Tween Bridge Solar Farm

Environmental Statement
Chapter 15: Agricultural Circumstances

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

APFP Regulation 5(2)(a)

Document Reference: 6.2.15

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Revision 1

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15. Agricultural Circumstances

15.1. Introduction

15.1.1. The Scheme involves the construction, operation, maintenance and decommissioning of a ground-mounted solar farm together with the Battery Energy Storage System (BESS) and the on-site RWE 400kV substation (the Scheme). The majority of the Scheme will take place on or under agricultural land. The Scheme is described in **ES Chapter 2 Scheme Description [Document Reference 6.1.2]**.

15.1.2. This chapter of the ES assesses the likely significant effects of the Scheme on agricultural assets. In particular this chapter considers the effects on agricultural land, as measured through the Agricultural Land Classification (ALC), and the likely significant effects on soils as a resource. The chapter considers the likely significant effects of the Scheme on farm economics and on the products they provide in terms of food, non-food and environmental benefits.

15.1.3. The assessment has been carried out by Kernon Countryside Consultants Ltd. The assessment draws on soil and agricultural land quality information provided by Amet Property Ltd.

15.1.4. This Chapter is supported by the following Figures:

- **ES Figure 15.1: Agricultural Land Classification results** [**Document Reference 6.4.15.1**]; and
- **ES Figure 15.2: Landownership Plan** [**Document Reference 6.4.15.2**].

15.1.5. The following Appendices are related to this Chapter:

- **Appendix 15.1: Agricultural Land Classification Report** [**Document Reference 6.3.15.1**]; and
- **Appendix 15.2: Farm Reports** [**Document Reference 6.3.15.2**].

15.1.6. Inserts and photographs are embedded in the chapter unless otherwise referenced. Reference is also made to the **outline Soil Management Plan (outline SMP [Document Reference 7.9.8])**.

15.2. Consultation

15.2.1. A summary of consultation responses received to the Scoping Report which are pertinent to consideration of agricultural circumstances is provided in **Table 15-1**.

Table 15-1 Summary of Consultation to the Scoping Report

CONSULTEE	SUMMARY OF CONSULTEE RESPONSE	HOW RESPONSE HAS BEEN ADDRESSED BY APPLICANT
Planning Inspectorate (13 March 2023)	Whilst the impacts may be reversible on decommissioning, the anticipated 45-year lifespan represents a long-term impact which should be reflected in the assessment.	The operational effects on agricultural land quality, soil and the outputs from the use of agricultural land for the duration of the Scheme are assessed as set out in **Section 15.5**.
Planning Inspectorate (13 March 2023)	The assessment should provide evidence that ALC grades do not decline during the operation phase of the Scheme.	The potential effects on soils and land quality are set out in the assessment in **Section 15.5**. Measures for soil management are set out in the **outline SMP** [**Document Reference 7.9.8**].
Planning Inspectorate (13 March 2023)	The ES assessment should reference the Defra Construction Code of Practice and the BSSS Guidance Note on benefitting from Soil Management in Construction.	These documents and other guidance and advice are referenced in the **outline SMP [Document Reference 7.9.8]**.
City of Doncaster Council (28 February 2023)	An assessment of the potential for soil compaction and effects on peat should be included.	These effects are considered in this chapter in **Sections 15.5 to 15.7**, and principles to avoid these effects are set out in the **outline SMP [Document Reference 7.9.8]**. The ALC Report at **Appendix 15.1**

CONSULTEE	SUMMARY OF CONSULTEE RESPONSE	HOW RESPONSE HAS BEEN ADDRESSED BY APPLICANT
		[**Document Reference 6.3.15.1**] did not identify peaty soils at agricultural depth.
Natural England (1 March 2023)	The extent to which soils would be disturbed, and any effects on agricultural land quality, should be considered.	These effects are considered in this chapter at **Sections 15.5 to 15.7.**

15.2.2. A summary of responses to the Preliminary Environmental Information Report as part of statutory consultation is provided in **Table 15-2**.

Table 15-2 Summary of Consultation Responses to the PEIR

CONSULTEE	SUMMARY OF CONSULTEE RESPONSE	HOW RESPONSE HAS BEEN ADDRESSED BY APPLICANT
City of Doncaster Council	All possible opportunities to limit the extent of Best and Most Versatile (BMV) land being utilised by the Scheme should be given, as such land has economic value.	The extent of BMV land within the Order Limits is assessed, as set out in **Section 15.4**. The economic and land use implications are considered in **Sections 15.5 to 15.7**.
North Lincolnshire Council	The loss of the use of BMV land will need to be robustly considered in the planning balance.	The extent to which land is lost, or used (but not lost) is assessed in **Sections 15.5 to 15.7**.
Thorne and Hatfield Moors Conservation Forum	Recent seasons have seen a lot of water standing within the Order Limits. The areas could be managed in such a way as to deliver a lagg fen or paludiculture regime providing benefits.	The comments are noted. The benefits to soils are described in **Section 15.6**. The potential for paludiculture has not, however, been considered. Land management for the operational phase is considered in **Section 15.6.**

Natural England	Soil will need to be handled according to best practice and reinstated to a high standard to avoid adverse impacts. An appropriate level of ALC survey results will be required to inform the assessment.	The ALC survey has been carried out at a mixture of detailed and semi-detailed levels. The justification for the level of survey is set out in **Section 15.4**. The handling of soils are set out in the **outline SMP** [**Document Reference 7.9.8**].
Natural England	A detailed breakdown of land affected permanently or temporarily by ALC grade should be provided.	A detailed breakdown is provided in **Section 15.4**.
Natural England	Justification to how 'restorable' works such as tracks, substations etc can be restored needs to be provided.	The reversibility of works is considered in **Sections 15.5 to 15.7** and in the **outline SMP [Document Reference 7.9.8]**.
Natural England	A detailed assessment of potentially peaty soils is required.	**Appendix 15.1 ALC Report [Document Reference 6.3.15.1]** did not identify peaty soils at agricultural depth.
Natural England	The outline Soil Management Plan should contain outline details of site monitoring during the operational phase, soil handling and storage, and decommissioning. Natural England note that cables buried deeper than 900mm can be left in situ on decommissioning.	The details are provided in section 7 of the **outline SMP [Document Reference 7.9.8].**

15.3. Assessment Approach

Methodology

15.3.1. The methodology follows that set out in the Scoping Report (**ES Appendix 1.2 Applicant's EIA Scoping report [Document Reference 6.3.1.2]**), but has been

modified in part in response to comments made in the consultation responses. The key receptors considered in this chapter are:

- Agricultural land;
- Soils;
- Agricultural and land-based rural businesses.

Agricultural Land

15.3.2. Agricultural land quality is measured by the ALC system. This methodology was devised by the Ministry of Agriculture, Fisheries and Food (MAFF) in the 1970s. It is described in Natural England's Technical Information Note TIN049 **[Ref 15-1]**. The classification considers the long-term physical limitations of land for agricultural use, especially the climate, site and soil characteristics, and the important interactions between them. The methodology was last revised by MAFF in 1988 **[Ref 15-2**].

15.3.3. To determine land quality, it is necessary for a competent soil surveyor to examine soils using a soil auger sampling on a regular grid (thereby eliminating potential bias in sampling) down to, where possible, 1.2m depth. Periodically pits should be dug to better describe soil profiles and to enable measurement of stoniness.

15.3.4. A mix of detailed (regular 100m grid) and semi-detailed (regular 200m grid) ALC survey has been completed. Field survey was undertaken between May 2023 and June 2025. In total 1,848 hectares (ha) of agricultural land has been classified across Parcels A to E and the cable routes between them, and is reported in this chapter.

15.3.5. The sampling records the soil type and texture, colour, the depth of any slowly permeable layer and the presence of mottles and their colour, stoniness, the depth of soil horizons etc. Each sample point is then assessed against the climatic variables for the area and an ALC grade is then determined. These are plotted and a soil surveyor then uses professional judgement to estimate the distribution and patterns of ALC by grade, plotting this on a plan and then measuring the areas.

15.3.6. Across most of the Order Limits surveys have been undertaken on a regular 200m grid (one auger per 4ha). For the areas where there will be solar PV modules and mounting structures, access tracks, temporary construction

compounds and cabling, plus small on-site supporting equipment items, this provides baseline ALC data in areas where there is minimal disturbance to soils and therefore minimal potential to adversely affect land quality. In areas proposed for RWE on-site substation and the four separate BESS areas where soil movement is required and accordingly there is the potential to affect land quality, additional auger sampling has been undertaken to a detailed (100m regular grid) level. No field survey has been carried out in the mitigation area at the eastern edge of Parcel E because that area will remain farmed, with no disturbance to the land or land quality.

15.3.7. The ALC has been completed in accord with the ALC Guidelines **[Ref 15-2]**. The ALC is reported in **Appendix 15.1 ALC Report** [**Document Reference 6.3.15.1**].

Soils

15.3.8. Soil type is recorded as part of the ALC at each auger sample point, including soil texture, depth, stoniness etc. The soil information has been used to inform the appropriate assessment of potential impacts. Clayey soils are most susceptible to structural damage if handled when wet or saturated because of their small particle size, whereas sandy soils are generally more resilient to being worked.

15.3.9. The soil survey has identified the soil type, texture, characteristics, depth etc and this has been used to inform the **outline SMP [Document Reference 7.9.8]**. The oSMP sets out the principles of soil assessment, to determine whether soils are suitable for being handled. It sets out the principles of handling soils for the construction and decommissioning works. This will be used as the basis for a SMP to be prepared post-consent at detailed design stage, which is secured via DCO Requirement. As such good soil management is considered as embedded mitigation.

Farm and Economic Impacts

15.3.10. The effects on farm businesses and on the wider land-based rural economy have been assessed based on information gathered from discussions with landowners and occupiers, and from observations made walking the farmland within Parcels A to E.

15.3.11. The potential significant effects on each farm have been reported in summary form, and are set out at **Appendix 15.2 Farm Reports** [**Document Reference 6.4.15.2**]. The factual information used in these reports has come from

interviews with landowners and their representatives and the information collected has been checked and validated where possible.

15.3.12. Farming enterprises are prone to change. Farming enterprises are businesses, run by people, and must adapt to changes caused by weather, commodity prices, labour availability, personal choice, diseases or Government incentives or regulations. Changes can be rapid, such as the changes in input and commodity prices following the invasion of Ukraine. The assessment of farm impacts has endeavoured to take a longer-term view of the type of farming operation likely to be operated, rather than a detailed snapshot at the time of assessment.

15.3.13. The assessment reviews long-term cropping and stocking, and the types of produce grown or livestock reared. It reviews direct and indirect labour and assesses the effects on farming enterprises and related economic implications.

15.3.14. The assessment also considers the wider effects of the Scheme on the rural economy, including on food production, evaluating the effects on a District, County and national basis.

Assessment of Significance

15.3.15. The significance of effects is based on a combination of the magnitude of a particular impact and the sensitivity of the receptor to change. Accordingly a high magnitude impact on a receptor that is of low sensitivity may not be significant in Environmental Impact Assessment (EIA) terms, whereas a medium magnitude impact on a receptor that is of high sensitivity may be significant.

15.3.16. The methodology used in this assessment follows that set out in the Scoping Report. The methodology results in any loss of 20ha or more of BMV being identified as a major adverse effect, and accordingly significant in EIA terms. Any loss of between 5 and 20ha of BMV land is a medium magnitude impact resulting in a moderate adverse effect, which is significant in EIA terms.

15.3.17. Whilst the loss of 5 ha or more of BMV land is therefore identified as significant in EIA terms, the loss of BMV should be considered in context. Land of BMV quality is not rare. Such land, as set out in Natural England's TIN049 **[Ref 15-1]** accounts for an estimated 42% of agricultural land in England. The Utilised Agricultural Area of England in 2024 was 8.7 million hectares **[Ref 15-3]**, such that about 3.7 million ha of BMV land is currently utilised for agricultural use. As is examined in this Chapter, land of BMV quality is not a rare resource locally.

15.3.18. Policy places no constraint on the use of land of poorer quality. For this assessment, following the IEMA Guide **[Ref 15-4]**, Subgrade 3b "moderate quality" land is considered to be of medium sensitivity, and land of Grades 4 "poor" and 5 "very poor" are considered to be of low sensitivity.

