Little Crow
Solar Park

Little Crow Solar Park, Scunthorpe

ENVIRONMENTAL STATEMENT

CHAPTER 10 - AGRICULTURAL CIRCUMSTANCES

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10 AGRICULTURAL CIRCUMSTANCES

10.1 INTRODUCTION

10.1.1 This chapter was prepared by Daniel Baird Soil Consultancy Ltd ('Baird Soil'). It provides an assessment of the likely significant Agricultural Land effects of the Development. Consideration is given within the chapter to the resources of agricultural land, the soil resource associated with that land, and the farm businesses operating at and around the site. Agricultural Land within the Order Limits is referred to as the agricultural soil survey area.

10.1.2 The chapter provides a brief summary of relevant planning policy and guidance, and a description of the methodology adopted for the assessment. This is followed by a description of the relevant baseline conditions of the Site and the surrounding area, and an assessment of the potential effects of the Development during both construction and decommissioning, and during operation of the completed Development. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any adverse effects, following which a summary of the likely significant residual effects of the Development is provided, having regard to mitigation adopted.

10.1.3 This chapter is supported by the following figures and appendices:

- **Figure 10.1 -** Agricultural Land Classification Grade Distribution
- **Figure 10.2 -** Agricultural Land Classification Grade Distribution Incorporating Gokewell Exclusion Zone
- **Appendix 10.1 -** Agriculture Baseline Report (Document ref 7.37 LC TA10.1)
- **Appendix 4.4 -** Outline Soil Management Plan (Document Ref 7.11 LC TA4.4)

10.2 LEGISLATION, PLANNING POLICY AND GUIDANCE

10.2.1 This section outlines the policy context relating to agricultural land and its development. There is no legislation of specific relevance to the soils and agriculture assessment.

- National Planning Policy and Guidance
- National Planning Policy Framework, 2019 [i]

10.2.2 The National Planning Policy Framework seeks to conserve and enhance the natural environment, paragraph 7 stating: *"The purpose of the planning system is to contribute to the achievement of sustainable development."*

10.2.3 Paragraph 170 lists six means by which planning policies should achieve this, a, b, e, and f being relevant to soils and agricultural land resource:

> Planning policies and decisions should contribute to and enhance the natural and local environment by:
>
> a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
>
> b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services - including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;

c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

10.2.4 The glossary of the NPPF gives the following definition: "Best and most versatile agricultural land: Land in grades 1, 2 and 3a of the Agricultural Land Classification".

Planning Practice Guidance[ii]

10.2.5 Paragraph 001 of the Natural Environment guidance directs that: "Planning policies and decisions should take account of the economic and other benefits of the best and most versatile agricultural land."

10.2.6 Under Renewable and Low Carbon Energy guidance, paragraph 013 states that particular factors a planning decision maker will need to consider include *"where a proposal involves greenfield land, whether (i) the proposed use of any agricultural land has been shown to be necessary and poorer quality land has been used in preference to higher quality land; and (ii) the proposal allows for continued agricultural use where applicable and/or encourages biodiversity improvements around arrays."*

Local Planning Policy

North Lincolnshire Local Development Framework and saved policies of the North Lincolnshire Local Plan (2003)[iii]

10.2.7 Policy CS2 of the Core Strategy deals with sustainable development and states how proposals must take into account the local environmental capacity including soil quality. There is no specific policy regarding the conservation of best and most versatile land in the North Lincolnshire Local Plan.

Guidance

Technical Information Note 049: Agricultural Land Classification (ALC)

10.2.8 Natural England Technical Information Note 049 (TIN049) Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural Land[iv], provides guidance on the application of the Agricultural Land Classification Guidelines[v], including survey methodology.

Table 10.1: Agricultural Land Classification Grading Definition

Grade	Definition
Grade 1	Land with no or very minor limitations to agricultural use. A wide range of agricultural and horticultural crops can be grown with high yields and less variable than on land of lower quality.
Grade 2	Land with minor limitations which affect crop yield, cultivation 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
Grade 3	Land with minor limitations which affect crop yield, cultivation 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
Subgrade 3a	Land 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.
Subgrade 3b	Land 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.
Grade 4	Land with severe limitations which significantly restrict the range of crops and / or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.
Grade 5	Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops

Code of Practice for the Sustainable Use of Soils on Construction Sites

10.2.9 The Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[vi] provides guidance on the conservation of soil for beneficial reuse at development sites, safeguarding both the mass of the soil resource and its functional capacity. The application of this code of practice is voluntary, however following the guidance can deliver clear benefits in terms of the sustainable use of a finite resource, minimising the generation of waste and sediment from a construction site, and the cost effective delivery of the Development.

Farming Circumstances

10.2.10 The NPPF does not provide direction on the potential effect of development on individual farm businesses. In the absence of such guidance, the farming circumstances assessment in this chapter follows the advice given by the superseded Planning Policy Guidance Note 7 (PPG7) and maintained by the Design Manual for Roads and Bridges (DMRB), Volume 11 - Environmental Assessment[vii]. It considers the effect of development on the following factors:

- The location of development in relation to farms;
- Farm size and structure;

- Buildings and other fixed equipment;
- Irrigation; and other effects of development on agriculture such as impact on drainage networks.

10.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

10.3.1 A full description of the proposed development is given in Chapter 4 of the ES. This section notes specific details of the proposal that have relevance to the potential impacts upon soils, agricultural land resource and farm businesses through construction, operation and decommissioning of the development.

10.3.2 The proposed solar park would comprise of rows of solar photovoltaic panels mounted on steel frames. The frames would be secured by pushing the slim legs into the ground to act as supports. The rows of panels are separated by clear ground to allow access for maintenance and to limit shading of panels. In addition, the mounting frame elevates the panel sufficiently that smaller livestock such as sheep can pass below and between rows.

10.3.3 Sufficient light passes through and between the panels to maintain a grass sward. It is desirable to maintain a green cover to promote rainfall infiltration and protect the soil surface from erosion. Grazing by sheep is a cost-effective means of controlling the grass growth and preventing the establishment of shrubs and trees but may be supplemented by grass cutting.

