RWE

Tween Bridge Solar Farm

8.20 Micro-siting Analysis to Minimise Effects on BMV Agricultural Land

Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Deadline 3 June 2026

Revision 1

TWEEN BRIDGE SOLAR FARM

EN010148

MICRO-SITING ANALYSIS TO MINIMISE EFFECTS ON BMV AGRICULTURAL LAND

June 2026

KERNON
COUNTRYSIDE CONSULTANTS LIMITED

TWEEN BRIDGE SOLAR FARM

EN010148

MICRO-SITING ANALYSIS
TO MINIMISE EFFECTS ON
BMV AGRICULTURAL LAND

June 2026

Authorised By ……

Greenacres Barn, Stoke Common Lane, Purton Stoke, Swindon SN5 4LL
T: 01793 771333 Email: info@kernon.co.uk Website: www.kernon.co.uk

*Directors - **Tony Kernon** BSc(Hons) MRAC MRICS FASAg **Sarah Kernon***
*Consultant – **Dan Miller** BSc(Hons)*

CONTENTS

Appendices

Copy of [**REP2-061**] Plan

1 INTRODUCTION

Introduction to this Document

1.1 Agricultural land is graded by a system of Agricultural Land Classification (ALC). This divides land into five grades 1 to 5, with Grade 3 divided into subgrades of 3a and 3b. The ALC methodology was published by MAFF in 1988 with the guidance updated in December 2025[1]. The Best and Most Versatile agricultural land (BMV) is land in ALC Grades 1, 2 and 3a. Recent estimates for the Department for the Environment, Food and Rural Affairs are that 50.9% of agricultural land in England will be of BMV quality[2].

1.2 In their Relevant Representations [RR-006] the City of Doncaster Council (CDC) at paragraph 11.36 noted that:

> "**The Doncaster Local Plan (Policy 60) sets out that where significant development is unavoidable, preference will be given to the use of poorer quality agricultural land in preference to higher quality land. The rationale for including outlying areas of the proposal and not excluding them to avoid increased impacts to the agricultural resource therefore needs to be fully detailed. This additional level of detail should be clearly illustrated, assessed and discussed for further consideration in terms of both national and local policy aims to limiting impacts to the BMV soil resource, with robust reasonings why lower grade agricultural land could not be utilised for these solar farm components**".

1.3 The Applicant committed to providing this "micro-siting analysis" at Deadline 3, in response to CDC's Local Impact Report at 11.19 [**REP2-089**]. This document provides an explanation about the siting of fixed equipment within the Site and how the design seeks to minimise the effects on land of BMV quality.

Structure of Report

1.4 This report addresses those elements of the Scheme where soil disturbance is expected and where the quality of BMV land might be affected. The document is structured as follows:

- Section 2 explains how BMV land was included in the design process;
- Sections 3 – 7 set out the considerations for key construction and operational components of the Scheme;

[1] Department for Environment Food and Rural Affairs (2025): Guidelines for assessing the quality of agricultural land

[2] Cranfield Environment and Agrifood (July 2025). RDE 118 Development of a Predictive Agricultural Land Classification Map for England

- a summary and conclusions in section 8.

1.5 This document references the ES Volume 1 Chapter 15 “Agricultural Considerations” **[Document Reference 6.2.15 Revision 2]**.

1.6 This document also refers to the Scheme Layout and Agricultural Layout Plan [**REP2-061**], which for ease of reference is reproduced at **Appendix A**.

2 BMV ISSUES IN DESIGN

2.1 The agricultural land quality of the Site and some adjacent land (no longer included in the proposals) was determined by way of a semi-detailed ALC survey, augering soils down to 1.2m (where possible) and determining the land quality by ALC grade. This work was undertaken in the early stages of the design process.

