Soil Environment Services Ltd

AGRICULTURAL LAND CLASSIFICATION

Pegasus Group

Chimmens

Soil Environment Services Ltd
November 2023

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Client:

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Chimmens

A report prepared on behalf of ***Soil Environment Services*** by:

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Managing Director

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CONTENTS

1. INTRODUCTION

An Agricultural Land Classification (ALC) has been carried out on ~166 ha of land referred to a Chimmens (Drawing 1). The site is centred on Grid Ref: 556895,167115. The development area surveyed during this survey amounts to ~ 96 ha and is marked by the red line in Drawing 1. The survey was conducted in October 2022 and classified the land into one or more of the below grades (see Drawing 1). During the survey, the site was in agricultural use.

1.1 Methodology

Agricultural land is classified into the following grades according to the 1988 guidelines[1].

Grade	Description
1	**Excellent quality agricultural land** with no or very minor limitations to agricultural use.
2	**Very good quality agricultural land** with minor limitations which affect crop yield, cultivation or harvesting.
3a **3b**	**Good quality agricultural land** capable of producing moderate to high yields of a narrow range of arable crops or moderate yields of a wider range of crops. **Moderate quality agricultural land** capable of producing moderate yields of a narrow range of crops or lower yields of a wider range of crops.
4	**Poor quality agricultural land** with severe limitations which significantly restrict the range of crops and/or level of yields.
5	**Very poor quality agricultural land** with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

The classification includes an initial desktop investigation to examine previously mapped soil types and to note the drift and solid geology followed by the field survey consisting of auger borings at one every 100 m in general and a pit excavated in each of the main soil types to confirm the structures and stone content if needed. Laboratory analysis of soil textures is undertaken if needed in order to confirm textures such the *heavy/medium* clay and *medium/fine* sand categories or stone content. All site survey profile data is listed in Appendix A.

All of the potential limitations are assessed and then the most limiting factor dictating the ALC grade was determined for this site and is detailed in Table 2.

1.2 Previous ALC gradings

Grading on the MAFF 1:250,000 scale Provisional ALC map indicated the site is located on ALC Grade 3 land to the south east and ALC Grade 2 to the north west. No detailed or semi detailed surveys have previously been undertaken at the site. Immediately to the south a detailed survey found ALC Grade 3a (Appendix B, http://publications.naturalengland.org.uk/publication/5805157799952384).

2. CLIMATIC LIMITATIONS

2.1 Overall climate

The climatological data for the site is detailed in Table 1.

Table 1
Climatological information[3]

Factor	Units	Value
Altitude AOD	m	80
Accumulated temperature	day°C (Jan-June)	1415.1
Average Annual Rainfall	mm	655.7
Field Capacity Days	days	132.9
Moisture Deficit Wheat	mm	111.3
Moisture Deficit Potatoes	mm	104.8
Overall climate ALC Grade	Grade 1	

Overall climate will not result in the most significant limiting factor for this site.

2.2. Local climate

Local climate will not result in a significant limiting factor for this site.

3 SITE LIMITATIONS

3.1 Gradient

The gradient will result in a significant limiting factor for parts of the site due to a slope in excess of 7 degrees and hence will give ALC Grade 3b in these areas.

3.2 Microrelief

The microrelief will not result in a significant limiting factor for this site.

3.3 Flooding

In general a low or no risk of flooding from rivers or surface water has been identified across the site -(https://www.gov.uk/check-long-term-flood-risk).

4 SOIL LIMITATIONS

4.1 Texture and structure

Two soil types predominate at the site. The soils have clayey topsoils over clayey subsoils in the south. The subsoil structure here is gleyed medium angular blocky over medium prismatic from around 45 cm depth. To the north the more silty soils are not gleyed and have no slowly permeable layer over chalk which can be just below the topsoil in places. The pattern is quite complex in places but a broad range of soil depth and stoniness results in ALC Grade 2 moslty in the north.

The site has previously been mapped as having soils of the following Associations (www.landis.org.uk).
To the north west:
The Coombe 1 Association: *Well drained calcareous fine silty soils deep in valley bottoms, shallow to chalk on valley sides in places. Slight risk of water erosion.*
To the south east:
The Batcombe Association: *Fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal water logging. Some well drained clayey soils over chalk. Variably flinty.*

Superficial Geology
Most of the northern two thirds of the site: *No information is available for this location.*
Valleys bottoms in the northern two thirds*:* *Head - Clay, silt, sand and gravel.*
The southern third*:* *Clay-with-flints Formation - Clay, silt, sand and gravel.*
Bedrock Geology
Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation - Chalk. Sedimentary bedrock

4.2 Depth
Soil depth will not result in a significant limiting factor for this site.

4.3 Stoniness
Stoniness is not a direct significant limiting factor for soils noted on site.

4.4 Chemical
Chemical contamination is not present and will not result in a significant limiting factor for this site..

5. INTERACTIVE LIMITATIONS

5.1 Wetness

The combination of a Wetness Class of III for the soils (see Appendix A) with the Field Capacity Days of 13629 and a topsoil texture of medium clay loam results in a wetness limitation and hence ALC Grade 3a.

