TECHNICAL APPENDIX 9: AGRICULTURAL QUALITY OF LAND

Longhedge Solar Farm

30/11/2022

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SUMMARY

9.1. An agricultural land quality survey has been undertaken of c. 94.24ha of land near Thoroton, Nottinghamshire in February 2022.

9.2. The land is mainly limited to subgrade 3a or 3b agricultural quality due to wetness and droughtiness limitations. Small areas are of grade 2 quality.

INTRODUCTION

9.3. Land Research Associates has been appointed by Renewable Energy Systems (RES) Ltd (the "Applicant") to undertake an Agricultural Quality of Land Assessment (ALC) for a proposed 49.9MW solar farm development (the "Proposed Development") on lands between Hawksworth and Thoroton, circa 15.5km east of Nottingham, Nottinghamshire (the "Application Site"); the approximate centre point of which can be found at Grid Reference E476129, N343467.

9.4. Please see **Figure 4 of Volume 2: Planning Application Drawings** for the layout of the Proposed Development.

9.5. This report provides information on the agricultural quality of c. 94.24ha of land between Hawksworth and Thoroton, circa 15.5km east of Nottingham, Nottinghamshire. The report is based on a survey of the land in February 2022 (which comprised a larger area of approximately 144 ha).

9.6. The report has been undertaken by Land Research Associates Limited, specialists in soil and agricultural land assessment for over thirty years.

9.7. For further information, please refer to the **Planning Statement** within **Volume 1**.

Development Description

9.8. The Proposed Development will consist of the construction of a 49.9 MW solar farm. It will involve the construction of bi-facial ground mounted solar photovoltaic (PV) panels, new access tracks, underground cabling, perimeter fencing with CCTV cameras and access gates, 2x temporary construction compounds, substation and all ancillary grid infrastructure and associated works.

Site Description

9.9. The Application Site is located in a semi-rural setting on lands between the settlements of Hawksworth (0.1km west) and Thoroton (0.2km southeast), circa 15.5km east of Nottingham, Nottinghamshire. (See **Figure 1** of **Volume 2: Planning Application Drawings** for further detail).

9.10. Centred at approximate Grid Reference E476129, N343467, the Proposed Development Site comprises nine fields covering a total area of c. 94.24hectares (ha), although only 37.7ha of this area is required to accommodate the solar arrays themselves, with the remaining area being used for ancillary infrastructure and mitigation and enhancement measures. The Proposed Development Site covers low lying lightly undulating agricultural land with an elevation range of c. 20m to 25m AOD. Internal field boundaries comprise, hedgerows, tree lines and several linear strips of woodland shelter belt. External boundaries largely consist of mature to lower hedgerows with individual trees and some evident gaps. In terms of existing

infrastructure; electricity pylons extend north-south through fields 5, 6 & 8, whilst electricity lines pass northwest to southwest through fields 4, 5, 6 & 9.

9.11. The Application Site will be accessed via the creation of a new entrance off the linear public highway Thoroton Road. The vegetation is set back from the road verge by a few metres and therefore visibility will not be an issue. Appropriate visibility splays are included within the CTMP.

9.12. The haul route will be from the A46 to the southwest of the Application Site. The vehicles will exit the A46, signposted A6097 (Mansfield), take the 4th exit at the roundabout onto Bridgford Street followed by the 1st exit at the next roundabout onto Fosse Way. Vehicles will travel along this road for approximately 1.5km to the next roundabout, where they will take the 2nd exit onto Tenman Lane. This road will be travelled on in an eastern direction for approximately 3.2km before taking a left hand turn onto Hawksworth Road and vehicles will travel along here for approximately 2km before taking a right hand turn onto Thoroton Road. Vehicles will travel in a southeast direction for approximately 0.9km before turning left into the Application Site.

9.13. There is one recreational route located within the Proposed Development Site (Bridleway 1 & 6 that pass through the northern fields), and several located close by (**See Figure 3 of Vol 2: Planning Drawings**). National Cycle Network (NCN) route 64 shares the minor road on the east side of the Proposed Development Site.

9.14. The Proposed Development Site is mostly contained within Flood Zone 1 (at little or no risk of fluvial or tidal / coastal flooding), however there are some areas of Flood Zone 2 and 3a which follow the watercourse/drains within the site and have been carefully considered during the design phase.

