



**Symmetry Park,
Oxford North**

**Agricultural
Quality**

Prepared by:
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Dimension
Partnership Ltd**

On Behalf of:
Tritax Symmetry Ltd

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Summary

- S.1 An agricultural land quality survey has been undertaken on land near the village of Little Chesterton, Bicester Oxfordshire in June 2021 (Refer to **Appendix EDP 1**).
- S.2 The majority of the land is limited by significant wetness and workability limitations restricted to subgrade 3b agricultural quality. Land in the north of the survey area is also limited to subgrade 3b quality by topsoil stoniness and droughtiness restrictions.

Section 1 Introduction

1.1 The Environmental Dimension Partnership Ltd (EDP) has been commissioned by Tritax Symmetry Ltd and Siemens Healthineers ('the applicant') to undertake an assessment of the agricultural quality of land at Symmetry Park, Oxford North, to accompany an application for full planning permission. This report provides information on the soils and agricultural quality of land near the village of Little Chesterton, Bicester Oxfordshire in June 2021 (Refer to **Appendix EDP 1**).

1.2 **Appendix EDP 1** also illustrates the location of the Application Site.

Site Environment

1.3 The site area comprises grassland fields grazed by sheep in the north at the time of survey. The site is bounded to the west by the M40 Motorway and to the south-west by the A41. To the east and north, the site is bordered by adjoining agricultural land and industrial buildings.

1.4 The site is level with some gentle undulations, at an elevation of approximately 70m above Ordnance Datum (aOD).

Published Information

1.5 1:50,000 scale BGS information records the geology of the land in the north of the survey area to be Limestone of the Cornbrash Formation with no superficial deposits recorded. The southern part of the survey area comprises principally Mudstones of the Kellaways Clay Member and Peterborough Member together with Sandstone and Siltstone of the Kellaways Sand Member. Alluvial superficial deposits of clay, silt, sand and gravel are recorded in limited parts of the southern area.

1.6 The National Soil Map (published at 1:250,000 scale) records the north as Aberford Association soils with the south mapped as Wickham 2 Association soils¹. Aberford soils are described as shallow, locally brashy, well drained calcareous fine loamy soil over limestone formed in Jurassic and Eocene limestone. Wickham 2 Association soils are slowly permeable, seasonally waterlogged, fine loamy over clayey, fine silty over clayey and clayey soils formed in drift over Jurassic and Cretaceous clay or Mudstone.

¹ Ragg, J.M., et al., (1984). *Soils and their Use in South East England*, Soil Survey of England and Wales Bulletin No. 15, Harpenden.

Section 2

Soils

- 2.1 A detailed soils and agricultural quality survey was carried out in June 2021 in strict accordance with MAFF (1988) guidelines². It was based on observations at intersects of a 100m 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 1.2m. A log of the sampling points and a map (Map 1) showing their locations are in an appendix to this report.

Heavy Slowly Permeable Soils

- 2.2 The soils in most of the site, with the exception of the most northern parts, were poorly drained and assessed as Wetness Class IV. They principally comprise a clay topsoil overlying clay subsoils which are gleyed and mottled and found to constitute a slowly permeable layer immediately below the topsoil.
- 2.3 An example profile is described below from a pit at observation 36 (Map 1).

0-35 cm	Brown (10YR 4/3) clay; stoneless; weakly developed medium sub-angular blocky structure; friable; abundant fine fibrous roots; smooth abrupt boundary to:
35-50 cm	Grey and dark yellowish brown (10YR 5/1, 4/6) clay; stoneless; moderately developed coarse to very coarse angular blocky structure; firm; abundant fine fibrous roots; <0.5% biopores; smooth clear boundary to:
50-100 cm+	Greyish brown and yellowish brown (10YR 5/2, 5/6) clay; stoneless; weakly developed very coarse prismatic structure; firm; common fibrous roots; <0.5% bio-pores.

Shallow Soils Over Limestone

- 2.4 The soils in the northern area are generally well drained and assessed as Wetness Class I. They comprise a medium or heavy clay loam topsoil usually overlying a similar textured subsoil, which show no signs of gleying or mottling and does not constitute a slowly permeable layer. The topsoil and subsoil have a relatively high content of brashy limestone fragments. Impenetrable limestone was encountered at relatively shallow depths below the thin subsoil horizon and was occasionally found immediately below the topsoil horizon.