15.3.19. The IEMA Guide **[Ref 15-4]** provides an assessment of the sensitivity of soils to being damaged by physical works. The sensitivity is based on soil type in different climatic regions, for example, high clay soils where the Field Capacity Days (FCD) exceeds 150 being categorised as high sensitivity.

15.3.20. As set out in the **Appendix 15.1 ALC Report** [**Document Reference 6.3.5.1**], the FCD for the purposes of ALC across the Order Limits is all below 126 days per year. These are the days when soils are replete with water, i.e. saturated. Under the IEMA Guide no soils in this climatic area are therefore of high sensitivity, so that no soil within the Order Limits is of higher than medium sensitivity.

15.3.21. The IEMA Guide does not provide sensitivity definitions for farm businesses, although effects are described in paragraph 8.3.3 of the IEMA Guide. The criteria in **Tables 15-3** to **15-4** are based on professional judgement. The methodology considers farm businesses to be generally resilient to change. Farm businesses are continually adapting to changes, such as from weather, commodity prices, availability of labour, Government requirements and incentives. Consequently farm businesses are of no higher than medium sensitivity.

15.3.22. The sensitivity of receptors will be measured as set out in **Table 15-3**.

Table 15-3 Methodology for Determining Receptor Sensitivity

Sensitivity	ALC/biomass production	Sensitivity of topsoil and subsoil	Agricultural businesses
High	Land of ALC Grades 1, 2 and subgrade 3a	No soils are of high sensitivity in this climatic area because the FCD is <150.	No farm businesses are considered to be of high sensitivity.
Medium	Land of ALC Subgrade 3b	High clay soils where the FCD is <150, or medium textured soils where the FCD is <225.	Full-time businesses, and farm businesses where the location of land is particularly important such as dairy farms.

Sensitivity	ALC/biomass production	Sensitivity of topsoil and subsoil	Agricultural businesses
Low	Land of ALC Grades 4 and 5	Soils with a high sand fraction where the FCD is <225.	Part-time farms or farms with low sensitivity to change, e.g. arable land or land held on short-term arrangements.
Negligible	Land of ALC Grades 4 and 5 with only indirect links	No soils are of negligible sensitivity.	Agricultural land that is not farmed or does not form part of a farm business.

*Field Capacity Days: Days When the Soil is Replete with Water

15.3.23. National policy (National Policy Statement EN-3) **[Ref 15-5]** advises that while land type should not be a predominating factor, land of lower ALC grade (non-BMV) should be preferred where possible. The temporary change of use of BMV land to solar development does have implications on the ability to farm the land for arable uses. The works are temporary and are completely reversible with restoration of land at decommissioning phase. Agricultural use in the form of grazing will be possible over much of the area for the duration of the operational phase. Therefore these effects are not considered to be a permanent loss of land within a wider agricultural use. While the land may be temporarily taken out of arable rotation (if it is currently in arable production) for a considerable period of time, the land quality will not deteriorate and the works are reversible. Under the IEMA Guide the impact on the land is therefore low. Solar projects typically involve minimal ground disturbance and can provide a valuable break from intensive agricultural practices associated with arable rotation.

15.3.24. This 'fallow' (resting) period allows the soil to recover from the constant cultivation, chemical inputs, and compaction associated with modern farming practices. As a result, over the course of the operational life of the Scheme (up to a maximum of 40 years) evidence would suggest that soil health indicators, e.g., organic matter content, soil nutrients, worm count, would improve under grassland, increasing its resilience and capacity for future agricultural use. This is recognised in national policy (National Policy Statement EN-3, see section 2.10.89 **[Ref 15-5]**) which notes that "*solar farms have the potential to increase the biodiversity value of a site, especially if the land was previously intensively*

managed. In some instances this can result in significant benefits and enhancements….".

15.3.25. The magnitude of impacts on agricultural land and soils will be assessed as per the methodology set out in **Table 15-4**. The determination of "loss" will draw on the definition in the IEMA Guide **[Ref 15-4]**. This defines "loss" for assessing magnitude as "*permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading)*". It identifies that "*temporary developments can result in a permanent impact if resulting disturbance or land use change causes permanent damage to soils*". As noted in **Table 15-4**, IEMA define "*temporary, reversible loss of soil related features*" as a Low magnitude of impact.

15.3.26. The IEMA Guide does not provide magnitude definitions for farm businesses, so professional judgement has been applied. The methodology in **Table 15-4** sets out that only farms that will be terminated are considered to experience a major adverse impact, with most changes either moderate or minor. There can be benefits for farms as a consequence of the proposals, so impacts can be both adverse and beneficial.

Table 15-4 Methodology for Determining Magnitude of Change

Magnitude of Impact	Definition	
	Effects on Agricultural Land (Soils)	Effects on Farm Businesses (agricultural businesses)
High	The Scheme would directly lead to the loss (including permanent sealing or land quality downgrading) of over 20 ha of soil-related features; or potential for improvement in one or more soil functions over an area of more than 20 ha.	The impact of development would render a full-time agricultural business non-viable, or would render a non-viable business viable.
Medium	The Scheme would directly lead to the loss (including permanent sealing or land quality downgrading) over an area of between 5 ha	The impact of the development would require significant changes in the day-to-day management of a full-time agricultural business, or closure of a part-

Magnitude of Impact	Definition	
	Effects on Agricultural Land (Soils)	Effects on Farm Businesses (agricultural businesses)
	and 20 ha of soil-related features; or potential for improvement in one or more soil functions over an area of between 5 ha and 20 ha.	time agricultural business. Loss of buildings or impacts on drainage or water supplies affecting the potential for at least 5 ha of adjacent land to be farmed fully. Significant benefits in the day-to-day operation of a farm business.
Low	The Scheme would directly lead to the loss (including permanent sealing or land quality downgrading) of less than 5 ha of soil-related functions; or potential for improvement in one or more soil functions over an area of less than 5 ha; or temporary reversible loss or improvements of soil related features.	Land take would require only minor changes in the day-to-day management / structure of a full-time agricultural business or land take would have a significant effect on a part-time business. Minor effects, direct or indirect, on surrounding land beyond the Order Limits. Minor benefits to the day-to-day operation of a farm business.
Negligible	No discernible loss or reduction or improvement of soil functions or volumes.	Land take would require only negligible changes in the day-to-day management of a full-time agricultural business or land take would require only minor changes to a part-time farm business, adverse or beneficial.

15.3.27. The assessment of the significance of effects will be determined based on the matrix in **Table 15-5**. Effects that are identified as being Major or Moderate are considered to be significant in terms of the EIA Regulations. This assessment has been informed by professional judgement.

15.3.28. Effects can be adverse or beneficial. In the assessment the impacts are considered to be of national, regional or local significance. Land of BMV quality is considered a receptor of national significance, whereas soils and farm

businesses, being more common and more resilient, are considered to be receptors of local significance.

15.3.29. Impacts can also be temporary or permanent. The IEMA Guide **[Ref 15-4]** does not distinguish between short or long term temporary effects, only between temporary and permanent effects. Accordingly all reversible impacts are described as temporary effects.

15.3.30. The assessment of significance is set out in **Table 15-5**. Those effects stated as moderate or major are significant in EIA terms.

Table 15-5 Methodology for Determining Significance

		Sensitivity of Receptor / Receiving Environment to Change / Impact			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Impact	**High**	Major	Moderate	Minor	Negligible
	Medium	Moderate	Minor	Minor	Negligible
	Low	Minor	Minor	Negligible	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Legislative and Policy Framework

Legislation

15.3.31. There is no legislation of direct relevance to the assessment.

National Policy Statements

15.3.32. **Overarching National Policy Statement for Energy** (**NPS EN-1**) **[Ref 15-6]** paragraph 5.11.3 notes that undeveloped greenfield land may need to be used for many forms of energy infrastructure. Paragraph 5.11.12 advises that the use of BMV land should be minimised, with a preference for use of poorer quality land. Paragraph 5.1.13 advises that applicants should seek to minimise impacts on soil health and promote soil quality through mitigation.

15.3.33. **The National Policy Statement for Renewable Energy Infrastructure** (**NPS EN-3**) **[Ref 15-5]** section 2.10 "Solar Photovoltaic Generation" sets out at paragraph 2.10.29 that while land type should not be a predominating factor in determining the suitability of the site's location for renewable energy development, where

the use of agricultural land has been shown to be necessary, poorer quality land should be preferred to higher quality land, avoiding BMV agricultural land where possible.

15.3.34. Further advice is provided as follows:

- Biodiversity relative to intensive agricultural use (paragraph 2.10.89): noting that solar farms have the potential to increase the biodiversity value of a site, especially if the land was previously intensively managed; and
- soil handling (paragraph 2.10.81), mitigation and soil preservation (paragraph 2.10.127): cross-referencing Defra's Construction Code of Practice for the Sustainable use of Soils (2009) **[Ref 15-7]** and advising on mitigation measures to minimise soil carbon loss and maximise soil biodiversity.

15.3.35. Paragraph 2.10.145 advises that the Secretary of State ('SoS') should take into account the economic and other benefits of BMV agricultural land. The SoS should ensure that the applicant has put forward appropriate mitigation measures to minimise the impacts on soils or soil resources.

15.3.36. The Government has announced consultation on targeted amendments to EN-1 and EN-3 (April 2025), but these do not materially alter the policy quoted above.

15.3.37. **The National Policy Statement for Electricity Networks Infrastructure** (**NPS EN-5**) **[Ref 15-8]** paragraph 2.9.25 requires a commitment to mitigate the potential effects of undergrounding works, requiring handling of soils, backfilling and return to the underlying ALC grade.

Planning Policy

15.3.38. **The National Planning Policy Framework** ('NPPF') (December 2024)**[Ref 15-9]** defines BMV land at Annex 2. The National Planning Policy Framework sets out in paragraph 187(b) that the economic and other benefits of BMV agricultural land should be recognised in planning decisions.

15.3.39. **Doncaster Council.** The Doncaster Local Plan 2015-2035 (September 2021) **[Ref 15-10]** Policy 58 on Low Carbon and Renewable Energy supports low-carbon energy generation. Criterion B) 6) requires reclamation to a suitable use such as agriculture or nature conservation.

15.3.40. Policy 60 protects soil resources. It outlines that the significant loss of BMV will only be supported where there are no alternative sites available and where possible, the land can be reinstated. Soil resources must be conserved, and high environmental soils (e.g., peats) should not normally be disturbed.

15.3.41. **North Lincolnshire Council.** The Core Strategy (June 2011) **[Ref 15-11]** does not contain any policy specific to agricultural land.

Limitations to the Assessment

15.3.42. There are no significant limitations to this assessment.

15.3.43. Field survey has provided the data for an assessment of the ALC of the Order Limits. In setting that in context, and in considering the policy framework, reference has been made to published "predictive" ALC maps and "likelihood of BMV" agricultural land maps. Those maps were not the result of extensive field survey and have limitations to their accuracy as a consequence, but they are used in this assessment in full recognition of these limitations. An explanation of the ALC system and methodology is provided in Natural England's TIN049 **[Ref 15-1]**. That area involves temporary disturbance for the installation of the cables. The works will involve only a small part of this area and soil survey can be completed at a later date once the corridor width has been defined, and can inform the final Soil Management Plan prior to construction works commencing.

15.4. Baseline Conditions

Site Description and Context

15.4.1. The Order Limits is mostly level, agricultural land in arable farming use. This is shown in the following photographs. These photographs are purely illustrative. They show land of different ALC qualities, all of which is level and where land quality differences are not discernible from visual inspection. A number of additional photographs are included in **Appendix 15.2 Farm Report [Document Reference 6.3.15.2]**.

Figure 15.1 Some of the land in the northern part of the Order Limits

Looking south over Parcel A7.

Figure 15.2 Some of the land in the central part of the Site

Looking south-west over Parcel C6.

Figure 15.3 Some of the land in the eastern part of the Site

Looking southwest over Parcel E16.