5.2. Droughtiness

The Available Water Capacity which subsequently when considered with respect to the Moisture Deficit for wheat and potatoes results in a Moisture Balance giving slight droughtiness limitation for both wheat or potatoes and hence results in ALC Grade 2.

Table 1a. Moisture balance limits for ALC Grade

Grade/	Moisture Balance limits (mm)		
Subgrade	*wheat*		*potatoes*
1	+30	*and*	+10
2	+5	*and*	-10
3a	-20	*and*	-30
3b	-50	*and*	-55
4	<-50	*or*	<-55

Source: MAFF 1988 ALC Guidance. Table 8

5.3 Erosion

Erosion will not result in a significant limiting factor for this site. No significant evidence of erosion was noted even though the soil type is prone to water erosion on the steeper ground.

6. AGRICULTURAL LAND CLASSIFICATION

6.1 Most limiting factor/s

Soil drouhtiness and wetness are the predominant limiting factors and result, in general, in Grade 2 for the droughty soils on the shallower chalk to the north and Grade 3a for the deeper clayey wetter soils to the south

Some smaller areas are 3a due to droughtiness where chalk is shallow and some 3b due to gradient.

6.2 Current grading

This survey has resulted in an Agricultural Land Classification of the following grades (Drawing 1):

Table 2. ALC gradings and limitations

Grade	Survey area		Development area		Limitation
	ha	%	ha	%	
1					
2	140	84.3	76	79.2	Droughtiness
3a	22	13.3	17	17.7	Droughtiness, wetness
3b	4	2.4	3	3.1	Gradient
4					
5					
Non-agricultural land					
Total	166	100%	96	100	

DRAWING 1

ALC Grade

Key

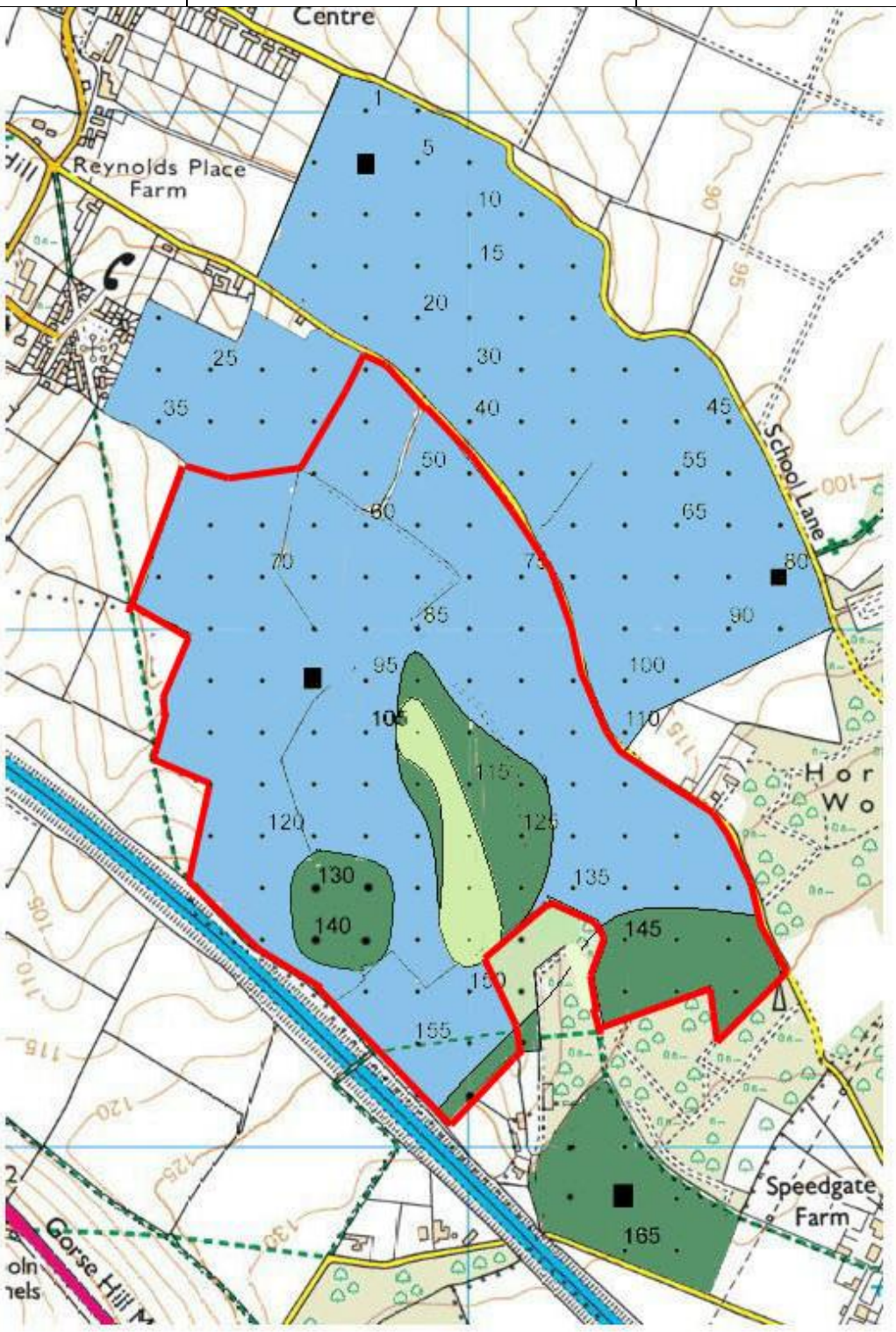
ALC Grades
- Grade 1
- Grade 2
- Grade 3a
- Grade 3b
- Grade 4
- Grade 5
- Non agricultural land

