Ecoenergy International Ltd




Solar Farm on land south of Berrington, Shrewsbury, Shropshire SY5 6HA

Statement of Case - Soil Management Plan

August 2023

ADAS

ADAS GENERAL NOTES

Project No.: 1051487

Title: Statement of Case Soil Management Plan Solar Farm on land south of Berrington

Date: 18/08/2023

Office: **ADAS Rosemaund, Preston, Wynne, Hereford, HR1 3PG**

Status: Draft v1

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Date:	21/08/2023	Date:	23/08/2023

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1 INTRODUCTION

1.1.1 ADAS is instructed by Ecoenergy Ltd to consider Agricultural Planning matters and the preparation of a Soil Management Plan to demonstrate no permanent loss of the agricultural land at the proposed Solar Farm south of Berrington.

1.1.2 The instruction follows the refusal by Shropshire Council on 16th May 2023 Ref: 22/04355/FUL for the erection of an upto 30MW Solar PV Array, comprising ground mounted solar PV panels, vehicular access, internal access tracks, landscaping and associated infrastructure, including security fencing, CCTV, client storage containers and grid connection infrastructure, including buildings and off-site cabling.

1.1.3 One of the reasons for refusal states that:

Loss of Best and Most Versatile Land

88.2% of the land within the 44.09-heatare is best and most versatile quality with 54.1% being higher Grade 2 quality. It is not considered that the renewable energy benefits of the proposals or the applicant's justifications for this choice of site are sufficient to outweigh the adverse impact of losing the arable production potential of this best and most versatile land for the 40-year duration of the proposed solar farm, assuming the land is physically capable of reverting to intensive arable production at the end of this time period. The proposals are therefore contrary to paragraph 174B of the NPPF and Core Strategy Policy CS6 (and the accompanying explanatory paragraphs). The proposal is also contrary to policy DP26 (part 2.k) of the emerging Shropshire Local Plan which states that solar farm development should use lower grade land in preference to best and most versatile land.

1.1.4 The report prepared by the Planning Officer noted:

6.4.10 The applicant advises that the proposed solar farm is a temporary form of development which can be fully reversed. Agricultural production can also be maintained (though constrained) during the operational life of the solar park. Consequently, the development proposal would not result in the permanent loss or degradation of agricultural land.

1.1.5 Conclusion

The proposed solar development would operate for a temporary period of 40 years and would be fully restored as agricultural land after decommissioning.

1.1.6 This statement considers that the land would be used for the proposed solar development for a temporary period of 40 years and the land would be restored as agricultural land after decommissioning. The 'best and most versatile' (BMV) agricultural land includes land in Grades 1 and 2 and Subgrade 3a.

2 AGRICULTURAL LAND QUALITY

2.1 Introduction

2.1.1 The land at the site of the proposed solar farm has been classified according to the according to the revised guidelines for Agricultural Land Classification issued in 1988 by the Ministry of Agriculture, Fisheries and Food (now Defra)[1].

2.1.2 The survey has identified agricultural land of either Grade 2, Subgrade 3a or Subgrade 3b quality.

2.1.3 Grade 2 land is described as very good quality agricultural land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

2.1.4 Grade 3 – good to moderate quality land is described as land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2. The grade is subdivided:

2.1.5 -Subgrade 3a is described as good quality agricultural land, which is capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

2.1.6 -Subgrade 3b is described as moderate quality agricultural land, which is capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

2.1.7 About 88% or 36ha of the site is classified as either Grade 2 or Subgrade 3a and is considered to be 'Best and Most Versatile' agricultural land.

[1] MAFF, (1988). *Agricultural Land Classification for England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land*.

2.2 Agricultural Land Quality and Soil Resource Management

2.2.1 The Agricultural Land Classification grade of the land at the time of decommissioning is strongly influenced by the management of the soil resources from early stage in the planning of a solar farm through the phases of commissioning, operation and decommissioning.

2.2.2 The management of the soil resources is supported by the Soil Management Plan (SMP).

2.2.3 The purpose of the SMP is:

- to ensure the protection and conservation of soil resources on site
- identify best practice to maintain the physical properties of the soils on site
- provide on-site reference on the management of the soil resource for site operators

2.2.4 The SMP follows the principles of best practice[2] [3] to maintain the physical properties of the soil with the aim of the restoring the land to its pre-construction condition at the end of the lifetime of a solar farm.

2.2.5 The principles of best practice to protect soil resources were developed from a research project undertaken in the 1990s, which considered the quality of agricultural land at the post restoration stage for several mineral sites[4]. The study included 34 sites with best and most versatile agricultural land quality and of these about half had maintained their pre-working grade at the start of the 5-year aftercare period and the majority had maintained or improved the grade at the end of the 5- year aftercare period. The study made several recommendations such as soil resource and management planning at an early stage in the planning process, recording details of stored soils and using appropriate machinery in suitable conditions.