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

2.5 An example profile of the well drained, brashy limestone soil type is described below from a pit at observation 6 (**Appendix EDP 1:** Map 1).

0-20 cm	Brown (10YR 4/3) heavy clay loam; 20% total stones (17% > 2 cm), small to large sub-angular limestone fragments; weakly developed fine sub-angular blocky structure; friable; many fine fibrous roots; very calcareous; smooth clear boundary to:
20-40 cm	Yellowish brown (10YR 5/4) clay; 25% small to medium sub-angular limestone fragments; weakly developed fine to medium angular blocky structure; friable; many fine fibrous roots; >0.5% biopores; very calcareous; grades in to:
40cm+	very brashy limestone with little interstitial clay very difficult to dig.

Section 3

Agricultural Land Quality

- 3.1 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. This report describes the main limitations affecting ALC grades at this site. Other factors (e.g. flooding, micro-relief etc.) were assessed but did not affect the overall grading of the site.
- 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 Classification³. The relevant site data for an average elevation of 70m aOD is given below.
- Average annual rainfall: 644mm;
 - January-June accumulated temperature >0 °C 1428 day;
 - Field capacity period 140 days
(when the soils are fully replete with water) late Sept-early May; and
 - Summer moisture deficits for: wheat: 107mm potatoes: 99mm.
- 3.3 The survey described in the previous section was used in conjunction with the agro-climatic data above to classify the survey area using the revised guidelines for ALC issued in 1988 by MAFF⁴. There are no climatic limitations at this locality.

Survey Results

- 3.4 The agricultural quality of the land is determined by wetness, topsoil stone content and droughtiness. Other potentially limiting factors have been assessed, but do not affect the land grading. Land of grade 3 has been identified.

Subgrade 3b

- 3.5 The majority of the land in the site is poorly drained (Wetness Class IV) which, together with the clay topsoil, under the local climate results in a significant wetness and workability limitation restricting such land to subgrade 3b quality.

³ Meteorological Office, (1989). Climatological Data for Agricultural Land Classification.

⁴ MAFF, (1988). Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land.

- 3.6 The land in the north has topsoil with a high content of brashy limestone which can have a detrimental effect on cultivation, harvesting and crop growth and cause increased wear on farm machinery. This land is limited to subgrade 3b by topsoil stoniness. Droughtiness of these soil profiles is also equally limiting to the quality of this land.

Non-agricultural Land

- 3.7 Two areas of non-agricultural land have been mapped within the site. An area of trees and scrub in the south-west and storage areas in the central north alongside industrial units.

Grade Areas

- 3.8 The land grades are shown on **Appendix EDP 1: Map 2**.

Appendix EDP 1

Details of Observations Maps

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Land at Junction 9, M40, Bicester, Oxfordshire: 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 >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
1	0-25	MCL (v)	18	25-45	MCL (v)	o	45+ Impenet rable	Limestone		0	I	3b	St/D
2	0-23	MCL (v)	20	23+ Impenet rable	Limestone					0	I	3b/4	St/D
3	0-28	HCL (v)	23	28-40	C (v)	o	40+ Impenet rable	Limestone		0	I	3b	St/D
4	0-30	C (v)	18	30-40	C (v)	o	40+ Impenet rable	Limestone		0	I	3b	St/D
5	0-20	MCL (v)	25	20-32	MCL (v)	o	32+ Impenet rable	Limestone		0	I	3b/4	St/D
6	0-20	HCL (v)	20	20-40	C (v)	o	40+ Impenet rable	Limestone		0	I	3b	St/D
7	0-17	HCL (v)	20	17-27	HCL (v)	o	27+ Impenet rable	Limestone		0	I	3b/4	St/D
8	0-18	HCL (v)	18	18-35	HCL (v)	o	35+ Impenet rable	Limestone		0	I	3b/4	St/D
9	0-30	HCL (v)	1	30+ Impenet rable	Limestone					0	I	3b	D
10	0-27	HCL (v)	10	27-50	C (v)	xxx	50+ Impenet rable	Limestone		0	IV	3b	W
11	0-31	HCL (v)	0	31-70	C (v)	xxx	70+ Impenet rable			0	IV	3b	W
12	0-32	C	3	32-85	C (fmn)	xxx	85+ Impenet rable			0	IV	3b	W
13	0-32	C	0	32-85	C	xxx	85-120	C	xxxx	0	IV	3b	W
14	0-45	HCL + C Mix of TS and SS	0	45-58	C	o	58-80 80+ Impenet rable	C	xxx	0	III	3b	W Disturbed
15	0-30	C	0	30-120	C	xxx				0	IV	3b	W
16	0-34	C	0	34-80	C	xxx	80-120	C	xxxx	0	IV	3b	W

