AGRICULTURAL QUALITY OF LAND NORTH-WEST OF NEWBOLD VERDON

Report 2484/1

26th November, 2024

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SUMMARY

An Agricultural Land Classification has been undertaken of 9.1 ha of land north-west of Newbold Verdon, Leicestershire during November 2024.

The site has coarse loamy soils and fine loamy soils over reddish clay. The land is of Grade 2 and Subgrade 3a agricultural quality, limited by stoniness and wetness.

1.0 Introduction

1.1 This report provides information on the agricultural quality of 9.1 ha of land north-west of Newbold Verdon, Leicestershire. This report is based on a desk study of published information and a field survey carried out in November 2024.

SITE ENVIRONMENT

1.2 The survey area comprises one field in winter cereals at the time of survey. The survey area is bordered to the north-west by Bosworth Lane (B585), the north and east by the settlement of Newbold Verdon, to the south by Newbold Verdon Primary School and to the west by adjoining agricultural land.

1.3 The land is very gently sloping, with an average elevation of approximately 134 m AOD.

PUBLISHED INFORMATION

1.4 British Geological Survey 1:50,000 scale information records the basal geology of the site as Gunthorpe Member mudstone, with thin inclusions of Cotgrave Sandstone and Edwalton Member mudstone along the north-eastern boundary. The eastern half of the site is recorded as being overlain by sand and gravel deposits and the western half of the siteby glacial till.

1.5 The National Soil Map (published at 1:250,000 scale)[1] shows the land as within the Beccles 1 Association in the west; typically comprising slowly permeable seasonally waterlogged fine loamy over clayey soils and similar clayey soils. In the east, Arrow Association soils are mapped; typically deep permeable coarse loamy soils affected by groundwater.

[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.

2.0 Soils

2.1 A detailed soils and agricultural quality survey was carried out in November 2024 in accordance with MAFF (1988) guidelines[2]. It was based on observations at intersects of a 100 m grid, giving a density of one observation per hectare. During the survey, soils were examined by a combination of pits and augerings to a maximum depth of 1.0 m. A log of the sampling points and a map (Map 1) showing their locations are in an appendix to this report.

2.2 The site has two main soil types, which vary in texture and drainage as described below.

COARSE LOAMS

2.3 These soils make up the south of the site. These soils typically comprise a slightly to moderately stony sandy loam topsoil over a permeable subsoil of similar texture. The subsoil is gleyed[3] but these soils are permeable to depth and any wetness issues could be alleviated with appropriate agricultural land drainage. The soils are freely-draining (Soil Wetness Class I).

2.4 An example profile is described from a pit at observation 6 (see Map 1) in an appendix to this report.

FINE LOAMS OVER REDDISH CLAY

2.5 These soils occur in the north of the site. They comprise sandy clay loam topsoil and permeable upper subsoil, over dense slowly permeable reddish clay. The subsoil is *gleyed* at shallow depth, evidence the soils suffer seasonal waterlogging. These soils are judged to be imperfectly-draining (Soil Wetness Class III).

2.6 An example profile is described from a pit at observation 3 (see Map 1) in an appendix to this report.

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

[3] Reddish soils with pale ped faces with ochreous mottles and ferri-manganiferous concentrations[4]Meteorological Office, (1989).*Climatological Data for Agricultural Land Classification*.

3.0 Agricultural Land Quality

3.1 To assist in assessing land quality, 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 Agricultural Land Classification (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.

3.2 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[4]. The relevant site data for an average elevation of 134 m AOD is given below from a central grid point at SK 441,041.

- Average annual rainfall: 693 mm
- January-June accumulated temperature >0°C 1319 day°
- Field capacity period (when the soils are fully replete with water) 160 days
- Summer moisture deficits for: wheat: 94 mm; potatoes: 82 mm

3.3 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[5]. There are no climatic limitations at this locality.

SURVEY RESULTS

3.4 The agricultural quality of the land is determined by wetness and stoniness. Other factors have been assessed but do not have an overall effect on the land grade. Land of Grade 2 and 3 quality has been identified.

Grade 2

3.5 This land occurs in the south of the site where coarse loamy soils are slightly limited by stoniness (5-10% stones >20 mm in diameter). Topsoil stone content may slightly impede precision drilling and distort root crops.

