FENWICK SOLAR FARM

Fenwick Solar Farm

EN010152

Environmental Statement

Volume III Appendix 2-1: Grazing Feasibility Study

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Revision History

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Prepared for:
Fenwick Solar Project Limited

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1. Introduction

1.1.1 This feasibility report has been prepared by an independent sheep specialist with 40 years' experience in the UK livestock industry.

1.1.2 Fenwick Solar Project Limited (the Applicant, a Boom Power company) is proposing a new solar farm with energy storage facilities at Fenwick, north of Doncaster.

1.1.3 The Scheme will generate low carbon electricity from Solar Photovoltaic (PV) Panels on land to the east of Fenwick, to the north of the city of Doncaster borough. Solar PV Panels will generate electricity, and a Battery Energy Storage System (BESS) will be installed allowing storage and export and import of electricity to/from the National Electricity Transmission System (NETS).

1.1.4 The 'Order limits' extend to approximately 509 hectares (ha) which is predominantly agricultural in nature. The Order limits will be made up of the Solar PV Site (407 ha), which includes environmental mitigation areas and planting and creation of wildlife habitats, the Grid Connection Corridor (95 ha), and the Existing National Grid Thorpe Marsh Substation (6 ha). The landscape features within the Solar PV Site consist predominately of agricultural fields mainly under arable production, with some areas of pasture, interspersed with individual trees, hedgerows, tree belts (linear) small woodland blocks and farm access tracks. The field boundaries primarily consist of hedgerows. The Applicant is planning to minimise the removal of trees and hedgerows for cable connections, security fencing or access requirements across different landholdings as far as reasonably practicable. After construction of the Scheme, a programme of reinstatement and habitat creation and enhancements would take place, including planting of additional trees and hedges to improve screening of the solar farm. Stock proof fencing to a maximum height of 2.2 m will be erected around the Solar PV Site.

1.1.5 The Order limits also includes a section of highway at the junction of the A19 and Station Road in the town of Askern to allow for abnormal indivisible load (AIL) vehicle access and escort. As the works would be limited to temporary traffic signal and banksman control for the period of AIL delivery.

2. Sheep grazing

2.1.1 Sheep are ruminants and are able to thrive on green fodder (grass, legumes, herbs, shrubs etc). They have four stomachs and through microbial activity in the rumen can digest a variety of green fodder crops, high in cellulose and hemi-cellulose, unlike monogastric animals which do not have this capability. They are therefore ideally suited to graze grass. They are much smaller than cattle, with mature female sheep weighing between 50 and 90 kg depending on breed, compared to mature cows of 500 to 800 kg. Their grazing habit and their size therefore makes them much more suitable for grazing amongst the Solar PV Panels than cattle or other grazing livestock.

2.1.2 In June 2023 there were about 15.4 million breeding ewes in the UK with almost 7 million of those in England (Ref. 1). They can be found grazing lowland, upland and high hill areas as shown in Plate 1 (Ref. 2), with the darker green areas showing the heaviest density of sheep in the North and West of the country. There are approximately 90 breeds of sheep in the UK with slightly differing characteristics, with some more suited to extensive grazing (hill areas and low stocking density) and others more suited to intensive systems in the lowlands.

2.1.3 It is clear from the map in Plate 1 that the sheep population in Yorkshire is focused mainly in West and North Yorkshire but South and East Yorkshire also have a good number of agricultural holdings with sheep. This situation has developed since South Yorkshire tends to have suitable, flat or undulating terrain for arable cropping but other than that there is no good reason why sheep and cattle cannot be kept in this area, and indeed many are. The sheep populations across the regions of Yorkshire are shown in Table 1.

Table 1: Sheep Holdings and Sheep Numbers in Yorkshire in December 2022/January 2023 (Ref. 2)

	Sheep Holdings	Sheep Numbers
Humberside (includes the East Riding)	579	59,161
North Yorkshire	3000	910,577
South Yorkshire	311	49,160
West Yorkshire	915	88,624

2.1.4 According to the Predicted Agricultural Land Classification (ALC) (**ES Volume II Figure 12-4: Predicted Agricultural Land Classification [EN010152/APP/6.2]**), the land around Fenwick is classified as Grade 4 and is therefore not of the highest quality for good arable yields (Ref. 3) and may well be more suited to grass and forage crops. ALC Survey Report (**ES Volume III Appendix 12-3: Agricultural Land Classification Report [EN010152/APP/6.3]**) concluded that the majority of the Solar PV Site is Subgrade 3b, with small patches of Grade 2, 3a and 4. If managed correctly, by providing good fencing and water supplies and good sheep husbandry, then there is no reason why the land under the panels cannot successfully

be grazed by sheep, as is common practice on other operational solar farms both within the UK and internationally.

