AGRICULTURAL LAND CLASSIFICATION REPORT

BURSTEAD SOLAR FARM AND BATTERY STORAGE

LAND SOUTH AND EAST OF GREAT BURSTEAD, BILLERICAY, ESSEX

MARCH 2022

AGRICULTURAL LAND CLASSIFICATION
BURSTEAD SOLAR FARM

CLIENT: ENSO GREEN HOLDINGS J LIMITED
PROJECT: BURSTEAD SOLAR FARM
DATE: 3RD MARCH 2022 – ISSUE 2
ISSUED BY: JAMES FULTON MRICS FAAV

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1. EXECUTIVE SUMMARY

1.1 This report assesses the Agricultural Land Classification (ALC) grading of 97.6Ha, or thereabouts, of agricultural land south and east of Great Burstead, Billericay, Essex.

1.2 The limiting factor is found to be soil wetness, a combination of the climatic regime, soil water regime and texture of the top 25cm of the soil.

1.3 The land is graded as follows:

Grade 3b: 97.6Ha

1.4 The redline area of the planning application is approximately 119ha, the difference between the surveyed area and the application area being non-agricultural land predominantly highways or land that is used temporarily for underground cables before being returned to its agricultural use

2. INTRODUCTION

2.1 Amet Property Ltd have been instructed by Enso Green Holdings J Limited to produce an Agricultural Land Classification (ALC) report on a 97.6-hectare site south and east of Great Burstead, Billericay, Essex. The ALC report is being prepared to accompany a planning application for a solar farm and battery storage facility with associated infrastructure.

2.2 The report's author is James Fulton BSc (Hons) MRICS FAAV who has worked as a chartered surveyor, agricultural valuer, and agricultural consultant since 2004.

2.3 The report is based on a site visit conducted on the 28th of October 2021 during which the conditions were overcast and showery. During the inspection two trial pits were dug to a depth of 120cm with additional shallower holes to determine the depth at which the soil structure changed as required. In addition to the trial pits an augur was used to take a minimum of one sample per hectare on the proposed development site to a depth of 120cm. A plan of augur points can be found at ***appendix 1***. The trial pits were at sample points 20, and 66. The trial pit locations were selected as they were representative of the soils found on site.

2.4 Further information has been obtained from the MAGIC website, the Soil Survey of England and Wales and the Meteorological Office.

2.5 The collected information has been judged against the Ministry of Agriculture Fisheries and Food Agricultural Land Classification of England and Wales revised guidelines and criteria for grading the quality of agricultural land.

2.6 The principal factors influencing agricultural production are climate, site and soil and the interaction between them MAFF (1988) & Natural England (2012). Where factors are used for ALC grading but do not give any limitation to this site, they are not discussed.

MAFF (1988) - *Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land*. MAFF Publications

Natural England (2012) - *Technical Information Note 049 - Agricultural Land Classification: protecting the best and most versatile agricultural land*, Second Edition

3. CLIMATE

3.1 Climate has a major, and in places overriding, influence on land quality affecting both the range of potential agricultural uses and the cost and level of production.

3.2 There is published agro-climatic data for England and Wales provided by the Meteorological Office, such data for the subject site is listed in the table below.

Figure 2.1 Agro-Climatic Data – Details at ***appendix 2***

Grid Reference	569548 192388
Altitude (ALT)	27.92
Average Annual Rainfall (AAR)	594.35
Accumulated Temperature - Jan to June (ATO)	1460.52
Duration of Field Capacity (FCD)	109.91
Moisture Deficit Wheat	120.59
Moisture Deficit Potatoes	111.67

3.3 The main parameters used in assessing the climatic limitation are average annual rainfall (AAR), as a measure of overall wetness; and accumulated temperature, as a measure of the relative warmth of a locality.

3.4 The Average Annual Rainfall and Accumulated Temperature provide no climatic limitation to grade.

3.5 The majority of the site is shown as Flood zone 1 – land with an annual risk of flooding of less than 1:1000. There was no evidence of flooding on site and it is not considered a limiting factor.