10.3.4 The development will include a substation and associated development facilities, buried cabling and security fencing, but the combined area of these will be a small fraction of that occupied by the solar panels. The substation and power storage facilities will be modular and sit on placed concrete rafts. Access tracks and hard standing will be hardcore laid over a geotextile mat.

10.3.5 Planning consent for solar park development is temporary, and an operational lifespan of 35 years is sought for the solar panels. At the end of this period the development is decommissioned. Decommissioning will remove the solar panels and their mounting frames, pulling up the steel supports from the ground. Cabling will be excavated and removed from the site. After removal of the associated development containers the concrete rafts will be lifted and taken off site. Lastly the hardcore for the tracks and hard standing crossing fields will be removed for reuse, and the geotextile removed.

Scope

10.3.6 This chapter covers three key issues of relevance to Agricultural Land. Firstly it considers the effects of the Development upon agricultural land as a resource, taking account of the land quality and versatility according to the Agricultural Land Classification Guidelines referred to above. Secondly the effects of development upon the soil resource are considered. The soil differs from the land that is associated with in that it can be translocated. Lastly it considers the effects of the Development upon farm businesses currently in operation upon the Site, and any effects the development may have on the management of surrounding agricultural land.

10.3.7 The above effects typically occur at the construction stage of the Development. However, consideration is also given to any ongoing effects upon the agricultural land resource and farming activities once the Development is complete and operational, then following the eventual decommissioning of the Development at the end of its temporary planning consent.

10.3.8 The ALC assessment is a quantitative assessment as it maps the extent of Best and Most Versatile ('BMV') land according to the prescribed ALC methodology. The assessment of likely effects upon a farm business is a qualitative assessment. The future management, marketplace or economic performance for a farm enterprise cannot be dictated or predicted with certainty.

10.3.9 A Scoping Opinion was provided by the Planning Inspectorate in January 2019. With regard to Agriculture, the Scoping Opinion requirements include:

10.3.10 The need for ALC grade distribution within the site, including differentiation between 3a and 3b,

10.3.11 Information on land take and impact on operations for each of the two farm units occupying the site, and

10.3.12 Details of proposed mitigation for any impacts on soils, agriculture and the land resource.

10.4 CONSULTATION

10.4.1 A summary of consultation responses to date is provided in Table 10.2 below.

Table 10.2: Summary of Consultations

Consultee	Summary of response	How Response has been addressed
The Planning Inspectorate	Within the ES, the total area of land at each ALC grade should be stated including a figure that differentiates between ALC grade 3a and 3b.	Detailed ALC survey undertaken with results presented on table of areas and plan.
The Planning Inspectorate	Report on likely effects on two farm businesses occupying the Site.	ES provides impact assessment for both farm businesses occupying land within the site
The Planning Inspectorate	Explain how the magnitude of effect criteria will be applied.	The ES explains how the magnitude of effect criteria are used for soils, land quality and farm businesses. No fixed criteria with threshold values are given as the sensitivity of different types of farm enterprise and soil type will differ between various effects.
The Planning Inspectorate	ES should include a description of all proposed mitigation or compensatory measures.	There is no mitigation for the loss of agricultural land resource as agricultural land or its quality and versatility cannot be

		replaced or translocated for all practical intents and purposes. Mitigation sections for Soil Resources and Farming Circumstances describe the mitigation proposed
The Planning Inspectorate	The ES should include details of measures taken to mitigate effects on agricultural soils during construction, eg through the provision of a Soil Management Plan. The ES should set out how any such mitigation is secured.	An Outline Soil Management Plan specific to the soil resource present within the site and the proposed development accompanies the submission

10.5 ASSESSMENT METHODOLOGY

Assessment of Agricultural Land Quality

10.5.1 Part of the Order Limits has been subject to a detailed Agricultural Land Classification (ALC) survey by a specialist Soil and Agriculture consultant. This was undertaken in July 2019 by Daniel Baird. The ALC survey was undertaken in line with Natural England's TIN049, using a survey density at the detailed scale (one sample point per hectare).

10.5.2 Sample points were placed on 100m intersections of the Ordnance Survey National Grid falling on agricultural land within the agricultural soil survey area. At these sample points, physical characteristics of the soil profile (depth, stone content, particle size distribution) were examined by using a hand auger to a depth of up to 1.2m. In addition to the hand auger, soil inspection pits were dug at representative locations to check the veracity of the auger boring data and to examine subsoil structural conditions undisturbed.

10.5.3 ALC guidelines and criteria require that the following factors be investigated:

- Climate: Average Annual Rainfall (AAR) and Accumulated Temperature above 0°C between January and June (AT0);
- Site: Gradient, Micro Relief and Flooding;
- Soils: Texture, Structure, Depth, Stoniness, and Chemical Toxicity; and
- Interactive Factors: Soil Wetness, Soil Droughtiness and Liability to Erosion.

10.5.4 Climatological data for ALC are provided for 5km intersections of the National Grid by the Meteorological Office, in collaboration with the National Soil Resources Institute. The data from these points is interpolated providing climate data for specific sites.

10.5.5 The interactive factors of soil wetness, soil droughtiness and liability to erosion are assessed according to the ALC criteria from the climate and soil profile data.

10.5.6 The ALC methodology does not assess the fertility or economic value of farmland, or the quality of the current land management. It is deliberately limited to features of the land and soil that are beyond the practical influence of land management and that can limit the versatility of land to support a range of different agricultural enterprises.

Assessment of Soil Resources

10.5.7 The Code of Practice for the Sustainable Use of Soils on Construction Sites recommends the use of the soil physical characteristics data, collected as part of an ALC survey, to identify topsoil and subsoil units for separate handling and beneficial reuse. This approach, used in this assessment, continues the practice that was used by the former MAFF ALC survey teams for minerals sites to advise on appropriate land restoration.