Site Environment

9.15. The land investigated comprises a block of nine fields. The site is level to gently sloping, at an average elevation of approximately 20 m AOD. At the time of the survey the land was under arable cropping.

Published Information

9.16. 1:50,000 BGS geological information shows the basal geology of most of the land as Branscombe Mudstone. An area in the north-west is recorded as Arden Sandstone Formation. The lower ground in central and eastern areas is largely recorded as overlain by Quaternary river alluvium. Patches of sand and gravel deposits are recorded in the north and east, and along the western boundary.

9.17. The National Soil Map (published at 1:250,000 scale) shows the lower ground as Fladbury Association: groundwater affected clays with poor drainage formed in river alluvium. The rest

of the site is recorded as Whimple 3 Association: mainly reddish fine loams over clay and clay soils with variable drainage, formed in thin drift over mudstone[1].

Soils

9.18. A detailed soil resource and agricultural quality survey was carried out in February 2022 in accordance with MAFF (1988) ALC guidelines. It was based on observations at intersects of a 100 m grid, giving a sampling density of one observation per hectare. During the survey soils were examined by a combination of pits and augerings to a maximum depth of 1.2 m. A log of the sampling points and a map (Map 1) showing their location is in an appendix to this report.

9.19. The survey found soils to vary in texture and drainage, controlled by changes in geology as described below:

Fine loams over clay formed in drift over mudstone

9.20. These soils are found on higher ground in the south-west, east and in patches elsewhere (where alluvial cover is absent). They comprise heavy or medium clay loam topsoil and upper subsoil, usually passing to reddish clay, often with weathered mudstone at depth. The clay subsoil is generally dense and slowly permeable and causes waterlogging (evidenced by pale and greyish ped faces and mottles and ferri-manganiferous concentrations) to shallow depth (Soil Wetness Class III); in some places, particularly on steeper slopes, the soils appear moderately freely-draining (Soil Wetness Class II).

9.21. Example pit descriptions with restricted drainage are provided from observation points 43, 51, 73, and 90 (see Map 1) in an appendix to this report. Better draining examples are provided from points 60 and 87.

Clay soils formed in alluvium

9.22. These soils dominate the southern and western parts of the site, where deep clayey alluvium overlies glacial deposits. The soils mainly comprise stoneless heavy clay loam or clay topsoil over dense, slowly permeable clay subsoil. Where the alluvium thins, loamy or sandy layers are found at depth. On the margins to the loamy soils described above, the topsoils are sandy clay loam textured.

9.23. These soils are dominant on the lower ground in central and eastern parts of the site. They comprise clay or heavy clay loam topsoil, usually directly over dense slowly permeable clay subsoil, which shows evidence of seasonal waterlogging (greyish colouration with ochreous mottles) to shallow depth (Soil Wetness Class III). The clay layer overlies sand and gravel at depth in some places.

[1]Ragg, J.M., *et al.,* (1984). *Soils and their Use in Midland and Western England,* Soil Survey of England and Wales Bulletin No. 12, Harpenden.

9.24. An example pit description is provided from observation point 37 (see Map 1) in an appendix to this report.

Loamy soils over interbedded mudstone and sandstone

9.25. These soils occur in the north-west of the site, mainly comprising slightly stony sandy clay loam upper layers, with dense slowly permeable greenish clay below. The subsoils often show evidence of seasonal waterlogging (greyish and pale colouration with ochreous mottles) although this varies with the thickness of the clay layer. The lower layers are mainly comprised of weathered mudstone or hard impenetrable sandstone. While the topsoil and upper subsoil is permeable, drainage is mainly restricted by the slowly permeable clay subsoil: Soil Wetness Class III or II.

9.26. Example pit descriptions are provided from observation points 4, 11 and 13 (see Map 1) in an appendix to this report.

AGRICULTURAL LAND QUALITY

9.28. To assist in assessing land quality, the Ministry of Agriculture, Fisheries and Food (MAFF) developed a method for classifying agricultural land by grade according to the extent to which physical or chemical characteristics impose long-term limitations on agricultural use for food production. The MAFF ALC system classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The system was devised and introduced in the 1960s and revised in 1988.

9.29. The agricultural climate is an important factor in assessing the agricultural quality of land and has been calculated using the Climatological Data for Agricultural Land Classification[2]. The relevant site data for an average elevation of 20 m is given below.