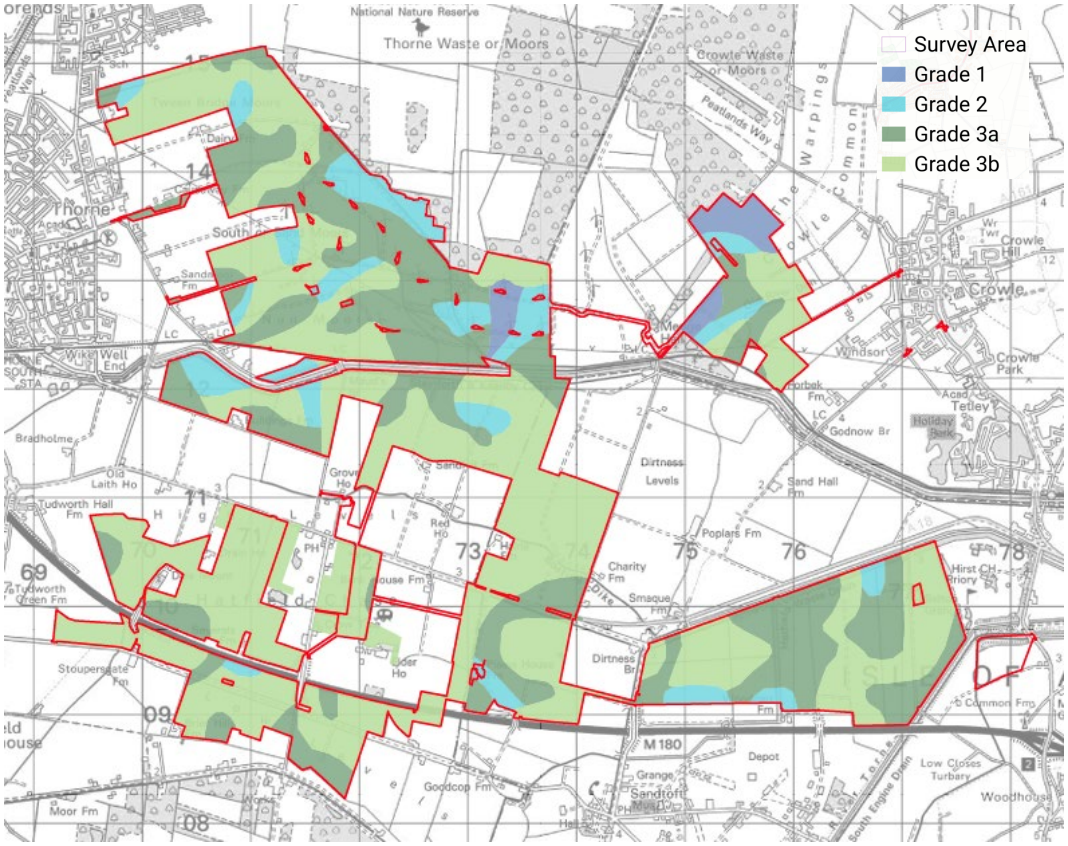
2.2 A semi-detailed survey involves assessing the soils on a regular grid pattern at a 200m spacing. Solar panels are recognised to be a low-impact development that does not adversely affect land quality, and this level of survey was considered suitable for determining land quality across this large area.

2.3 The ALC results were available to the design team from October 2023. Land quality was therefore considered fully in the site layout and design process and was discussed in design meetings as the Scheme evolved.

2.4 As the location for the larger items of fixed equipment was determined within the Site, the ALC surveyors returned to those areas to undertake additional ALC sampling points in particular to provide additional information for the outline Soil Management Plan [**REP2-078**]. Therefore, for areas where there is greater soil disturbance, such as the BESS and substation areas, detailed ALC at 1 auger per hectare has been completed.

2.5 The ALC distribution of the land within the Order Limits is shown on Figure 15-8 within the ES chapter **[Document Reference 6.2.15 Revision 2]** of the ES, and in Appendix 15.1 ALC report [**APP-120**] and Figure 15.1 ALC Plan [**APP-173**]. For ease of reference the plan from [**APP-173**] is reproduced below.

*Insert 1: ALC Results (taken from [**APP-173**]*



2.6 The following sections focus on the considerations given to BMV land for key elements of the Scheme focussing on areas where soil might be disturbed, and in particular:

- the solar panel areas;
- the substation and BESS;
- tracks and smaller equipment;
- construction compounds;
- enhancement works.

2.7 All elements of the proposed facility are addressed in the ES Chapter 15 **[Document Reference 6.2.15 Revision 2]** and the oSMP [**REP2-078**].

2.8 This document should be read in conjunction with the Applicant's written responses to ExQ1 **[REP2-088]**, notably questions 9.0.4 and 9.0.16. These responses set out how a number different factors helped inform and influence siting decisions. Moreover, it sets out that there are limiting technical factors, such as the need to ensure complex electrical equipment is located outside areas at a higher risk of deeper flood waters and away from topple zones (as explained further, below) which present significant immovable constraints that have a major bearing on siting decisions. The context in which agricultural

land quality has helped influence micro siting should be viewed through the lens of such constraining factors.

