fencing	The fence around the solar PV area will comprise a deer fence (wooden posts and metal wire mesh) and the mesh will be up to 2m in height. The fence posts will measure up to 2.2m above ground level. The fence around the substations, BESS and PCS will be palisade fencing, up to 3m in height.
CCTV	The camera height will be up to 4m tall.
Permissive Paths	A permissive path network is proposed, connecting to existing Public Rights of Way.
Landscape Planting	To include grassland, wildflower meadows, hedgerow planting and tree planting. The broad aim will be to improve connectivity, both within the Site and the wider landscape, to create a mosaic of a range of habitat types, benefitting a diverse variety of fauna as a result, and to create landscape planting to help screen the visual impact of our Project.

In addition to **Table 1,** a set of Design Principles have been established and will be used in the design evolution of our Project. These design measures have been set to ensure likely significant effects are avoided and to improve the overall design of our Project. The Design Principles include the following offsets:

- Solar infrastructure is set away from the following environmental features, by the following minimum measurements ('offsets'):
  - Trees: 10m
  - Woodlands: 15m
  - Hedgerows: 10m
  - Waterbodies: 10m
  - Drains: 8m
  - Rivers: 16m
  - Public Rights of Way: 15m
  - Badger Sets: 30m
- Project substations and BESS, have been sited at least 300m from residential properties and 100m from Public Right of Ways.

A plan showing the layout of our Project once built is provided in **Figure 3.** This shows the proposed locations of the different elements of our Project, which for some elements include potential alternative locations, for instance for the BESS and substation compound (discussed further below). The landscaping planting is shown in **Figure 3** and indicates land for mitigation and enhancement. It is noted existing habitats (such as hedgerows) will also be enhanced and new habitats created within the land shown as having PV Solar modules.

Figure 3 - Operational Parameter Plan



one earth solar farm

PROJECT	**One Earth Solar Farm**
DRAWING TITLE	**Parameter Plan**
CLIENT	**One Earth Solar Ltd.**

DRAWN BY **JG**	DRAWING NO.
CHECKED BY **SG**	**XX**
DATE **24/04/2024**	REV **0**

During operation, our Project would be maintained and operated in accordance with appropriate management plans. The following preliminary documents setting out the principles of these management plans will be submitted as part of our DCO Application:

- outline Battery Safety Management Plan: this will set out the key fire safety provisions for the BESS proposed to be installed in our Project including measures to reduce fire risk and fire protection measures. The OBSMP will take into account good practices for battery fire detection and prevention, in addition to setting an emergency response plan;
- outline Landscape and Ecology Management Plan: this will set out the short and long-term measures and practices that will be implemented to establish, monitor, and manage landscape and ecology mitigation and enhancement measures embedded in the design;
- outline Operational Phase Environmental Management Plan: this will identify how commitments will be translated into actions and includes a process from implementing the actions through to the allocation of key roles and responsibilities for the appointed contractor(s). It will be designed and operated with the objective of compliance with relevant environmental legislation and mitigation measures.

Our Project will be operational for 60 years and it is assumed that the Solar PV modules will be replaced once during the operational phase.

Optionality

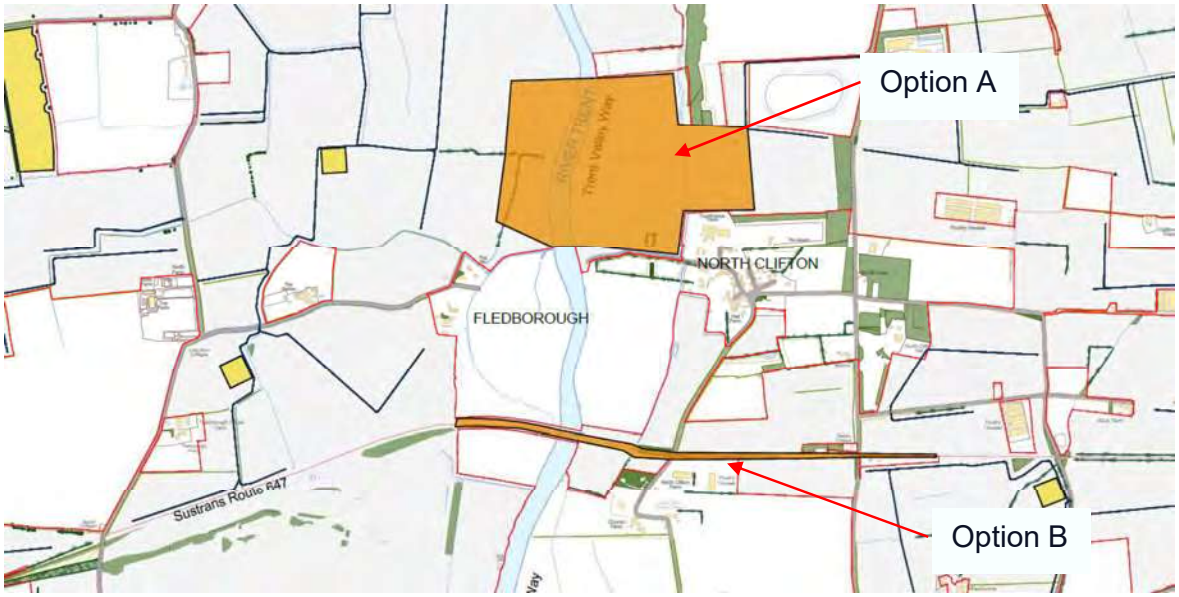
At this stage of our Project, we are still exploring the options for routing our cables to cross the River Trent, linking land to the east of the river with the National Grid High Marnham substation to the west of our Site. In addition, we are still considering the location of our BESS and substation compound to the west of the River Trent. These options are currently not defined as we are still gathering technical, engineering and environmental information. Details of the options are provided in the following subheadings

For the PEIR each of the options for cable crossing and the locations of the BESS and substations have been assessed. The highest level of significance from these options (or part of these options) has then been reported in our technical assessments, and represents the worst case in terms of environmental effects.

River Crossing Options

The location of the two options for how the cables required will cross the River Trent are shown in **Figure 4** and include either drilling underground beneath the River Trent (known as Horizonal Directional Drilling (HDD)) (Option A) or using the existing above ground Fledborough viaduct (Option B).

Figure 4: Options for Cable Crossing



For Option A, cables would be installed beneath the River Trent in this area using HDD and would avoid trenching or disturbance of the watercourse bed and banks. The cables would be buried in trenches on the approach to the river, then pass beneath the riverbed (more than 5m below the bed of the River) via holes. At this stage we do not know where the cables could cross the River Trent and as such **Figure 4** shows a larger area where this linear cable could go.

In terms of Option B, it is assumed the cable(s) would be attached externally to the Fledborough viaduct crossing the River Trent. The cabling would either be installed within the structure of the existing Fledborough Viaduct or on the external support brackets. A structural assessment of the viaduct would be undertaken to determine if this option is possible.

We will only be taking one of the locations forward as part of our DCO Application.