- Average annual rainfall: 564 mm
- January-June accumulated temperature >0°C 1425 day°
- Field capacity period (when the soils are fully replete with water) 110 days early Dec – early Apr
- Summer moisture deficits for: wheat: 121 mm potatoes: 116 mm

9.30. The survey described in the previous section was used in conjunction with the agro-climatic data above to classify the site using the revised guidelines for ALC issued in 1988 by MAFF[3]. There are no climatic limitations at this locality.

Survey Results

9.31. The agricultural quality of the land is determined by wetness and/or droughtiness. Other factors were assessed but were not found to have an effect on the final grade. Land of Grades 2 and 3 has been identified.

Grade 2

9.32. This grade of land is found in a few patches on higher ground over mudstone. The soils are freely-draining (Soil Wetness Class I or II), with medium textured topsoil. Under the dry local climate, the subsoils do not supply sufficient moisture to fully offset summer droughtiness, which will have slight effects on yields of cereal crops. Where the soils have slight drainage impedance (Soil Wetness Class II), machinery access is likely to be limited for periods in winter, and wetness is an equally limiting factor.

[2] *Climatological Data for Agricultural Land Classification*. Meteorological Office, 1989
[3]MAFF, (1988).*Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

Subgrade 3a

9.33. This sub-grade includes the land in the west over inter-bedded sandstone and mudstone. All of the land is limited by droughtiness, caused by the restricted moisture storage of the subsoils. This is likely to reduce average yields of arable crops. A small number of observations over sandstone layers have a greater degree of droughtiness restriction, but as these could not be mapped separately, they are judged appropriately graded according to average degree of limitation.

9.34. Having moderately high topsoil clay content and imperfect drainage (Soil Wetness Class III), much of the land is equally limited by wetness, which is likely to restrict machinery access in winter and early spring.

Subgrade 3b

9.35. This sub-grade includes the clay soils over alluvium which occupy most of the lower ground. The combination of high topsoil clay content and imperfect drainage mean machinery access is rarely possible in spring due to wetness, and arable cropping is therefore mainly restricted to autumn sowings.

9.36. Significant areas of reddish soils over mudstone with slowly permeable clay at shallow depth are also limited by wetness to this sub-grade.

Other land (non-agricultural)

9.37. This includes farm tracks, water bodies and blocks of woodland.

Grade areas

9.38. The boundary of the land grade is shown on Map 2 and the area occupied is shown below

Table 9.1: Areas occupied by the different land grades

Grade/Subgrade	Area (ha)	% of the land
Grade 2	1.7	2
Subgrade 3a	33.7	36
Subgrade 3b	54.0	58
Other land	3.9	4
Total	93.3	100

APPENDIX

Details of Observations
Maps
Selected droughtiness calculations
Laboratory analysis

Land near Thoroton: Soils and ALC survey – Details of observations at each sampling point

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
1	0-28	SCL	<5	28-35	C(r)	xxx	28-60 60-110	LMS LMS+C bands	xxx xxx	0	II/III	3a	D
2	0-30	SCL	<5	30-50	SCL	xx	50+	stopped on SST		0	II	3b	D
3	0-35	SCL	<5	35-70	C(r)	xxx	70-90 90+	SCL stopped on SST	x	0	III	3a	W/D
4	0-32	MCL	<5	32-45	HCL	xxxx	45-89 89+	C SST	xxx	0	III	3a	W/D
5	0-30	MSL-SCL	<5	30-50	st LMS	xxx	50-100	C	xxxx	0	III	3a	W/D
6	0-30	SCL	<5	30-80	C(r) with sand incl	xxx	80-100+	SCL	xxx	0	III	3a	W/D
7	0-30	SCL	<5	30-60	C	xxx	60-70 70+	st SCL stopped on SST	xxx	0	III	3b	D
8	0-30	HCL/SCL	<5	30-70	st HCL/SCL	xxx	70+	SST		0	III	3a/b	W
9	0-30	HCL	<5	30-50	C	xxx	50-70 70-90 90-110	HCL C SCL	xxx xxx xxx	0	III	3b	W
10	0-34	HCL	3	34-45	HCL	x	45-70 70-100	HCL C(r)	xxx xxx	0	II	3a	W/D
11	0-29	SCL	5-10	29-45	SCL	xx(x)	45-64 64+	C MST	xx(x)	0	II	3a	D
12	0-32	SCL	5-10	32-65	C	xxx	65-85 85-90+	SCL C	xxx xxxx	0	III	3a	W/D
13	0-30	SCL	5	30-42	SCL	xxx	42-78 78-120	C MST	xxxx	1	III	3a	W/D
14	0-35	SCL	<5	35-55	SCL	xxx	55-110 100+	HCL stop on stones	xxx	0	III	3a	W/D
15	0-30	HCL	<5	30-45	HCL	xxx	45-80 80+	(st) SCL stopped on stones	xxx	0	III	3a	W/D
16	0-30	HCL/C	<5	30-80	C	xxxx	80-100	(SCL	xxx	0	III	3b	W
17	0-30	HCL	<5	30-45	HCL	xx	45-70	HCL	xx(x)	0	II	3a	W
18	0-30	HCL	<5	30-55	HCL-SCL	xxx	55-85 85+	C(r) stopped	xxx	0	III	3b	W
19	0-28	HCL	<5	28-70	C(r)	xx	70-100	C+MST	xx	2	III	3b	W
20	0-30	SCL/MSL	5-10	30-52	SCL/MSL	xxx	52-90+	C	xxxx	1	III	3a	D
21	0-35	SCL	5-10	35-42	SCL	xxx	42-90+	C	xxxx	1	III	3a	W/D
22	0-29	SCL/MSL	5	29-55	SCL	xx	55-90+	C(r)	xx	1	II	3a	D
23	0-34	SCL	<5	34-53	SCL	xx	53-90+	C(r)	xx	1	II	3a	D