3 SOLAR PANEL AREAS

3.1 Solar panels are proposed across the Site as shown on the application plans.

3.2 As described in the ES Chapter 15 **[Document Reference 6.2.15 Revision 2]** the installation of the solar PV mounting structure does not adversely affect soil structure, and results in no adverse impacts on agricultural land quality or soil resources. Figure 15.11, from the ES, illustrates the limited effect of installing mounting structure piles.

Figure 15.11 Mounting Structure Piles being Installed (taken at Tiln Farm, Retford, in January 2023)

3.3 Therefore solar panels do not affect the quality of agricultural land, as described in ES Chapter 15 **[Document Reference 6.2.15 Revision 2]**, and panel layout is not considered further in this document.

4 BESS SUBSTATIONS AND BESS

4.1 This section addresses the siting of the BESS, 400 kV and 132 kV substations. An assessment of the quantum of land by ALC grade, rounded to the nearest 0.1 ha, is set out in the ES Chapter 15. The areas affected, as set out in the ES Chapter 15 Table 15-11 **[Document Reference 6.2.15 Revision 2]** , are as follows.

Table 1: ALC Results – Substations and BESS

	1	2	3a	3b	Total
BESS areas	0.8	0.8	0.8	7.5	9.9
400kV substation	0	0	0.4	3.0	3.4
132kV substations	0	0.7	0.7	2.8	4.2
Total	**0.8**	**1.5**	**1.9**	**13.3**	**17.5**

4.2 The areas associated with the above works are shown on the Works Plans **[Document Reference 2.3 Revision 3]**, on the Indicative Layout and Cross Section Plans **[Document Reference 2.9 Revision 2]** and on the indicative Operational Layout Plans **[CR1-018 and CR1-019]**.

BESS Locations

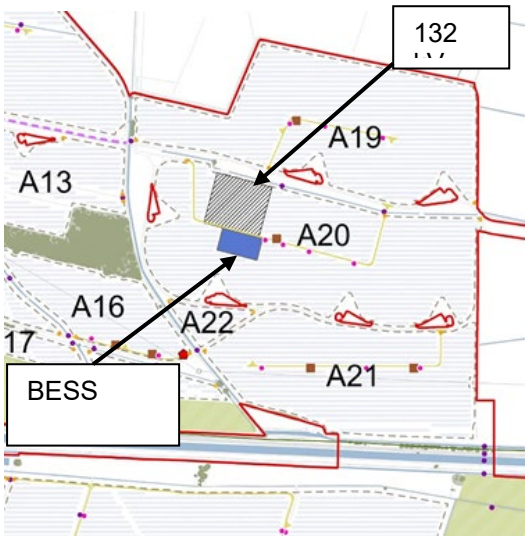
4.3 There are 4 No BESS compound areas located mostly on land of non-BMV (i.e. poorer) quality. As set out in section 15.5.22 of the ES Chapter 15 **[Document Reference 6.2.15 Revision 2]**, each BESS is estimated to require an area of approximately 2.5 ha. These areas are now mapped on the Scheme Layout and Agricultural Layout Plan [**REP2-061**]. For ease of reference a copy of this is at **Attachment A**.

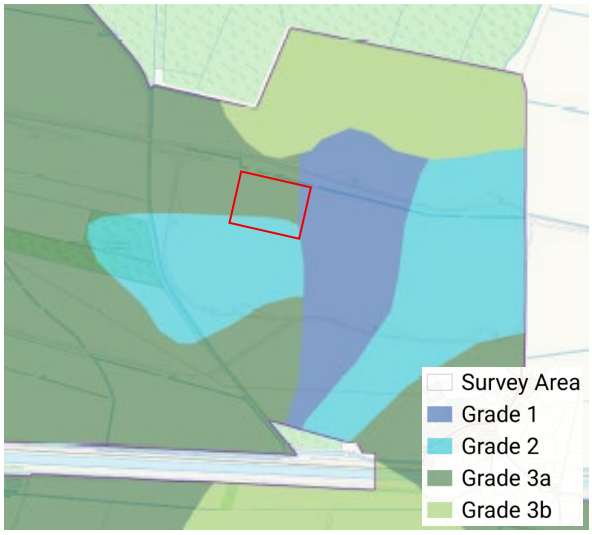
4.4 3 No of the 4 No BESS areas have been located on land of subgrade 3b “moderate” quality. These are shown on the Scheme Layout and ALC Plan [**REP2-061**] reproduced in **Appendix A**. Collectively these account for 7.5 ha of subgrade 3b in Table 2.