15.4.2. The level nature of the Order Limits means that in wet periods water can stand on the site, as shown below.

Figure 15.4 Water Retention in Winter

Parcel C4, looking west, December 2023

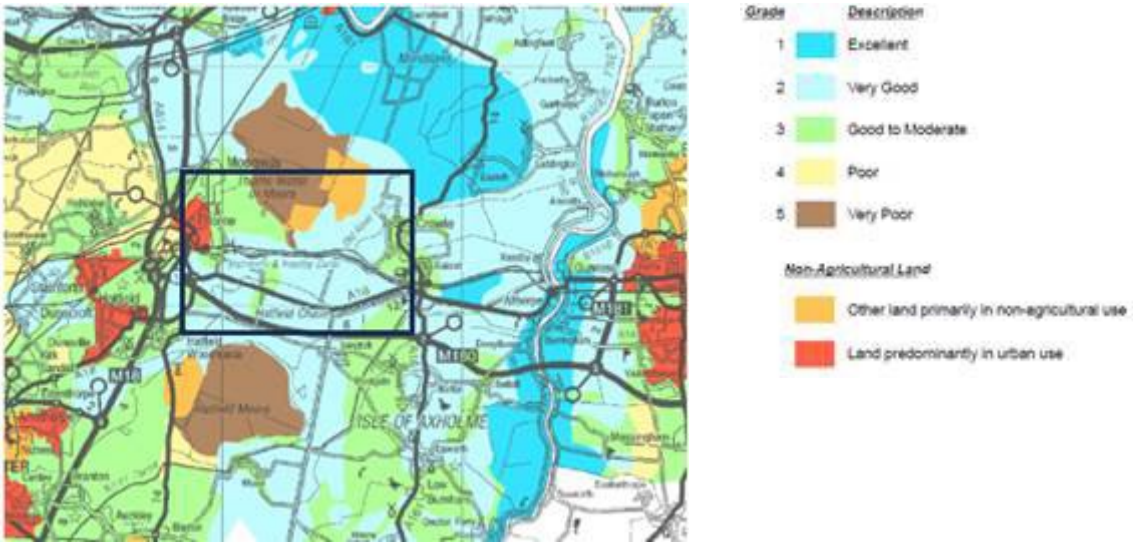
Parcel E13, looking south, December 2023

Parcels E6 and E7, looking east

15.4.3. The Order Limits is shown on the "provisional" ALC maps from the 1970s as being of Grade 2 "very good" agricultural land quality and undifferentiated Grade 3 "good to moderate" quality. As can be seen on **Figure 15.5** Extract from Provisional ALC Map, much of the wider area in the vicinity of the Order Limits

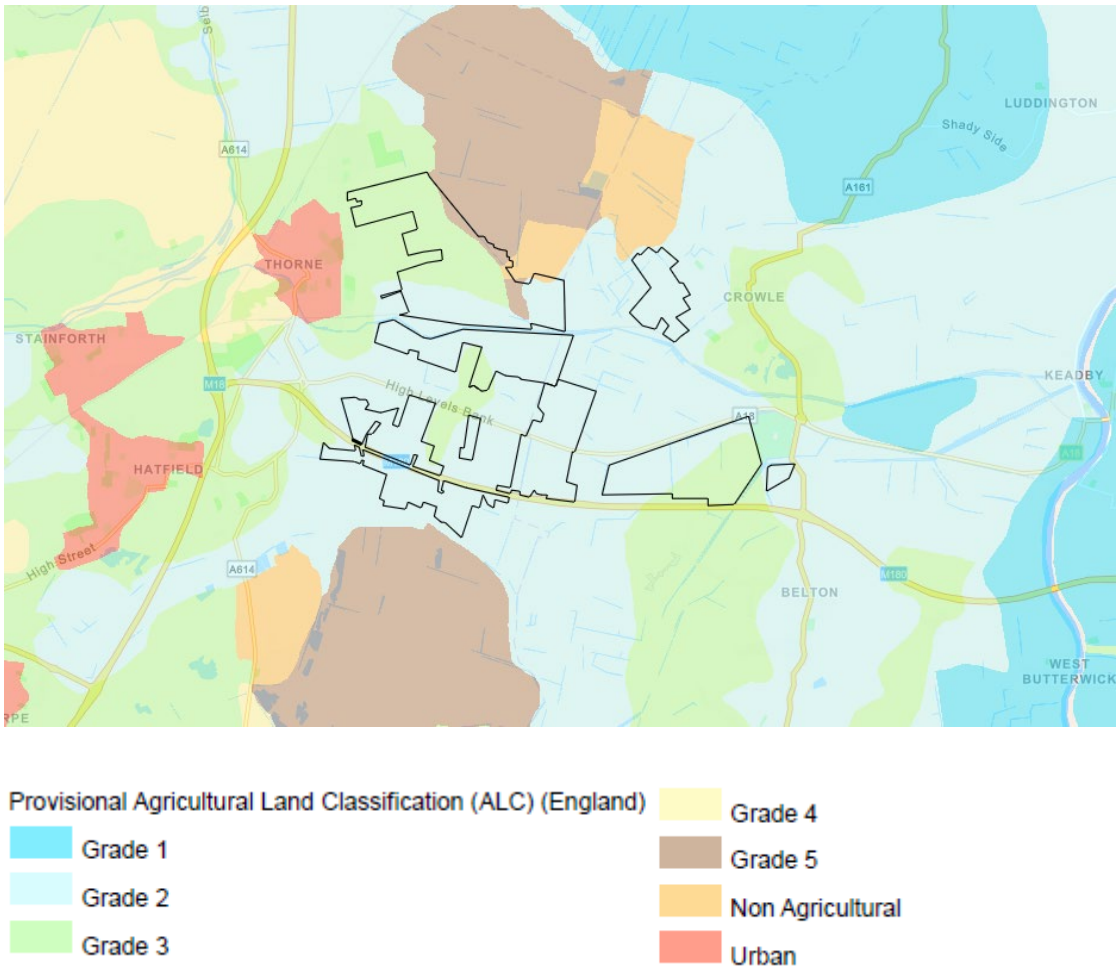
is similarly shown to be of Grade 2 agricultural land quality. The general area of the Order Limits is within the black-edged box.

Figure 15.5 Provisional ALC of the Wider Area



15.4.4. In 2020 Natural England digitised these maps. The detail for the Order Limits is shown on **Figure 15.6**. As described in Natural England's Technical Information Note 049 **[Ref 15-1]**, these maps are not suitable for use for site specific analysis, but are for strategic purposes only, having been produced at a 1:250,000 scale only. Therefore whilst these maps show the site as Grade 2 and undifferentiated Grade 3, that is not a reliable grading for land use planning decisions.

Figure 15.6 Provisional ALC of Order Limits Parcels A to E (marked approximately by the black lines)

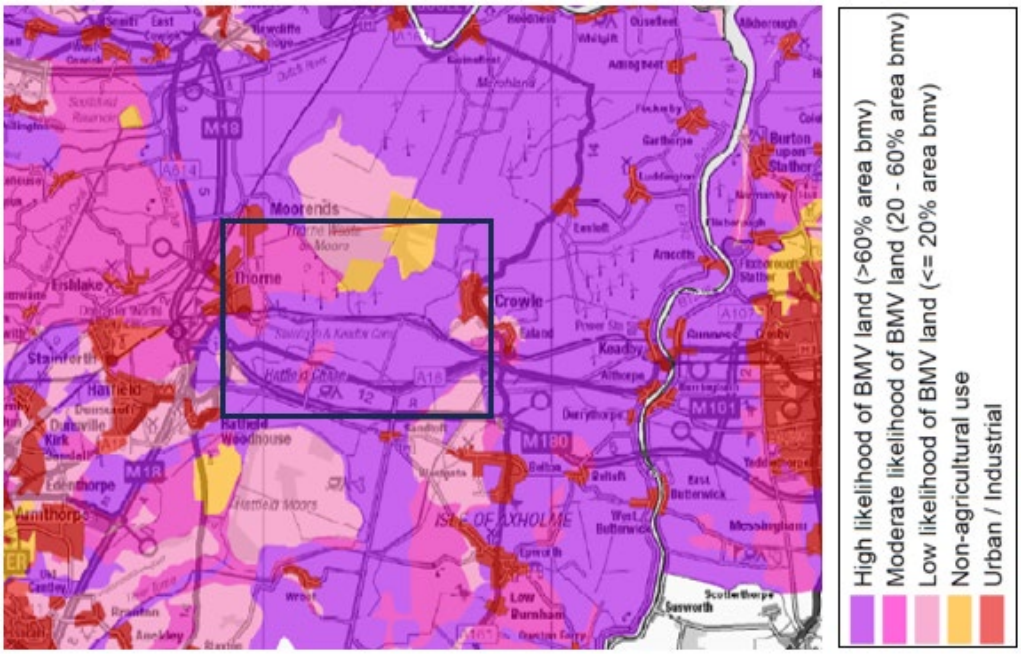


15.4.5. In 2017, Natural England published plans **[Ref 15-12]** showing the likelihood of the proportion of BMV agricultural land. These maps divide the agricultural land across England into three categories of proportions:

- High (>60% area of BMV agricultural land);
- Moderate (20 - 60% area of BMV agricultural land); and
- Low (<20% area of BMV agricultural land).

15.4.6. The Order Limits is shown as being mostly in the high likelihood of comprising BMV agricultural land, as is much of the wider area in the vicinity, as shown on **Figure 15.7**. Parts of the Order Limits, particularly the northern part, are shown as falling into the moderate likelihood of BMV. As set out in the key, the dark purple areas are >60% area BMV.

Figure 15.7 Extract from Likelihood of BMV Agricultural Land Quality Maps



15.4.7. In the absence of County or District-wide ALC surveys, which have not been undertaken anywhere in England, the only available data to estimate the proportion and area by ALC grade is that in the provisional ALC map series from the 1970s. Natural England estimate that 42% of agricultural land in England is BMV, of which 21% is Grades 1 and 2, under the current ALC methodology. Statistically, therefore, there is a need to increase the proportion of land in Grades 1 and 2 on the provisional ALC maps by 9% to match this estimate, and apply a multiplier of 38% to the undifferentiated Grade 3.

15.4.8. The estimate of land by ALC Grade in England, North Lincolnshire and Doncaster District is provided in **Table 15-6**. In respect of the baseline data for the two local planning authority areas, they both contain an above-average proportion of BMV, as estimated from the 1:250,000 series provisional maps. The Utilised Agricultural Area in England at 1 June 2024 was 8.7 million hectares **[Ref 15-13]** and 42% of that means almost 3.7 million hectares of BMV agricultural land in active agricultural use.

Table 15-6 Estimate of Land by ALC Grade

ALC Grade	England		North Lincolnshire		Doncaster District	
	Ha	%	Ha	%	Ha	%
1 Excellent	354,562	3.1	8,249	10.6	0	0
2 Very good	1,848,874	16.2	37,177	47.6	15,710	32.8
3 Good to moderate	6,290,210	55.0	31,237	40.0	22,205	46.3
4 Poor	1,839,581	16.1	1,382	1.8	7,330	15.3
5 Very poor	1,100,305	9.6	11	0	2,700	5.6
Total	11,433,532	100.0	78,056	100.0	47,945	100.0
BMV Estimate (1)	4,802,100	42	61,400	78.6	25,600	53.4

(1) Grades 1 and 2 added together x 1.09, plus 38% of Grade 3, rounded to nearest 100 ha.

15.4.9. **Table 15-6** shows that 78.6% of North Lincolnshire is BMV on the provisional maps, and 53.4% of Doncaster District, compared to the national average of 42%.

Baseline Survey Information

Agricultural Land Quality

15.4.10. Surveys have been completed on a detailed or semi-detailed basis across the Solar PV development and the connections between Parcels A to E.

15.4.11. The Order Limits is mostly agricultural land and is generally level. Across most of the Order Limits the works involve either the installation of the Panel Areas involving the installation of ground-mounted solar PV generating stations and associated mounting structures, and on-site supporting equipment, or land used for mitigation and enhancement. **Section 15.5** describes how the works in these areas do not generally disturb soils, and as a result agricultural land quality will not be adversely affected. Accordingly for those areas a semi-detailed level of survey has been completed, which provides an appropriate level of survey information.

15.4.12. In the BESS and RWE substation areas there is a greater level of disturbance. In these areas, therefore, especially where soil may be moved, a detailed (i.e. one sample per hectare) level of ALC survey has been completed and is reported in Appendix 15.1 ALC Results [**Document Reference 6.4.15.1**].

15.4.13. No ALC survey is needed for the mitigation area in Parcel E, where the land will continue to be farmed with arable crops, but with winter stubbles and breeding bird management techniques included. There will be no change to the use or land quality of this area.

15.4.14. There are no climatic limitations to ALC grade. The FCD for the Order Limits, important for assessing the potential sensitivity of soils, is less than 126 days. The soils are generally stoneless or contain less than 5% stones. The topography is flat, and there are no micro-relief limitations.