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
24	0-31	SCL	<5	31-54	SC	xxx	54-83 83+	mstSCL Stopped on stones	xxx	1	III/II	3a	D
25	Drainage ditch												
26	0-30	C	0	30-49	C	xxx	49-90+	HZCL	xxx	0	III	3b	W
27	0-30	C	<5	30-80+	C(gr)	xxxx				0	III	3b	W
28	0-30	HCL	<5	30-70	HCL	x	70-80 80-110+	HCL C(r)	xxx xxx	0	II	3a	W
29	0-34	HCL	<5 <5	34-70	C(r)	xx	70-80+ 80+	mudstone stopped	-	2	III	3b	W
30	0-30	HCL	<5	30-70	C(r)	xx	70-100+	mudstone		1	III	3b	W
31	0-30	SCL/HCL	<5	30-52	C	xxx	52-90+	C(r)	xx	1	III	3a/3b	W
32	0-29	SCL	<5	29-53	SCL	xxx	53-90+	C	xxxx	1	III	3a	W/D
33	0-35	SCL	<5	35-52	mstMSL	xx(x)	52-90+	C	xxxx	1	III/II	3a	D
34	0-33	SCL	<5	33-43	SCL(r)	xx	43-63 63+	SC(r) Stopped on stones	xx	1	II	3a	D
35	0-30	HCL	<5	30-73	C	xxx	73-90+	C(r)	xxx	1	III	3b	W
36	0-34	HCL	<5	34-55	C	xxx	55-90+	mstSCL	xxx	0	III	3b	W
37	0-35	C	0	35-77	SC	xxx	77-110+	LMS	xxx	0	III	3b	W
38	0-28	C	0	28-90+	C	xxx				0	III	3b	W
39	0-30	HCL/C	<5	30-80	HCL/C	xxx	80-110+	C(r)	xxx	1	III	3b	W
40	0-25	HCL	<5	25-60	C(r)	x	60-100+	C+MST	x	2	II/III	3a/3b	W
41	0-30	HCL	<5	30-40	HCL	xx	40-100+	C(r)	xx	0	III	3b	W
42	0-31	HCL	<5	31-68	C(r)	xx	68+	MST	xxx	0	III/II	3b/3a	W
43	0-30	MCL/SCL	<5	30-60	SCL	xx	60-100+	C(r)	xxx	0	II	3a/2	D
44	0-32	SCL	<5	32-67	stMSL	xxx	67-90+	C	xxxx	1	III	3a	W
45	0-33	SCL	<5	33-90+	C(r)	xxx				1	III	3a	W
46	Woodland												
47	0-28	HCL/C	0	28-55	HCL/C	xxx	55-90+	C	xxx	1	III	3b	W
48	0-35	C	0	35-56	C	xxx	56-90+	HZCL	xxx	0	III	3b	W
49	0-30	C	<5	30-45	C(r)	x	45-80 80+	MST stopped		1	III	3b	W
50	0-33	HCL	<5	33-100	C(r)	xxx				1	III	3b	W
51	0-30	HCL	<5	30-52	HCL	xxx	52-120	C(r)	xxx	0	III	3b	W
52	0-30	HCL	<5	30-50	C(r)	xxx	50-60 60-90 90+	HCL C(r) MST	xxx xxx	1	III	3b	W
53	0-30	MCL	<5	30-60	HCL-SCL	xx	60-100+	C(r)	xxx	1	II	2	D
54	0-32	HCL	<5	32-45	C	xxx	45-80+	C(r)	xxx	0	III	3b	W
55	0-25	C	<5	25-70	C(gr)	xxxx	70-100+	C(gr)	xxxx	0	III	3b	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
56	0-30	C	<5	30-100	C	xxxx				0	III	3b	W
57	0-35	C	0	35-45	C	xxx	45-80 80-100+	ZC C	xxxx xxxx	0	III	3b	W
58	0-30	HCL/.C	0	30-40	C(r)	xx	40-80+	MST		2	II	3a	W/D
59	0-30	HCL/C	<5	30-60	C+mudstone	xx	60+	stopped		2	II	3a	W/D
60	0-30	HCL	<5	30-60	C(r)	xxx	60-90 90+	C+ MST MST	xxx	1	II	3a	W
61	0-35	C	0	35-90	C(gr)	xxxx				0	III	3b	W