4.5 As described in Paragraph 15.5.26 of the ES Chapter 15 **[Document Reference 6.2.15 Revision 2]** one BESS is located in an area (field A20) with a complex mix of three grades, all of BMV quality. For the measurement in Table 2 the 2.5 ha was estimated to be a mix of Grades 1, 2 and 3a in Table 2, because ALC boundaries are always estimates rather than exact and this was a cautious worst-case approach. The location of this BESS is shown below in Insert 3. In this area of the Order Limits, all the nearby land is also BMV, and accordingly in this case BMV land could not be avoided. The provision of

a substation and BESS in this part of the Site is required to meet the operational design of the Scheme, whereby substations are distributed at intervals to efficiently serve the surrounding PV arrays. This arrangement minimises cable runs and associated transmission losses and is therefore necessary for the effective operation of the Scheme. The BESS has been sited adjacent to existing access tracks to minimise additional land disturbance. Alternative siting to the north, within an area of Subgrade 3b land adjacent to a designated ecological site, was considered; however, this raised potential operational and environmental constraints. In particular, the proximity to the ecological designation introduces sensitivities (including potential noise effects), and would also not align optimally with the required spatial distribution of substations across the Scheme.

Insert 3: BESS Location and ALC (location indicated on ALC)



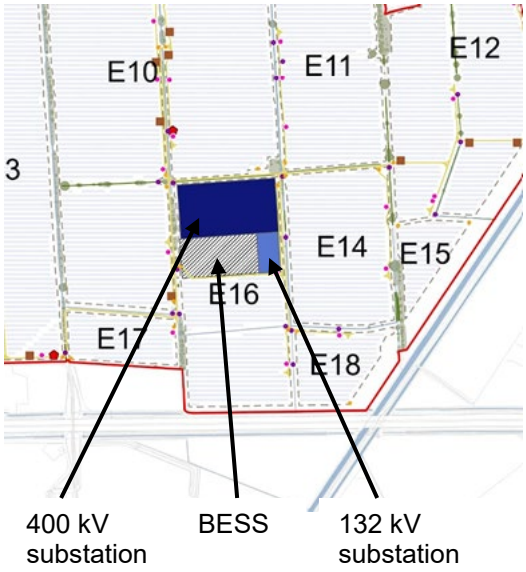


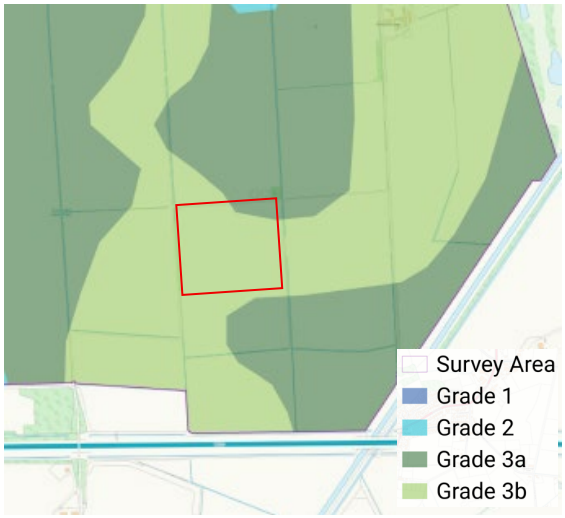
4.6 Therefore three of the four BESS areas were sited to avoid BMV. One could not be located away from BMV land.

400kVSubstation Location

4.7 The 400kV substation is located in the corner of field E16. The substation and fixed equipment linked to this 400kV substation occupy a broadly square part of the northern edge of the field, which is a mostly Subgrade 3b field. The location aligns with the existing field boundaries, including a track on the northern boundary, and minimises the use of land of BMV quality.

Insert 4 Substation and ALC (location indicated on ALC)





4.8 This area in Field E16 is shown, looking southwest, in the photograph below (Photo 1).

Photo 1: Looking at Substation Area

132kV Substation Locations

4.9 There are 7No. 132kV substations across the Scheme, each requiring approximately 0.6 to 0.7 ha of land. 5No. are located on Subgrade 3b land, with only 2No. partially located on land of BMV quality.

4.10 The 5No. 132 kV substations located partially on Subgrade 3b land are in fields A9, C6, D5, D14 and E16. The 2No. located on BMV land are in fields A20 and E1.

4.11 The substation in field A20 adjoins the BESS and is shown on Insert 3 above. Land on all sides of the BESS is BMV, so BMV could not be avoided. The substation has been located here to avoid flood risk area 3b and be furthest from residential buildings. The BESS is required to be located adjacent to the substation in order to minimise losses in transmission of electricity between the BESS and the substation.