15.4.15. The soils across the Order Limits include some sandy and loamy medium sands, and areas where soils are clayey. The ALC classification has identified soils limited by droughtiness and soils limited by wetness. The ALC of the areas surveyed is set out in the **Table 15-7**, and shown in **Figure 15.1 Agricultural Land Classification [Document Reference 6.4.15.1]**.

15.4.16. The results for Land Parcels A to E are shown on a reduced-size copy of **Figure 15.1 Agricultural Land Classification [Document Reference 6.4.15.1]**in **Figure 15.8** below, followed by the ALC results. The ALC covers a slightly larger area than the Order Limits and the results also wash over areas of wind turbine bases, farm buildings etc which are not within the Order Limits. Those extra areas are not included in the total reported in Table 15-7, which is for the Order Limits. The ALC plan also does not include the mitigation area in Parcel E which is to be used for ecological mitigation with no impact on soils or land quality, and therefore does not need to be surveyed, as explained in 15.4.13. Table 15-7 sets out the ALC results for the Order Limits. The results are rounded to the nearest whole hectare.

Figure 15.8 Reduced-size ALC Results

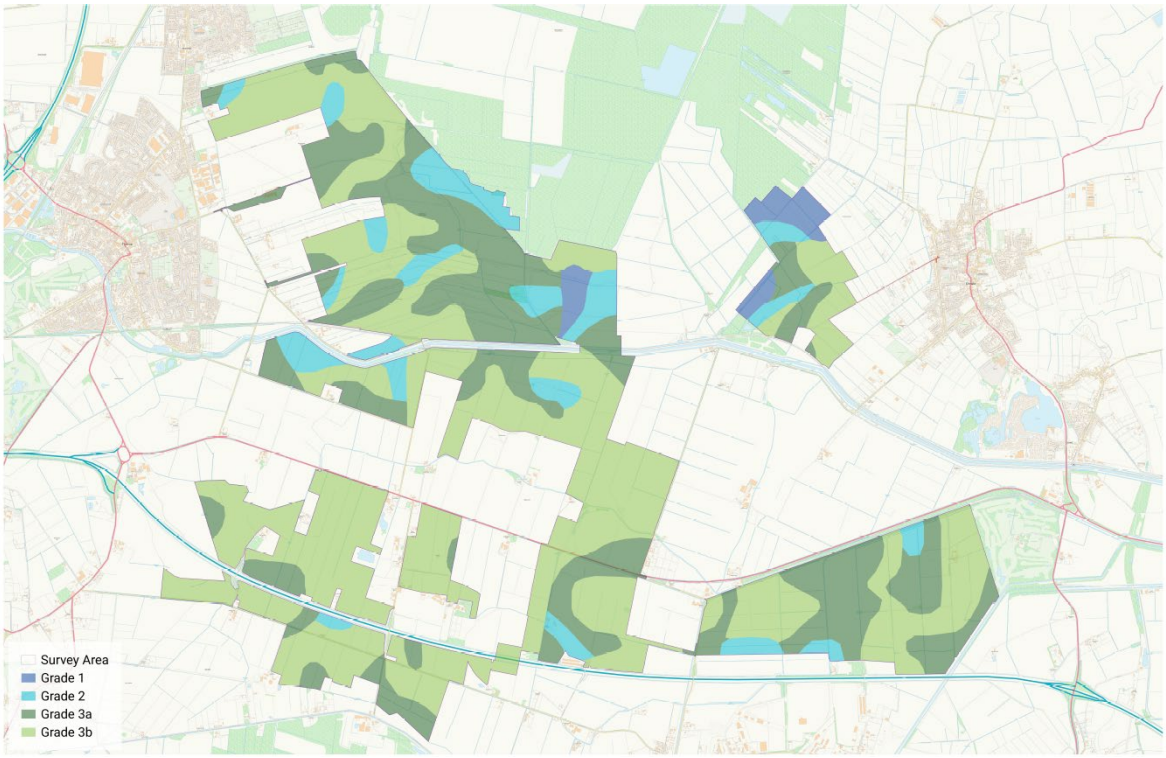


Table 15-7 ALC of Parcels A to E (incl. mitigation, not shown on plan)

Plan Colour	ALC Grade	Description	Area (ha)	Proportion (%)
	1	Excellent	48	2.6
	2	Very good	180	9.8
	3a	Good	585	32.0
	3b	Moderate	1,001	54.7
	N/A	Not affected	17	0.9
		Total	1,831	100.0

15.4.17. The ALC data is set out in **Appendix 15.1 ALC Report** [**Document Reference 6.3.15.1**].

Soils

15.4.18. The soils across the Order Limits are shown on the 1:250,000 scale Soil Survey of England and Wales map as a mix of different soils, mostly in the following six Associations:

- 532b: Romney, deep stoneless permeable calcareous coarse and fine silty soils;
- 712i: Foggathorpe 2, slowly permeable seasonally waterlogged stoneless clayey and fine loamy over clayey soils;
- 811b: Conway, deep stoneless fine silty and clayey soils variably affected by groundwater;
- 813b: Fladbury 3, stoneless, clayey, fine silty and fine loamy soils affected by groundwater;
- 821b: Blackwood, deep permeable sandy and course loamy soils; and
- 861b: Isleham 2, deep permeable sandy and peaty soils affected by groundwater.

15.4.19. The Order Limits lies within the area edged black on the plan below. The distribution of soils across the Order Limits identified by field survey generally follows this pattern. In the northern part of the Order Limits the soils are clayey and fine loamy over clayey soils, and become coarse and fine silty around the area of the canal. Soils in the northeast are sandy or fine silty or loamy in texture. There is another band of clayey and fine loamy over clayey soils, and those in the southern parts of the Order Limits are much more sandy in nature.

Figure 15.9 Extract from National Soil Map

Farm Businesses

15.4.20. There are a number of holdings farming land within Parcels A to E of the Order Limits. These are shown, purely for the purposes of easy identification, on **Figure 15.2 Landownership Plan [Document Reference 6.4.15.2]**, based on Google Earth images. The holdings are identified by references A, B, C etc. Further information is provided in **Appendix 15.2 Farm Reports [Document Reference 6.3.15.2]**.

15.4.21. Almost all of the land in Parcels A to E is in arable farming use, by a mixture of tenures and management methods. Assessment has identified that the farm businesses within Parcels A to E are all of medium or low sensitivity. Much of the land is occupied by full-time farmers, but a number of field parcels are owned by non-farming or part-time farming enterprises or let to other farmers to farm. There are no dairy farms within the Order Limits. Accordingly there are no particularly sensitive receptors.

15.4.22. The pattern of land ownership and occupation across Parcels A to E is of blocks of land generally not served by farm buildings within the Order Limits. In many cases multiple fields are farmed together, but there are single fields owned between other land ownerships. The general field pattern is of straight lines and fields separated by drainage ditches.

15.4.23. North of the railway the land form differs, as shown in **Figure 15.2 Landownership Plan [Document Reference 6.4.15.2]**. Rather than large regular fields typical of most of Parcels A to E, the southern part of Parcel A has a pattern of multiple narrow fields between drainage channels and with a number of different ownerships. The most northern area is characterised by large arable fields.

15.4.24. Information on individual farms is set out in **Appendix 15.2 Farm Reports [Document Reference 6.3.15.2]** together with plans and photographs, but is summarised in **Table 15-8**.

Table 15-8 Summary of Farm Businesses

Reference	Area Farmed (ha rounded)	Description
A	550	Dairy Farm is a 550ha owned arable farm. The farm crops cereals with combineable break crops, including oilseed rape. The farm lets out up to 30ha per annum for others to grow potatoes on rotation. The farm has diversified sources of income from storage and wind turbines.
B	140	This farm extends to 142ha, of which about 50ha is owned. The farm operates an arable rotation of combineable crops (wheat, barley, beans principally). Up to 8ha is let out annually on rotation for others to grow potatoes.
C	200	Hall Farm is a 220ha arable farm, with about 120ha owned. The farm crops winter and spring-sown cereals and combinable break crops.
D	600	Grove House Farm is a 600ha farming operation, approximately half of which is owned with the rest on a mix of rented and contract-farmed arrangements. The farm operates a dairy unit at Bank House Farm, which is unaffected except for the cable route. The farm and the land affected operates a cereal and combineable break crop rotation plus grows maize.

Reference	Area Farmed (ha rounded)	Description
E	180	This holding operates mostly a cereals and combineable crops arable rotation, over 180ha (of which two thirds is owned). In addition the farm rents land annual for growing potatoes and parsnips, but not within the Order Limits. The holding is in multiple different blocks.
F	60	This is a 60ha farm operating a rotation of cereals and some potatoes.
G	210	The farm operates an all-arable, combineable crops rotation of cereals and break crops.
H	Information declined	The land within the Scheme is owned and farmed for arable cropping.
I	1,000	The land off Jaque's Bank and at Cottage Farm forms part of a 1,000ha holding. The enterprises include cereals (wheat, barley, oats), oilseed rape, combineable peas, agri-environmental cover crops, maize (for Anaerobic Digestion (AD). All farmed by contractors. The land has access to irrigation from the dykes. Sheep sometimes graze cover crops when planted.
J	1,300	The land is part of a 1,300ha farming business of mixed tenure. The land at Crowle is used for cereals and combineable break crops, vining peas (periodically) and a modest area of potatoes on rotation. There is access to limited-value irrigation from the dykes.
K	1,000	The land forms part of a large farming business across about 1,000ha. The land is used for cereals and combineable break crops, or for growing maize for AD. There is access to irrigation from the dykes. The building within the block of land (but not within the Order Limits) is a small grain store not well suited to modern scale farm machinery. Sheep sometimes graze cover crops when planted.

Reference	Area Farmed (ha rounded)	Description
L	Not known	This is an isolated block of arable land, used for root crops and periodically for potatoes. Irrigation is available.
M	550	This farm extends to 550ha of which the majority is owned. The land within the Order Limits is used for cereals and combineable break crops (often beans or linseed). Irrigation is available from the dykes, but is rarely used.
N	360	The holding extends to 360ha in total, the majority of which is owned. The wider farm crops cereals, combineable break crops, maize (for AD) and sugar beet. Typically one field is let out annually for potato production. There is access to land north of the M18 from north (off the A18) and south (via an overbridge). Access to land north of the railway is via a crossing or via track by the railway crossing.
O	40	This is a bare block of arable land, accessed off the A18, and let out for arable cropping. The block extends to 41ha and is divided into separate fields by ditches.
P	10	This is a single-field block of arable land behind the old farm buildings. It is cropped by neighbours on an informal arrangement.
Q	30	This is an off-lying parcel of arable land farmed as a small part of a large farm located some distance away.
R	10	The land extends to 8.5ha in two parcels, divided by the railway. 6.5ha lies within the Order Limits. It is arable land managed by Farm A on behalf of the Trust.
S	5	Isolated small block of arable land, farmed by a neighbouring farmer on an informal arrangement.

Reference	Area Farmed (ha rounded)	Description
T	170	An arable farm cropped for mostly combineable crops,. Only one field is included, for biodiversity reasons.

15.4.25. It is not proposed that any farm buildings will be demolished as part of the Scheme.

15.5. Assessment of Likely Effects

Construction

15.5.1. The Scheme's construction phase is described in **ES Chapter 2 Scheme Description [Document Reference 6.1.2]**. The effects have been considered in terms of the solar PV development, substations, BESS, and landscaping. Reference should also be made to the **outline Soil Management Plan** [**Document Reference 7.9.8**].

Panel Areas

15.5.2. The start of the construction process involves marking out on the ground, which is done on foot. Teams then lay out the mounting structures ready for insertion. This stage is non-intrusive. A tractor and trailer will typically be used to transport the mounting structures to the fields, then each is lifted off by hand.

15.5.3. Construction workers then drive the mounting structures into the ground using small machinery. This is a swift process and has little impact on the soil because the structures are inserted into the soil with no removal of soil and the soil is simply pushed aside. An example of this construction activity is shown in **Figure 15.10**.

Figure 15.10 Mounting Structure Piles being Installed

15.5.4. The design of the ground-mounted solar PV generating station varies from one project to another, and as described in **chapter 2: Scheme Description**, both fixed and tracker panels may be used in this Scheme. All involve driving a mounting structure into the ground, so the installation process and effects on soils and agricultural land are all similar. The limited impact of installing the mounting structure on the underlying land is illustrated in **Figure 15.11**. The purpose of the photograph is to show that there is little disturbance to the soils. The design above ground does not affect soils and therefore may vary from the example. The purpose of the photograph is to show the mounting structures as they enter the ground and to show the absence of effects of on soils and land from the construction traffic.