2.1.5 The current landowners may not have sheep husbandry skills but these can be developed or other sheep keepers or new entrants to farming in the area may well be keen to rent the land to keep and expand their own sheep enterprises.

2.1.6 Sheep grazing will need to be managed according to grass availability and soil type – varying stocking density by season and soil conditions which will be learnt over the first years of the system. The choice of stock type – breeding ewes with lambs, dry ewes or store sheep will be dictated by the sheep manager but most sheep – apart from lambing ewes, could be grazed under the panels. It is likely that shepherding at lambing time would be hindered by the panels making it difficult to locate any ewes that are having lambing difficulties. Lambing would therefore happen elsewhere (as is the case for many flocks when ewes are housed over the lambing period) and the sheep brought back to the area once lambs are over 6 weeks of age. Flocks of dry sheep would be the easiest to manage since there would be no need to be sorting and selecting lambs for slaughter and health issues would be minimal. The primary purpose of sheep being on the land is to graze and manage the grass, not to produce lamb/wool, so a wide range of less agriculturally productive breeds could be considered at much lower stocking densities than might otherwise be considered for a profitable, commercial flock. The key to maintain the species diversity of the swards under the panels will be careful grazing management of the sheep, increasing and decreasing stocking density (i.e. sheep numbers) according to grass/herb growth and not grazing lower than 4 cm sward height to avoid loss of certain forage species, slow grass recovery and potential ingress of less desirable plants. Simply sowing multi-species swards rather than cereals will enhance biodiversity, and the organic matter generated by the sheep will improve soil quality and resilience to encourage a wider range of invertebrates. The sheep grazing system will need to be consistent with the commitments identified in the **Biodiversity Net Gain (BNG) Assessment [EN010152/APP/7.11]**.

2.1.7 Sheep in the UK vary in height and weight very significantly, with small, hill type sheep (e.g. Welsh Mountain) at 50 kg and less than 1 m tall, and some of the larger lowland type breeds (e.g. Oxford Down or Hampshire) may be as heavy as 100kg or more and up to 1.2m tall. Choice of breed will be important when considering suitable sheep to graze under the panels at their minimum height but it is unlikely that grazing will be limited by the panels themselves for any significant length of time.