62	0-30	HCL	<5	30-100	C(gr)	xxxx				0	III	3b	W
63	0-30	C	<5	30-50	C(gr)	xxx	50-100+	C(r)	xxx	0	III	3b	W
64	0-28	C	<5	28-40	C	xxx	40-60 60-100+	ZC C	xxxx xxx	0	III	3b	W
65	0-30	HCL/C	0	30-50	C	xxx	50-90 90-100+	C(r) MST	xxx	0	III	3b	W
66	0-27	HCL	<5	27-70	C(r)	xxx	70-100+	C+ MST	xxx	0	III	3b	W
67	0-30	C	0	30-100	C+ZC	xxxx				0	III	3b	W
68	0-31	C	<5	31-90	C(gr)	xxxx	90-110+	SCL	xxx	0	III	3b	W
69	0-32	HCL	<5	32-70	C(gr)	xxx	70-100+	st SCL	xxx	0	III	3b	W
70	0-30	C	<5	30-70	C(gr)	xxx	70-100+	C(r)	xxx	0	III	3b	W
71	0-30	HCL	<5	30-80	C(gr)	xxx	80-110+	st C+S	xxx	0	III	3b	W
72	0-36	HCL	0	36-61	HZCL/C(r)	o	61-90+	HZCL(r)	xx	3	III/II	3a	W
73	0-30	HCL	<5	30-48	C(r)	xxx	48-100+	C(r)	xxx	2	III	3b	W
74	0-29	C	<5	29-70+	C	xxx				1	III	3b	W
75	0-32	ZC	<5	32-62	ZC	xxx	62-90+	ZC(r)	xxx	1	III	3b	W
76	0-32	HZCL	0	32-90+	ZC	xxx				0	III	3b	W
77	0-26	ZC	<5	26-90+	C	xxx				1	III	3b	W
78	0-36	HZCL/ZC	<5	36-53	C	xxx	53-90+	SCL/gravel	xx(x)	1	III	3b	W
79	0-30	M/HZCL	<5	32-62	HZCL(r)	o	62-90+	HZCL(r)	xx	2	II	3a/2	W
80	0-28	HCL	<5	28-60	HCL(r)	xx	60-90+	C(r)	xxx	2	II	3a	W
81	0-27	HCL	<5	27-66	C	xxx	66-90+	C(r)	xxx	1	III	3b	W
82	0-32	C/HCL	<5	32-72	C(r)	xx	72-90+	HCL(r)	xxx	0	III	3b	W
83	0-30	HZCL	<5	30-53	C(r)	x	53-90+	MST		1	II/III	3a/3b	W
84	Woodland												
85	0-36	C	<5	36-80+	C	xxx				0	III	3b	W
86	0-30	HCL	<5	30-70	(st) C	xxx	70-100	SCL	xxx	0	III	3b	W
87	0-26	MCL	<5	26-100+	HCL(r)	x					I	2	D
88	0-34	HCL	<5	34-53	C(r)	o	53-100+	MST	-	3	II/III	3a/3b	W
89	0-25	HCL/MCL	<5	25-73	C(r)	xx	73-90+	HCL(r)	xx(x)	2	II/III	3a	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
90	0-31	HCL	<5	31-68	C(r)	xxx	68+	MST		1	III	3b	W
91	0-31	C	<5	31-51	C(r)	xxx	51-90+	MST		0	III	3b	W
92	0-26	HZCL	<5	26-56	C(r)	x	56-90+	MST		1	III	3b	W
93	0-39	C	0	39-50	C	xxx	50-90+	C(r)	xxx	0	III	3b	W
94	0-31	C	0	31-90+	C	xxx				0	III	3b	W
95	0-30	C	<5	30-70	C(gr)	xxx	70-100+	C	xxxx	0	III	3b	W
96	0-29	SCL	<5	29-52	SC	xxx	52-80+	SC(r)	xx	1	III	3a	W/D
97	0-30	HCL	<5	30-51	HCL(dist)	xxx	51-80+	C(r)	xx	2	III	3b	W
98	0-35	MCL	<5	35-50	MCL(r)	o	50-68 68+	MCL/MST MST(hard)	o	2	I/II	3a	D
99	0-26	C	<5	26-57	C(r)	xx	57-90+	HCL	o	1	III/II	3b/3a	W
100	0-35	HCL	<5	35-53	C	xxx	53-90+	HCL/C(r)	xxx	0	III	3b	W
101	0-31	C	0	31-57	C	xxx	57-90+	HZCL(r)	xxx	1	III	3b	W
102	0-25	HZCL	0	25-72	C	xxx	72-90+	HZCL(r)	xxx	1	III	3b	W