10.5.8 The ALC detailed survey data includes information on the depth, clay content and stoniness of topsoil and subsoil horizons, enabling the mapping of the extent of soil units appropriate for separate stripping, storage and beneficial reuse. The survey data is included as Appendix 12.2 of this ES. Mapping of soil units would form part of a Soil Management Plan that would be a condition of planning consent.

Farming Circumstances

10.5.9 The assessment methodology for assessing farming circumstances is taken from the now superseded PPG7 as indicated above. Although superseded, the guidance on assessment of farming circumstances was not replaced or updated by the new policy documents

10.5.10 Annex B of PPG7 noted the following factors that could be pertinent to assessing planning applications and designing development to minimise impact on local agriculture.

- The location of development in relation to farms;
- Farm size and structure;
- Buildings and other fixed equipment; and,
- Access to irrigation.

10.5.11 Two farm businesses occupy land within the Site. Information was gathered on the size and nature of their farm businesses and the individual farm enterprises that comprise them, in telephone interviews. The information provided was augmented with the surveyor's own observations when conducting the ALC field survey.

10.6 LIMITATIONS AND ASSUMPTIONS

10.6.1 As directed by TIN049, soil characteristics for the detailed ALC survey were gathered at sample points at 100m intervals. This limits the mapping of ALC grades to a scale of 1:10,000 and the calculation of extents to the nearest 0.1ha to avoid presenting spurious accuracy. The soil characteristics examined will however vary continuously between these sample points, and patterns may be present within the site that the one per hectare sampling density is unable to resolve.

10.6.2 1.3ha of agricultural land was added to the agricultural soil survey area after the ALC field work was completed. This area was considered too small to justify returning to the site to include as the travel time required would be disproportionate to add a single auger sample point. This area has therefore been mapped as Land Not Surveyed.

10.7 SIGNIFICANCE CRITERIA

10.7.1 Best and most versatile agricultural land is a strategic, finite and irreplaceable national resource with longstanding policy to prevent the unnecessary loss of such land to non-agricultural development. Land in ALC Grades 1, 2 and 3a is considered to be the nation's best and most versatile land. Paragraph 170 of the NPPF directs that planning

should consider the economic and other benefits of the best and most versatile agricultural land.

10.7.2 For all practical intents and purposes, agricultural land cannot be created or translocated, nor can a compensatory area of land have its ALC grade enhanced. There is therefore no viable potential for beneficial effect or mitigation with regard to agricultural land quality.

10.7.3 Land has a soil resource associated with it. This soil has a functional capacity that can be degraded or lost (for instance contamination of soil) in addition to the potential for loss of the soil material itself. Some functions of soil, such as the preservation of cultural artefacts and the support of biodiverse habitats, are covered elsewhere in this ES, for example Chapter 8: Archaeology and Built Heritage Document Ref 6.8 LC ES CH8) and Chapter 7: Ecology (Document Ref 6.7 LC ES CH7) of this ES. For this chapter, the capacity of the soil for agricultural production is the primary issue.

10.7.4 Soil is for all practical intents and purposes a non-renewable resource. Therefore the preservation and beneficial reuse of this resource is desirable in its own right.

10.7.5 As for the loss of agricultural land and soil, there are no set significance criteria for effects on farm businesses or the individual enterprises of a farm business. Effects can include the direct loss of land to a farm business, and the indirect limitation imposed on agricultural land use.

10.7.6 For the agricultural land resource, the presence of BMV land and the grade of that land determine sensitivity, Grades 1 and 2 land being of higher sensitivity than land in Grade 3a. The magnitude of change criteria is based on the extent of BMV land lost, with the area of 20ha being take from the threshold the former MAFF used for intervening in planning decisions.

10.7.7 The sensitivity of soil material varies in relation to the stress and its physical characteristics, for instance high clay content increases the vulnerability of soil to structural damage while in a wet and plastic consistency. Low clay content can increase the vulnerability of exposed soil material to erosion from rainfall. Topsoil is typically of greater sensitivity than subsoil as it is more limited in extent and the higher organic matter content can fuel a rapid transition to anaerobic conditions.

10.7.8 The sensitivity of farmland and farm enterprises can also vary, for instance breeding livestock being more sensitive to disturbance from dog walkers than arable cropping.

10.7.9 Table 10.3, Table 10.4 and Table 10.5 illustrate magnitude of impact criteria for the agricultural land resource, soil resources and farm businesses, as used in this assessment. These magnitude criteria are not absolute, and can be qualified, for instance looking at the relative areas of land quality grades affected, and a farm business as a whole, rather than individual enterprises.

Table 10.3: Magnitude of Change Criteria: Agricultural Land Resource

Magnitude of change	Criteria
High	Loss of 20 hectares or more of BMV land (Adverse).
Medium	Loss of less than 20 hectares BMV land (Adverse).
Low	Loss of agricultural land with no BMV (Adverse).
Negligible	Loss of land in Grades 4 and 5

Table 10.4: Magnitude of Change Criteria: Soil Resources

Magnitude of change	Criteria
High	Disposal of topsoil or loss of productive functional capacity e.g. land contamination (Adverse).
Medium	Loss of topsoil for agricultural production but retained for beneficial reuse, or degradation of productive capacity (Adverse).
Low	Loss of subsoil for agricultural production but retained for beneficial reuse (Adverse).
Negligible	Marginal loss of soil material such as light erosion from construction easement (Adverse).

Table 10.5: Magnitude of Change Criteria: Farming Circumstance

Magnitude of change	Criteria
High	Termination of a farm business (Adverse) Creation/expansion of primary farm enterprise (Beneficial)
Medium	Termination of a farm enterprise (Adverse) Creation/expansion of a farm enterprise (Beneficial)
Low	Constraint of a farm enterprise (Adverse) Enhancement of existing farm enterprise (Beneficial)
Negligible	Minor interruption to farm enterprise planning (Adverse) Temporary enhancement of existing farm enterprise (Beneficial)

10.7.10 Tables 10.6, 10.7 and 10.8 illustrate the sensitivity scales for assessment of agricultural land, soil resources and farm businesses. Table 10.9 is the Effects Significance Matrix.