4.12 The substation in E1 is shown below in Insert 5. Whilst this is on Subgrade 3a land, as shown the Subgrade 3a is a narrow band of land within a wider Subgrade 3b mix. There is access at this point. The substation is required here to benefit from existing and proposed screening. All substations are spread at intervals across the Scheme to serve solar panel PV areas feeding into them, that is that each generally serves a wider area of panels and need to be spaced as such to provide the most efficient cabling design. If substations were placed closer together, greater lengths of cable (and subsequent cabling losses) would be required from panel areas to reach the substation.

Insert 5: 132kV Substation and ALC (location indicated on ALC)

4.13 This area of field E1 is shown, looking east, in the photograph below (photo 2). The distinction between subgrades 3a and 3b is not discernible in land use or crop growth. The substation involves a corner of a field, with a road to the immediate north, minimising the area affected.

Photo 2: Looking East Over E1

Conclusions

4.14 Therefore in the site design process locating the larger items of equipment such as BESS, 400kv and 132kv substations, consideration was given to avoiding BMV land and this was mostly achieved:

- 3 of the 4 BESS areas are on non-BMV land;
- the 400 kV substation is mostly on non-BMV land;
- 5 of the 7 132 kV substation are on non-BMV land.

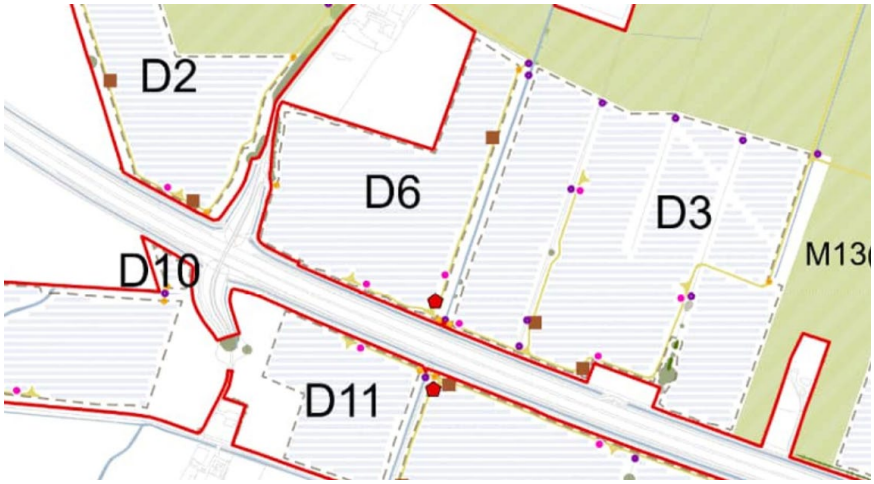
5 TRACKS AND SMALLER EQUIPMENT

5.1 ES Chapter 15 **[Document Reference 6.2.15 Revision 2]** paragraphs 15.5.10 to 15.5.18 address the construction of access tracks and the smaller items of fixed equipment such as inverters.

Access tracks

5.2 Access tracks around the Site are required for servicing the solar farm. Tracks, as shown on the example insert 6 below as thin yellow lines, largely follow close to or along field edges, in generally straight lines, responding to the layout of the panels but also the existing pattern of field shapes.

Insert 6: Example Details of Proposed Tracks



5.3 BMV land boundaries do not align with filed boundaries in most cases. Tracks generally follow field edges. Given the complex pattern of the land quality distribution around the Site it would not be possible to design a solar and BESS scheme, so that tracks avoid land of BMV quality. Indeed, the current agricultural activities have not defined their field boundaries based on the ALC of the land. Therefore the new access tracks were located for operational requirements rather than designed to avoid BMV land. Access tracks are required to go around solar PV areas and, in some cases, to ensure access can be gained to other site infrastructure such as substations. They are designed to stay within panel areas and make most efficient use of the land with a field containing solar PV. They become a part of the land required and cannot be separated from the solar PV area. As set out in Table 15-9 of the ES Chapter 15 **[Document Reference 6.2.15 Revision 2]**, the tracks involve a total of 9.1 ha of BMV, which is 38% of the total area required for tracks.