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

15.5.5. There is minimal damage caused by the next stage of the construction process, which is the assembling of the framework and the bolting-on of panels to

assemble the solar PV generating stations. This stage requires the various framework and panel components to be transported to site. They are lifted off by hand and assembled by hand. Machinery travels down the lines between the strings of solar PV generating stations being assembled. There is no ground disturbance, so the only risk comes from travelling over the land in typical agricultural-sized machinery.

Figure 15.12 Part Installed Panels (Bentham Farm, Purton)

15.5.6. The design of solar PV generating stations varies within the site. Fixed panels, either fixed east-west or trackers, involve posts being inserted into the ground. Fixed ballasted solar panels involve concrete blocks or stone gabions. All three are shown, for illustrative purposes, below, but recognising that final designs may differ.

Figure 15.13 Examples of Solar PV Generating Station Fixings

15.5.7. The installation of the Solar PV panels in isolation therefore has a negligible adverse impact on soils of high and medium sensitivity, resulting in a **negligible adverse** effect, which is **not significant**.

Construction Compounds

15.5.8. Construction compounds are temporary areas, and will be fully restored at the end of the construction phase (some may then be used for Panel Areas, see **ES Chapter 2: Scheme Description [Document Reference 6.1.2]**). The works usually involve stripping topsoil in suitable conditions which is stored temporarily in a bund. A membrane is normally then added, and an aggregate surface placed on the matting, as shown in **Figure 15.14**. On restoration the process is reversed, and the topsoil is replaced. Construction compounds will normally be in place for no more than 2 years, and soils will not have deteriorated if stored as set out in the **oSMP** [**Document Reference 7.9.8**]. Works will be undertaken under the guidance of the final Soil Management Plan (which will be developed from the oSMP), and will give full attention to Defra's Construction Code of Practice **[Ref 15-7]** and the soil suitability criteria in the Institute of Quarrying Good Practice Guide **[Ref 15-14]**. The Scheme may be developed in phases, and the duration any particular construction compound is required for may vary.

Figure 15.14 Newly Installed Construction Compound

15.5.9. These works are temporary and short term. They are fully reversible. The impact is of low magnitude, on agricultural land of high or medium sensitivity, and soils of medium or low sensitivity, resulting in **minor** or **negligible** effects, which is **not significant**.

Access Tracks

15.5.10. Access tracks, including works to widen entrances, are usually constructed in a similar manner to construction compounds, although increasingly consideration is being given to above-ground installation methods not involving the removal of topsoil. In the case of topsoil removal this will be stored alongside the track, for easy restoration at the decommissioning phase, if required.

15.5.11. The land areas by ALC grade affected temporarily by tracks is estimated as set out in **Table 15-9**. The layout is shown indicatively on the illustrative design plans. Based on those indicative plans, the areas potentially affected by ALC grade have been measured. Whilst the final areas may vary, the variation is unlikely to be significant. For example it would be functionally illogical to provide tracks other than where needed. The proportion of land in each ALC grade is similar, but slightly less, than the proportion of each ALC grade across Parcels A to E (taken from **Table 15-6**) adding weight to the reliability of the estimate.

Table 15-9 Estimate of Access Tracks by ALC Grade

ALC Grade	Area (ha)	Proportion (%)
1 Excellent	0.4	1.7
2 Very good	2.0	8.5
3a Good	6.7	28.0
3b Moderate	14.8	61.8
Total	**23.9**	**100.0**

15.5.12. The impact is the removal of 9.1ha of BMV for the duration of the Scheme. The works are fully reversible, however, and the impact is therefore of low magnitude, but on resources of high or medium sensitivity. The effect is **minor adverse**, which is **not significant**. It may be that on decommissioning some or all of these tracks may be left for agricultural use, if the landowners request them to be left. If all were left there would be a permanent loss of 9.1 ha of BMV, which is a medium magnitude impact on a resource of high sensitivity, which is a **moderate adverse** effect, which is **significant**.

Cabling Within the Panel Areas

15.5.13. Electrical cables need to be connected between the ground-mounted solar PV generating stations and the on-site supporting equipment, and from those to the on-site substations.. This will involve trenches, dug with a machine. The trench width will depend upon the size of cable. In all cases the work involves removing the topsoil and placing it to one side of the trench. The subsoil is then removed and placed on the other side of the trench. This looks disruptive but the disturbance of the soil is limited to the width of the trench. Once the cable has been inserted the subsoil is then replaced, with the topsoil put back on the top.

15.5.14. This approach is used to ensure that soils are restored and settle within days, and return to grass growth rapidly, or are suitable for being sown. This is illustrated in **Figure 15.15**, which were taken at a solar development site 14 days after the trench was first dug, for a development similar in nature to the Scheme but with lower panel heights. The photograph is included to illustrate the short-term limited effects of the activity on the soils.

Figure 15.15 Cabling Channels during Cable Installation

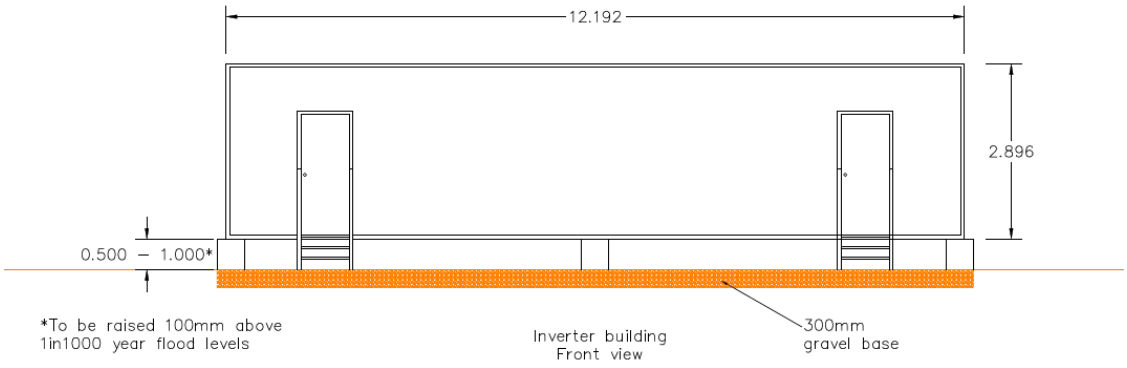
15.5.15. Overall, the Scheme's internal (ie within and between Parcels A to E) cabling will result in a negligible magnitude impact on land quality. A negligible impact on resources of high or medium sensitivity results in a **negligible** effect, which is **not significant**.

Fixed Equipment

15.5.16. On-site supporting equipment including inverters, transformers and switchgear, typically stand on concrete bases or hardstanding. An example is shown below,

being the Typical Inverter from **Figure 2.6 Indicative Layouts and Cross Section [Document Reference 2.4.2.6]**. These require the removal of topsoil from the area under the building and the construction of a hard base, in a similar manner to the construction of the construction compounds.

Figure 15.16 Typical Inverter Front Elevation



15.5.17. The quantum of land involved is set out in **Table 15-10**. This estimates the land areas under and around all the fixed equipment. The distribution is shown on the layout plans. The switchgears and spares containers collectively involve a total of 0.25ha for the 82 units involved. The inverters are required regularly around the Order Limits, and collectively involve 0.63ha for the 210 units proposed. The estimate below is based on a proportionate use of land by ALC grade. The collective area of BMV is less than 0.4ha.

Table 15-10 Estimate of Fixed Equipment by ALC Grade

ALC Grade	Area (ha)	Area (%)
1 Excellent	<0.1	2
2 Very good	0.1	10
3a Good	0.3	32
3b Moderate	0.5	56
Total	**0.9**	**100**

15.5.18. These works are temporary and are capable of full restoration. The impact is therefore of low magnitude, on resources of high or medium sensitivity. This results in a **minor adverse** effect, which is **not significant**.

Fencing

15.5.19. Fencing, with periodic security cameras, will be typical deer fencing, as illustrated on the application plans and as indicatively shown in **Figure 15.17**.

Figure 15.17 Typical Deer Fencing

15.5.20. Around the substations a palisade fence will be installed. These fences are more substantial but are also capable of being removed and the ground fully restored on decommissioning.

15.5.21. The impact of fencing and CCTV cameras is negligible. The effect is therefore **negligible**, which is **not significant**.

Battery Energy Storage System (BESS) and Substations

15.5.22. Fixed infrastructure is proposed as shown on the layout plans. This includes 4no BESS areas, 7no 132kV substations, plus a RWE on-site 400kV Substation. Detailed ALC has been undertaken for the BESS and RWE substation areas, with the results as set out in **Table 15-11**. Each 100MW BESS is estimated to involve about 2.5ha of land. Each of the 132kV substations is estimated to require only 0.7 ha.

15.5.23. The RWE on-site 400kV Substation is to be located north of one of the BESS areas (in Parcel E16) and is of the order of 3.4ha.

15.5.24. BESS compounds are constructed in a manner similar to the construction compounds. An example of a BESS is shown below, with the topsoil stored to the side.

Figure 15.18 Example of a BESS

15.5.25. The detailed ALC results for the BESS and substation areas are shown on **Figure 15.1 Agricultural Land Classification** [**Document Reference 6.4.15.1**]. They collectively involve 17.5ha of land.

15.5.26. Of the BESS areas, three are located on land of Subgrade 3b. One is located on a complex mix of Grades 1, 2 and 3a land. Of the 132kV substations, four are located on Subgrade 3b land, one is on Subgrade 3a land and one is on Grade 2 land.

15.5.27. The RWE on-site 400kV Substation is mostly on Subgrade 3b land. It is located in the corner of a field and the north-eastern corner of that field is classified as Subgrade 3a (parcel E16).

15.5.28. The collective total of land involved for the fixed infrastructure is shown below.

Table 15-11 ALC Results for BESS and Substations

	Land by ALC Grade (ha)				
	1	2	3a	3b	Total
BESS	0.8	0.8	0.8	7.5	**9.9**
132kV	0	0.7	0.7	2.8	**4.2**
400kV	0	0	0.4	3.0	**3.4**
Total	**0.8**	**1.5**	**1.9**	**13.3**	**17.5**

15.5.29. It is assumed that these works will be fully restored on decommissioning. On that basis the impact will be low magnitude on land of high and medium sensitivity resulting in a **minor adverse** effect, which is **not significant**.

15.5.30. In a worst-case assessment, the RWE on-site 400kV Substation may not be restored. If that is assumed, it will result in the loss of 3.4ha of land of which only 0.4ha is Subgrade 3a BMV land. This will result in an adverse impact of low magnitude, on resources of high and medium sensitivity, resulting in an effect of **minor adverse** significance, which is **not significant**.

Summary of Construction Effects on Agricultural Land Quality

15.5.31. The construction effects on agricultural land quality are set out in **Table 15-12**.

Table 15-12 Summary of Construction Effects on ALC

Works	Temporary/ Permanent	Significance of Effect
Panel Areas	Temporary	Negligible
Construction compounds	Temporary	Minor adverse
Access tracks	Temporary	Minor adverse
Cabling within Panel Areas	Temporary	Negligible

Works	Temporary/ Permanent	Significance of Effect
Inverters, Spares Containers, Switchgear	Temporary	Minor adverse
Fencing and CCTV	Temporary	Negligible
BESS Areas	Temporary	Minor adverse

15.5.32. Individually the construction effects are all minor or negligible adverse. Taken collectively the works are minor adverse, being temporary works. The collective effect is **minor adverse**, which is **not significant**.

Effects on Soils

15.5.33. The potential effects on soils have been described alongside the effects on agricultural land in the assessment. The disturbance to soils is generally temporary and limited. The soils within the Order Limits are of medium sensitivity across much of the Order Limits (excluding NGET Grid Connection Cable Route), where soils are loamy over clay. In the southern parts of the Order Limits the soils are generally sandy and fall within the low sensitivity category, i.e. they are generally resilient to being handled and disturbed.

15.5.34. Soils are not generally disturbed during the construction phase. Disturbance to soils is mostly restricted to the physical moving of soils for the creation of tracks and bases, or cabling, as described in the preceding section reviewing the effects on land quality, or to any adverse effects from the movement of machinery causing surface damage or, potentially, compaction.