Table 10.6: Sensitivity of Receptor: Agricultural Land Resource

Sensitive / Value of receptor	Example Criteria
Very High	Agricultural land predominantly in Grades 1 and 2
High	Agricultural land predominantly in Grade 3a or containing some Grade 1 and 2
Medium	Agricultural land containing some Grade 3a
Low	Agricultural land all Grade 3b or lower

Table 10.7: Sensitivity of Receptor: Soil Resources

Sensitive / Value of receptor	Example Criteria
Very High	Disturbing heavy textured soil in plastic condition
High	Disturbing medium textured soil in plastic condition
Medium	Disturbing medium textured soil in friable condition.
Low	Disturbing light textured soil in friable condition

Table 10.8: Sensitivity of Receptor: Farming Circumstances

Sensitive / Value of receptor	Example Criteria
Very High	Breeding livestock and stock with biosecurity restrictions
High	High value vegetable and fruit crops.
Medium	Dairy requiring daily collection of perishable milk.
Low	Housed livestock

Table 10.9: Effects Significance Matrix

Sensitivity Receptor	Magnitude of Change			
	High	**Medium**	**Low**	**Negligible**
Very High	Major	Major / moderate	Minor / Moderate	Moderate/ minor
High	Major / Moderate	Moderate / minor	Moderate / Minor	Minor /Negligible
Medium	Major / moderate	Moderate / minor	Minor / Negligible	Negligible
Low	Moderate / minor	Moderate / minor	Negligible	Negligible

10.8 BASELINE CONDITIONS

Existing Baseline

10.8.1 The Agricultural Circumstances Baseline document (Document Ref 7.37 LC TA10.1) provides details of the agricultural assessment work for the agricultural soil survey area. These details are summarised below.

Agricultural Land Resource

10.8.2 The detailed ALC survey of the Site found agricultural land in Grades 3a and 3b. Grade 3b predominates, with Grade 3a being relatively limited in extent. The land mapped as Non-Agricultural comprises areas of woodland, pond, rough and a midden within the study area. Numerous farm tracks cross the site, some of them surfaced. These have not been mapped out as Non-Agricultural land to improve clarity for ALC grade presentation. Table 10.10 below shows the extent of ALC Grades found by the detailed survey covering the agricultural soil survey area. The distribution of ALC grades is shown on Figure 10.1.

Table 10.10: ALC Grade Distribution within the Study Area

ALC Grade	Area (ha)	Area (%)
Grade 1	0.0	0.0
Grade 2	0.0	0.0
Grade 3a	36.6	16.3
Grade 3b	173.5	77.2
Grade 4	0.0	0.0
Grade 5	0.0	0.0
Land Not Surveyed	1.3	0.6
Non-Agricultural	13.3	5.9
Total	224.7	100.0

10.8.3 The detailed ALC survey of the agricultural soil survey area found agricultural land in Grades 3a and 3b. No area of land was found at the detailed scale that could be mapped out as Grades 1, 2, 4 or 5.

10.8.4 The small area of Land Not Surveyed protruding from the northern edge of the Order Limits was not included at the time of survey. The land comprises a small narrow field jutting into Santon Wood. Were this land to have been included in the detailed ALC survey, a single auger point would have fallen within it.

10.8.5 Four separate areas of Grade 3a land were identified by the detailed ALC survey. Soil profiles are predominantly deep, freely drained and light textured, with soil droughtiness being the primary limitation limiting this land to Grade 3a. Some soil profiles were found with a clayey subsoil that impeded drainage overlain by a sandy loam topsoil. The impeded drainage leaves the land seasonally waterlogged (Wetness Class IV), which in conjunction with the sandy loam topsoil and local climate characteristics, gives a soil wetness limitation to Grade 3a.

10.8.6 Grade 3b land covers the majority of the study area, with a number of differing soil types found within this area. A small number of profiles were found with a clayey subsoil that impeded drainage overlain by a clay loam topsoil. As above, the land is seasonally waterlogged (wetness Class IV) but owing to the higher clay content of the topsoil the land has a more severe soil wetness limitation to Grade 3b.

10.8.7 The dominant soil type within the Grade 3b area comprises light textured soils with limited depth and/or elevated stone content. Soil droughtiness is more severe than for the free drained land classed as Grade 3a because the shallower soil can not retain such a high volume of crop available water. In addition, the volume of larger stones (stones retained by a 20mm sieve) is sufficiently high at many sample points to impose a topsoil stoniness limitation to Grade 3b.

10.8.8 The final soil type found in the Grade 3b area has profiles comprising very light (sand) material. Where sand is found as the topsoil texture the land is limited to Grade 3b as the minimal cohesive strength of that soil makes it excessively vulnerable to erosion both by wind and raindrop impact. Signs of significant erosion and deposition of this sand are visible within the site, with prominent rills formed since the last cultivation, and low hummocks of wind-blown sand building up near some hedgerows and tree belts. Much of the topsoil eroded each year will however leave the site creating nuisance and impairing water quality elsewhere in addition to the loss of productive topsoil.

10.8.9 Some of the land mapped as Grade 3b in the south west corner of the site showed evidence of previous disturbance, with depressions, an undulating surface and abrupt changes in soil depth.

10.8.10 Land mapped as non-agricultural comprises small blocks of woodland and scrub, a pond and an uncropped area periodically used to store composts prior to spreading on the land.

10.8.11 The Gokewell Exclusion Zone within the site will not be developed and will provide an area for ecological enhancements. This exclusion zone has been set to protect a cultural heritage asset, the site of a former priory. This exclusion zone will have no Solar PV or switch gear compound within it for the duration of the development.

10.8.12 Of the approximately 11.4ha of land within the exclusion zone, 6.1ha is Grade 3a, 2.9ha in Grade 3b with the remaining land being Non-Agricultural. The 6.1ha of Grade 3a in the exclusion zone is almost half of the best and most versatile land present within the

whole site area. Figure 10.2 (Drawing Ref DRWG P18-0718_27) shows the ALC grade distribution with the Gokewell Exclusion Zone removed.