2.2.6 On any construction site there exists the risk of soil compaction from the use of heavy machinery and traversing land in unsuitable ground conditions. Soil compaction happens when soil is compressed. The soil structure is damaged when the soil is either traversed or handled when soil moisture conditions are unsuitable. This results in damage to the soil structure and a loss of soil porosity (the gaps through which water and air move in the soil).

2.2.7 The field criteria for signs of soil compaction include waterlogging on the surface, an increase in soil consistence (strength), a reduction in visible macropores, changes to the soil structure, colour and distribution of soil roots and soil moisture within the profile.

2.2.8 Much of the site is classified as having a medium resilience to structural soil damage and hence there exists the risk of soil compaction on the site, similar to many construction sites.

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[2] Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites

[3] The Institute of Quarrying (2021) Good Practice Guide for Handling Soils in Mineral Workings. https://www.quarrying.org.soils/soil-guidance

[4] Defra (2000). Evaluation of Mineral Sites restored to Agriculture. Project Code LE0206. http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=3621

The western part of the site has a light textured soil with a high resilience to structural soil damage. An area of heavy clay loam soils in the central part of the site has low resilience to structural soil damage.

2.2.9 The avoidance of soil compaction is the primary aim of good soil management through the SMP.

2.2.10 The SMP has identified 3 soil units and in areas where soil stripping and storage may be required, the soils of similar texture are stripped and stored together.

2.2.11 There will be stripping of the topsoil and subsoil, where concrete bases are required for associated infrastructure.

2.2.12 Stored soils will be placed in bunds on site for the life of the solar farm. A research report[5] covering over 30 mineral sites commented that 'storage does not seem to have a deleterious effect on medium textured soils' and that 'soil storage had no great effect on restoration quality but slightly increased the risk of land entering the aftercare period with a lower grade than before working'. However, at the end of the 5-year aftercare period the grade of the land improved to the pre-working grade. The report recommended actions to mitigate the effects of storage which are now part of best practice. Mitigation includes bund design and management.

2.2.13 An infield assessment of the soil moisture condition of the soil undertaken by a suitably qualified person is key to avoiding trafficking or handling the soil when in an unsuitable condition i.e. too wet. Mitigation includes handling the soils when they area as dry as reasonably practicable (normally below the plastic limit and not normally within 24 hours of significant rainfall (i.e. >10mm in a 24-hour period).

2.3 AGRICULTURAL LAND USE

2.3.1 At the time of the Agricultural Land Classification survey the fields for the proposed solar farm were under a green cover crop, as part of an arable rotation.

2.3.2 During the commissioning phase and through the operational phase to decommissioning the land will be under a grass/clover ley. There are potential benefits of increased soil organic matter content resulting from the agricultural land use change from arable use to low-maintenance grassland on solar farms. The relationship between soil structure and soil organic matter is documented [6] and the beneficial effect of soil organic matter on soil structure is established. Through the life of the solar farm there will be an increase in soil organic matter during the time the land is under the grass/ley mix. Upon reversion to arable

[5] Defra (2000). Evaluation of Mineral Sites restored to Agriculture. Project Code LE0206. http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=3621

[6] Cranfield University (2001), A Guide to Better Soil Structure 2001. http://adlib.everysite.co.uk/adlib/defra/content.aspx?doc=94893&id=1101

production it is expected that the soil organic matter level will have increased, although once arable production commences the soil organic matter level will become dynamic.

2.3.3 The grass/clover ley land use will be beneficial to managing the potential soil erosion risk in the western part of the site. The combination of gradient and light soil textures presents a high risk of soil erosion by water.

2.3.4 Decommissioning will involve the removal of all infrastructure in suitable soil moisture conditions including cabling and the reinstatement of soil where required.

2.3.5 Management of any visible signs (e.g. standing water or surface runoff) of soil compaction will include examination of the soil profile. Current techniques on alleviating soil compaction are effective in the topsoil and subsoil, generally to a depth of 45cm[7] . For deep subsoil compaction specialist equipment can operate to depths of about 60cm.

2.3.6 The land should be physically capable of reverting to arable production.

[7] Batey T. (2009). Soil compaction and soil management-a review. Soil Use and Management December 2009 25, 335-345. https://doi.org/10.1111/j.1475-2743.2009.00236.x

3 SUMMARY AND CONCLUSIONS

3.1 SUMMARY

3.1.1 On any construction site the risk of soil compaction exists. The risk arises from the use of heavy machinery and handling soils in unsuitable conditions.

3.1.2 Established best practice is the preparation of a soil management plan for the site. The plan identifies the soil types and includes details of the soil moisture assessment required to be undertaken prior to and during any site operations.

3.1.3 The implementation of the soil management plan at all stages of the life of a solar farm is key to protecting the soil resources and protecting the physical condition of the soil.

3.2 CONCLUSION

3.2.1 With adherence to the soil management plan and the implementation of mitigation set out, the land at Berrington should be physically capable of reverting to arable production after the end of the life of the solar farm.