4. SOILS

4.1 The soil across the site is very consistent and can be graded as one block.

4.2 The trial pit and augur sampling indicate the predominant soil type across the site being clay topsoil over clay subsoil (with some small areas of heavy clay loam or heavy silty clay loam topsoil) – detailed assessment can be found at ***appendix 3***.

4.3 Soil pit descriptions

Sample point 20

Horizon 1: 0cm to 35cm dark greyish brown (10YR 4/2) clay with a weak course subangular blocky structure

Horizon 2: From 35 cm to 120cm grey (10YR 5/1) clay with a massive structure with many ochreous and black mottles

Sample point 66

Horizon 1: 0cm to 35cm dark greyish brown (10YR 4/2) clay with a weak course subangular blocky structure and few small hard stones (1-5%)

Horizon 2: From 35 cm to 65cm grey (10YR 5/1) clay with a course angular blocky structure with many ochreous and black mottles

Horizon 3: From 65cm to 120cm grey (10YR 5/1) clay with a massive structure with many ochreous and black mottles

4.4 Soil Association

The available mapping shows the site to be largely within the Windsor with a small area at the south of the eastern block to be within the Ratsborough Association. The majority of the site fits within the descriptions of the Windsor Association with the small area of Heavy Silty Clay Loam witting into the Ratsborough Association.

4.5 Stone was present in some of the topsoils at up to 10%. These stones were generally small (sub 2cm) so do not affect cultivation and are not considered a limiting factor.

5.0 Interactive Factors

5.1 In-Field wetness class:

Site conditions: Undisturbed
Slowly permeable layer: Clay at 30-120cm depth, mottles evidencing wetness, course angular blocky or massive structure
Gleying – grey or pale colours dominant in the horizon and ochreous mottles

Maff guide to ALC states 'Mineral Soil with a slowly permeable layer starting within 80cm and gleying present starting within 40cm use figure 7 to determine wetness class':

Using Figure 7 from the MAFF guide the Wetness Class is determined as Wetness Class III

5.2 Wetness Assessment

Field Capacity Days (FCD)	102.21
Wetness Class	III
Soil Texture	Clay/Heavy Clay Loam/Heavy Silty Clay Loam

Table 6 Grade According to soil wetness – mineral soils, describes this combination as Grade 3b.