Soil Resource

10.8.13 The soil resource within the study area is predominantly light textured (sandy loam to loamy sand) and free drained. Small areas of clayey soils are found scattered across the site, in some instances with a covering of sandy loam topsoil material originating from higher up the slope. The largest continuous block of very light (sand) soils is found in the south western quarter, but pockets of this material are again found scattered across the site.

10.8.14 Topsoil and subsoil material differ in their organic matter content. The higher organic matter in topsoil improves soil structure, porosity and moisture retention as well as providing nutrients for plant growth. It is therefore of greater value as a growth medium than the underlying subsoil. This organic matter also makes the topsoil more vulnerable to becoming anaerobic (reduced oxygen conditions detrimental to plant root growth) if aeration is restricted, such as by flooding, compaction or burying in a storage bund.

10.8.15 The majority of land within the site is under conventional arable management with ploughing each year for trash incorporation, weed control and preparation of a seed bed. The loosening and inversion of soil aerates it, speeding the metabolization of organic matter sufficiently that the topsoil organic matter will continue to decline to a low equilibrium irrespective of the quantity of additional organic matter that can be practically applied to the land.

Farming Circumstances

10.8.16 Two farm businesses occupy land within the order limits. In addition, a housed poultry unit adjoins the site but is not part of the Order Limits. Most of the site is bounded by woodland and the British Steel site. Connecting agricultural land for this large site is limited to one field to the south and a very small field to the north.

10.8.17 Farm Business A is an owner occupier of land in the north east of the agricultural soil survey area. The land is an outlying parcel belonging to a large arable farm business. Farm Business A land within the site is mostly arable with one smaller field under permanent grass as part of a Countryside Stewardship scheme. This grassland is not grazed. Farm Business A occupies approximately 34ha of land within the agricultural soil survey area.

10.8.18 Farm Business B occupies the remaining agricultural land within the agricultural soil survey area site (approximately 191ha) on a contract farming arrangement with the landowner. The land is in arable production apart from the three small fields to the far south west which are under grass and not grazed. The owner of Farm Business B is seeking to downscale his business in preparation for retirement. A potato contracting enterprise is being wound up and the contract farming of the outlying land in the agricultural soil survey area was not intending to continue into 2020.

10.8.19 The poultry barns are connected to a network of farm tracks running across the proposed development site. However, this unit has independent access to the B1207 road to the east and has no need to make use of access across land within the Order Limits.

10.9 POTENTIAL EFFECTS

Construction Effects

Agricultural Land Resource

10.9.1 Construction work will start the temporary curtailment of arable production at the site. For Work No. 1: Arrays of Ground Mounted Solar Panels, the land can remain in agricultural production, grazing sheep, but arable land management will stop for the duration of the development, an extended fallow period.

10.9.2 Hardstanding, substation and associated development (Work Nos. 2A, 2B, 4, 5 and 7) will cover the soil surface for the minor area they occupy.

10.9.3 The land resource below the solar panels not lost and therefore has low sensitivity to the proposed development.

10.9.4 The resulting effect of the construction work on the Agricultural Land Resource will therefore be short term, reversable, local and have negligible significance.

Soil Resource

10.9.5 Solar panel construction work will involve trafficking the land in a similar manner to the current arable land use where high axle load vehicles like combine harvesters and grain trailers are regularly used. Heavy plant use will include excavators for digging trenches and cranes for placing substation and associated development.

10.9.6 Although very little movement of soil will take place, compaction may occur from trafficking by construction vehicles, but this compaction will be broadly similar to the business as usual of arable land management.

10.9.7 The resulting effect of the construction disturbance on the soil resource at the Site will be short term, reversible, local and of negligible significance.

Farming Circumstances

10.9.8 As for the agricultural land resource, the start of construction work will mark the start of the temporary curtailment of arable management at the site for Farm Business A and B. While construction work is taking place the land will not be available for grazing livestock either. Noise from construction work near the poultry barns could have the potential to disturb stock, however any such noise will be masked by the forced ventilation these poultry barns use.

10.9.9 Overall the unmitigated effect of the site preparation and construction is short term, reversable, local and of negligible significance.

Decommissioning Effects

Agricultural Land Resource

10.9.10 Decommissioning work will allow the land to managed for arable production again after an extended fallow period of being grazed by livestock. Solar panels and their mounting frames will be removed for no loss of agricultural land resource quality or extent.

10.9.11 Removal of the switchgear housings, associated hard standing and access tracks will be followed by reinstatement of the stripped and stored topsoil to allow this land to return to its former agricultural function.

10.9.12 As for construction effects, the land resource has a low sensitivity to the proposed decommissioning and the resulting effect of this work on the Agricultural Land Resource will therefore be short term, reversable, local and have negligible significance.

Soil Resource

10.9.13 As for construction, decommissioning will involve trafficking the land in a similar manner to the current arable land use where high axle load vehicles like combine harvesters and grain trailers are regularly used. Heavy plant use will include excavators for digging trenches and cranes for placing substation and associated development.

10.9.14 Although very little movement of soil will take place, compaction may occur from trafficking by the decommissioning plant, but this compaction will be broadly similar to the business as usual of arable land management.

10.9.15 The resulting effect of the decommissioning disturbance on the soil resource at the Site will be short term, reversible, local and of negligible significance.

Farming Circumstances

10.9.16 Decommissioning of the Solar Panels will allow a return to arable management of the land. As is currently the case, the actual management of the farmland (arable, pasture, horticulture etc) is a decision for the farm manager based upon the market conditions, opportunities and regulatory environment at that time. There is no obligation for land to return to arable production just as at present there is no obligation to maintain arable production.

10.9.17 Overall, the unmitigated effect of the site decommissioning is short term, reversable, local and of negligible significance.

Completed Development

Agricultural Land Resource

10.9.18 During the anticipated 35 year operational phase the Agricultural Land Resource will continue to support agricultural production, being grazed by sheep. Although the management of this agricultural land will be constrained by the temporary presence of the Solar Panels, the extent, quality and versatility of the land resource will not be impaired.