5.4 The results from Table 15-9 are repeated below.

Table 2: Areas for Tracks by ALC Grade (to nearest 0.1 ha)

Item	**ALC Grade (area in ha)**				
	1	**2**	**3a**	**3b**	**Total**
Tracks	0.4	2.0	6.7	14.8	23.9

5.5 The ES assesses a worst-case scenario that some or all of these tracks may be left for agricultural use if the landowners request them to be left (see ES Chapter 15 paragraph 15.5.12).

Inverters

5.6 There are 210 No. small inverters shown on the Indicative Layout, and the collective amount of BMV land involved is less than 0.4 ha. Inverters need to be located around the Site and are placed adjacent to access tracks. The amount of BMV land involved is negligible, and micro-siting to avoid BMV is not feasible given the requirement to use land to place solar PV panels in whole fields as well as supporting infrastructure. These areas will be fully restored on decommissioning.

6 CONSTRUCTION COMPOUNDS

6.1 The effect of construction compounds is considered in the ES Chapter 15 at 15.5.8 and 15.5.9 **[Document Reference 6.2.15 Revision 2]**.

6.2 A plan showing the location of the main construction compounds and satellite compounds was provided as [**APP-133**]. This identifies the location of the 20 main compounds and 11 satellite compounds. In terms of locations within the Site, these are recorded in the table below.

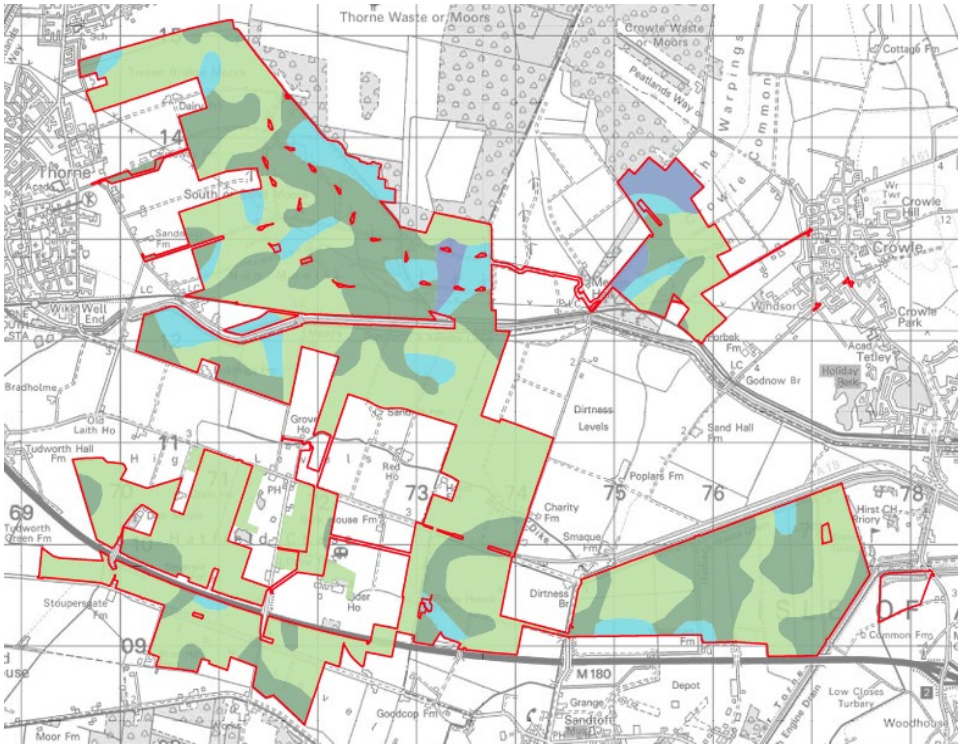
Table 3: Number of Construction Compounds on BMV Land

	BMV	**Non-BMV**
Main compound	7	13
Satellite compound	5	6

6.3 Construction compounds are short-term and fully reversible works. As set out in the Outline Soil Management Plan (OSMP) **[REP2-078]** temporary access and construction compound areas are fully reversible.

6.4 Where construction compounds are located on or partially on land of BMV quality, that land quality will not be adversely affected following restoration at the end of the construction phase. The land quality map and location of the construction compounds are shown below.

Insert 7: ALC Distribution



Insert 8: Construction Compound Locations

6.5 Following construction these areas will be restored to the same agricultural quality as existed pre-construction and then will be used for the solar PV arrays, as shown on the layout plans [**REP2-064**] [**REP2-065**].