- Boring
- Pit
- Development boundary

Soil Environment Services

Ordnance Survey copy licence PMR0046161

Drawing Title: ALC Grade	Drawing No.: 1
Scale: 1:11000	Date: 20/09/2022



APPENDIX A

Soil profile data

Notes

1 All abbreviations relating to soil parameters are standard and derived from the guidance documents:

Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land. MAFF. 1988.
Soil Survey Field Handbook. Technical Monograph No.5. Soil Survey of England and Wales.1976.

2 The pit data is detailed in this table and information on structure and stone content copied to the appropriate boring profiles.

3 Any blanks or zeros in the cells indicate the data is not needed or appropriate for that cell.

4 If 'NA' is inserted in a cell the information is not appropriate on this occasion.

5. Boring or pit locations are directly (within 2 m accuracy) on the grid reference corresponding to the points on the map unless otherwise stated.

6 A point directly marked on a track, boundary or other feature will be moved 2-3 m off the point or omitted if surrounding points and soil types allow.

7. Borings that are potentially within 15 m of a gas pipeline are limited to 0.4 m depth and the strata description in the data table below this depth will be extrapolated from nearby borings and upper strata characteristics.

8. The *Observation Density* is 1 per ha on a 100 m grid or using a semi *Free Survey* method if appropriate*. The letter 'B' in the second column of the data table refers to an observation point at which a boring will have been undertaken. In some situations it is not possible to visit the location due to for example crop status or animals in a field. In such cases, the location is moved or nearby data is used. The soil, geology, topography, flood risk and aerial crop patterns are assessed from published sources and the soils will be subject to a full 120 cm depth boring if possible. If all data sources are agreeable, a soil pattern can be established.

* British Society of Soil Science. Working With Soil – The Professional Competency Scheme. Agricultural Land Classification: England and Wales. How2 sheet 4.2.4. 2018.

9. For moisture balance calculations, *strongly, moderately* and *well developed* structure will equate to *good, moderate* or *poor* structure terms respectively in Table 14 of the guidelines.