10.9.19 As land resource is not lost the magnitude of change is negligible. Sensitivity is medium owing to the presence of some Grade 3a land.

10.9.20 The resulting effect of the completed development on the Agricultural Land Resource will therefore be medium term, reversable, local and have negligible adverse significance.

Soil Resource

10.9.21 While operational, the soil resource at the site will remain under a perennial green cover. Benefits to the soil resource of this 35 year period of green cover with no ploughing will include:

- No bare soil surfaces vulnerable to wind and water erosion
- Improved infiltration of rainwater reducing erosive surface water runoff
- Greater exploitation of subsoil by perennial plant roots, improving drainage and loosening compacted subsoils

- Recovery of topsoil organic matter to a higher equilibrium, improving aggregate stability, water holding capacity and plant nutrient availability.

10.9.22 By facilitating a recovery in topsoil organic matter, this enforced fallow period will enhance the functional capacity of the soil resource for future arable production. There will be additional benefits from the recovery of soil organic matter including carbon sequestration and hydrology but this assessment centres on the soil's functional capacity for agricultural production.

10.9.23 The small proportion of land occupied by the temporary hard standing, substation and associated development will not experience this soil resource benefit, but the extent of this area is limited in comparison to the land under solar panels.

10.9.24 The benefit of enhancing soil functional capacity for agricultural production is of medium magnitude, with the predominantly light textured topsoil having medium sensitivity to this change.

10.9.25 The soil resource will therefore experience a medium term, reversable, local effect of moderate beneficial significance.

Farming Circumstances

10.9.26 During operation, grass below and between the solar panels will need to be managed. The most cost effective means of doing this is to graze the land with sheep. The land can therefore remain in agricultural production for the duration of the solar panel development.

10.9.27 Farm Business A will earn rent from the solar park occupation of their land, a new diversified enterprise. Farm Business B has no security of tenure for the contract farming agreement on the site and is looking to downscale by giving up the contract farming of land within the site. Rent for the solar park will go to the landowner.

10.9.28 The poultry barns will not experience any effect from the operation of the solar park.

10.9.29 Therefore the overall effect from the operational phase is expected to be medium term, reversable, local and of negligible significance for the affected farm businesses.

10.10 MITIGATION AND LIKELY SIGNIFICANT RESIDUAL EFFECTS

Construction

Agricultural Land Resource

10.10.1 There is no effective mitigation for the loss of best and most versatile agricultural land, and there is no actual loss of agricultural land resource. Therefore, the residual effect of the construction of the Development will remain short term, reversable, local and have negligible significance.

Soil Resource

10.10.2 An Outline Soil Management Plan (Document Ref 7.11 LC TA4.4) will sit alongside the Construction Environmental Management Plans for the development, providing guidance on the sowing of a green cover following the removal of the preceding arable crops, avoidance of trafficking over land when in a wet and plastic condition, and the

appropriate stripping and storage of topsoil prior to placing areas of hard standing and concrete rafts.

10.10.3 Stripping and storing topsoil from these small areas will prevent the material being covered and compacted for the duration of Little Crow Solar Park. At decommissioning it will also permit deeper and more effective decompaction of the subsoil material before the stored topsoil is replaced.

10.10.4 By following an appropriate soil management plan the effect of site preparation and construction on the soil resource will remain short term, reversible, local and of negligible adverse significance.

Farming Circumstances

10.10.5 As noted previously, Farm Business A is the only unit that will experience any temporary loss of arable production on securely held land, and will receive rent for the duration of the solar park occupation. There is no requirement for additional mitigation and residual construction effects remain short term, reversable, local and of minor adverse significance.

Decommissioning Effects

Agricultural Land Resource

10.10.6 As for construction effects there is no effective mitigation for the loss of best and most versatile agricultural land, and there is no actual loss of agricultural land resource. Therefore, the residual effect of the decommissioning of Little Crow Solar Park will remain short term, reversable, local and have negligible significance.

Soil Resource

10.10.7 The Outline Soil Management Plan will also cover the decommissioning and land restoration works. In addition to the same provisions for avoidance of trafficking over land when in a wet and plastic condition. Advice specific to the decommissioning phase will cover the appropriate handling of stored soil material as it is returned, appropriate aftercare of the land, and the identification and remediation of compacted subsoils.

10.10.8 By following an appropriate soil management plan the effect of site decommissioning and restoration on the soil resource will remain short term, reversible, local and of negligible adverse significance.

Farming Circumstances

10.10.9 As for construction effects there is no requirement for additional mitigation and residual decommissioning effects remain short term, reversable, local and of minor adverse significance.

Completed Development

Agricultural Land Resource

10.10.10 As for the potential effects of construction, there is no additional effect upon the agricultural land resource from the operation of the solar panels, and no effective means of mitigation. The residual effect of operation upon the agricultural land resource remains medium term, reversable, local and have negligible adverse significance.

Soil Resource

10.10.11 For the soil resource within the operational development, the effect of the development is beneficial. Therefore no further mitigation is proposed and the residual effect remains medium term, reversable, local and of moderate beneficial significance.

Farming Circumstances

10.10.12 Operation of the site will create an opportunity for local sheep graziers to access a new and sizeable area of pasture, expanding the size of their enterprise and improving economy of scale. The residual effect from the operational phase is expected to be medium term, temporary, local and of negligible significance farm businesses.

10.11 SUMMARY

10.11.1 The potential effects, mitigation and significance of likely significant residual effects is described in Table 10.11 below.