15.5.35. The machinery involved in the construction and installation of the solar PV generating stations and associated mounting structures is generally small, as reviewed in the consideration of the effect on land quality, and generally smaller than most farm machinery. There will not be a requirement for multiple trafficking across the same areas other than delivering the equipment and mounting structures along the gaps between the Solar PV generating stations, and any damage to the soil surface in those areas will generally be limited and can readily be remedied, as described in the **oSMP [Document Reference 7.9.8]**. The magnitude of impact is low, on soils of medium or low sensitivity, resulting in a **minor or negligible adverse** effect, which is **not significant**.

15.5.36. The machinery required to construct the tracks, bases for the BESS, bases for the fixed inverter buildings, will be larger, and these works should be carried out when soils are sufficiently dry. This is described in the **oSMP [Document Reference 7.9.8]**. The effect on soils will be temporary. The works, therefore, will be of low magnitude, on resources of medium sensitivity, resulting in a **minor adverse** effect, which is **not significant**.

15.5.37. Therefore, the effects on soils are temporary. A temporary, reversible impact on soil-related features (including biomass production) is a low magnitude impact. The soils in the Order Limits are of medium or low sensitivity, therefore the effect will be **minor** or **negligible adverse**, which is **not significant**.

Effects of Farm Businesses

15.5.38. Effects on the occupying farm businesses will commence and change during the construction phase. The effects on farm size and structure, and long-term operation, being the effects once the Scheme is constructed, are described under the operational phase below.

15.5.39. Construction activity will be carefully controlled so that the use of the local highway network is not significantly affected, so travel between farmyards and agricultural land in the area will continue unhindered. There are no internal tracks within the area of the Scheme that serve other farmland, so the Scheme will not significantly affect any existing access routes between fields not within the Scheme.

15.5.40. There are only low or negligible construction-phase impacts on agricultural businesses, which are of medium or low sensitivity. Accordingly the construction-phase effects are **minor** or **negligible**, which is **not significant**.

Summary of Construction Phase Effects

15.5.41. In respect of direct effects during construction, it is concluded as follows:

15.5.42. **Agricultural land quality**. The majority of the Development will not affect agricultural land quality. Works that involve soil disturbance are limited in scale, temporary and reversible, and therefore of low magnitude, as totalled in **Table 15-13**. BMV quality land within the Order Limits accounts for approximately 44.3% of parcels A to E, but the quantum disturbed is only 13.7ha. All but 0.4ha of this will be fully restored on decommissioning. Accordingly the impact is of

low magnitude on resource of high sensitivity, resulting in an adverse effect of **minor adverse** significance, which is **not significant**.

Table 15-13 Summary of Disturbed Land

	ALC Grade (ha)				
Component	**1**	**2**	**3a**	**3b**	**Total**
Access Tracks	0.4	2.0	6.7	14.8	**23.9**
Supporting equipment	0	0.1	0.3	0.5	**0.9**
BESS	0.8	0.8	0.8	7.5	**9.9**
132kV	0	0.7	0.7	2.8	**4.2**
400kV	0	0	0.4	3.0	**3.4**
Total	1.2	3.6	8.9	28.6	**42.3**

15.5.43. **Soils.** The soils are mostly of medium sensitivity, with soils of low sensitivity particularly in the eastern parts of the Order Limits. The soils will generally not be disturbed, and disturbance for installation of the solar PV generating stations, trenching and cable laying will be temporary. Overall the magnitude of impact is low, on resources mostly of medium sensitivity, resulting in an adverse effect of **minor adverse** significance, which is **not significant**.

15.5.44. **Farm businesses.** Construction works are temporary and short-term, and there are only low or negligible adverse impacts on farms of medium or low sensitivity, resulting in **minor** or **negligible adverse** effects, which is **not significant**.

Operational Phase

15.5.45. The assessment of the Scheme's operational phase effects is based on the Scheme as outlined in **ES Chapter 2 Scheme Description [Document Reference 6.1.2]**.

15.5.46. The potential effects during the operational phase of the Scheme are:

- Effects on soils from long-term grassland uses and the effects from site maintenance activities;
- Effects on the operation of the farm businesses and local agricultural labour needs;
- Food production implications. This is generally an economic/ land use consideration; and
- The economic and other considerations of the use of BMV agricultural land, as required in NPS EN-3 **[Ref 15-5**].

Agricultural Land Quality

15.5.47. There will be no further disturbance to soils during the operational phase of the Scheme; therefore, the agricultural land quality within the Order Limits will not be affected during this phase of the Scheme.

15.5.48. There will be no requirement for heavy machinery to traffic soils during the operational phase. Accordingly, there will be no significant disturbance of soils affecting land quality. The combination of increasing organic matter levels (see below) and lack of machinery activity will allow a natural enhancement of the soil. This will not, however, alter the ALC grade of land within the Order Limits.

15.5.49. Maintenance and cleaning machinery will be transported via a van or small tractor, which is generally lighter than most farm machinery. A typical cleaning machine is shown in **Figure 15.21**. If the soils are wet when access is taken, there is the potential for slight indentations to be made (such as shown in **Figure 15.22** for a development similar in nature to the Scheme), but such effects on soils are not significant and will not alter the ALC grade. Typically, the machinery such as illustrated in **Figure 15.21** is used, which is no heavier than a small tractor. Cleaning typically takes place in late spring, to clean the panels before the main solar generation period, when soils are normally dry and therefore not susceptible to damage in any event, but cleaning is possible at any time of the year when ground conditions allow.

Figure 15.19 Cleaning of Solar Modules

15.5.50. There may occasionally be small rutting caused by agricultural vehicles (for example quads) or vans used by engineers. Typical light impacts are illustrated in **Figure 15.22**. These indents will normally be levelled by the feet of grazing sheep or will level naturally over time, but if there are deeper ruts they could be repaired by a lightweight roller in the spring.

Figure 15.20 Example of Minor Ruts Caused by Vehicles

15.5.51. There may be occasional need for works of repair which might disturb soils. These will be infrequent. If possible, any works requiring soils to be moved should be timed for the summer period, following the guidance outlined in the **oSMP [Document Reference 7.9.8]**. Any trenching, whether carried out in ideal

conditions or not, rapidly recovers and is indistinguishable once grass cover has returned. These effects will be of negligible magnitude.

15.5.52. Therefore there are no physical works required during the operational phase which will adversely affect agricultural land quality. The land quality will be unchanged. The impacts are therefore of negligible magnitude, on resources of medium or high sensitivity, resulting in an effect of **negligible** significance, which is **not significant**.

15.5.53. In terms of land use, there will be a change over most of the Order Limits from arable (cereals and break crops mostly) to grassland. Once the solar PV generating stations have been installed, the land may be used by sheep for grazing (or otherwise managed grassland). Both land uses fall within the definition of agriculture **[Ref 15-15]**. The change of agricultural land management from arable to mixed Solar PV modules and grassland uses is a land management consideration. Land use changes of this nature do not result in an adverse effect on agricultural land quality.

15.5.54. The effect on agricultural land quality during the operational phase is therefore **negligible**, which is **not significant**.

Effect on Soils

15.5.55. There will be potential for benefits for soil health and quality.

15.5.56. The majority of land within the Order Limits is currently arable land fertilised with inorganic fertiliser, as well as spread with farmyard manure and liquid slurry. Grass is not generally grown in rotation currently and organic matter levels within the soil are generally low.

15.5.57. The land will be sown to grassland and managed, including potentially by being grazed with sheep, for the duration of the operational phase. This is expected to have a positive benefit for the soils.

15.5.58. Soil is an important resource. It is estimated by the Environment Agency that the UK's soils store about 10 billion tonnes of carbon, equal to about 80 years of greenhouse gas emissions, but that an estimated 4 million hectares are at risk of compaction and 2 million ha are at risk of erosion. Intensive agriculture has caused arable soils to lose 40 – 60% of their organic carbon **[Ref 15-16]**.

15.5.59. The EA report **[Ref 15-16]** notes that significant decreases in erosion risk occur when fields change from winter cereal use to permanent grassland. Organic

matter in soils acts like a sponge and can hold 20 times its weight in water. In the British Society of Soil Science **[Ref 15-17]** note they identify that "*significant long-term land use change (eg. conversion of arable land to grassland or woodland) has by far the biggest impact on soil organic carbon (SOC)*", and that soils with a higher rate of SOC are less prone to runoff and erosion, have greater water infiltration and retention, increased biological activity and improved nutrient supply.

15.5.60. Overall, therefore, for the majority of land within the Order Limits, where arable soils will go into long-term grassland land coverage, there will be a significant benefit for soils.

15.5.61. There will be no requirement for heavy machinery to traffic soils during the operational phase. Accordingly, there will be no compacting of soils and the combination of increasing organic matter levels and lack of machinery activity will allow a natural enhancement of the soil. There will be no adverse impacts, therefore.

15.5.62. Water run-off from panels will reach all the ground under the panels. Panels come in sections and water drains down between these sections. Soils will not be harmed during the operational phase due to lack of moisture. This can be seen **in Figures 15.23** and **15.24**, where gaps between panels can be seen and grass growth below the panels is good.

Figure 15.21 Panels Array Showing Gaps Between Panels

Figure 15.22 Grass Growth Below and Between Arrays

15.5.63. There is therefore the potential for improvements in one or more soil functions. These are beneficial impacts. They are, however, temporary and could be reversed once soils are returned to arable cropping following decommissioning. The effects are therefore assessed as being of low magnitude, on resources of medium or low sensitivity, resulting in **minor** or **negligible beneficial** effects, which are **not significant.**

Farm Business Implications

15.5.64. The assessment of effects on farm businesses has been undertaken following interviews with land owners or occupiers, and field walking of much of the land within Parcels A to E. Farm impact reports are set out in **Appendix 15.2 Farm Report [Document Reference 6.3.15.2]**.

15.5.65. Much of the land is owner-occupied, meaning that the land owner is also the farmer. Landowners would not have entered into land agreements unless they had concluded that there would not be significant adverse effects on the operation of their businesses.

15.5.66. The location of the farm businesses is shown indicatively on **ES Figure 15.2 Land Ownership Plan [Document Reference 6.4.15.2]**.

15.5.67. Some of the land is occupied by tenant farmers, although none is occupied by secure tenants. Where land is occupied by tenants it is mostly on short term, word-of-mouth arrangement with neighbours occupying small parcels of land, or periodic crop agreements (eg for potatoes).

15.5.68. Impacts on land farmed by contractors are generally limited, because they operate on an insecure and rapidly-changing business base. Land contract

farmed changes often from year to year, although some contractors farm land for many years. All effects on contractors are therefore considered to be low magnitude.

15.5.69. A description of the effects by farm is provided in **Table 15-14**.

Table 15-14 Description of Farm Effects

Farm Business	Description of Effects
A	The Scheme involves a significant part of this arable farm. The land is all under arable cropping and, whilst the arable operations will reduce in size, a substantial full-time farm will remain. Medium magnitude impact.
B	The Scheme affects two strips of land, in three fields, and will have a low magnitude impact on the overall holding.
C	The land within the Scheme is arable land and, whilst the farm will be reduced in size, a full-time unit will remain. The impact will be low magnitude.
D	This substantial arable farm will be reduced by the inclusion of a substantial proportion (about 25%) of land within the Scheme, but this is arable land and there will be no significant impacts on the rest of the farm. Overall a low magnitude impact.
E	There will be a low magnitude impact from the inclusion of land within the Scheme, which will not affect continued arable cropping on other land owned and rented. Overall a low magnitude impact.
F	This is a small arable unit and will cease to operate as the majority of land is within the Scheme. This will be a medium magnitude impact.
G	The Scheme will reduce the farm by a significant proportion (about 40%), but this is all arable land and a full-time unit will remain. Medium magnitude impact.
H	There will be a reduction in farmed area, but this is all arable land. This is cautiously assessed as a medium magnitude impact as full information has not been provided.