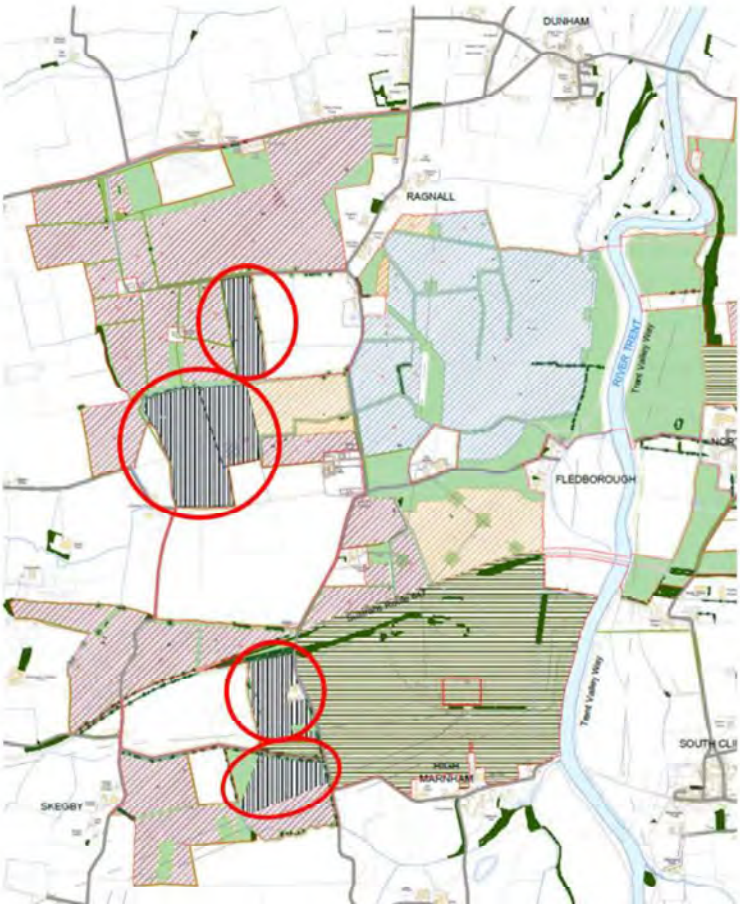
BESS and Substation Locations

There are two locations within our Project where both the BESS and substation could be located, one could be located on the east and one could be located on the west of the River Trent, as indicated by **Figure 5**.

The BESS would allow the storage of energy generated by the solar panels at times of low demand and release to grid at times when demand is high or when solar irradiance is lower (known as load shifting). As a secondary function, the BESS would also have the ability to import power from the grid directly to allow the BESS system to help support the grid through grid balancing mechanisms. The substations would consist of switchgear and transformers and other power quality equipment to transform the electricity generated by the PV Solar Modules into electricity for use within the National Grid.

We are considering the location of our BESS and substation compound on the west of the River Trent. We would only be taking one of the locations within the west of the River Trent forward as part of our DCO Application.

Figure 5: Options for the Location of our Substation and BESS Compound



Construction Phase

At this stage it is anticipated that the construction phase would commence in 2027 and run for two years, finishing in 2029.

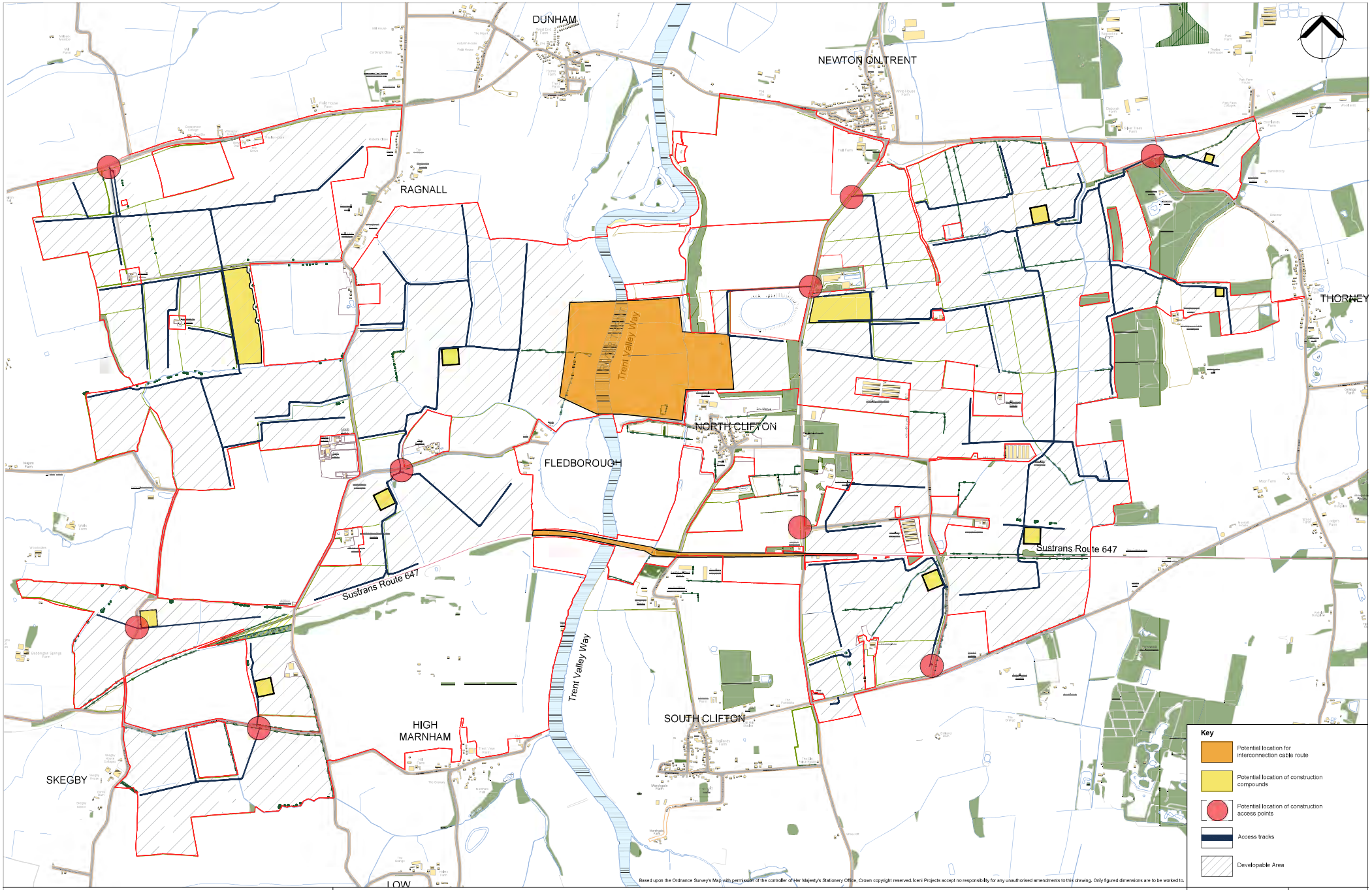
Construction activities would include:

- Site preparation, such as targeted site clearance and creation of access points:
- Transportation of construction materials, plant and equipment;
- Set up of temporary on-site construction compounds and security fencing;
- Construction of cable crossing points over or under the River Trent;
- Upgrading existing tracks and construction of new access roads within our Site;
- Marking the location of infrastructure components; and installation such as:

  - assembling PV module mounting structures and then mounting the PV modules themselves;
  - Installation of electric cabling, substations, inverters, transformer cabins, and battery storage units;
  - Construction of the substation and BESS compounds, Power Conversion Stations and installation of equipment;
- Landscaping and habitat enhancement; and
- Testing and commissioning.