10. Pit information in addition to that listed in the table below will be detailed in Section 4.1 and 4.3 if needed.

Obs point	Grid ref. if off intersection	Boring or Pit	Grad.(deg)	Base Depth (cm)	OFFICE USE	Text.	Calc	Matrix colour	Motts./black ferro. conc. % depth	Mott colour or FC if ferro. conc.	Ped face colour	Stns %	Stns type	Porosity	Struct (/F=firm consistence)	Degree of development	SPL depth (cm)	Gleying depth (cm)	SWC	Grade (wetness)	TAv	EAv	StTAv	StEAv	MBW	Grade (Drought. WHEAT)	MBP	Grade (Drought. POTATOES)
1		P	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
2		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
3		B	≤7	30		MZCL	Y	10YR43				5	HR/CH								19		6		18.38	2	7.76	2
				50	#	MZCL		7.5YR54				5	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				75	#	ZC		7.5YR53				10	HR/CH	P	M	WK					13	8	6	4				
				120	0	CH						30	HR								10	7	1	0.5				
4		B	≤7	30		MZCL	Y	10YR43				5	HR/CH								19		6		18.38	2	7.76	2
				50	#	MZCL		7.5YR54				5	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				75	#	ZC		7.5YR53				10	HR/CH	P	M	WK					13	8	6	4				
				120	0	CH						30	HR								10	7	1	0.5				
5		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
6		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
7		B	≤7	30		MZCL	N	10YR4				5	CH/HR								19		6		13.85	2	10.01	1
				65	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	5	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
8		B	≤7	30		MZCL	N	10YR4				5	CH/HR								19		6		13.85	2	10.01	1
				65	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	5	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
9		B	≤7	30		MZCL	N	10YR4				5	CH/HR								19		6		13.85	2	10.01	1
				65	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	5	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
10		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
11		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
12		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
13		B	≤7	30		MZCL	N	10YR4				5	CH/HR								19		6		13.85	2	10.01	1
				65	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	5	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
14		B	≤7	30		MZCL	N	10YR4				5	CH/HR								19		6		13.85	2	10.01	1
				65	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	5	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
15		B	≤7	30		MZCL	N	10YR4				5	CH/HR								19		6		13.85	2	10.01	1
				65	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	5	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
16		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
17		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
18		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
19		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
20		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				

Obs point	Grid ref. if off intersection	Boring or Pit	Grad. (deg)	Base Depth (cm)	OFFICE USE	Text.	Calc	Matrix colour	Motts/ black ferro. conc. %/ depth	Mott colour or FC if ferro. conc.	Ped face colour	Stns %	Stns type	Porosity	Struct (/F=firm consistence)	Degree of development	SPL depth (cm)	Gleying depth (cm)	SWC	Grade (wetness)	TAv	EAv	StTAv	StEAv	MBW	Grade (Drought. WHEAT)	MBP	Grade (Drought. POTATOES)
21		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
22		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
23		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
24		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
25		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
26		B	≤7	30		MZCL	Y	10YR43				5									19		1		21.30	2	-1.19	2
				45	#	MZCL		7.5YR54				5		P	MSAB	MD			I	1	17	10	1	0.5				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
27		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
28		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
29		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
30		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
31		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
32		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
33		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
34		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
35		P	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
36		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
37		B	≤7	30		MZCL	Y	10YR43				5									19		1		21.30	2	-1.19	2
				45	#	MZCL		7.5YR54				5		P	MSAB	MD			I	1	17	10	1	0.5				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
38		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
39		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
40		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				

Obs point	Grid ref. if off intersection	Boring or Pit	Grad. (deg)	Base Depth (cm)	OFFICE USE	Text.	Calc	Matrix colour	Motts./ black ferro. conc. %/ depth	Mott colour or FC if ferro. conc.	Ped face colour	Stns %	Stns type	Porosity	Struct (/F=firm consistence)	Degree of development	SPL depth (cm)	Gleying depth (cm)	SWC	Grade (wetness)	TAv	EAv	StTAv	StEAv	MBW	Grade (Drought. WHEAT)	MBP	Grade (Drought. POTATOES)
41		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
42		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
43		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
44		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
45		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
46		B	≤7	30		MZCL	Y	10YR43				10	HR/CH								19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD			I	1	17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
47		B	≤7	30		MZCL	Y	10YR43				5									19		1		21.30	2	-1.19	2
				45	#	MZCL		7.5YR54				5		P	MSAB	MD			I	1	17	10	1	0.5				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
48		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
49		B	≤7	30		MZCL	Y	10YR43				5									19		1		15.10	2	-7.39	2
				35	5	MZCL		7.5YR54				5		P	MSAB	MD			I	1	17	10	1	0.5				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
50		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
51		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
52		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
53		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
54		P	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
55		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
56		B	≤7	25		MZCL	N	10YR42				5	CH/HR								19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
57		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		6.35	2	-1.54	2
				50	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK			I	1	17	10	6	4				
				120	#	C		7.5YR53				40	HR	P	M	WK					13	7	1	0.5				
				120	0							0									0	0	0	0				
58		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		22.75	2	2.76	2
				50		MZCL		10YR54				10	CH/HR	P	MSAB	MD			I	1	16	10	6	4				
				120		ZC		10YR53				25	CH/HR	P	M	WK					13	8	6	4				
				120								0									0	0	0	0				
59		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		22.75	2	2.76	2
				50		MZCL		10YR54				10	CH/HR	P	MSAB	MD			I	1	16	10	6	4				
				120		ZC		10YR53				25	CH/HR	P	M	WK					13	8	6	4				
				120								0									0	0	0	0				
60		B	≤7	30		MZCL	N	10YR43				5	CH/HR								19		6		22.75	2	2.76	2
				50		MZCL		10YR54				10	CH/HR	P	MSAB	MD			I	1	16	10	6	4				
				120		ZC		10YR53				25	CH/HR	P	M	WK					13	8	6	4				
				120								0									0	0	0	0				