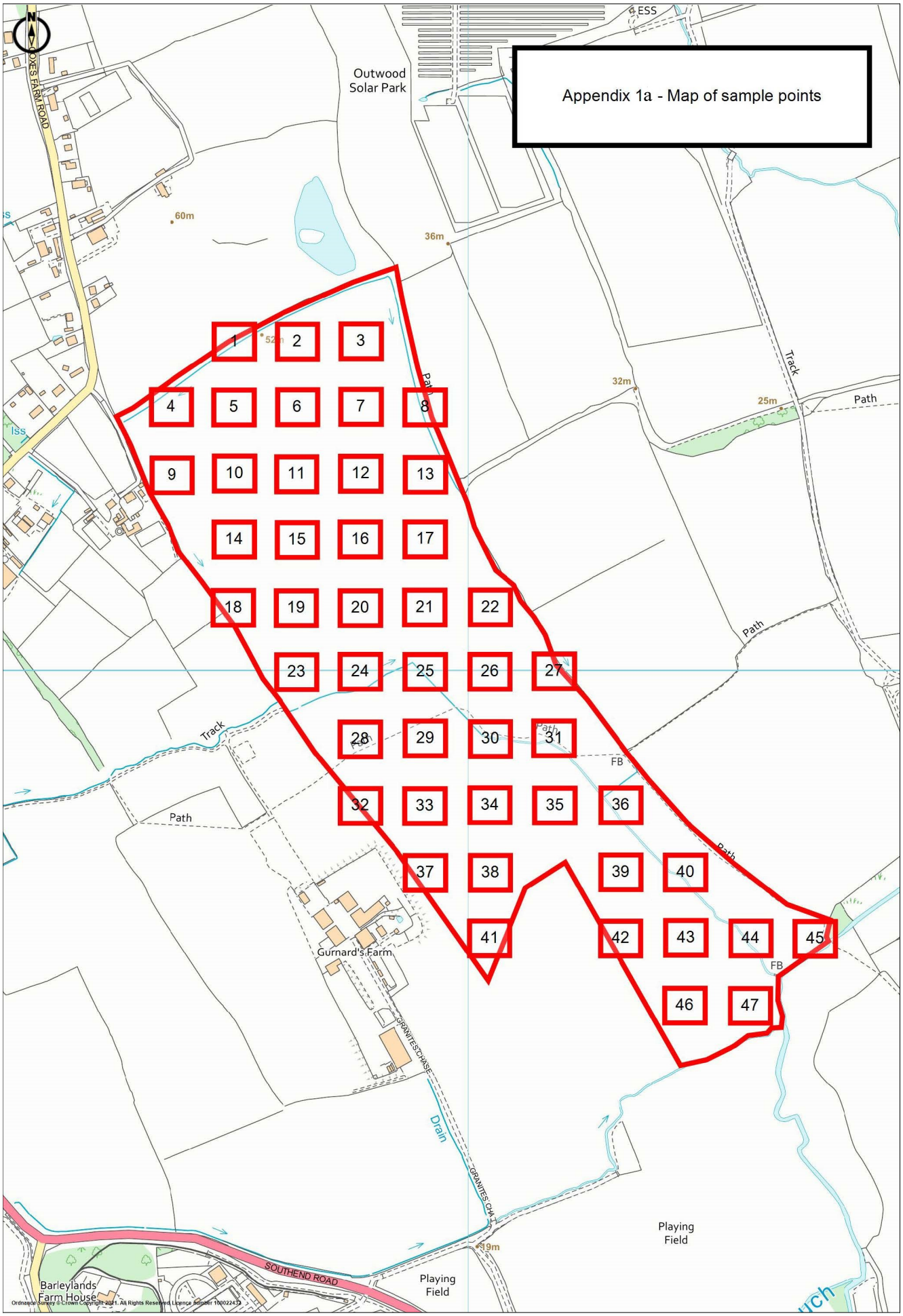
6.0 AGRICULTURAL LAND CLASSIFICATION

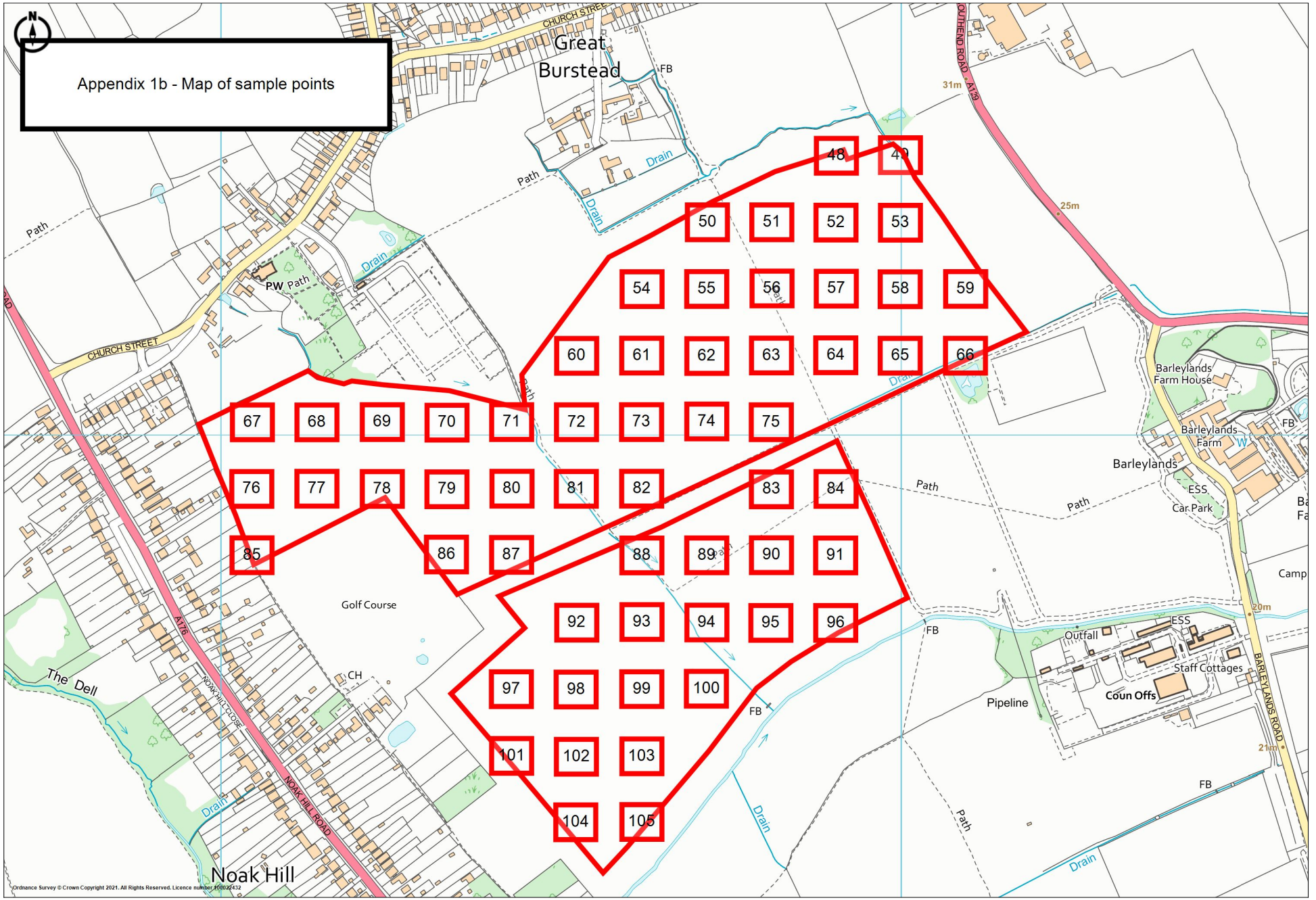
6.1 The Agricultural Land Classification provides a framework for classifying land according to which its physical or chemical characteristics impose long-term limitations on agricultural use. The limitations can operate in one or more of four principal ways: they may affect the range of crops that can be grown, the level of yield, the consistency of yield and the cost of obtaining it.

6.2 The principle physical factors influencing agricultural production are climate, site and soil and the interactions between them which together form the basis for classifying land into one of 5 grades; grade 1 being of excellent quality and grade 5 being land of very poor quality. Grade 3 land, which constitutes approximately half of all agricultural land in the United Kingdom is divided into 2 subgrades – 3a and 3b. A full definition of all of the grades can be found at ***appendix 4.***

6.3 The MAFF 1:250,000 map indicates the site to be Grade 3 land.

6.4 This assessment sets out that while no one factor limits the grade of the land, the interaction between climate and soil result in a wetness assessment that limits the land to grade 3b. A plan of the land grading can be found at ***appendix 5***.





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LANDMARK INFORMATION

APPENDIX 2 – AGRO-CLIMATIC DATA

Site Details: Burstead Solar Farm

Grid reference (centre of site): 569548 192388

Altitude: Mean 27.92

Climatic data from surrounding locations:

Grid Reference	ALT	AAR	LR_AAR	ASR	ATO	ATS	MDW	MDP	FCD
56501900	39	595	0.2	305	1450	2458	119	115	109
56501950	52	605	0.3	325	1433	2439	113	108	113
57001900	21	590	0.3	300	1469	2481	122	119	108
57001950	59	606	0.3	305	1424	2431	117	112	113