Subgrade 3a

3.6 The fine loamy soils over reddish clay in the north of the site are limited by wetness. The moderately high clay content of the topsoils and imperfect drainage (Soil Wetness Class III) mean that land access with machinery is likely to be restricted in winter and

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

early spring. However, late spring and autumn croppings are likely to be possible in most years.

3.7 Also included in this land grade are coarse loamy soils with moderately high topsoil stone content (10-15% stones > 20 mm diameter). Topsoil stone content will distort the quality of root crops, cause increased wear on machinery and reduce nutrient holding capacity.

Grade areas

3.8 The land grade boundary is shown on Map 2 and the areas occupied is shown below.

Table 1: Area occupied by the land grades within the site

Grade/subgrade	*Area (ha)*	*% of the agricultural land*
Grade 2	3.0	33
Subgrade 3a	6.1	77
Total	9.1	100

APPENDIX

SURVEY OBSERVATION LOG

EXAMPLE DROUGHTINESS CALCULATIONS

MAPS

ALC survey: North-West Newbold Verdon – Details of observations at each survey point

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth	Texture	Stones	Depth	Texture	Mottling	Depth	Texture	Mottling	(°)	Class	Grade	Main
	(cm)		>20 mm (%)	(cm)			(cm)						limitation
1	0-31	SCL	5-10	31-66	SCL	xxx	66-100+	Cr	xxx	0	III	3a	W
2	0-30	SCL	5-10	30-46	SCL	xxx	46-66 66-100+	Cr Cr	xxx xxx	0	III	3a	W
3	0-30	SCL	5-10	30-46	SCL	xxx	46-100+	Cr	xxx	0	III	3a	W
4	0-31	SCL	10-15	31-50	SCLr	xxx	50-100+	Cr	xxx	1	III	3a	W
5	0-30	SCL	5-10	30-70+	MSL	xxx	70+	Stopped on stones		0	II	2	St
6	0-30	MSL	5-10	30-100+	MSL	xxx				1	I	2	St
7	0-31	MSL	10-15	31-100+	MSL	xxx				0	I	3a	St
8	0-28	SCL	5-10	28-60	SCL/MSL	xxx	60-90+	CSL 30% gravel	xx	0	I	2	St

Soil 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
xxxx	mottles or f-m concentrations (gleyed horizon) dominantly blueish/greenish matrix, often with some reddish mottles (gleyed horizon)

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

Limitations:

W - wetness/workability
D - droughtiness
De - depth
F - flooding
St – stoniness
G - gradient
T – topography/microrelief
C - Climate

Suffixes & prefixes:

o - organic

(vsl, sl, m, v, x)**st** – (very slightly, slightly, moderately, very, extremely) **stony**[6]

(vsl, sl, m, v, x)**ca**
(very slightly, slightly,
moderately, very, extremely) **calcareous**[7]

Slowly permeable layers[4]

a depth underlined (e.g. <u>50</u>) indicates
the top of a slowly permeable layer

A wavy underline (e.g. <u>50</u> indicates
the top of a layer borderline to slowly permeable

Wetness Class[5]

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

Other abbreviations

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

[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)

Grades shown as intergrade e.g. **3a**/3b are close to the grade boundary. The estimate of which side of the boundary the grading falls is the shown first (in bold here)
grades in brackets eg. (3a) raised by one grade due to calcareous topsoil