A plan showing the layout of our Project during construction is provided in **Figure 6.** This shows the indicative locations of construction compounds; the preliminary construction routes; and the cabling options across the River Trent. The final locations will be included in our DCO Application and considered within the ES.

Figure 6 - Construction Parameter Plan



PROJECT	**One Earth Solar Farm**	DRAWN BY **JG** CHECKED BY **SG**	DRAWING NO. **XX**
DRAWING TITLE	**Construction Parameter Plan**	DATE **24/04/2024**	REV **0**
CLIENT	**One Earth Solar Ltd.**		

During construction our Project would be maintained and operated in accordance with appropriate management plans. The following preliminary documents setting out the principles of these management plans will be submitted as part of our DCO Application:

- outline Construction Environmental Management Plan (oCEMP): this will set out the effective, site-specific procedures and mitigation measures to monitor and control environmental impacts throughout the construction phase of our Project. This will ensure that construction activities so far as is practical do not adversely impact amenity, traffic or the environment in the surrounding area. The oCEMP also sets out the monitoring and auditing activities designed to ensure that such mitigation measures are carried out, and that they are effective;
- outline Construction Traffic Management Plan (oCTMP): the purpose of the CTMP is to propose how construction traffic including site personnel movements will be safely controlled at our Site by the developer and its sub-contractors. This will include:
  - routing of construction vehicles;
  - access arrangements to our Site;
  - details of the vehicle holding area(s);
  - details of any diversion, disruption or other abnormal use of the public highway or public right of ways during construction works;
- outline Soils Management Plan: this will manage any potential impacts to the soil (and agricultural land) during and on completion of our Project (considering the construction, decommissioning and operational phases). The OSMP will identify those areas within the Site which may be more susceptible to damage, for example, the temporary access tracks, construction compounds and steep slopes; and will set out details of when soil handling should be avoided (for example when it is wet or after periods of heavy rainfall or high winds) and it will advise on when soils are suitable for being handled or trafficked. The OSMP will also detail measures for soil management and follow the principles of best practice to maintain the physical properties of the soil, with the aim of restoring the land to its pre-construction condition following the temporary construction use and at the end of the lifetime of our Project, after decommissioning; and
- outline Employment Skills Supply Chain Management Plan: the OESSCMP sets out measures to maximise opportunities to promote economic benefits in relation with skills, supply chains, and employment in the local region, which is required to deliver the entirety of our Project. For example, how our Project will develop essential skills which would benefit the local population through apprenticeships and workforce training.

These will be revised as and when further detailed information is available. Measures to be included within the oCEMP and an oCTMP are included in **Volume 1** of our PEIR.

Decomissioning Phase

As above, our Project will be operated for up to 60 years after which it would be decommissioned.

Decommissioning would include the removal of all above ground infrastructure with the exception of the two project substations, which are likely to remain. Permissive paths would be removed. Underground cables may remain in situ. Trees and hedgerows planted as part of our Project are assumed to remain in situ when the land is returned to the landowners. It is considered all of the solar PV Modules and batteries used in our Project will be recycled. At this stage, it is considered decommissioning will occur over two years.

During decommissioning our Project will be subject to a Decommissioning Management Plan. This will set out the principal decommissioning activities and the measures that will be implemented, so far as is practical, to ensure the works do not adversely impact amenity, traffic or the environment in the surrounding area. It will also set out the monitoring and auditing activities designed to ensure that such mitigation measures are carried out, and that they are effective. A Decommissioning Management Plan will be submitted as part of our DCO Application.

Preliminary Assessment of Likely Significant Effects

As above, National Significant Infrastructure Projects are generally required to be subject to an EIA. EIA is a formal process that assesses relevant environmental information to identify the likely significant environmental effects of a project and potential mitigation measures for avoiding, preventing, reducing or, if possible, offsetting likely significant environmental effects. It provides decision-makers with the environmental information needed to make informed decisions when determining applications for certain projects. This includes the provision of information on the likely significant environmental effects that will occur as a result of a project.

To inform our PEIR and the EIA process more generally, we have been undertaking environmental surveys since May 2023 to gather baseline data. In October 2023 we published our EIA Scoping Report and submitted to PINS, to which they responded in December 2023.

The EIA Scoping Report describes the effects of our Project that have the potential to be significant and the proposed method by which we are making an assessment in the EIA. It is important to note that EIA Scoping is a process whereby only those potential effects that are likely to be significant are taken forward for further assessment and therefore considered and reported upon within the PEIR and ES. The proposed approach in the EIA Scoping Report is being consulted upon and we have also been discussing the design of our Project, the assessment surveys and methodologies for our technical assessments with relevant statutory consultees (such as the local authorities, Natural England and the Environment Agency).

The PEIR presents the findings of the surveys we have undertaken to date, as well as details of the preliminary assessments that have been made on the following technical aspects. These technical topics have been agreed with PINs:

- Biodiversity
- Hydrology and Hydrogeology

- Land and Soils
- Buried Heritage
- Cultural Heritage
- Landscape and Visual
- Transport and Access
- Air Quality
- Carbon and Climate Change
- Noise and Vibration
- Human Health
- Socio-Economics

The results from our preliminary assessments show that for all topics, apart from landscape and visual, and cultural heritage (discussed below), there are no likely significant adverse effects caused by our Project. This is because we have ensured sensitive uses (such as the scheduled monuments) are avoided and/or have suitable offsets when designing our Project. In addition, our Project will adhere to the design principles and the environmental management plans ensuring any likely significant effects are avoided, offset and / or controlled.

For landscape and visual, and cultural heritage the preliminary assessments show that during construction, operation and decommissioning there are likely significant adverse effects due to the change in use from agricultural land to our Project.

Figures 7 to **10** show the landscape and visual, and cultural heritage receptor locations considered in the assessments (in purple and grey), and the receptor locations where the preliminary assessments identify a likely significant adverse effect (in purple).

During construction and decommissioning the preliminary likely significant adverse effects are primarily due to the presence of construction vehicles and construction activity. Once built, in the first year, the landscape planting is young and is not fully mature. However, as shown by **Figures 8** and **9**, over time, once the landscaping is matured and the vegetation effectivity screens the solar infrastructure, the number of receptors where there could be a likely significant adverse effect is reduced.