Obs	Topsoil			Upper subsoil			Lower subsoil			Slope	Wetness	Agricultural quality	
No	Depth (cm)	Texture	Stones >20 mm (%)	Depth (cm)	Texture	Mottling	Depth (cm)	Texture	Mottling	(°)	Class	Grade	Main limitation
17	0-26	C	0	26-75	C	xxx	75-120	C	xxxx	0	IV	3b	W
18	0-30	C	0	30-95	C	xxx	95-120	C	xxxx	0	IV	3b	W
19	0-28	C	0	28-120	C	xxx				0	IV	3b	W
20	0-32	C	0	32-120	C	xxx				0	IV	3b	W
21	0-30	C	0	30-50	C	xxx	50-120	C	xxx	0	IV	3b	W
22	0-35	C	0	35-50	C (fmn)	xxx	50-120	C	xxxx	0	IV	3b	W
23	0-31	C	0	31-65	C (fmn)	xxx	65+ Impenet rable			0	IV	3b	W
24	0-26	C	0	26-80	C (fmn)	xxx	80-120	SC	xxx	0	IV	3b	W
25	0-30	C	0	30-90	C (fmn)	xxx	90-120	C	xxxx	0	IV	3b	W
26	0-33	C	0	33-75	C (fmn)	xxx	75-120	C	xxxx	0	IV	3b	W
27	0-27	C	0	27-80	C (fmn)	xxx	80-120	C (FS)	xxxx	0	IV	3b	W
28	0-35	C	0	35-120	C	xxx				0	IV	3b	W
29	Non-Ag												
30	Non-Ag												
31	0-30	C	0	30-48	C (fmn)	xxx	48-120	C	xxxx	0	IV	3b	W
32	0-25	C	0	25-50	C (fmn)	xxx	50-100 100-120	SC C	xxx xxxx	0	IV	3b	W
33	0-28	C	0	28-56	C (fmn)	xxx	56-70 70-120	SC C	xxx xxxx	0	IV	3b	W
34	0-29	C	0	29-120	C	xxx				0	IV	3b	W
35	0-30	HCL	0	30-50	C	xxx	50+ Impenet rable	Limestone		0	IV	3b	W
36	0-35	C	0	35-50	C	xxx	50-120	C	xxx	0	IV	3b	W
37	0-35	C	0	35-50	C	xxx	50-120	C	xxx	0	IV	3b	W
38	0-32	C	0	32-120	C	xxx				0	IV	3b	W
39	0-27	C	0	27-70	C	xxx	70-120	C	xxx	0	IV	3b	W
40	0-30	C	0	30-75	C (fmn)	xxx	75-90 90+ Impenet rable	SC	xxx	0	IV	3b	W
41	0-31	C	0	31-120	C	xxxx				0	IV	3b	W
42	0-28	C	0	28-120	C (fmn)	xxxx				1	IV	3b	W
43	0-30	C	0	30-40	C	xxx	40-120	C	xxx	1	IV	3b	W
44	0-32	HCL	0	32-120	C	xxx				1	IV	3b	W
45	0-30	C	0	30-70	C (fmn)	xxx	70-120	C	xxxx	2	IV	3b	W
46	0-27	C	0	27-120	C	xxx				0	IV	3b	W

[illegible]

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
xxxx	mottles or f-m concentrations (gleyed horizon) 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

SI – slope

T – topography/microrelief

Suffixes & prefixes:

r-reddish, gn – greenish

o - organic

(m, v, x)st – (moderately, very, extremely)

stony, chky-chalky

(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)

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

²Texture in accordance with particle size classes in Hodgson (1997)