Table 10.11: Summary of Potential and Residual Effects

Description of Effect	Potential Effect	Mitigation	Residual Effect
Construction			
Loss of Agricultural Land Resource	***short term***, ***reversable***, ***local*** of ***negligible*** significance.	none	***short term***, ***reversable***, ***local*** of ***negligible adverse*** significance.
Loss and Degradation of the Soil Resource	***short term***, ***reversible***, ***local*** of ***negligible*** significance	Soil Management Plan	***short term***, ***reversible***, ***local*** of ***negligible adverse*** significance
Loss of Land to the Farm Business and Disruption to Agricultural Occupants Outside the Site	***short term***, ***reversable***, ***local*** of ***negligible*** significance	none	***short term***, ***reversable***, ***local*** of ***negligible*** significance
Decommissioning			
Loss of Agricultural Land Resource	***short term***, ***reversable***, ***local*** of ***negligible*** significance	None	***short term***, ***reversable***, ***local*** of ***negligible adverse*** significance
Loss and Degradation of the Soil Resource	***short term***, ***reversible***, ***local*** of	Soil Management Plan	***short term***, ***reversible***, ***local*** of

Description of Effect	Potential Effect	Mitigation	Residual Effect
	negligible significance		***negligible adverse*** significance
Loss of Land to the Farm Business and Disruption to Agricultural Occupants Outside the Site	***short term***, ***reversable***, ***local*** of ***negligible*** significance	none	***short term***, ***reversable***, ***local*** of ***negligible*** significance
Completed Development			
Loss of Agricultural Land Resource	***medium term***, ***reversable***, ***local***, of ***negligible*** significance	none	***medium term***, ***reversable***, ***local***, of ***negligible*** significance
Recovery of Soil Organic Matter under extended fallow	***medium term, reversable***, ***local*** and of ***moderate beneficial*** significance	none	***medium term, reversable***, ***local*** and of ***moderate beneficial*** significance
Loss of Land to the Farm Business and Disruption to Agricultural Occupants Outside the Site	***medium term***, ***reversable***, ***local*** and of ***negligible*** significance	new land for local sheep grazers	***medium term***, ***reversable***, ***local*** and of ***negligible*** significance

10.12 REFERENCES

[i] National Planning Policy Framework https://www.gov.uk/government/publications/national-planning-policy-framework--2#history

[ii] Planning Practice Guidance https://www.gov.uk/government/collections/planning-practice-guidance

[iii] North Lincolnshire Local Plan https://www.northlincs.gov.uk/planning-and-environment/planning-policy/north-lincolnshire-local-plan/

[iv] TIN049. Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural Land. Natural England 2009 http://publications.naturalengland.org.uk/publication/35012

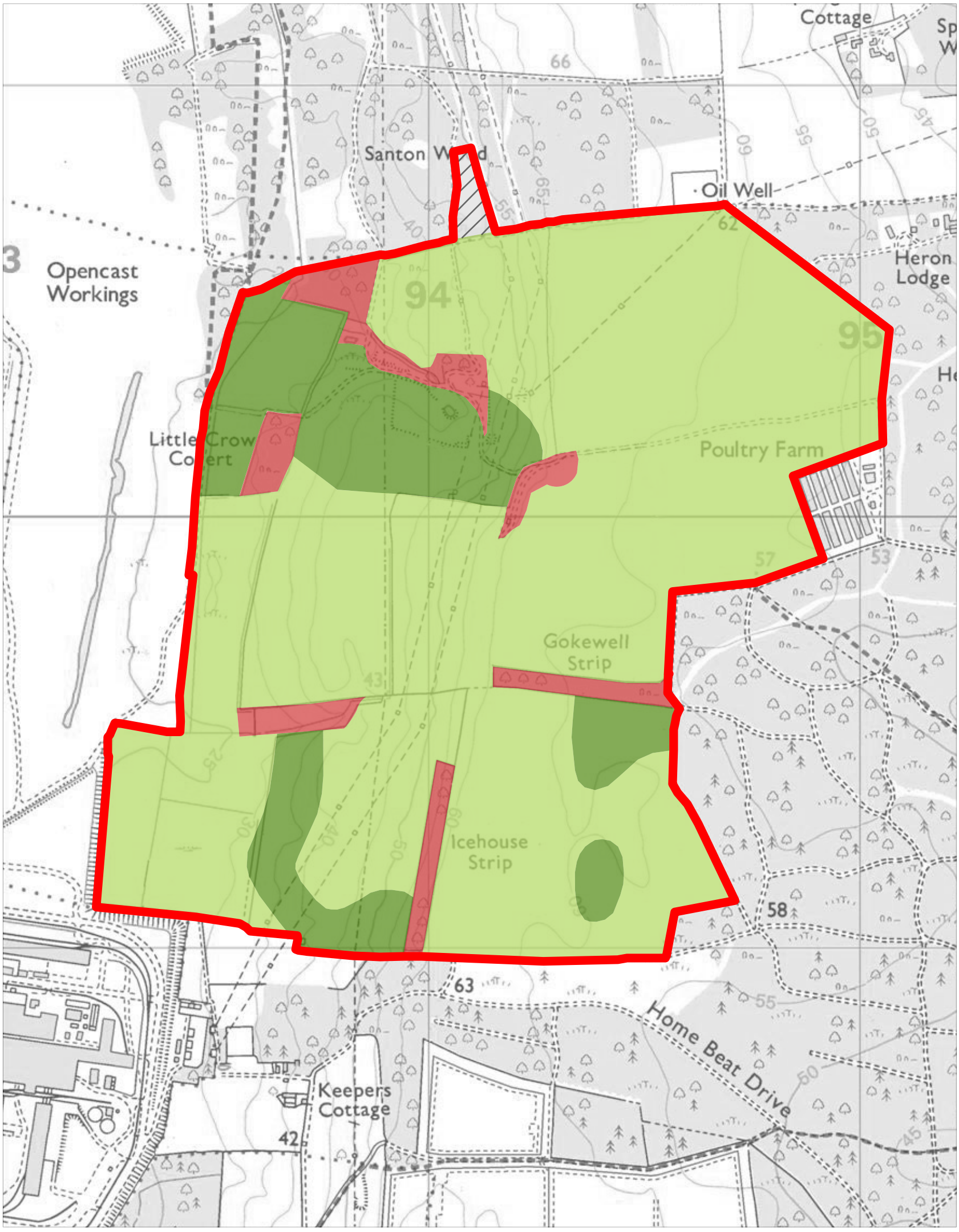
[v] Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land. MAFF 1988. http://archive.defra.gov.uk/foodfarm/landmanage/land-use/documents/alc-guidelines-1988.pdf