Figure 7: Preliminary Likely Significant Adverse Effects During Construction

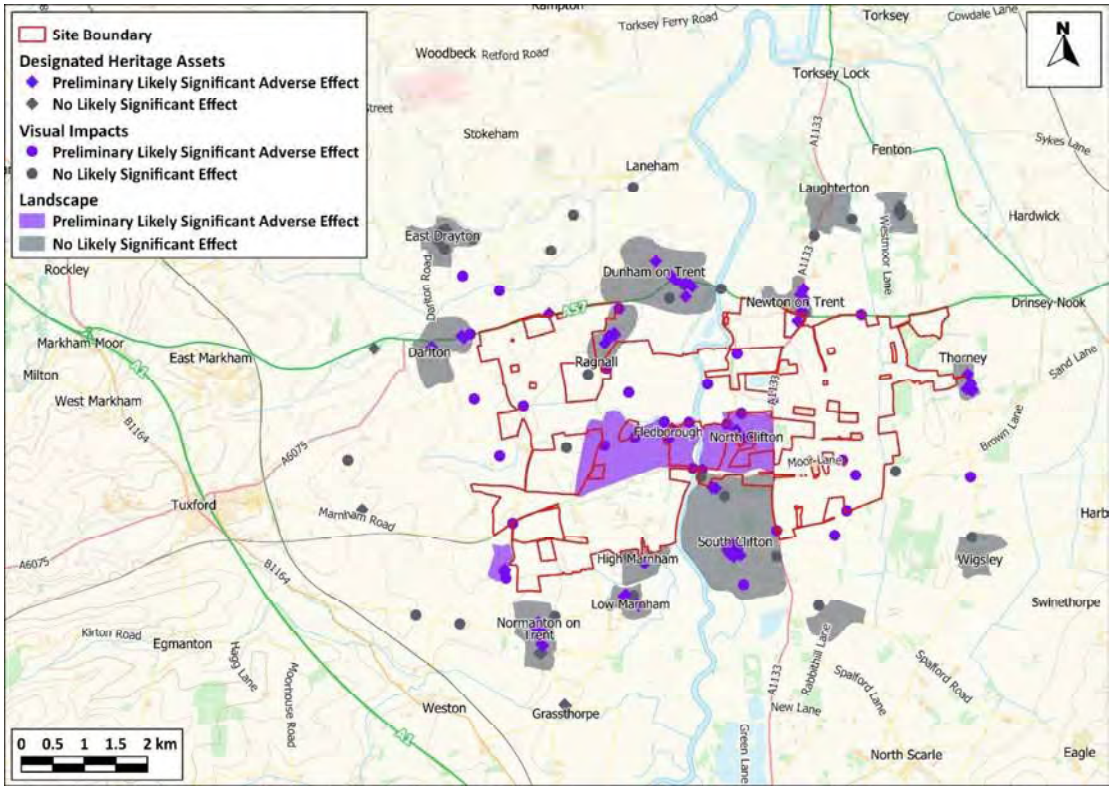


Figure 8: Preliminary Likely Significant Adverse Effects During Operation (Year 1)

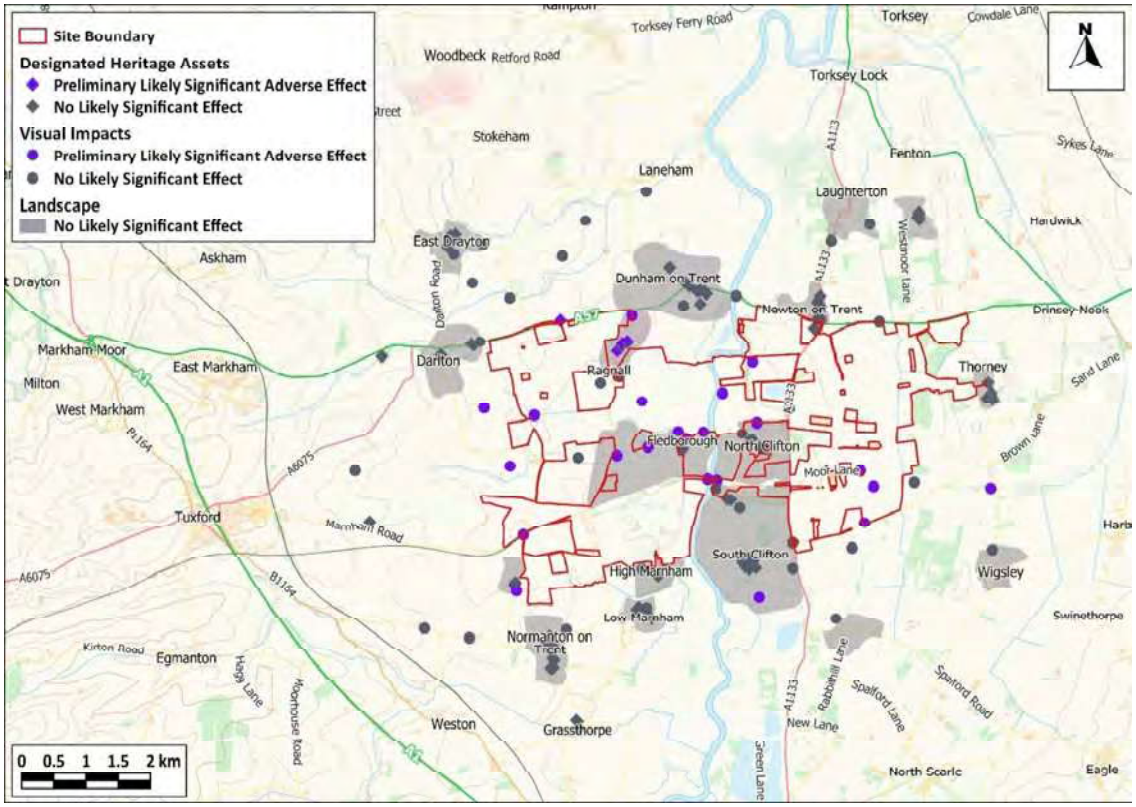


Figure 9: Preliminary Likely Significant Adverse Effects During Operation (Year 15)