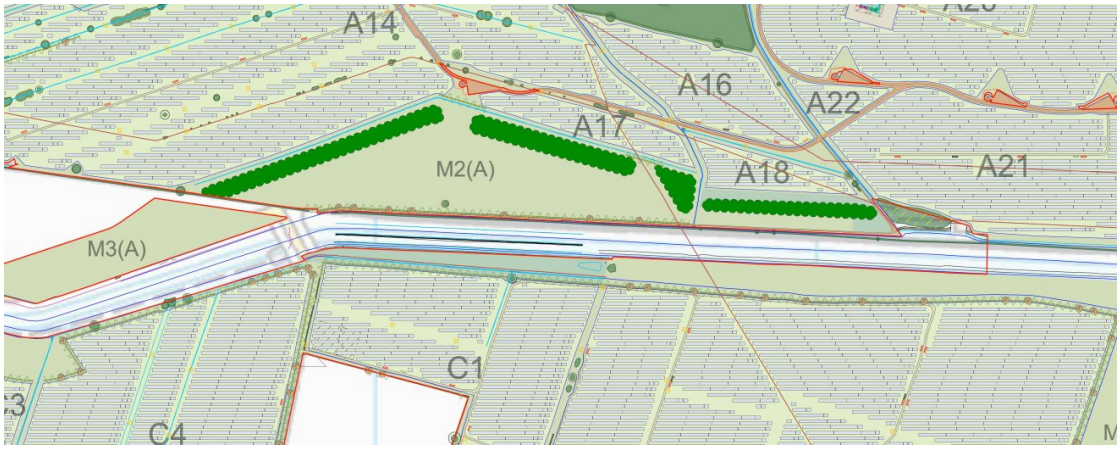
7 WOODLAND PLANTING

7.1 Proposals for environmental enhancement do not generally involve the disturbance of soil. They do not therefore involve the loss or downgrading of agricultural land quality due to sealing-over or the irreversible downgrading of land.

7.2 Tree planting proposals are explained and shown on the Landscape and Visual Mitigation Strategy [**Document Reference 6.4.6.4 Revision 4**]. This section records tree planting proposals against ALC areas.

7.3 The woodland planting in Parcel A mostly follows the edge of the field, minimising the area affected and minimising disruption to future farming activities as shown below in Insert 9. This is on an area of Subgrades 3a and 3b land, as shown on Insert 10, and is shown in Photograph 3 looking north east from the location identified on Insert 10. This planting is required for additional/enhanced visual mitigation, principally for users of the canal corridor in this section.

Insert 9: Woodland Planting and ALC



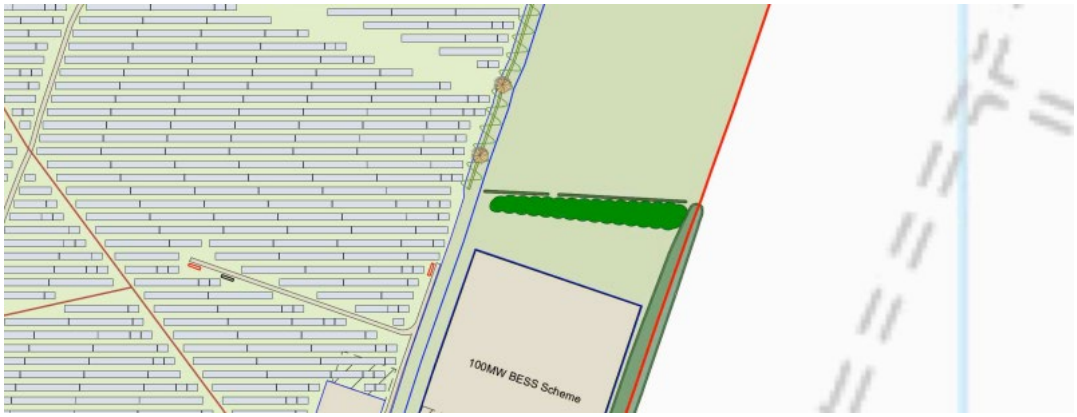
Insert 10: ALC Results

Photo 3: Looking NE

7.4 No tree planting is Proposed in Parcel B.

7.5 The small area of woodland planting in Parcel C, to provide screening to the 100MW BESS Scheme is on Subgrade 3b land, along a field edge, just north of the Proposed BESS is shown in Insert 11.