Obs point	Grid ref. if off intersection	Boring or Pit	Grad. (deg)	Base Depth (cm)	OFFICE USE	Text.	Calc	Matrix colour	Motts/ black ferro. conc. %/ depth	Mott colour or FC if ferro. conc.	Ped face colour	Stns %	Stns type	Porosity	Struct (/F=firm consistence)	Degree of development	SPL depth (cm)	Gleying depth (cm)	SWC	Grade (wetness)	TAv	EAv	StTAv	StEAv	MBW	Grade (Drought. WHEAT)	MBP	Grade (Drought. POTATOES)
61		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
62		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
63		B	≤7	25		MZCL	N	10YR42				5	CH/HR						I	1	19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK					17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
64		B	≤7	25		MZCL	N	10YR42				5	CH/HR						I	1	19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK					17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
65		B	≤7	25		MZCL	N	10YR42				5	CH/HR						I	1	19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK					17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
66		B	≤7	25		MZCL	N	10YR42				5	CH/HR						I	1	19		6		17.18	2	-0.62	2
				45	#	MZCL		7.5YR54				10	CH/HR	P	MSAB	WK					17	10	6	4				
				120	#	MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120	0							0									0	0	0	0				
67		B	≤7	30		MZCL	N	10YR42				5	CH/HR						I	1	19		6		20.45	2	0.46	2
				40		MZCL		10YR34				5	CH/HR	P	MSAB	MD					17	10	6	4				
				120		MZCL		10YR54				25	CH/HR	P	M	WK					13	8	6	4				
				120								0									0	0	0	0				
68		P	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		14.98	2	-7.52	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
69		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
70		B	≤7	30		MZCL	N	10YR43				5	CH/HR						I	1	19		6		22.75	2	2.76	2
				50		MZCL		10YR54				10	CH/HR	P	MSAB	MD					16	10	6	4				
				120		ZC		10YR53				25	CH/HR	P	M	WK					13	8	6	4				
				120								0									0	0	0	0				
71		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
72		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
73		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
74		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
75		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
76		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		20.23	2	2.91	2
				50		MCL		10YR44				5	HR	P	MSAB	MD					16	10	1	0.5				
				120		MCL		10YR44				5	HT	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
77		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		20.23	2	2.91	2
				50		MCL		10YR44				5	HR	P	MSAB	MD					16	10	1	0.5				
				120		MCL		10YR44				5	HT	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
78		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		20.23	2	2.91	2
				50		MCL		10YR44				5	HR	P	MSAB	MD					16	10	1	0.5				
				120		MCL		10YR44				5	HT	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
79		B	≤7	30		MZCL	N	10YR42				5	CH/HR						I	1	19		6		20.45	2	0.46	2
				40		MZCL		10YR34				5	CH/HR	P	MSAB	MD					17	10	6	4				
				120		MZCL		10YR54				25	CH/HR	P	M	WK					13	8	6	4				
				120								0									0	0	0	0				
80		B	≤7	30		MZCL	N	10YR42				5	CH/HR						I	1	19		6		20.45	2	0.46	2
				40		MZCL		10YR34				5	CH/HR	P	MSAB	MD					17	10	6	4				
				120		MZCL		10YR54				25	CH/HR	P	M	WK					13	8	6	4				
				120								0									0	0	0	0				