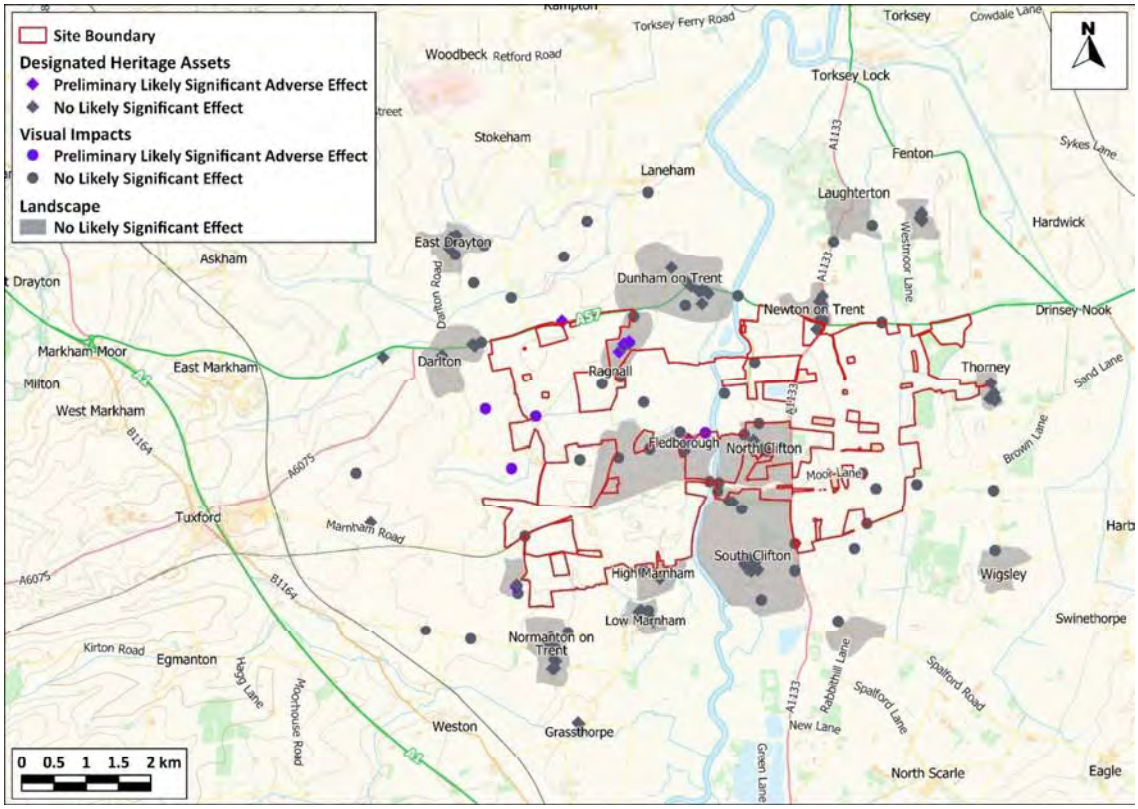
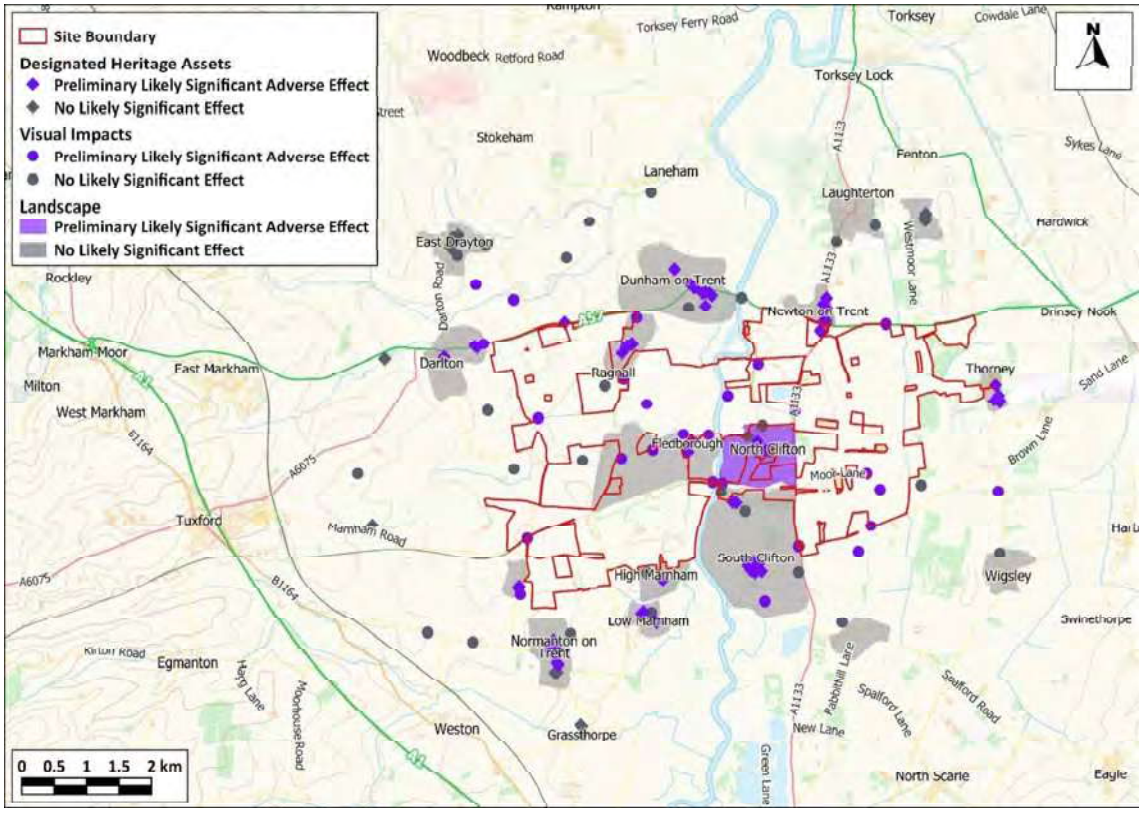


Figure 10: Preliminary Likely Significant Effects During Decomissioning



We will be undertaking further survey, assessment and design works to confirm these preliminary likely significant adverse effects. This may also include additional design and landscaping mitigation, where possible. The further assessment work will be reported within the ES, which will be submitted as part of our DCO Application.

In addition to the above, our preliminary assessments show our Project results in likely significant positive effects for carbon and climate change, health and socio-economics for the following reasons:

- our Project will generate zero-carbon electricity, assisting with the displacement of electricity generated by fossil fuel. This also has a positive effect on climate anxiety experienced by the population
- our Project will create jobs during construction, decommissioning and operation
- our Project will assist with the economy in particular from local spend during the construction phase
- solar farms provide reliable renewable energy and can generate electricity at cheaper rates which helps to reduce energy costs for consumers
- new permissive paths are proposed within our Project, connecting villages

The full preliminary likely significant effects, as a result of our Project, for all environmental disciplines is presented in **Table 1** and **Table 2** in **Appendix A**.

Next Steps

As above, it is noted that the design of our Project is currently being developed and the process of gathering information and identifying how the environment might be affected by our Project is still continuing. The PEIR does not represent the final design. This further work is shown in **Table A1** and **Table A2 of Appendix A**, and includes detailed assessment, additional fieldwork, and design work, including any further mitigation measures. The further assessment work will be reported within the ES, which will be submitted as part of our DCO Application.

Cumulative Effects

We have considered the likely significant effects of our Project along with cumulative schemes which includes:

- other schemes within the local vicinity within 15km of our Project that have planning permission (or development consent) but are not yet built; or
- schemes where a planning application (or DCO application) has been submitted but a decision not yet made; or
- major schemes likely to occur due to existing policy.

This has resulted in a long-list of cumulative schemes, consisting of 54 schemes. Using professional judgement, the long-list of schemes has been reviewed against their potential to act in a cumulative way with our Project. Only those where such cumulative potential exists considered further (a short-list of cumulative schemes).

The preliminary assessment showed there are no new significant cumulative effects to occur during the construction and decommissioning phases of our Project or once our Project is operational.

To confirm (or otherwise) in the ES the results of the cumulative effects made, a further cumulative assessment and review of the potential of significant effects will be undertaken. This will consider the predicted results from the further technical assessments to be undertaken, and the predicted likely significant effects. An assessment cut-off date relating to the cumulative schemes to be considered within the cumulative assessments, will be reported within the ES.