Farm Business	Description of Effects
I	The land within the Scheme is all arable land, farmed for cereals and maize as part of a large farming operation. The contraction in farmed area (about 20%) will not affect rotations, staffing or farming activities elsewhere. Overall this is assessed as a low magnitude impact.
J	The land within the Scheme is off-lying arable land and mostly of moderate quality. There will be only a low magnitude impact on the farm.
K	The land within the Scheme is all arable land, farmed as part of a large farming enterprise for cereals and maize. There will be a medium magnitude adverse effect because of the scale of change, but a large and viable farm will continue.
L	The land within the Scheme is arable land, in two blocks. This is cautiously assessed as a low magnitude impact, as the land is owned and only two fields are involved, but full information has not been available.
M	The land within the Scheme is arable land at the northern edge of the farm. There will be a modest reduction in arable land, but only a low magnitude adverse impact.
N	The land north of the M18 is cereal land and will remain accessible from the north. There will be an overall reduction in land farmed, but the impact will be only of low magnitude.
O	This is a block of arable land let to others to farm. This is a low magnitude impact.
P	This is a long, narrow block of arable land, let to others to farm, and there will be only a low magnitude impact and no inhibition to access to the remaining land.
Q	This is a small parcel of offlying arable land, low magnitude impact.
R	The land is let to others to farm and the impact is therefore low magnitude.

Farm Business	Description of Effects
S	This is an isolated arable field, let to others to farm. The impact is low magnitude.
T	There will be a very low magnitude impact from limitations to winter-sown cropping, but this area will otherwise continue to be farmed.

15.5.70. The areas within the Scheme will not necessarily be lost to farming. These areas will in significant areas potentially be grazed with sheep. Their management could remain under the control of the current farmers or could be undertaken by others. Whether they choose to manage the sheep themselves, or let others manage the sheep, the overall farming activities will not be significantly reduced in size. The mitigation area will continue to be farmed.

15.5.71. There will potentially be benefits for the local labour market, because sheep production requires greater labour input than arable farming. The Pocketbook for Farm Management **[Ref 15-18]** estimates of labour required for cereals and lowland sheep production are compared in **Table 15-15**. This shows that sheep production requires more labour per hectare than cereals. Therefore, overall agricultural labour needs will not reduce.

Table 15-15 Labour Estimates

Crop	Hours/ha/year
Winter cereals, including hauling straw	12.5
Sheep – 4 hours per ewe at 6 ewes/ha (where kept)	24.0

15.5.72. Therefore, the effects on farm businesses are adverse (in terms of farm structure). The farms will benefit from income from the energy generated by the Panel Areas, together potentially with income from farming sheep. Coupled with these benefits, the overall impact of this diversification is considered to be as set out in **Table 15-16**. This identifies the sensitivity of the holding (of which most are full-time units of medium sensitivity) and the magnitude of the impact.

The largest impacts are of medium magnitude. A medium magnitude impact on a medium sensitivity resource results in an effect of **minor adverse** significance, which is **not significant.**

Table 15-16 Summary of Farm Impact Assessment

Farm Business Reference	Sensitivity	Magnitude	Significance
A	Medium	Low	Minor adverse
B	Medium	Low	Minor adverse
C	Medium	Low	Minor adverse
E	Medium	Low	Minor adverse
E	Medium	Low	Minor adverse
F	Medium	Medium	Minor adverse
G	Medium	Medium	Minor adverse
H	Medium	Medium	Minor adverse
I	Medium	Low	Minor adverse
J	Medium	Low	Minor adverse
K	Medium	Medium	Minor adverse
L	Medium	Low	Minor adverse
M	Medium	Low	Minor adverse
N	Medium	Low	Minor adverse
O	Low	Low	Negligible
P	Low	Low	Negligible
Q	Low	Low	Negligible
R	Low	Low	Negligible

Farm Business Reference	Sensitivity	Magnitude	Significance
S	Low	Low	Negligible
T	Low	Low	Negligible

15.5.73. The analysis identifies that the effects on farm businesses are.

- 12 no. effects of **minor adverse** significance, which is **not significant;**
- 2 no. effects not fully known but using professional judgement the effects are assessed to be **minor adverse**, which is **not significant; and**
- 6 no. effects of **negligible** significance, which is **not significant**.

Food Production and Economic Implications

15.5.74. This section of the chapter considers agricultural land use implications specifically in the context of the outputs of agricultural land in terms of food, industrial or other benefits. The section reviews:

- The requirement to use agricultural land for food production;
- The importance of climate change and its effects on food production;
- Food security considerations and the Government's position;
- The effects on food and other production of the Scheme;
- The importance of those effects in a local and national context;
- Leading to an assessment of the significant of the effects.

The Requirement to Use Land for Food Production

15.5.75. The use of land for "agriculture", which is defined in the Town and Country Planning Act 1990 (s336), is not "development" (as defined in s55 (2) (e). Planning consent is not required to use land for agriculture, or to change between any different agricultural enterprises.

15.5.76. The definition of agriculture allows a wide range of agricultural uses. Some relate to food production, others do not. There is no requirement to use land for food production, or to use it for any particular intensity of use. It follows that a

landowner can do what they wish with their land within the definition of agriculture. For example, the landowner could rewild and graze it at a low intensity, or graze it with horses, or plant short-rotation coppice, or plant ancillary woodland, or fallow it. Food production is not an obligation.

15.5.77. In practice, there is no specific incentive to use land for food production, other than for normal commercial gain. Government incentives are primarily aimed at non-food benefits from land. Agri-environmental land use initiatives such as the Countryside Stewardship Scheme or the Sustainable Farming Initiative fund the reversion of arable land to non-food uses. In the June Census, at 1 June 2024, some 305,000 ha of arable land was being used for non-food biodiversity management **[Ref 15-19]**.

15.5.78. In context, the Written Ministerial Statement on "Solar and Protecting our Food Security and Best and Most Versatile Agricultural Land" **[Ref 15-20]** sets out that "*even in the most ambitious scenarios [solar] would still occupy less than 1% of the UK's agricultural land*". As recorded earlier, currently 8.7 million hectares of land is in active agricultural use. 1% of that is 87,000 hectares, which can be assessed in context with over 300,000 ha being funded for non-food uses.

The Importance of Climate Change

15.5.79. In a Statement to Parliament on 18 July 2024 **[Ref 15-21]** the Secretary of State for Energy Security and Net Zero stated that "*The biggest threat to nature and food security and to our rural communities is not solar panels or onshore wind; it is the climate crisis, which threatens our best farmland, food production and the livelihoods of farmers"*.

15.5.80. This has repeated in the Solar Roadmap June 2025 **[Ref 15-22]** which notes that "*the biggest risk to food security and the natural environment is the climate and nature crisis",* noting in the "solar misconceptions" addendum that *"solar farms are helping to tackle this directly"***.**

Food Security Considerations

15.5.81. The UK is currently about 75% self sufficient in indigenous foods, i.e. foods we can grow. This has improved slightly since 2021. In the United Kingdom Food Security Report 2024 **[Ref 15-23]**, Executive Summary, the key performance takeaway on UK production is as follows: "***The UK's overall balance of trade and production is broadly stable***. *The UK continues to source food from domestic production and trade at around an overall 60:40 ratio*.

***Key Statistic**: The production-to-supply ratio was at 62% for all food and 75% for indigenous foods (meaning those that can be grown in the UK) in 2023, showing a small increase from 61% and 74% in 2021. This is a continuation of the broadly stable trend seen in recent years*".

15.5.82. *In respect of* the crops that can be grown, the UK is self-sufficient or near self-sufficient in cereals, oilseeds, other non-vegetable arable crops, milk and sheep meat. The UK produced approximately 20 million tonnes of cereals in 2024, for example **[Ref 15-24]**. A Government Statement at the end of 2022 **[Ref 15-25]** confirmed that there are no food security concerns at the present time. The Food Security Report 2024 identified a small improvement since 2022 to 74% self-sufficiency in the products we can produce in the UK.

15.5.83. As a nation we buy and sell agricultural produce to suit our tastes. We have done so for centuries. That does not mean we cannot survive from what we produce. This can be illustrated by reference to the UK Food Security Report 2021 (update of December 2022 **[Ref 15-26]**), which set out the following:

"*However, from a purely calorific perspective, the (below average) grain yield in 2020 of 19 million tonnes would be sufficient to sustain the population. It is equivalent to 283kg per person, 0.8 kilos per day. A kilo of wheat provides 3,400 calories (and barley slightly more at 3520 calories), making 0.8 kilos of grain over 2,600 calories, compared to recommended calorie intake of 2,000 to 2,500 for adults. From these figures it is easy to demonstrate that, even without accounting for other domestic products like potatoes, vegetables, grass-fed meat and dairy, and fisheries, current UK grain production alone could meet domestic calorie requirements if it was consumed directly by humans in a limited choice scenario*".

15.5.84. Trends in output for different sectors (eg cereals, fruit and vegetables, milk, potatoes, red meat, poultry meat) reflect world economics, not the ability of the UK to produce food.

15.5.85. There is no concern from Government about food security, and no requirements or incentives to manage land for food production. The temporary land use change from agriculture (only some of which is for food) to a mix of energy production and agriculture will not result in any significant adverse environmental or economic effects.

The Economic and Other Effects.

15.5.86. NPS EN-3 **[Ref 15-5]** and the NPPF (2024) **[Ref 15-9]** advise that the economic and other considerations of the use of BMV land should be considered. To assess the economic benefits of BMV land, one methodology is to compare the economics of BMV land to poorer quality land, assuming that such land is used for solar panels as an alternative.

15.5.87. There is no statistical data that provides yields or economic performance of BMV compared to non-BMV land. Accordingly, only an assessment based on professional judgement is possible, assuming that BMV land falls into the "high" performance, and non-BMV land falls into the "average" performance, in agricultural budget books. On this basis, the incremental increase in food production if BMV land is used is shown in **Table 15-17**. This assumes a wheat and barley production, rather than the grassland/maize/cereals production currently grown over the farms.

Table 15-17 Crop Production Budgets

Crop	Average Yield	High Yield	Difference
Winter feed wheat	8.3 t/ha	9.5 t/ha	1.2 t/ha
Winter feed barley	7.3 t/ha	8.4 t/ha	1.1 t/ha
Winter oilseed rape	3.5 t/ha	4.0 t/ha	0.5 t/ha
Lowland sheep ewes	9 ewes/ha	10 ewes/ha	1 ewe/ha

Nix Pocketbook for Farm Management 55th Edition ***[Ref 15-18]***

15.5.88. Across the BMV agricultural land within the Scheme this would, if the area was all used for food production, have the following implications for cereal/ oilseed production. This assumes 100% wheat, being the worst-case (i.e. largest) effect. It assumes that all of the BMV land is cropped, therefore not allowing for field margins, hedgerows, any biodiversity areas etc. And it assumes all of that land is capable of the maximum yield. The assessment is therefore worst case and somewhat unrealistic. This is shown in **Table 15-18**.

Table 15-18 Difference in Production (assuming total area of 813 ha of BMV and all wheat cropping)

Crop	Change in Yield	Area (ha)	Change (t)
Winter feed wheat	1.2 t/ha	813	976

15.5.89. The use of agricultural land for the deployment of Panel Areas is assumed to be accepted. Consequently the assessment focuses not on the absolute production, but on the incremental production were poorer quality land to be used elsewhere rather than the BMV land within the Scheme. On that measure the incremental reduction in production should the Scheme be moved to poorer quality land elsewhere would be under 1,000 tonnes of wheat per annum.

15.5.90. As set out in the farm reports (**Appendix 15.2: Farm Reports [Document Reference 6.3.15.2**]), the land is used for a variety of arable crops. These include crops for human consumption (some cereals, potatoes), animal feed (some cereals, some break crops), industrial uses (some break crops) and energy uses (maize for anaerobic digestion). Farming supplies multiple markets and this site is no different.

15.5.91. The implications for food production are limited. Much agricultural output is currently destined for animal feed or industrial use. Any use of land within the Site for growing sheep, the meat from which will directly go to human food, will be a benefit.

The Importance of These Effects in a Local and National Context.

15.5.92. The reduction in production of circa 1,000 tonnes of cereals can be compared to the UK cereal production in 2024 of just under 20 million tonnes **[Ref 15-27]**.

15.5.93. The Utilised Agricultural Area in England is 8.7 million ha. Natural England estimate that 42% of this is BMV (TIN049, **[Ref 15-1**]). That equates to 3.7 million ha of BMV agricultural land in England.

15.5.94. The total cropping area in England at June 2024 was just over half (57%) of agricultural land. In England the total croppable area at 1 June 2024 was 4,968,220 hectares. At the same date the total "uncropped arable land" was 580,662 ha. This includes all arable land not in production, such as bare fallow and land used for agri-environmental benefits.

15.5.95. Agricultural facts for Yorkshire and the Humber **[Ref 15-28]** identify that 52% of the total farmed area of 1,125,000 ha is arable, including uncropped arable land and temporary grass, an area of about 585,000 ha.