Altitude Adjusted

Altitude adjusted

Grid Reference	AAR	ATO	FCD	MDW	MDP	Proximity Adjustment
56501900	592.78	1462.63	108.68	120.29	111.41	7.68%
56501950	597.78	1460.45	111.96	115.98	104.87	7.20%
57001900	592.08	1461.11	108.30	121.14	115.03	45.79%
57001950	596.68	1459.43	111.65	120.84	109.06	39.34%

Site Average Annual Rainfall: 594.35

Site Accumulated Temperature January to June: 1460.52

Site Field Capacity Days: 109.91

Moisture Deficit Wheat: 120.59

Moisture Deficit Potatoes: 111.67

Appendix 3

		Topsoil						Subsoil 1						Subsoil 2					
Sample No	Altitude	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure	Depth	Texture	Colour	Stoniness	Mottles	Structure
1	52	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
2	43	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
3	36	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
4	45	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
5	41	0-30	C	10YR 4/2			WCSAB	30-120	C	10YR 5/1		MOB	M						
6	38	0-30	C	10YR 4/2			WCSAB	30-120	C	10YR 5/1		MOB	M						
7	35	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
8	30	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
9	38	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
10	36	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
11	32	0-30	C	10YR 4/2			WCSAB	30-120	C	10YR 5/1		MOB	M						
12	30	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
13	27	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
14	29	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
15	28	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
16	24	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
17	20	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
18	27	0-25	C	10YR 4/2			WCSAB	25-120	C	10YR 5/1		MOB	M						
19	24	0-30	C	10YR 4/2			WCSAB	30-120	C	10YR 5/1		MOB	M						
20	20	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
21	22	0-40	C	10YR 4/2			WCSAB	40-120	C	10YR 5/1		MOB	M						
22	23	0-40	C	10YR 4/2			WCSAB	40-120	C	10YR 5/1		MOB	M						
23	22	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
24	20	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
25	20	0-40	C	10YR 4/2			WCSAB	40-120	C	10YR 5/1		MOB	M						
26	20	0-40	C	10YR 4/2			WCSAB	40-120	C	10YR 5/1		MOB	M						
27	24	0-40	C	10YR 4/2			WCSAB	40-120	C	10YR 5/1		MOB	M						
28	20	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
29	20	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
30	20	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
31	19	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
32	20	0-40	C	10YR 4/2			WCSAB	40-120	C	10YR 5/1		MOB	M						
33	20	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
34	20	0-30	HZCL	10YR 4/2			MSAB	30-70	C	10YR 5/1		MOB	CAB	70-120	ZC	10YR 5/4			C PRISM
35	19	0-30	HZCL	10YR 4/2			MSAB	30-70	C	10YR 5/1		MOB	CAB	70-120	ZC	10YR 5/4			C PRISM
36	17	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
37	23	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
38	21	0-35	HZCL	10YR 4/2			MSAB	35-80	C	10YR 5/1		MOB	CAB	80-120	ZC	10YR 5/4			C PRISM
39	19	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
40	15	0-40	C	10YR 4/2			WCSAB	40-120	C	10YR 5/1		MOB	M						
41	22	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
42	14	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
43	14	0-40	C	10YR 4/2			WCSAB	40-120	C	10YR 5/1		MOB	M						
44	14	0-40	C	10YR 4/2			WCSAB	40-120	C	10YR 5/1		MOB	M						
45	14	0-40	C	10YR 4/2			WCSAB	40-120	C	10YR 5/1		MOB	M						
46	14	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
47	13	0-35	C	10YR 4/2			WCSAB	35-120	C	10YR 5/1		MOB	M						
48	29	0-35	C	10YR 4/2	10%		FSAB	35-50	C	10YR 5/1		MOB	CAB	50-120	C	10YR 5/3		MOB	CAB
49	29	0-35	C	10YR 4/2	10%		FSAB	35-50	C	10YR 5/1		MOB	CAB	50-120	C	10YR 5/3		MOB	CAB
50	30	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						