Appendix A: Summary of Preliminary Likely Significant Effects

Table 1: Summary of Preliminary Likely Significant Effects During Construction and Decomissioning

Aspect and Potential Impact	Preliminary Likely Significant Effect	Further Information	Next Steps
Biodiversity			
Impact to Local Wildlife Sites, including Fledborough to Harby Dismantled Railway and Dunham Dubs, Dunham Oxbow, Darnsyke Marsh, and Fledborough Holme	No Likely Significant Effects	The adoption of the management plans (including the OCEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.
Impact to Habitats of Principal Importance including Coastal and Floodplain Grazing Marsh; Hedgerows; Ponds; and Ditches	No Likely Significant Effects	The adoption of the management plans (including the OCEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.
Impact to Higher Value Habitats including Plantation Woodland and Neutral Grassland	No Likely Significant Effects	The adoption of the management plans (including the OCEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.

Impact to The River Trent	No Likely Significant Effects	The adoption of the management plans (including the OCEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.
Impact of our Project on Protected Species, including badger, bats, birds, otter, reptiles and water vole	No Likely Significant Effects	The adoption of the management plans (including the OCEMP) will mitigate any significant effects	Further project specific monitoring and surveys to be undertaken for bats, otter, reptiles and water vole. The additional data will be analysed and design work to be undertaken. This will be reported within the ES.
Hydrology and Hydrogeology			
Flood Risk Effects on Users of the Site	No likely significant effects	The adoption of the management plans (including the OCEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.
Flood Risk Effects to Areas off Site	No likely significant effects	The adoption of the management plans (including the OCEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.

Effects of Changes in Quality and Quantity of Surface Water Runoff	No likely significant effects	The adoption of the management plans (including the OCEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.
Hydrogeology and Groundwater Flows	No likely significant effects	The adoption of the management plans (including the OCEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.
Potable Water Demand	No likely significant effects	The adoption of the management plans (including the OCEMP) will mitigate any significant effects	Potable water demand will be quantified, and discussions will be held with Anglian Water to determine any capacity concerns.
Land and Soils			
Contaminated Land	No likely significant effects	With the adoption of management plans (including the Soil Management Plan) and a set of best-practice measures to control pollution, no significant effects are likely.	A preliminary risk assessment will be completed, which will set out the sources of pollution, the potential pathways and the measures to control any emissions. This will be reported within the ES.

Groundwater	No likely significant effects	With the adoption of management plans (including the Soil Management Plan) and a set of best-practice measures to control pollution, no significant effects are likely.	A preliminary risk assessment will cover potential risks to groundwater. This will set out the sources of pollution, the potential pathways and the measures to control any emissions. This will be reported within the ES.
Soil and Agricultural Land	No likely significant effects	With the adoption of management plans (including the Soil Management Plan) and a set of best-practice measures to control pollution, no significant effects are likely.	A detailed Agricultural Land Classification survey to determine the quality of the soil is underway, and results will be available in time to provide a more detailed baseline for assessment as part of the EIA process. This will be reported within the ES.
Buried Heritage			

Impacts to buried heritage assets from Prehistoric, Roman, Saxon and Medieval, Post Medieval, Undated periods.	No likely significant effects	With the adoption of management plans (including the OCEMP) and with appropriate archaeological evaluation strategy, no significant effects are likely.	A more detailed assessment and a review of the potential effects on buried heritage assets will be included in the archaeology Desk Based Assessment and Environmental Statement. These will be supported by the results of the currently ongoing geophysical survey, the results of any proportionate archaeological evaluations and further desk-based research. This will be reported within the ES.
Cultural Heritage			
Designated Heritage Assets (such as Listed Buildings) within 1km radius	Likely significant adverse effects (temporary)	There is likely to be visual and experiential effects of construction activity on the heritage value of designated assets within 1km.	Detailed assessment, subject to further analysis and design work. This will be reported within the ES.
Designated Heritage Assets (such as Listed Buildings) outside of 1km radius	No likely significant effects	Our Project will not affect the heritage value of the designated assets due to distance and screening.	Detailed assessment, subject to further analysis and mitigation work. This will be reported within the ES.
Non-Designated Heritage Assets (such as the Fledborough Viaduct) within 1km radius	No likely significant effects	The heritage asset is of low value (in designation terms) and as such our Project will not affect the heritage value.	Detailed assessment, subject to further analysis and mitigation work. This includes further design work should the Fledborough Viaduct be used for the cable crossing. This will be reported within the ES.

Landscape and Visual			
Out of the 17 village character areas, impact to the landscape on the following nine character areas during construction: • North Clifton Village Farmlands • Wigsley Village Farmlands with Plantations • Besthorpe River Meadowlands • Dunham on Trent Village Farmlands • East Drayton • Normanton on Trent • Fledborough • Skegby • North Clifton	Likely significant adverse effects (temporary)	Changes and alteration to landform and vegetation cover. Activity of a greater scale than general farming. Resulting in a high magnitude of change.	Detailed assessment, subject to further analysis and mitigation work. This will be reported within the ES.
Out of 56 worst-case viewpoints potential impact to the views for the following 24 receptors during construction: • Residents of Ragnall • Residents of east Fledborough • Residents of central Fledborough • Residents of west Fledborough • Residents of Skegby • Residents of North Clifton • Residents within the eastern	Likely significant adverse effects (temporary)	Introduction of construction activity. May result in changes and alteration to landform and vegetation cover, as well as activity in a greater scale than general farming.	Detailed assessment, subject to further analysis and mitigation work. This will be reported within the ES.

part of the Site, such as Moor Farm (northern)
- Residents on the southern edge of the Site, such as Moor Farm (southern)
- Residents of Wells Farm
- Residents of America Farm
- People walking on PRoW within the western edge of the Site, west of Main Street
- People walking on PRoW within the western part of the Site, east of Main Street
- People walking on PRoW within the western edge of the Site, west of Main Street
- People walking on PRoW within the western part of the Site, east of Main Street
- People walking on PRoW within the eastern side of the Site, west of A1133
- People walking on PRoW within the eastern side of the Site, east of A1133
- People walking on the Trent Valley Way
- People walking/cycling over on Sustrans route over Fledborough Viaduct

• People walking on PRoW north west of the Site • People walking on Birkland Lane • People walking on PRoW west of the Site • People travelling on A57 • People travelling on A1133 • People travelling on Main Street			
Out of the 17 village character areas, impact to the landscape on the following seven character areas during decommissioning: • North Clifton Village Farmlands • Wigsley Village Farmlands with Plantations • Besthorpe River Meadowlands • Dunham on Trent Village Farmlands • East Drayton • Normanton on Trent • North Clifton	Likely significant adverse effects	Changes and alteration to landform and vegetation cover, resulting in a high magnitude of change.	Detailed assessment, subject to further analysis and mitigation work. This will be reported within the ES.
Out of the 56 worst-case viewpoints, potential impact to the views for the following 19 receptors during decommissioning: • Residents north of Ragnall	Likely significant adverse effects (temporary)	Introduction of decommissioning activity may result in changes and alteration to landform and vegetation cover.	Detailed assessment, subject to further analysis and mitigation work. This will be reported within the ES.