Insert 11: Woodland Planting Parcel C

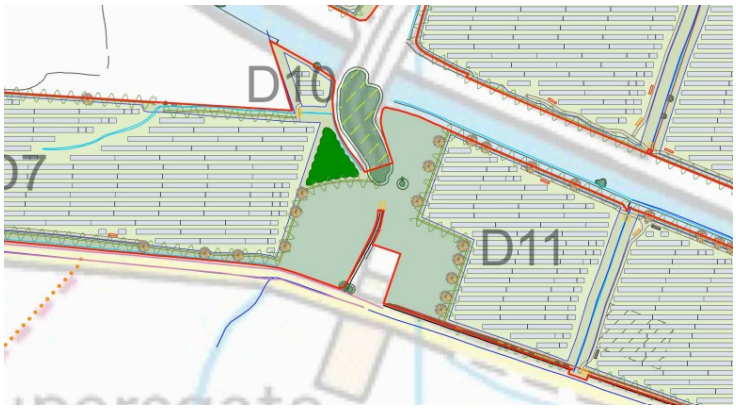


7.6 A small strip on Subgrade 3a, at the very west of Field C9, is also proposed to provide visual screening to the properties to the east of Jaque's Bank as shown in Insert 12.

Insert 12: Woodland Planting Parcel C

7.7 The woodland planting proposed in Parcel D is to provide additional connective cover for local deer, is a small corner of a field, on Subgrade 3b, next to the overbridge to the motorway, as shown below in Insert 12.

Insert 13: Woodland Planting Parcel D



7.8 The woodland planting in Parcel E is at the edge of E19 and E20, is to provide additional visual screening to the south west of the drive to the adjacent property. The woodland in E20 is on land of ALC Grade 2. It is proposed alongside an existing track and complements trees on the other side of the track, as compared below and the area of BMV land involved is 0.3 ha.

Insert 14: Planting Proposed and Aerial View, Parcel E

7.9 An estimate of the areas of tree planting by ALC grade are as follows.

Table 4: ALC for Woodland Planting

ALC Grade	2	3a	3b	Total (ha)
Parcel A	0	3.5	2.2	5.7
Parcel B	0	0	0	0
Parcel C	0	0.5	0.4	0.9
Parcel D	0	0	0.3	0.3
Parcel E	0.3	0	0.2	0.5
Total (ha)	**0.3**	**4.0**	**3.1**	**7.4**

Conclusions

7.10 Woodland planting does not affect the soil resource, but it changes the use of land. The locations for woodland planting were selected principally for landscape and visual reasons, largely to provide additional visual screening, and in the small number of locations where land was BMV, the planting generally follows field edges thus minimising effects for future agricultural use after decommissioning.

8 SUMMARY AND CONCLUSIONS

8.1 Agricultural land quality across the Site was identified early in the design process, and the results informed the layout and design. Where possible, BMV agricultural land was avoided for works which might disturb quality, or its disturbance was minimised by design.

8.2 It was not possible to avoid areas of BMV for all aspects involving disturbance to the soil.

8.3 Some BMV land is, of necessity, impacted, for the reasons explained in this report.

8.4 As set out in the Chapter 15 of the ES **[Document Reference 6.2.15 Revision 2]**, as the Scheme is temporary in nature this is mostly to be restored fully to agriculture upon decommissioning. Therefore, there will be limited permanent loss of land of BMV

8.5 Soil management measures are set out in the outline Soil Management Plan [**REP2-078**].

Attachment A

Copy of [REP 2-061]

LEGEND

- Order Limits

Existing Features

- Public Rights of Way
- Powerlines and Pylons

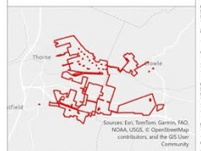
Scheme

- Access Points
- Crossing Points
- Inverters
- Switchgears
- Spares Containers
- Internal Access Tracks
- 400kV Substation
- 132kV Substation
- BESS
- Permissive Path
- Fencing
- Fixed Solar PV Modules
- A1 Field Reference

ALC Grade

- Grade 1
- Grade 2
- Grade 3a
- Grade 3b

Notes:
1. The drawing is for illustrative purposes only
2. The location of the features shown are indicative only to show the key features of Tween Bridge Solar Farm for which development is sought
3. The indicative layout demonstrates one way that the Scheme could be undertaken within the parameters of the DCO, consent is not being sought for this layout.



Tween Bridge Solar Farm

Figure name: 15.3 Scheme Layout and Agricultural Land Classification Plan

0 125 250 500 Metres

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

Scale: 1:10,000 | Paper Size: A0 | Sheet: 1 of 1

RWE

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Greenacres Barn, Stoke Common Lane, Purton Stoke, Swindon, Wiltshire SN5 4LL
Telephone: 01793 771333 • Email: info@kernon.co.uk • Website: www.kernon.co.uk