103	0-45	C	<5	45-60+	C(dist)	xxx				0	-	-	-
104	0-34	C	0	34-64	C	xxx				0	III	3b	W
105	0-30	HCL	<5	30-55	C(dist)		55-100+	st SCL	xxx	0	II	3a	dist
106	Not recorded												
107	0-27	HCL	<5	27-50	HCL(r)	xxx	50-90+	C(r)	xxx	3	III	3b	W
108	0-30	HCL	<5	30-51	HCL(r)	xx(x)	51-90+	MST		1	II/III	3a/3b	W
109	0-30	HCL	<5	30-50	HCL	xx	50-70 70-100+	C(r) MST	xxx	1	II	3a	W
110	0-30	HCL	<5	30-70	C(r)	XXX	70-80+ 80+	MST stopped		2	III	3b	W
111	0-30	HCL	<5	30-45	HCL	xxx	45-70 70+	C(r) mudstone	xxx	1	III	3b	W
112	Woodland												
113	0-28	HZCL	0	28-65	C(r)	x	65-90+	C(r)	xxx	2	III/II	3b/3a	W
114	0-27	HZCL	0	27-37	C(r)	xx(x)	37-90+	C(r)	xxx	1	III	3b	W
115	0-30	HCL	<5	32-51	HCL(r)	xx(x)	51-90+	MST/HCL(r)	xx	1	I/II	2/3a	W
116	0-28	HCL	<5	28-35	HCL	xxx	35-70 70+	C stopped on gravel	xxx	0	III	3b	W
117	0-32	HZCL	0	32-55	HZCL	xxx	55-80+	ZC	xxx	1	III	3b	W
118	0-28	HCL	<5	28-50	HCL(r)	xxx	50-100+	mudstone		0	II/III	3a/3b	W
119	0-28	MCL	<5	28-55	MCL	xx(x)	55-100+	C(r)	xxxx	2	II/III	3a	W
120	0-31	MCL/HCL	<5	31-50	HCL	xx(x)	50-90 90-110+	C(r) mudstone	xxx	1	III	3a/3b	W
121	0-30	M-HCL	<5	30-40	HCL	xx	40-60 60-100+	HCL C(r)	xxx xxx	0	II/III	3a/3b	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
122	0-28	HCL	<5	28-90	C(r)	xxx	90-100	mudstone		1	III	3b	W
123	0-28	MCL/HCL	<5	28-40	HCL	xx	40-65 65-90+	C(r) mudstone	xxx	0	II/III	3a/3b	W
124	0-32	MCL	<5	32-54	MCL(r)	o	54-65 65+	MST MST(hard)	-	1	I	2	D
125	0-25	HCL	<5	25-45	HCL	xxx xx	45-55 55-100+	st C C(r)	xx	0	III	3b	W
126	0-25	MCL	<5	25-70	C(r)	xxx	70-100+	mudstone		2	III	3a	W
127	0-30	MCL	<5	30-50	MCL	xx	50-100+	st C	xxx	1	II	2	W/D
128	0-30	HCL	<5	30-52	HCL	xx(x)	52-90 90+	C(r) mudstone	xxx	0	III	3b	W
129	0-30	HCL	<5	30-55	C(r)	xx	55-70 75+	mudstone stopped		0	III	3b	W
130	0-35	MCL	<5	35-45	HCL	xx	45-100+	C(r)	xxx	0	III	3a	W
131	0-32	HCL	<5	32-100	C(r)	xxx				1	III	3a	W
132	0-30	MCL-SCL	<5	30-60	MCL-SCL	x	60-110+	MSL	xx	2	II	2	W
133	0-30	MCL	<5	30-50	HCL	xx(x)	50-100+	C(r)	xx	0	III	3a	W
134	0-26	HCL	<5	26-70	C(r)	xxx	70-100+	mudstone		0	III	3b	W
135	0-30	MCL	<5	30-70	C(r)	xx	70-100+	C+mudstone	xx	0	III	3a	W
136	0-30	SCL	<5	30-90	SCL	x	90-110+	LMS	xxx	2	I/II	2	D
137	0-27	MCL-SCL	<5	27-60	HCL	xx(x)	60-100+	C(r)	xx	0	II	2	W/D
138	0-30	HCL	<5	30-60	HCL	xx	60-110+	C(r)	xx	0	II	3a	W