[vi] Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Defra 2011 https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites

[vii] Design Manual for Roads and Bridges, Volume 11 - Environmental Assessment http://www.standardsforhighways.co.uk/dmrb/vol11/index.htm

Figure 10.1

AGRICULTURAL LAND CLASSIFICATION GRADE DISTRIBUTION



KEY:

- AGRICULTURAL SOIL SURVEY AREA (224.7HA) 100%
- GRADE 3A (36.6HA) 16.3%
- GRADE 3B (173.5HA) 77.2%
- NON AGRICULTURAL (13.3HA) 5.9%
- LAND NOT SURVEYED (1.3HA) 0.6%

N W E S

0 50 150 250m

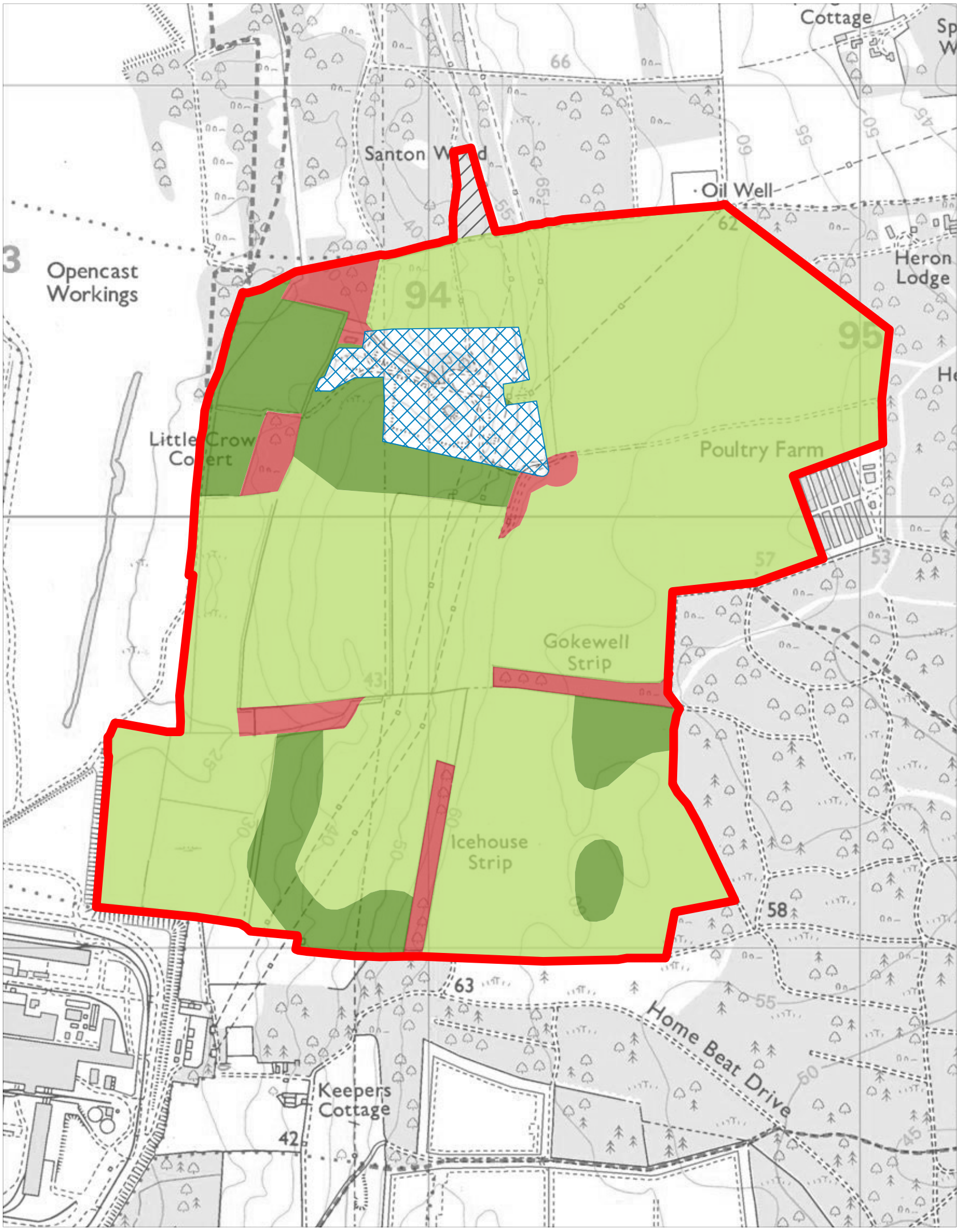
LITTLE CROW SOLAR PARK - AGRICULTURAL LAND CLASSIFICATION GRADE DISTRIBUTION

Pegasus Design

PLANNING | DESIGN | ENVIRONMENT | ECONOMICS | www.pegasusgroup.co.uk | TEAM/DRAWN BY: ST | APPROVED BY: GR | DATE: 29/11/19 | SCALE: 1:10,000 @ A3 | DRWG: P18-0718_26 SHEET NO: __ REV: E |

Figure 10.2

AGRICULTURAL LAND CLASSIFICATION GRADE DISTRIBUTION INCORPORATING THE GOKEWELL PRIORY EXCLUSION ZONE



KEY:

- AGRICULTURAL SOIL SURVEY AREA (224.7HA) 100%
- GOKEWELL EXCLUSION ZONE (11.4HA) 5.1%
- GRADE 3a (30.5HA) 13.6%
- GRADE 3b (170.6HA) 75.9%
- NON AGRICULTURAL (10.9HA) 4.8%
- LAND NOT SURVEYED (1.3HA) 0.6%

N W E S

0 50 150 250m

LITTLE CROW SOLAR PARK - AGRICULTURAL LAND CLASSIFICATION GRADE DISTRIBUTION INCORPORATING GOKEWELL EXCLUSION ZONE