Obs point	Grid ref. if off intersection	Boring or Pit	Grad. (deg)	Base Depth (cm)	OFFICE USE	Text.	Calc	Matrix colour	Motts/ black ferro. conc. %/ depth	Mott colour or FC if ferro. conc.	Ped face colour	Stns %	Stns type	Porosity	Struct (/F=firm consistence)	Degree of development	SPL depth (cm)	Gleying depth (cm)	SWC	Grade (wetness)	TAv	EAv	StTAv	StEAv	MBW	Grade (Drought. WHEAT)	MBP	Grade (Drought. POTATOES)
81		B	≤7	25		MZCL	N	10YR32	2/10	10YR46		2	HR				25	25	IV	3b	19		1		17.78	2	7.58	2
				55		MZCL		10YR51	10/25	10YR46		5	HR	P	CP	MD					17	10	1	0.5				
				120		HZCL		2.5Y52	15/55	7.5YR46		5	HR	P	M	WK					12	6	1	0.5				
				120								0									0	0	0	0				
82		B	≤7	30		MCL	N	10YR31	2/10	7.5YR46		2	HR				30	30	IV	3b	18		1		15.67	2	-0.29	2
				52		HCL		10YR52	5/30	10YR56		10	HR	P	CP	MD					16	10	1	0.5				
				120		C		7.5YR54	10/52	10YR56	7.5YR53	10	HR	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
83		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		15.48	2	4.81	2
				50		MZCL		7.5YR54				5	HR	P	MSAB	MD					17	10	1	0.5				
				120		MZCL		10YR44				5	HR	P	M	MD					12	6	1	0.5				
				120								0									0	0	1	0.5				
84		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
85		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
86		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
87		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
88		P	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		20.23	2	2.91	2
				50		MCL		10YR44				5	HR	P	MSAB	MD					16	10	1	0.5				
				120		MCL		10YR44				5	HT	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
89		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		20.23	2	2.91	2
				50		MCL		10YR44				5	HR	P	MSAB	MD					16	10	1	0.5				
				120		MCL		10YR44				5	HT	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
90		B	≤7	30		MZCL	N	10YR42				5	CH/HR						I	1	19		6		20.45	2	0.46	2
				40		MZCL		10YR34				5	CH/HR	P	MSAB	MD					17	10	6	4				
				120		MZCL		10YR54				25	CH/HR	P	M	WK					13	8	6	4				
				120								0									0	0	0	0				
91		B	≤7	30		MZCL	N	10YR42				5	CH/HR						I	1	19		6		20.45	2	0.46	2
				40		MZCL		10YR34				5	CH/HR	P	MSAB	MD					17	10	6	4				
				120		MZCL		10YR54				25	CH/HR	P	M	WK					13	8	6	4				
				120								0									0	0	0	0				
92		B	≤7	30		MZCL	N	10YR42				5	CH/HR						I	1	19		6		20.45	2	0.46	2
				40		MZCL		10YR34				5	CH/HR	P	MSAB	MD					17	10	6	4				
				120		MZCL		10YR54				25	CH/HR	P	M	WK					13	8	6	4				
				120								0									0	0	0	0				
93		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
94		P	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		15.48	2	4.81	2
				50		MZCL		7.5YR54				5	HR	P	MSAB	MD					17	10	1	0.5				
				120		MZCL		10YR44				5	HR	P	M	MD					12	6	1	0.5				
				120								0									0	0	1	0.5				
95		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
96		B	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30	5	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
97		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
98		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40	#	MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120	#	CH						0									10	7	1	0.5				
				120	0							0									0	0	0	0				
99		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		20.23	2	2.91	2
				50		MCL		10YR44				5	HR	P	MSAB	MD					16	10	1	0.5				
				120		MCL		10YR44				5	HT	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
100		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		20.23	2	2.91	2
				50		MCL		10YR44				5	HR	P	MSAB	MD					16	10	1	0.5				
				120		MCL		10YR44				5	HT	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				