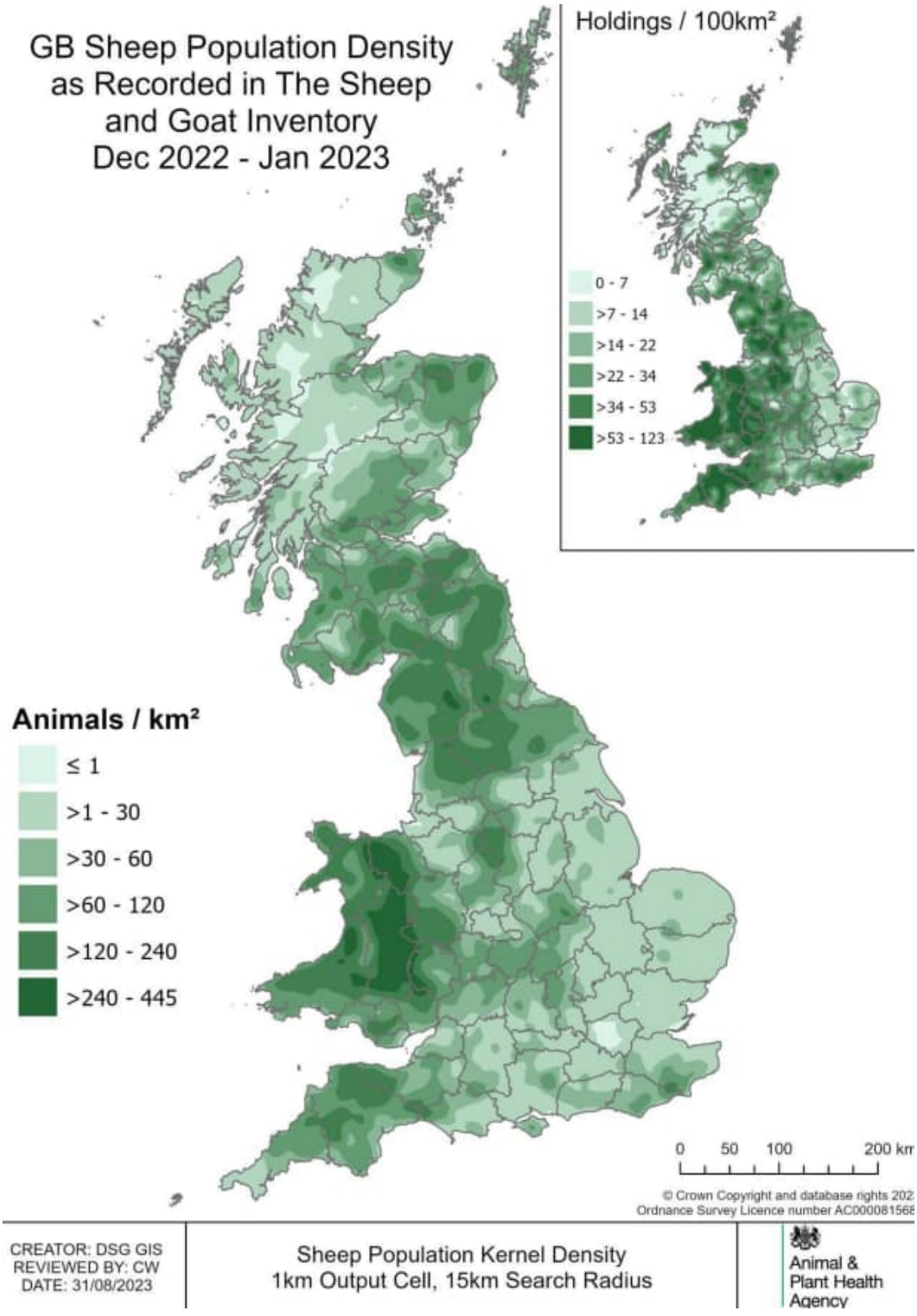

Plate 1: Sheep Population Density

2.1.8 Sheep systems are evolving and the current trend is to farm sheep with minimal purchased feed and to maintain breeding flocks on almost forage alone. This is in line with increasing soil organic matter, reducing use of imported feeds and maintaining flock performance. Indeed, there is a move to introduce sheep into arable rotations to help improve soil structure and fertility, to help control problem weeds like blackgrass and to improve profitability (Ref. 4).

2.1.9 Changing the proposed arable area to grassland for sheep should bring benefits to both biodiversity and soil health (Ref. 5). It will also increase carbon sequestration. Sheep will also benefit from parasite free pastures in the first year or more, will have shade and shelter under the solar panels and if well managed on a rotational grazing system should also perform well. There may be a need to supplement sheep with minerals and trace elements pertinent to the area (as is normal practice on many farms) and this can be defined by testing forage and perhaps blood testing the sheep themselves, but if needed, supplements can be easily administered orally or by injection.

2.1.10 There will be a need for sheep handling facilities – either mobile (which is the preferred method in terms of flexibility and sheep welfare, as sheep will not have to move far from their assigned area) or fixed at key points over the Order limits. This will enable easy management of the animals should any require management intervention or veterinary treatments.

2.1.11 Some of the benefits of keeping sheep on land that was in arable production previously:

a. Sheep have minimal housing and machinery needs.

b. Through their manure, sheep can contribute to soil organic matter. This provides vital nutrients for crops and supports soil organisms that keep the soil healthy.

c. Sheep benefit the environment by grazing on mixed species swards that increase biodiversity and provide habitat and food for insects.

d. Swards that include leguminous species that fix atmospheric nitrogen, increase soil fertility and cut the need for artificial fertilisers.

3. Conclusion

3.1.1 Grazing sheep in a solar farm is being successfully managed on other sites in the UK and across the world and there is no reason why this cannot be done on the proposed Fenwick Farm site. As table 1 suggests there are already 311 sheep holdings in South Yorkshire proving that the land is suitable for sheep farming.

4. References

Ref. 1 DEFRA. Livestock Populations in the United Kingdom at June 2023.

Ref. 2 Animal and Plant Health Agency (2023). Livestock Demographic Data Group: Sheep Population Report.

Ref. 3 Natural England (2010) Yorkshire and Humber Region, 1:250 000 Series Land Classification.

Ref. 4 National Sheep Association (2017). The Benefits of Sheep in Arable Rotations.

Ref. 5 British Society of Soil Science (2022). Science Note: Soil Carbon

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