- Residents of Ragnall
- Residents of east Fledborough
- Residents of central Fledborough
- Residents of west Fledborough
- Residents of Skegby
- Residents within the eastern part of the Site, such as Moor Farm (northern)
- Residents on the southern edge of the Site, such as Moor Farm (southern)
- People walking on PRoW within the western edge of the Site, west of Main Street
- People walking on PRoW within the western part of the Site, east of Main Street
- People walking on PRoW within the eastern side of the Site, west of A1133
- People walking on PRoW within the eastern side of the Site, east of A1133.
- People walking on the Trent Valley Way
- People walking/cycling over on Sustrans route over Fledborough Viaduct
- People walking on PRoW north

west of the Site • People walking on Birkland Lane • People travelling on A57 • People travelling on A1133 • People travelling on Main Street			
Transport and Access			
Non-motorised User (NMU) Amenity	No likely significant effects	With the development of a Construction Traffic Management Plan (CTMP), and a set of best-practice measures which will be adopted, no significant effects are predicted.	Further assessment to include confirmation on the details as outlined in the CTMP. The oCTMP will be reported within the ES.
Fear & Intimidation	No likely significant effects	With the development of a CTMP and a set of best-practice measures which will be adopted, no significant effects are predicted.	Further assessment to include confirmation on the details as outlined in the CTMP. The outline CTMP will be reported within the ES.

Road Safety	No likely significant effects	With the development of a CTMP, and a set of best-practice measures which will be adopted, no significant effects are predicted.	Further assessment to include confirmation on the details as outlined in the CTMP. The outline CTMP will be reported within the ES.
PRoW Users	No likely significant effects	With the adoption of the OCEMP and a suitable PRoW path management plan as detailed in the development of a CTMP, no significant effects are predicted.	Further assessment to include confirmation on the details of the Path Management Plan as outlined in the CTMP. The outline CTMP will be reported within the ES.
Severance	No likely significant effects	With the development of a suitable Path Management Plan included within the CTMP, and a set of best-practice measures which will be adopted, no significant effects are predicted.	Further assessment to include confirmation on the details of the Path Management Plan as outlined in the CTMP. The outline CTMP will be reported within the ES

Pedestrian Delay	No likely significant effects	With the development of a suitable Path Management Plan included within the CTMP, and a set of best-practice measures which will be adopted, no significant effects are predicted	Further assessment to include confirmation on the details of the Path Management Plan as outlined in the CTMP. The outline CTMP will be reported within the ES
Non-motorised User Amenity	No likely significant effects	With the development of a suitable Path Management Plan included within the CTMP, and a set of best-practice measures which will be adopted, no significant effects are predicted	Further assessment to include confirmation on the details of the Path Management Plan as outlined in the CTMP. The outline CTMP will be reported within the ES
Non-motorised Fear & Intimidation	No likely significant effects	With the development of a suitable Path Management Plan included within the CTMP, and a set of best-practice measures which will be adopted, no significant effects are predicted	Further assessment to include confirmation on the details of the Path Management Plan as outlined in the CTMP. The outline CTMP will be reported within the ES

Non-motorised Road Safety	No likely significant effects	With the development of a suitable Path Management Plan included within the CTMP, and a set of best-practice measures which will be adopted, no significant effects are predicted.	Further assessment to include confirmation on the details of the Path Management Plan as outlined in the CTMP. The outline CTMP will be reported within the ES
Air Quality			
Construction and Decommissioning Dust	No likely significant effects	With the adoption of the OCEMP and a set of best-practice measures to control dust generation, no significant effects are likely.	Risk assessment will be carried out in accordance with relevant guidance to determine the dust measures to be included within our Project. This will be presented in our ES.
Construction and Decommissioning Traffic Human Health	No likely significant effects	Current and future air quality conditions in the study area significantly below the relevant air quality objectives, such that no exceedances are likely.	An air quality computer dispersion model will be used to quantify the impacts of road traffic emissions. The results will be presented in our ES.

Construction and Decommissioning Traffic on Ecological Sites	No likely significant effects	Based on the expected volume of additional road traffic using roads within 200 m of sensitive ecological sites, no significant effects are likely.	A detailed screening of potential effects, based on traffic flow data from the appointed Transport Consultant, will be carried out and presented in our ES. Should the screening threshold be exceeded, a computer dispersion model will be used to quantify the impacts on designated ecological sites.
Construction and Decommissioning Plant	No likely significant effects	Based on the anticipated size of the plant, proximity to existing sensitive receptor locations and considering current and future air quality conditions in the study area are significantly below the relevant air quality objectives, no exceedances are likely.	The likely plant to be used for our Project will be set out in the ES.
Carbon and Climate Change			
Greenhouse Gases	No likely significant effects.	The amount of greenhouse gases produced in the construction and decommissioning of our Project is small in comparison to regional, national and global emissions.	The next steps of the GHG assessment will be to refine the GHG footprint of our Project and the baseline and define the effects.

Noise and Vibration			
Construction Traffic Noise and Vibration	No likely significant effects.	The construction compounds proposed within our Project are indicative and there remains flexibility in terms of their final location. The adoption of the management plan (including the oCEMP) will mitigate effects.	The potential effects of construction traffic noise and vibration will be quantified in accordance with DMRB LA111 guidance and presented as part of our ES.
Onsite construction noise	No likely significant effects.	The construction compounds proposed within our Project are indicative and there remains flexibility in terms of their final location. The adoption of the management plan (including the oCEMP) will mitigate effects.	The potential effects of onsite construction noise will be quantified in accordance with the methodology set out in BS 5228, Part 1, as part of our ES.

Onsite construction vibration	No likely significant effects.	The majority of the area of our Site will not contain plant or equipment that is likely to generate substantial levels of noise. The Design Principles will ensure large noise generating plant and equipment will be sited at least 300m from residential properties.	The potential effects of onsite construction vibration will be quantified in accordance with the methodology set out in BS 5228, Part 2, as part of our ES
Human Health			
Community identity, culture, resilience and influence	No likely significant effects.	The adoption of the management plans (including the OCEMP) will mitigate any significant effects.	Further analysis and design work to be undertaken. This will include the determination of any additional mitigation required. This will be reported in the ES
Employment and income (on the Priority Groups)	Likely significant positive effects	A significant number of jobs will be supported.	A detailed assessment of the significance of effect will be presented in our ES.
Socio-Economics			
Local employment and economy	Likely significant positive effects	A significant number of jobs will be supported, directly and indirectly from our Project.	A detailed assessment of the significance of effects will be presented in our ES.

Table 2: Summary of Preliminary Likely Significant Effects During Operation (including Maintenance)

	Preliminary Likely Significant Effect	Further Information	Next Steps
Biodiversity			
Our Project will include grassland, wildflower meadows, hedgerow planting and tree planting; and existing habitats will be enhanced. There will be positive effects due to the reduction in chemical (pesticides, fertiliser, etc), arable management and farming practices. In addition, there will be improved connectivity, both within the Site and the wider landscape, creating a mosaic of a range of habitat types, benefitting a diverse variety of fauna as a result. The operational phase is expected to result in likely significant positive effects on all ecological features.			
Hydrology and Hydrogeology			
Flood Risk Effects on Users of the Site	No likely significant effects	The adoption of the management plans (including the oOEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.
Flood Risk Effects to Areas off Site	No likely significant effects	The adoption of the management plans (including the oOEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.