51	28	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
52	26	0-30	C	10YR 4/2	10%		FSAB	30-50	C	10YR 5/1		MOB	CAB	50-120	C	10YR 5/3		MOB	CAB
53	25	0-35	C	10YR 4/2	5%		FSAB	35-50	C	10YR 5/1	10%	MOB	CAB	50-120	C	10YR 5/1		MOB	CAB
54	31	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
55	29	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
56	27	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
57	26	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
58	25	0-35	C	10YR 4/2	5%		FSAB	35-50	C	10YR 5/1	10%	MOB	CAB	50-120	C	10YR 5/1		MOB	CAB
59	24	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
60	35	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
61	32	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
62	29	0-35	C	10YR 4/2	10%		FSAB	35-50	C	10YR 5/1		MOB	CAB	50-120	C	10YR 5/3		MOB	CAB
63	26	0-30	C	10YR 4/2	10%		FSAB	30-50	C	10YR 5/1		MOB	CAB	50-120	C	10YR 5/3		MOB	CAB
64	24	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
65	23	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
66	21	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
67	48	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
68	48	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
69	46	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
70	45	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
71	42	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
72	39	0-35	C	10YR 4/2	5%		FSAB	35-50	C	10YR 5/1	10%	MOB	CAB	50-120	C	10YR 5/1		MOB	CAB
73	38	0-35	C	10YR 4/2	10%		FSAB	35-50	C	10YR 5/1		MOB	CAB	50-120	C	10YR 5/3		MOB	CAB
74	30	0-35	C	10YR 4/2	10%		FSAB	35-50	C	10YR 5/1		MOB	CAB	50-120	C	10YR 5/3		MOB	CAB
75	25	0-30	C	10YR 4/2	10%		FSAB	30-50	C	10YR 5/1		MOB	CAB	50-120	C	10YR 5/3		MOB	CAB
76	48	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
77	46	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
78	44	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
79	40	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
80	34	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
81	32	0-35	C	10YR 4/2	10%		FSAB	35-50	C	10YR 5/1		MOB	CAB	50-120	C	10YR 5/3		MOB	CAB
82	29	0-35	C	10YR 4/2	10%		FSAB	35-50	C	10YR 5/1		MOB	CAB	50-120	C	10YR 5/3		MOB	CAB
83	23	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
84	23	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
85	49	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
86	37	0-40	C	10YR 4/2	<5%		FSAB	40-120	C	10YR 5/1		MOB	CAB						
87	35	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
88	31	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
89	29	0-30	C	10YR 4/2			FSAB	30-120	C	10YR 5/1		MO	CAB						
90	24	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
91	23	0-35	C	10YR 4/2			FSAB	35-50	C	10YR 5/1		MO	CAB	50-120	C	10YR 5/3		MOB	M
92	28	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
93	26	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
94	24	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
95	23	0-30	C	10YR 4/2			FSAB	30-120	C	10YR 5/1		MO	CAB						
96	22	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
97	27	0-35	HCL	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
98	25	0-35	HCL	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
99	23	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
100	22	0-35	C	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
101	28	0-35	HCL	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
102	25	0-35	HCL	10YR 4/2			FSAB	35-120	C	10YR 5/1		MO	CAB						
103	22	0-35	HCL	10YR 4/2		B	FSAB	35-120	C	10YR 5/1		MO	CAB						

104	24	0-35	C	10YR 4/2		FSAB	35-120	C	10YR 5/1	MO	CAB
105	22	0-35	C	10YR 4/2		FSAB	35-120	C	10YR 5/1	MO	CAB
	27.92										

APPENDIX 4 - DESCRIPTION OF ALC GRADES

Grade 1 - excellent quality agricultural land Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 - very good quality agricultural land 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.