Obs point	Grid ref. if off intersection	Boring or Pit	Grad. (deg)	Base Depth (cm)	OFFICE USE	Text.	Calc	Matrix colour	Motts/ black ferro. conc. %/ depth	Mott colour or FC if ferro. conc.	Ped face colour	Stns %	Stns type	Porosity	Struct (/F=firm consistence)	Degree of development	SPL depth (cm)	Gleying depth (cm)	SWC	Grade (wetness)	TAv	EAv	StTAv	StEAv	MBW	Grade (Drought. WHEAT)	MBP	Grade (Drought. POTATOES)
101		B	≤7	25		MZCL	N	10YR32	2/10	10YR46		2	HR				25	25	IV	3b	19		1		19.68	2	9.96	2
				60		MZCL		10YR51	10/25	10YR46		5	HR	P	CP	MD					17	10	1	0.5				
				120		HZCL		2.5Y52	15/55	7.5YR46		5	HR	P	M	WK					12	6	1	0.5				
				120								0									0	0	0	0				
102		B	≤7	30		MCL	N	10YR31	2/10	7.5YR46		2	HR				30	30	IV	3b	18		1		15.67	2	-0.29	2
				52		HCL		10YR52	5/30	10YR56		10	HR	P	CP	MD					16	10	1	0.5				
				120		C		7.5YR54	10/52	10YR56	7.5YR53	10	HR	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
103		B	≤7	25		MCL	N	10YR22				2	HR				25	25	IV	3b	18		1		16.17	2	1.98	2
				55		C		7.5R43	10/25	7.5YR46	7.5YR53	2	HR	P	CP	MD					16	10	1	0.5				
				120		C		2.5Y52	20/55	7.5YR46		15	HR	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
104		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		15.48	2	4.81	2
				50		MZCL		7.5YR54				5	HR	P	MSAB	MD					17	10	1	0.5				
				120		MZCL		10YR44				5	HR	P	M	MD					12	6	1	0.5				
				120								0									0	0	1	0.5				
105		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
106		B	9	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
107		B	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
108		P	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
109		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		20.23	2	2.91	2
				50		MCL		10YR44				5	HR	P	MSAB	MD					16	10	1	0.5				
				120		MCL		10YR44				5	HT	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
110		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		20.23	2	2.91	2
				50		MCL		10YR44				5	HR	P	MSAB	MD					16	10	1	0.5				
				120		MCL		10YR44				5	HT	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
111		B	≤7	25		MCL	N	10YR42				2	HR				25	25	IV	3b	18		1		18.83	2	1.51	2
				50		HCL		10YR43	5/25	7.5YR56	7.5YR53	2	HR	P	CP	MD					16	10	1	0.5				
				120		HCL		10YR53	10/50	7.5YR56		5	HR	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
112		B	≤7	25		MCL	N	10YR42				2	HR				25	25	IV	3b	18		1		18.83	2	1.51	2
				50		HCL		10YR43	5/25	7.5YR56	7.5YR53	2	HR	P	CP	MD					16	10	1	0.5				
				120		HCL		10YR53	10/50	7.5YR56		5	HR	P	M	WK					12	7	1	0.5				
				120								0									0	0	0	0				
113		B	≤7	35		MCL	N	10YR43				10	HR				50	30	III	3a	18		1		16.13	2	4.51	2
				50		HCL		10YR53				10	HR	G	FAB	MD					16	10	1	0.5				
				70		C		10YR53	10/50	10YR56		5	HR	P	MPR	MD					16	8	1	0.5				
				120		C		10YR54	20/70	10YR56		5	HR	P	M	WK					13	7	1	0.5				
114		B	≤7	35		MCL	N	10YR43				10	HR				50	30	III	3a	18		1		16.13	2	4.51	2
				50		HCL		10YR53				10	HR	G	FAB	MD					16	10	1	0.5				
				70		C		10YR53	10/50	10YR56		5	HR	P	MPR	MD					16	8	1	0.5				
				120		C		10YR54	20/70	10YR56		5	HR	P	M	WK					13	7	1	0.5				
115		B	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
116		B	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
117		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
118		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
119		B	≤7	25		SCL	N	10YR41				0					25	25	IV	3b	17		1		40.70	1	14.21	1
				70		MSZL		10YR43	5/25	10YR56		0		P	CAB	MD					17	11	1	0.5				
				120		MSZL		10YR42	5/70	10YR56		0		P	CPR	WK					15	9	1	0.5				
				120								0									0	0	0	0				
120		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		13.10	2	2.43	2
				45		MZCL		7.5YR54				5	HR	P	MSAB	MD					17	10	1	0.5				
				120		MZCL		10YR44				5	HR	P	M	MD					12	6	1	0.5				
				120								0									0	0	1	0.5				