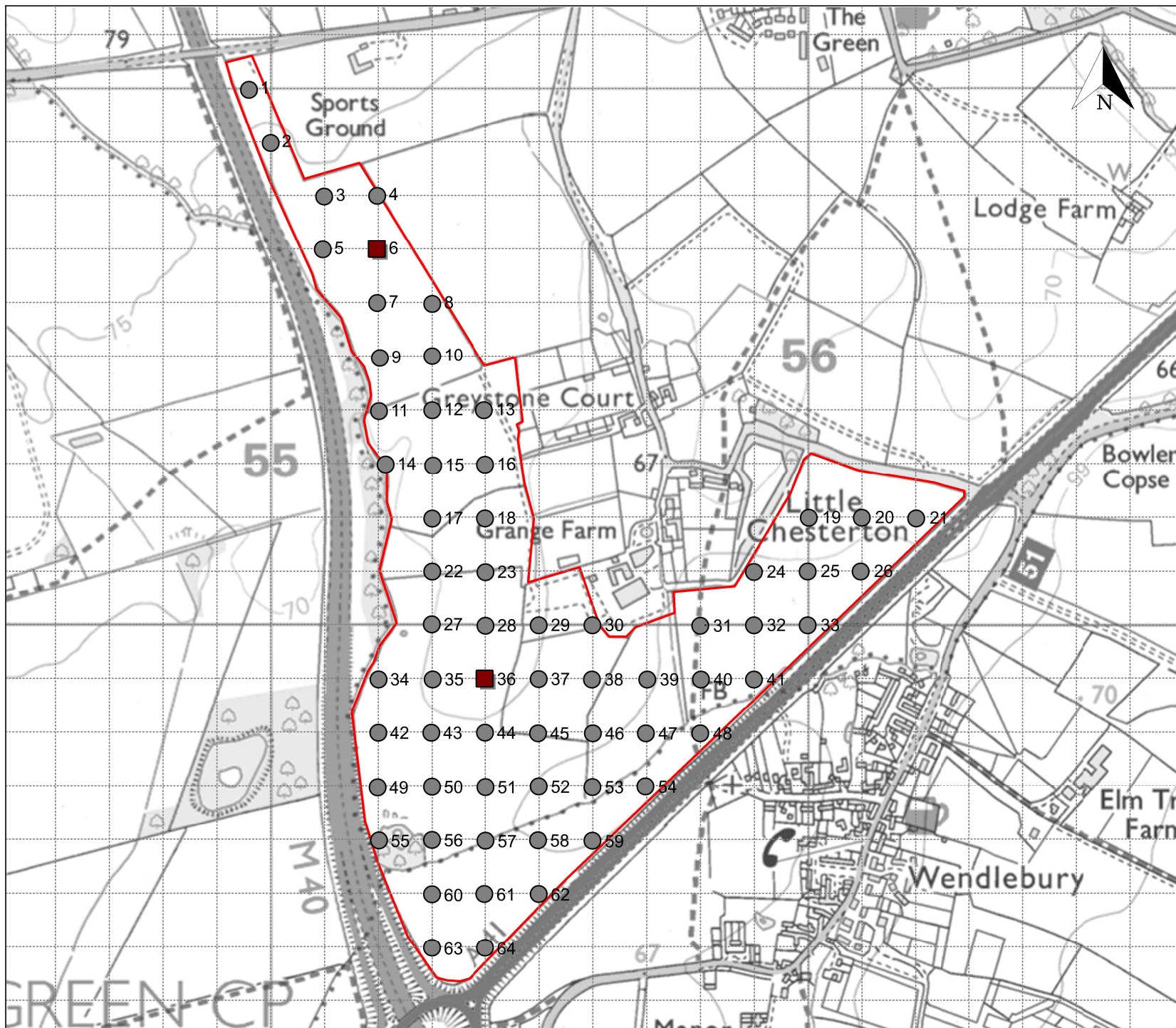
³ Occasionally recorded in the texture box

⁴Permeability 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)

⁵Soil Wetness Classes are defined in Hodgson (1997)

⁶stoniness classes as defined in Hodgson (1997)

⁷calcareous classes as defined in Hodgson (1997)



KEY

● Auger observation

■ Soil/land grade description pit

□ Survey area

Client:



Site:

**Land at Junction 9, M40,
Bicester**

Map title:

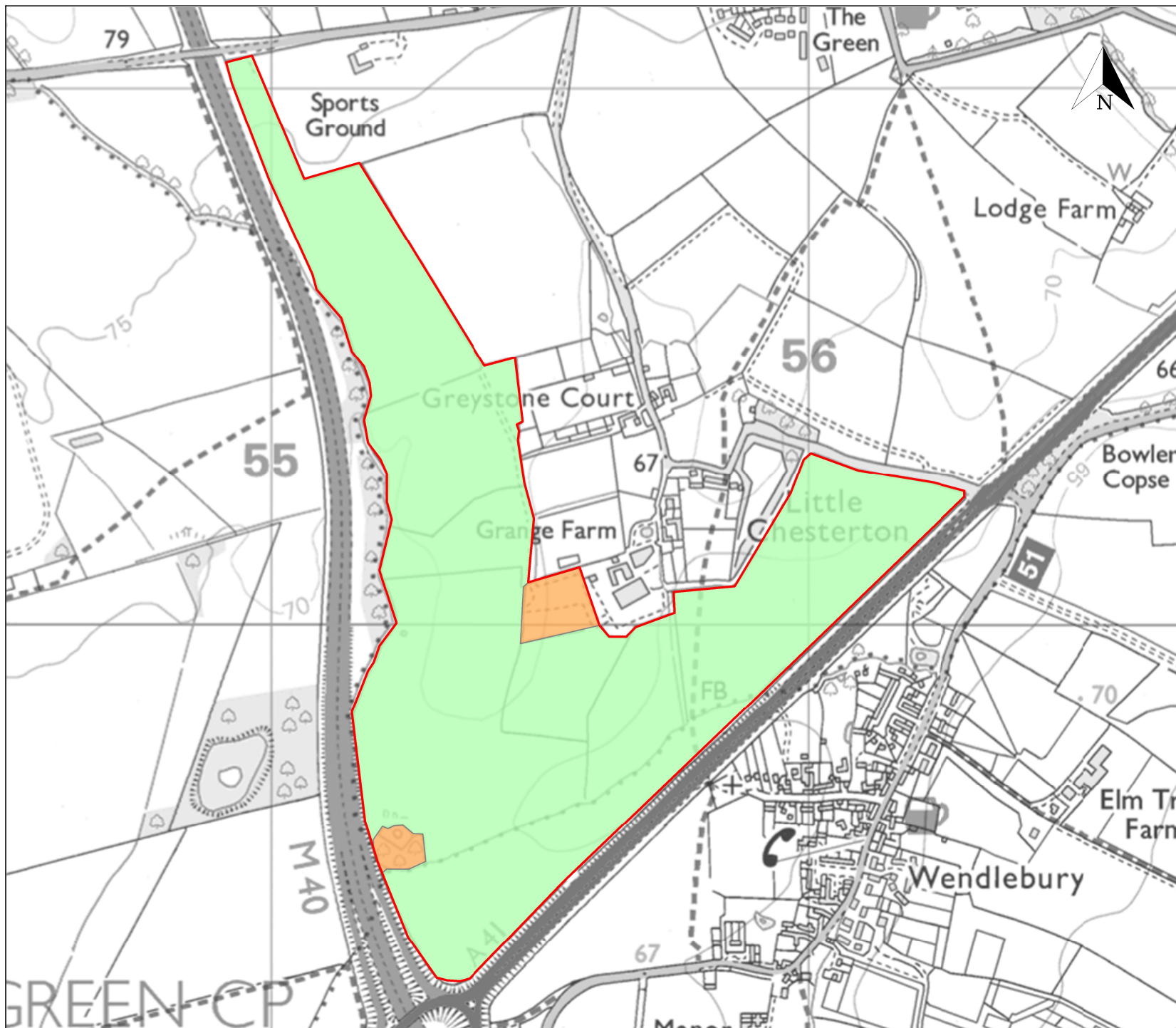
**Map 1
Survey observations**

**Land
Research
ASSOCIATES**

Land Research Associates
Lockington Hall
Lockington
Derby DE74 2RH
01509 670570

Scale: 1:10,000

Date: 21/06/2021



KEY



Subgrade 3b



Non agricultural



Survey area

Client:



Site:

**Land at Junction 9, M40,
Bicester**

Map title:

**Map 2
Agricultural Land Classification**

**Land
Research
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Scale: 1:10,000

Date: 21/06/2021



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