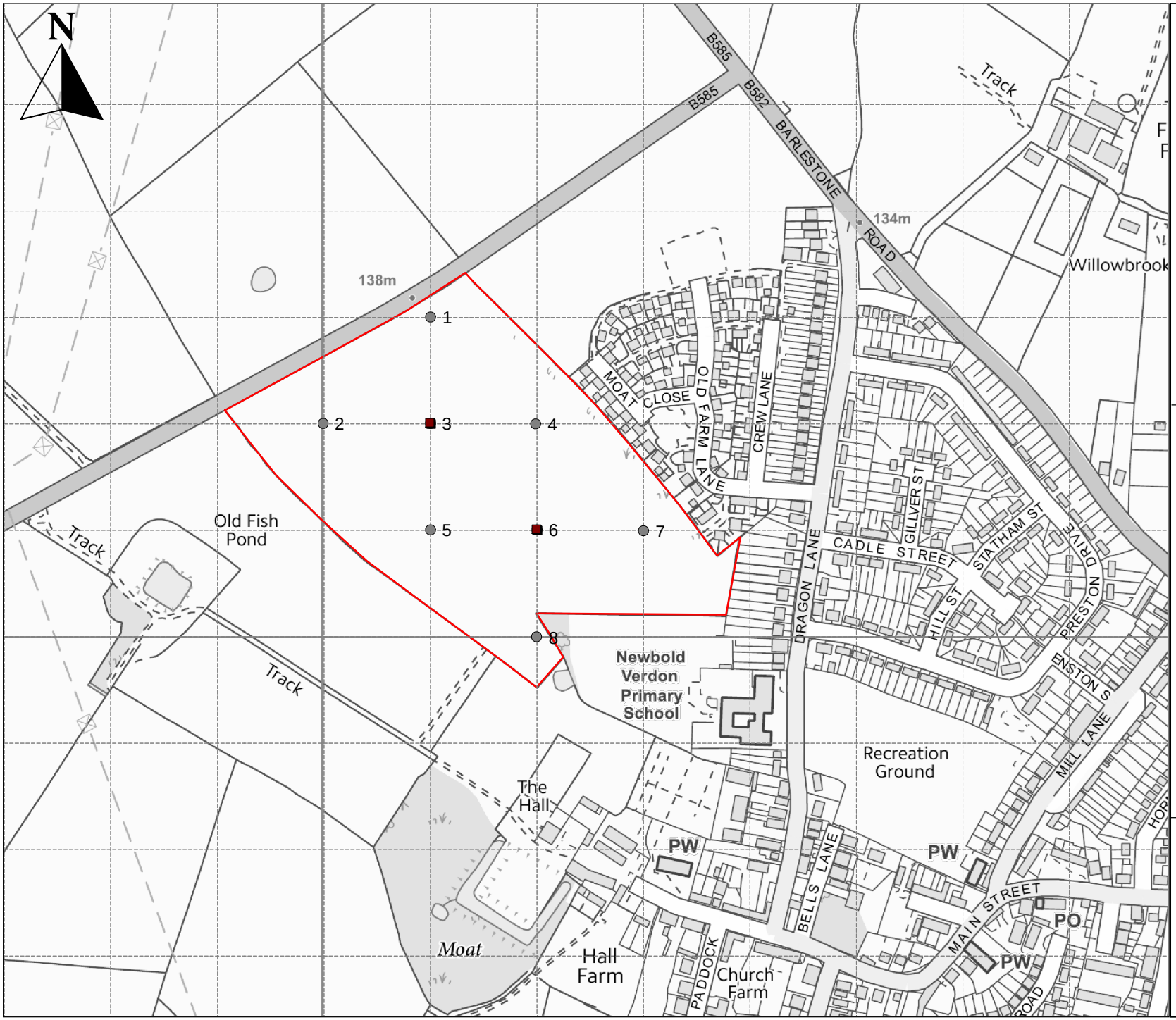
Soil pit descriptions

Pit 3

0-30 cm	Dark reddish grey (5YR 4/2) sandy clay loam with 10% medium and 5% large rounded hard stones; moderately developed coarse subangular blocky structure; friable; porous; few fine roots; smooth clear boundary to:
30-46 cm	Reddish brown (5YR 5/2) sandy clay loam with reddish grey (5YR 5/2) ped faces and common fine reddish yellow (5YR 6/8) and grey (5YR 6/1) mottles; 15% rounded medium stones; moderately developed medium subangular blocky to angular blocky structure; friable; porous; uneven clear boundary to:
46-120 cm	Red (2.5YR 5/6) clay with pale red (2.5YR 6/2) ped faces and common reddish yellow (5YR 6/8) mottles; slightly stony; weakly developed very coarse prismatic structure; very firm; <0.5% biopores.

Pit 6

0-30 cm	Brown (7.5YR 4/2) medium sandy loam with 10% medium mixed hard stones; moderately developed fine subangular blocky structure; friable; porous; smooth clear boundary to:
30-120 cm+	Brown (7.5YR 5/4) medium sandy loam with 5% reddish yellow (7.5YR 6/8) mottles; well developed medium subangular blocky structure; 15-20% medium stones; porous.