Survey log key

Gley indicators[1]

o	unmottled
x	1-2% ochreous mottles and brownish matrix (or a few to common root mottles (topsoils))[3]
xx	>2% ochreous mottles and brownish matrix and/or dull structure faces (slightly gleyed horizon)
xxx	>2% ochreous mottles and greyish or pale matrix (gleyed horizon) or reddish matrix and >2% greyish, brownish or ochreous mottles and pale ped faces mottles or f-m concentrations (gleyed horizon)
xxxx	dominantly blueish matrix often with some ochreous mottles (gleyed horizon)

Slowly permeable layers[4]

a depth underlined (e.g. 50) indicates the top of a slowly permeable layer
A wavy underline (e.g. 50) indicates the top of a layer borderline to slowly permeable

Texture[2]

C - clay
ZC - silty clay
SC - sandy clay
CL - clay loam (H-heavy, M-medium)
ZCL - silty clay loam (H-heavy, M-medium)
SZL - sandy silt loam (F-fine, M-medium,C-coarse)
LS - loamy sand (F-fine, M-medium, C-coarse)
SL - sandy loam (F-fine, M-medium, C-coarse)
S - sand (F-fine, M-medium, C-coarse)
SCL - sandy clay loam
P - peat (H-humified, SF-semi-fibrous, F-fibrous)
LP - loamy peat; PL - peaty loam

Wetness Class[5]

I (freely drained) to VI (very poorly drained)

Limitations:

W - wetness/workability
D - droughtiness
De - depth
F - flooding
St – stoniness
Sl – slope
T – topography/microrelief

Suffixes & prefixes:

r-reddish, gn – greenish
o - organic
(m, v, x)st – (moderately, very, extremely)

(vsl, sl, m, v, x)(very slightly, slightly, moderately very, extremely) calcareous

Other abbreviations

fmn - ferri-manganiferous concentrations
dist - disturbed soil layer;
R – bedrock (CH – chalk, SST – sandstone
LST – limestone, MST – Mudstone)

[1]Gley indicators in accordance with Hodgson, J.M., 1997. Soil Survey Field Handbook (third edition). Soil survey technical monograph No. 5

[2]Texture in accordance with particle size classes in Hodgson (1997)
[3] Occasionally recorded in the texture box
[4]Permeability is estimated for auger borings and must be confirmed by full pit observations in accordance with the definitions in: Revised Guidelines for grading the quality of Agricultural Land (Maff 1988)
[5]Soil Wetness Classes are defined in Hodgson (1997)
[6]stoniness classes as defined in Hodgson (1997)
[7]calcareous classes as defined in Hodgson (1997)