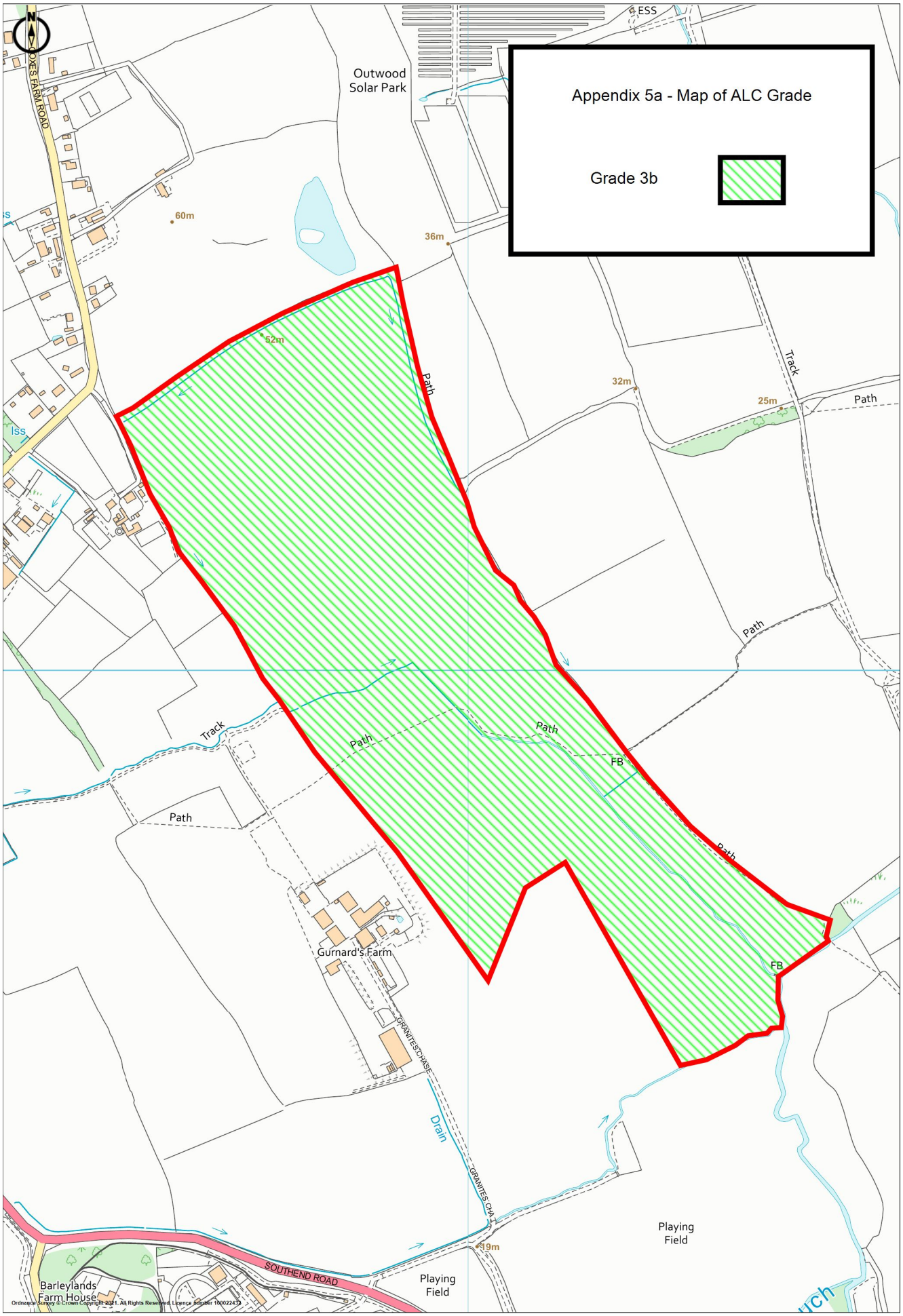
Grade 3 - good to moderate quality agricultural land Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a - good quality agricultural land 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 - moderate quality agricultural land 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 - poor quality agricultural land 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 - very poor-quality agricultural land Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.