KEY

- Auger observation
- Soil/land grade description pit
- Survey area

Site:

Land north-west of Newbold Verdon, Leicestershire

Map title:

Map 1
Survey observations

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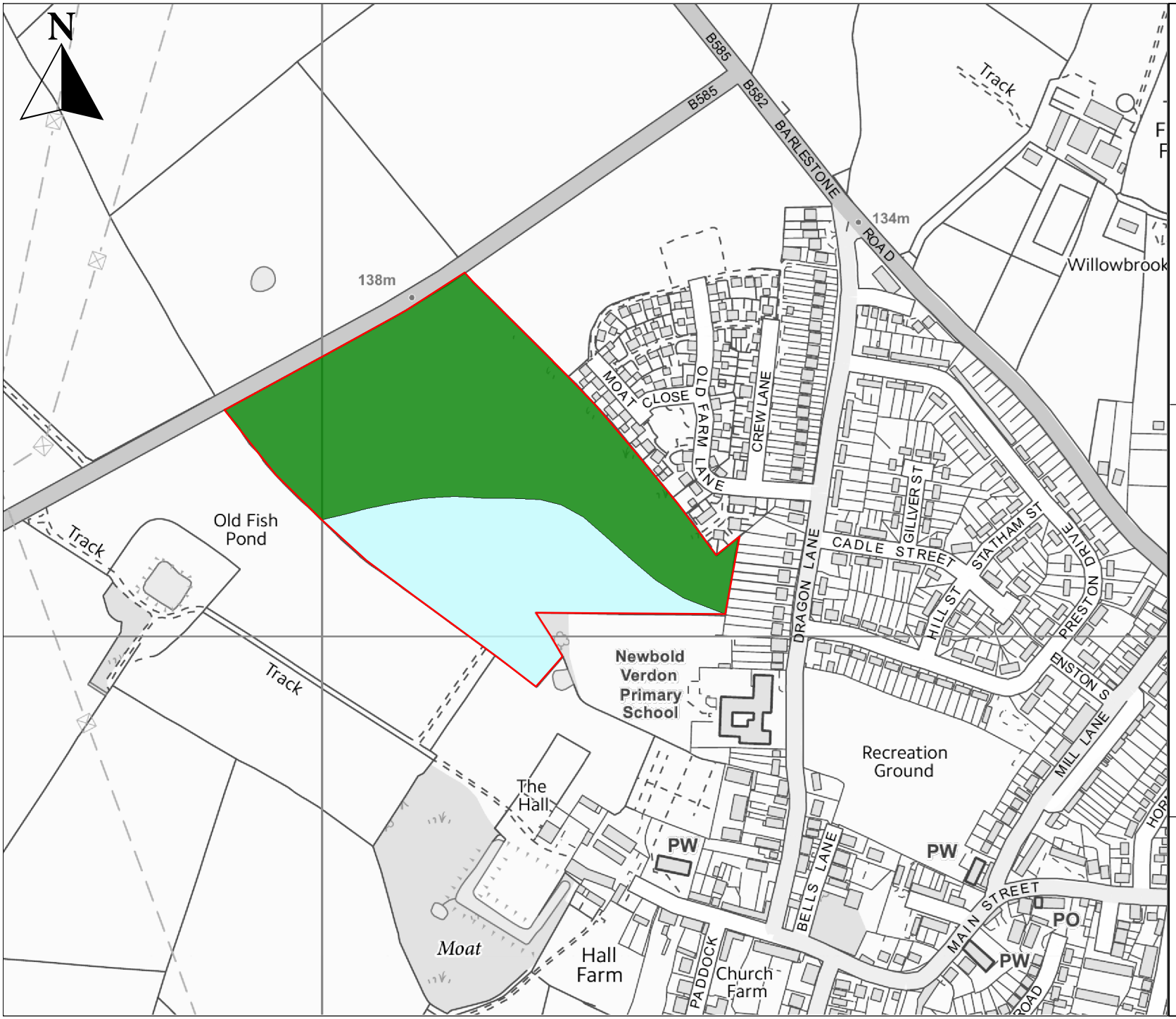
www.lra.co.uk

Scale: 1:5,000

Date: 26/11/2024



KEY

- Grade 2
- Subgrade 3a
- Survey area

Site:

Land north-west of Newbold Verdon, Leicestershire

Map title:

Map 2
Agricultural Land Classification

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Scale: 1:5,000

Date: 26/11/2024