15.5.96. The importance of land use change of the Order Limits is not significant on a national or regional scale.

Assessing the Significance of Effects

15.5.97. The breakdown of agricultural land use in a particular area can be recorded, but there are no powers or incentives to influence that land use. On a national and regional basis the implications of the use of BMV in this case for solar PV arrays and potential sheep production, rather than for arable crop production, is negligible. Assuming that solar deployment needs to take place on agricultural land, the incremental difference is less than 1,000 tonnes.

15.5.98. In respect of food production, the impact is temporary and of low magnitude. A low magnitude impact on a resource of low sensitivity (arable production) results in an effect of **negligible** significance, which is **not significant**. In respect of the local agricultural economy, the impact is beneficial, but at a negligible scale. A negligible benefit on a low sensitivity resource is overall a **negligible** effect, which is **not significant**.

Summary of Operational Phase Effects

15.5.99. Therefore it can be concluded that in respect of operational effects:

- There will be no further effects on agricultural land quality, therefore no change which is a **negligible** significance effect, which is **not significant;**
- There will be a benefit on soil health and its carbon-holding benefits, but this is a temporary low magnitude benefit on resources of medium or low sensitivity, resulting in an effect which will be **minor or negligible beneficial**, which is **not significant;**
- The effects on occupying farm businesses are mostly of medium or low magnitude, on holdings of low sensitivity, leading to overall effects of **minor or negligible** significance, which is **not significant**; and
- The impacts on food production and the wider local agricultural economy are of negligible magnitude, on low sensitivity resources, and overall therefore of **negligible** significance, which is **not significant.**

Decommissioning Phase

15.5.100. Decommissioning works will be secured through a Decommissioning Environmental Management Plan, in outline version of which is provided with the application [**Document Reference 7.9.3**].

15.5.101. Measures to mitigate potential effects on land and soil quality will be secured through the final SMP, broadly in line with the **oSMP [Document Reference 7.9.8]**.

15.5.102. Cables buried below agricultural working depth are likely to be left in-situ, to minimise further unnecessary disturbance to soil. Where fixed infrastructure or cables are to be removed, they will be removed in suitable conditions. If cables are being removed the works will include careful removal of topsoil and subsoil, to be stored in segregated piles, followed by reinstatement. Fixed infrastructure bases will be removed, membranes removed, and the ground loosened and topsoil replaced.

15.5.103. The removal of the solar PV generating stations and associated mounting structures will involve the disassembly of the panels and framework, followed by mechanical removal of the mounting structures.

15.5.104. The soils across the solar PV generating area will then be loosened with normal agricultural machinery, and returned to the farmers in a condition suitable for continued agricultural use.

15.5.105. Once the solar PV generating stations have been removed the bases for the on-site supporting equipment can be removed. This will involve removing the crushed stone bases and matting, loosening the soil to remove compaction, then returning topsoil to the areas. The topsoil will then be worked with normal agricultural machinery to create a tilth suitable for return to the landowner.

15.5.106. The decommissioning of the seven on-site 132kV substations and the on-site 400kV RWE substation (if decommissioned) and BESS areas will result in the removal of all above and below ground equipment and materials, and the restoration of the land back to the pre-construction land quality.

15.5.107. Any adversely affected under-field drainage will be repaired, with replacement drainage schemes installed as required.

15.5.108. Following decommissioning, the land will be returned to the landowners in a condition suitable for agricultural use.

15.5.109. In terms of **agricultural land**, the works will involve a further temporary period of disturbance on land of high or medium sensitivity. The magnitude of impact will be low, and the consequent effect will be **minor adverse**, which is **not significant.**

15.5.110. In terms of **soils**, these are mostly of medium sensitivity and the works will be temporary and short-term, leading to a low magnitude impact. This will result in **minor adverse** effects, which are **not significant.**

15.5.111. **Agricultural businesses** will not be adversely affected by decommissioning works, other than any short-term disturbance to areas grazed. This will be temporary. Therefore the magnitude of impact is low, on businesses of medium or low sensitivity, resulting in **minor** or **negligible adverse** effects, which are **not significant.**

Summary of Decommissioning Effects

15.5.112. **Decommissioning** can be timed to be carried out when soil conditions are suitable, as set out in the **oSMP [Document Reference 7.9.8]**, and will not have any adverse agricultural effects. Thereafter, the land will be available for continued agricultural use. The decommissioning effects are of **minor** or **negligible adverse** significance, which is **not significant.**

15.6. Mitigation Measures

Embedded Mitigation

15.6.1. As described in 15.3.9, appropriate soil management is considered to be embedded mitigation. Therefore the assessment assumes that an appropriate level of soil management, especially in respect of timing of land work operations, is part of the Scheme. The outline SMP [**Document Reference 7.9.8**], which will help inform a SMP to be controlled by the DCO, is part of the methodology for construction, operation and decommissioning of the Scheme.

Additional Mitigation

15.6.2. No mitigation measures beyond those set out in the **oSMP [Document Reference 7.9.8]** are required.

Residual Effects

15.6.3. The residual effects are therefore:

(i) Construction Phase:

- Agricultural land quality: There will be temporary disturbance to 13.7ha of BMV land, such that the impact is low on resources of high sensitivity, resulting in **minor adverse** effects, which are **not significant**. Worst-case approximately 0.4ha of Subgrade 3a will be irreversibly developed if the RWE 400kV substation is not removed at the decommissioning phase, which would be a low magnitude impact on a high sensitivity resource, which is **minor adverse** and **not significant.** Some of the access tracks may be left in-situ if landowners request them, which will generally be beneficial for farming use. This would potentially result in the permanent loss of 9.1 ha of BMV (as set out in Table 15-9), which would be medium magnitude impact on a high sensitivity resource, resulting in a **moderate adverse** effect, which is **significant**. In farming terms the implications are minimal, as the tracks mostly follow field edges and will be of operational benefit;

- Soils: The soils are mostly of medium sensitivity, and the impacts are temporary and of low magnitude, resulting in effects of **minor adverse** significance, which are **not significant**; and

- Farm businesses and economics: The construction works have only low or negligible impacts on farms of medium or low sensitivity resulting in effects of **minor** or **negligible** significance, which are **not significant**.

(ii) Operational Phase:

- Agricultural land quality: Any impacts will be of negligible magnitude, on resources of high or medium sensitivity, resulting in effects of **negligible** significance, which is **not significant**;

- Soils: There will be benefits across large areas within the Order Limits, where arable land will go into long-term grassland. The benefit is, however, temporary and could be reversed on decommissioning. Accordingly the benefit is of low magnitude, on resources mostly of medium sensitivity, resulting in effects of **minor** significance, which is **not significant**;

- Farm businesses and economics: 19 farm businesses are affected, with different degrees of impact. None are significant, however, and the overall effects are of **minor** or **negligible** significance, which is **not significant**; and

- Food production: There will be a negligible impact on food production nationally or regionally, which is **not significant**.

(iii) Decommissioning Phase:

- Agricultural land quality: There will be some short term, temporary and reversible impacts, and the overall effects will be **minor adverse**, which is **not significant**;

- Soils: There will be some short term, temporary and reversible impacts, and the overall effects will be **minor adverse**, which is **not significant**;

- Farm businesses and economic effects: Disturbance to farming operations will be short-term and the effects will be **minor** or **negligible adverse**, which is **not significant**.

15.7. Summary

Introduction

15.7.1. This chapter of the ES considers agricultural land, soils and agricultural businesses.

Baseline Conditions

15.7.2. The Order Limits comprises a mixture of land quality, from Grade 1 to Subgrade 3b. The Order Limits contains approximately 813ha of BMV land, representing 44.4% of the Order Limits, and approximately 1,001ha of moderate quality Subgrade 3b land. 17ha of mitigation land will remain in arable farming use, with no effect on land quality. The pattern of distribution of land quality is complex. Soils are loamy or sandy. There are 20 farm businesses with land in the Scheme.

Likely Significant Effects

15.7.3. There will be a main RWE 400kV substation plus seven 132kV on-site substations and four Battery Storage areas. Collectively the fixed infrastructure will cover 13.7ha of BMV land, of which all except 0.4ha will be restored at

decommissioning. The impact is consequently temporary and of low magnitude, and the overall effect is **minor adverse**, which is **not significant**.

15.7.4. Soils will be handled carefully (as outlined in the **outline SMP** [**Document Reference 7.9.8**]) for the 42.3ha where soils are disturbed, of which 13.7ha is BMV. The effects are **minor adverse** or **negligible**, which is **not significant**.

15.7.5. There are 20 farm businesses with land within Parcels A to E of the Scheme. The land is all used for arable cropping and the impacts on all farm businesses are **minor adverse** or **negligible**, which is **not significant**. There are no significant adverse effects on food production or security, or the wider land-based rural economy.

Mitigation and Enhancement

15.7.6. A Soil Management Plan will be implemented to minimise damage to soils and ensure that any damage is ameliorated. The restoring of arable soils with grassland for the duration of the operation phase will produce benefits for the soil resource.

Conclusion

15.7.7. There will be **no significant adverse** effects from the loss of BMV soils for the duration of the Scheme, and most areas will be fully restored at decommissioning.

15.7.8. In the scenario where the RWE 400kV substation is not removed and all the farm tracks are left in-situ (which would be at the discretion of the landowners), there could be a **moderate adverse** effect from the loss of BMV, which would be **significant**, but would need to be balanced against the agricultural operational benefits those tracks will allow.

15.7.9. **Table 15-19** provides a summary of effects, mitigation and residual effects.

Table 15-19 Summary of Effects, Mitigation and Residual Effects

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation / Enhancement Measures	Residual Effects
Construction								
Agricultural land	Loss or downgrading	Temporary	High and medium	Low	UK	Minor (or Moderate [1]) adverse (not significant)	None	Minor adverse (not significant)
Soils	Damage to soil structure	Temporary	Medium or low	Low	Local	Minor adverse (not significant)	Soil Management Plan	Minor adverse (not significant)
Farm businesses	Effect on viability	Permanent	Medium or low	Medium or low	Local	Minor or negligible	None	Minor adverse or

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation / Enhancement Measures	Residual Effects
						(not significant)		negligible (not significant)
Operation								
Agricultural land	Effect on ALC grade	Permanent	High or medium	Negligible	UK	Negligible (not significant)	SMP	Negligible (not significant)
Soils	Damage to soil structure	Temporary	Medium or low	Minor	Local	Minor adverse (not significant)	None	Minor adverse (not significant)

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation / Enhancement Measures	Residual Effects
Agricultural economy and food	Harm to farm viability	Permanent	Medium or low	Medium or low	Local	Minor adverse or negligible (not significant)	None	Minor adverse or negligible (not significant)
Decommissioning								
Agricultural land	Effect on ALC grade	Permanent	High or medium	Low	UK	Minor adverse (not significant)	None	Minor adverse (not significant)

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation / Enhancement Measures	Residual Effects
Soils	Damage to soil structure	Temporary	Medium or low	Low	Local	Minor adverse (not significant)	SMP	Minor adverse (not significant)
Agriculture and rural economy	Harm to farm viability	Temporary	Medium or low	Low	Local	Minor adverse or negligible (not significant)	None	Minor adverse or negligible (not significant)

(1) **Applying a worst-case assumption that none of the access tracks are removed, but are retained by the landowners (at their discretion), this could be a moderate adverse effect, which is significant, but which would result in agricultural operational benefits.**

15.8. References

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[Ref 15-22] Department for Energy Security and Net Zero (June 2025), Solar Roadmap

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15.9. Glossary

Term/Acronym	Description
Agricultural land quality	The quality of agricultural land for agricultural use. This is measured by the Agricultural Land Classification.
Agricultural Land Classification	A methodology devised by MAFF in 1988. It classifies Grade 1 as excellent quality, Grade 2 as very good quality, Grade 3a as good quality, Grade 3b as moderate quality, Grade 4 as poor quality and Grade 5 as very poor quality.
Anaerobic Digestion	A process whereby bacteria break down biomass, producing biogas which is usually used to generate electricity.
Best and Most Versatile Agricultural Land	Land in ALC Grades 1, 2 and 3a.
Field Capacity Days	A calculation used in ALC, determining the number of days in a calendar year that soil is replete (ie saturated) with water.
Arable cropping	The production of plants.
Combineable crops	Arable crops that are capable of being harvested by a combine harvester.