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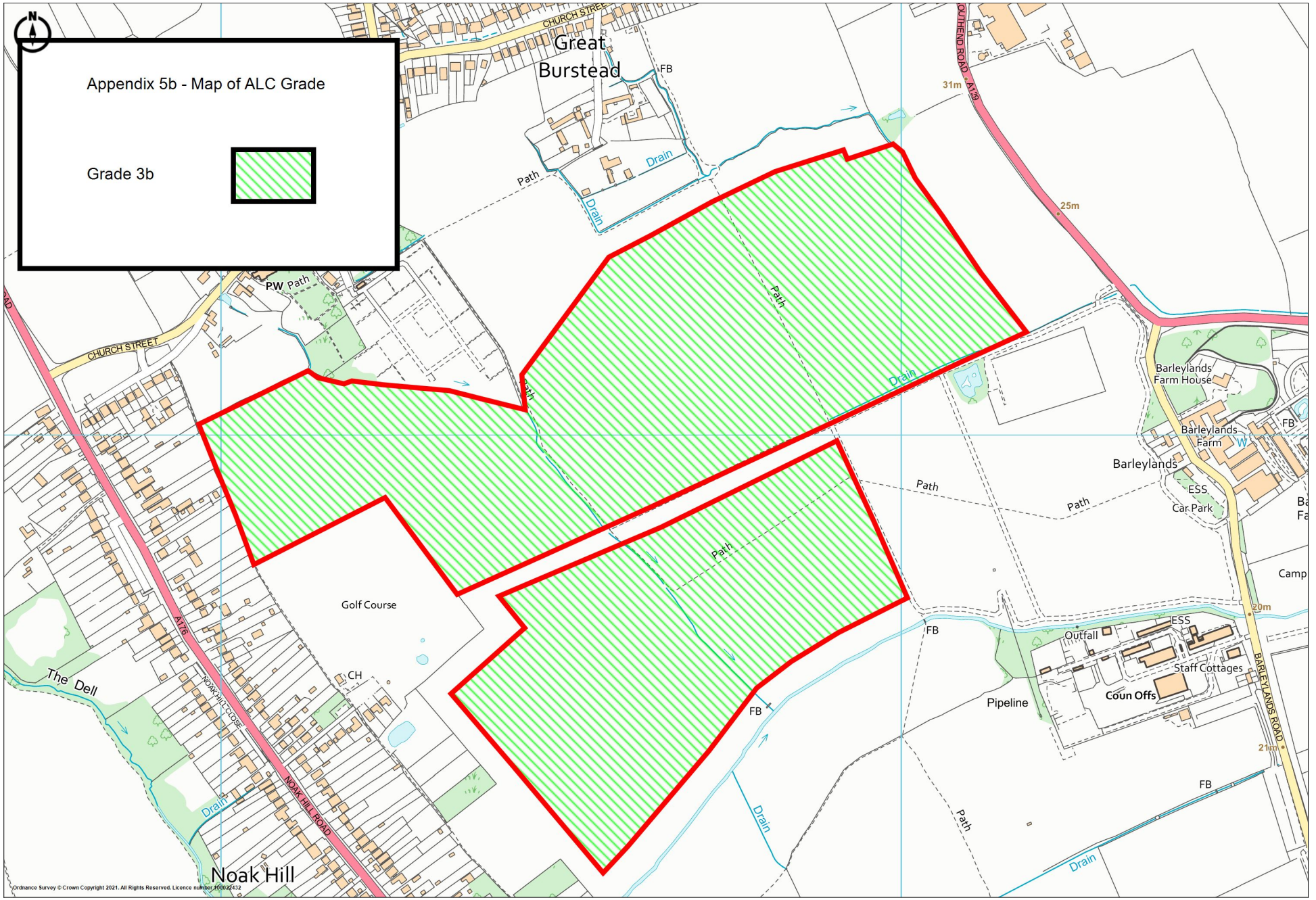

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