Effects of Changes in Quality and Quantity of Surface Water Runoff	No likely significant effects	The adoption of the management plans (including the oOEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.
Hydrogeology and Groundwater Flows	No likely significant effects	The adoption of the management plans (including the oOEMP) will mitigate any significant effects	Further analysis and design work to be undertaken. This will be reported within the ES.
Potable Water Demand	No likely significant effects	The adoption of the management plans (including the oOEMP) will mitigate any significant effects	Potable water demand will be quantified and discussions will be held with Anglian Water to determine any capacity concerns.
Land and Soils			

Potential impacts from contamination and the use of agricultural land	No likely significant effects	With the adoption of management plans (including the Soil Management Plan) and a set of best-practice measures to control pollution, no significant effects are likely. The land will be handed back to the landowner for agricultural use after 60 year.	Preparation of management plans to submit as part of the DCO Application. This will be reported within the ES.
Buried Heritage			
There are no impacts to buried heritage assets from our Project during operation.			
Cultural Heritage			
Designated Heritage Assets (such as Listed Buildings) within 1km radius	Likely significant adverse effects	There is likely to be visual and experiential effects on some selected designated assets within 1km.	Detailed assessment, subject to further analysis and design work. This will be reported within the ES.
Designated Heritage Assets (such as Listed Buildings) outside of 1km radius	No likely significant effects	Our Project will not affect the heritage value of the designated assets due to distance and screening.	Detailed assessment, subject to further analysis and mitigation work. This will be reported within the ES.

Non-Designated Heritage Assets (such as the Fledborough Viaduct) within 1km radius	No likely significant effects	The heritage asset is of low value (in designation terms) and as such our Project will not affect the heritage value.	Detailed assessment, subject to further analysis and mitigation work. This includes further design work should the Fledborough Viaduct be used for the cable crossing. This will be reported within the ES.
Landscape and Visual			
Year 1: out of the 17 village character areas, impact to the landscape on the following five character areas: • North Clifton Village Farmlands • Wigsley Village Farmlands with Plantations • Dunham on Trent Village Farmlands • East Drayton • Normanton on Trent	Likely significant adverse effects	Changes and alteration to landform and vegetation cover. Planting is immature, resulting in a high magnitude of change.	Detailed assessment, subject to further analysis and mitigation work. This will be reported within the ES.
Year 15: out of the 17 village character areas, impact to the landscape on the following two character areas: • Besthorpe River Meadowlands • Dunham on Trent Village Farmlands	Likely significant adverse effects	Changes and alteration to landform and vegetation cover, taking account of mature planting.	Detailed assessment, subject to further analysis and mitigation work. This will be reported within the ES.
Year 1: Out of 56 worst-case viewpoints potential impact to the views for the following 17	Likely significant adverse effects	Introduction of solar PV modules, taking account of immature planting.	Detailed assessment, subject to further analysis and mitigation work. This will be reported within the ES.

receptors during operation: • Residents north of Ragnall • Residents of Ragnall • Residents of east Fledborough • Residents of central Fledborough • Residents of west Fledborough • Residents of Skegby • Residents within the eastern part of the Site, such as Moor Farm (northern) • Residents on the southern edge of the Site, such as Moor Farm (southern) • Residents of Wells Farm • Residents of America Farm • People walking on PRoW within the western edge of the Site, west of Main Street • People walking on PRoW within the western part of the Site, east of Main Street • People walking on PRoW within the eastern side of the Site, west of A1133 • People walking on PRoW within the eastern side of the Site, east of A1133 • People walking on the Trent Valley Way	May result in a particular change to the views.

• People walking/cycling over on Sustrans route over Fledborough Viaduct • People walking on PRoW west of the Site			
Year 15: Out of 56 worst-case viewpoints potential impact to the views for the following two receptors during operation: • Besthorpe River Meadowlands • Dunham on Trent Village Farmlands	Likely significant adverse effects	Introduction of solar PV modules, taking account of mature planting. May result in a particular change to the views.	Detailed assessment, subject to further analysis and mitigation work. This will be reported within the ES.
Transport and Access			
There are no impacts to transport and access from our Project during operation.			
Air Quality			
There are no impacts to air quality from our Project during operation.			
Carbon and Climate Change			

Greenhouse Gas (GHG) Assessment	Likely significant positive effects	Our Project is expected to have a significant beneficial effect on climate as a result of the zero-carbon electricity it will generate during operation and the fossil fuel electricity generation that it is expected to displace as part of the UK National Grid.	Our Project's GHG footprint will be further refined as more detailed design information is fed into the assessment. The next steps of the GHG assessment will be to refine the GHG footprint of our Project and the baseline and define the effects. This will be reported in the ES.
Climate Change Resilience (CCR) Assessment	No likely significant effects	Our Project has been designed to respond to future climatic changes, such as the height of the solar panels being located up to 1.8m above ground level in response to an increase in flood levels due to global warming.	The next steps of the CCR assessment are to develop further detail in the assessment based on the detailed design and determination of any additional mitigation required. This will be reported in the ES.

In-combination Climate Change Impact (ICCI) Assessment	No likely significant effects.	Our Project has considered future climatic changes and each of the technical assessments have considered whether future climate change will reduce or worsen any of our Projects predicted environmental effects.	The ICCI will be further developed with input from other technical Chapter authors as detailed assessment work is undertaken as part of the final ES. The next steps include additional detail in the ICCI, and determination of any additional mitigation required. This will be reported in the ES.
Noise and Vibration			
Operational Noise	No likely significant effects.	The majority of the area of our Site will not contain plant or equipment that is likely to generate substantial levels of noise. The Design Principles will ensure large noise generating plant and equipment will be sited at least 300m from residential properties.	The potential effects of operational noise from onsite plant and equipment will be quantified in accordance with the methodologies set out in BS 4142 and presented as part of our ES.
Human Health			

Community identity, culture, resilience, and influence	No likely significant effects.	The adoption of the management plans (including the OEMP) and taking account of the landscaping as well as the design measures will mitigate any significant effects.	Further analysis and design work to be undertaken. This will include the determination of any additional mitigation required. This will be reported in the ES
Climate change mitigation and adaption	Likely significant positive effects	The provision of green energy is a significant contribution towards national targets. This could contribute towards a positive effect on climate anxiety experienced by the population.	Further analysis and design work to be undertaken. This will include the determination of any additional mitigation required. This will be reported in the ES
Wider societal infrastructure and resource	Likely significant positive effects	Unsubsidised solar farms provide reliable renewable energy and can generate electricity at cheaper rates which helps to reduce energy costs for consumers.	Further analysis and design work to be undertaken. This will include the determination of any additional mitigation required. This will be reported in the ES
Socio-Economics			

Local employment and economy	Likely significant positive effects	Jobs will be created directly (employees within our Project) and indirectly (employees in the supply chain) from our Project.	A detailed assessment of the significance of effects will be presented in our ES.
Public Rights of Way	Likely significant positive effects	New permissive paths will be included in our Project to create new routes connecting villages.	Further analysis and design work to be undertaken. A detailed assessment of the significance of effects will be presented in our ES.

one earth
solar farm