Obs point	Grid ref. if off intersection	Boring or Pit	Grad. (deg)	Base Depth (cm)	OFFICE USE	Text.	Calc	Matrix colour	Motts./ black ferro. conc. %/ depth	Mott colour or FC if ferro. conc.	Ped face colour	Stns %	Stns type	Porosity	Struct (/F=firm consistence)	Degree of development	SPL depth (cm)	Gleying depth (cm)	SWC	Grade (wetness)	TAv	EAv	StTAv	StEAv	MBW	Grade (Drought. WHEAT)	MBP	Grade (Drought. POTATOES)
121		B	≤7	25		MZCL	N	10YR32	2/10	10YR46		2	HR				25	25	IV	3b	19		1		19.68	2	9.96	2
				60		MZCL		10YR51	10/25	10YR46		5	HR	P	CP	MD					17	10	1	0.5				
				120		HZCL		2.5Y52	15/55	7.5YR46		5	HR	P	M	WK					12	6	1	0.5				
				120								0									0	0	0	0				
122		B	≤7	25		MZCL	N	10YR42				5	HR						I	1	19		1		14.53	2	3.86	2
				50		MZCL		7.5YR54				5	HR	P	MSAB	MD					17	10	1	0.5				
				120		MZCL		10YR44				5	HR	P	M	MD					12	6	1	0.5				
				120								0									0	0	1	0.5				
123		B	≤7	25		MZCL	N	10YR42				5	HR						I	1	19		1		14.53	2	3.86	2
				50		MZCL		7.5YR54				5	HR	P	MSAB	MD					17	10	1	0.5				
				120		MZCL		10YR44				5	HR	P	M	MD					12	6	1	0.5				
				120								0									0	0	1	0.5				
124		B	9	30		ZCL	Y	10YR43				10	HR						I	1	19		1		9.30	2	-13.19	3a
				120		CH						0									10	7	1	0.5				
				120		CH						0									0	0	1	0.5				
				120								0									0	0	0	0				
125		B	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
126		B	≤7	30		MCL	Y	10YR42				5	CH/HR						I	1	18		6		6.15	2	-9.64	2
				35		MCL		10YR43				15	CH/HR	P	FSAB	MD					16	10	6	4				
				120		MCL		10YR54				30	CH/HR	P	M	WK					12	7	6	4				
				120								0									0	0	0	0				
127		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
128		P	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
129		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
130		B	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
131		B	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
132		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		-9.25	3a	4.81	2
				50		MZCL		7.5YR54				5	HR	P	MSAB	MD					17	10	1	0.5				
				120		MZCL		10YR44				5	HR	P	M	MD					12	6	1	0.5				
				120								0									0	0	1	0.5				
133		B	9	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
134		B	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
135		B	≤7	25		MZCL	N	10YR42				5	CH/HR						I	1	19		6		17.18	2	-0.62	2
				45		MZCL		7.5YR54				10	CH/HR	P	MSAB	WK					17	10	6	4				
				120		MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120								0									0	0	0	0				
136		B	≤7	25		MZCL	N	10YR42				5	CH/HR						I	1	19		6		17.18	2	-0.62	2
				45		MZCL		7.5YR54				10	CH/HR	P	MSAB	WK					17	10	6	4				
				120		MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120								0									0	0	0	0				
137		B	≤7	25		MZCL	N	10YR42				5	CH/HR						I	1	19		6		17.18	2	-0.62	2
				45		MZCL		7.5YR54				10	CH/HR	P	MSAB	WK					17	10	6	4				
				120		MZCL		7.5YR53				20	HR	P	M	WK					13	8	1	0.5				
				120								0									0	0	0	0				
138		B	≤7	30		MCL	Y	10YR42				5	CH/HR						I	1	18		6		13.60	2	-2.19	2
				50		MCL		10YR44				10	CH/HR	P	FSAB	MD					16	10	6	4				
				120		MCL		10YR54				30	CH/HR	P	M	WK					12	7	6	4				
				120								0									0	0	0	0				
139		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
140		B	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				

Obs point	Grid ref. if off intersection	Boring or Pit	Grad. (deg)	Base Depth (cm)	OFFICE USE	Text.	Calc	Matrix colour	Motts/ black ferro. conc. %/ depth	Mott colour or FC if ferro. conc.	Ped face colour	Stns %	Stns type	Porosity	Struct (/F=firm consistence)	Degree of development	SPL depth (cm)	Gleying depth (cm)	SWC	Grade (wetness)	TAv	EAv	StTAv	StEAv	MBW	Grade (Drought. WHEAT)	MBP	Grade (Drought. POTATOES)
141		B	≤7	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
142		B	≤7	30		MZCL	N	10YR43				5	HR						I	1	19		1		15.48	2	4.81	2
				50		MZCL		7.5YR54				5	HR	P	MSAB	MD					17	10	1	0.5				
				120		MZCL		10YR44				5	HR	P	M	MD					12	6	1	0.5				
				120								0									0	0	1	0.5				
143		B	9	25		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		9.63	2	-12.87	3a
				30		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
144		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
145		B	≤7	30		MCL	N	10YR42				5	HR						III	3a	18		1		17.38	2	0.06	2
				50		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD	50	30			16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				
146		B	≤7	30		MCL	N	10YR42				5	HR						III	3a	18		1		17.38	2	0.06	2
				50		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD	50	30			16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				
147		B	≤7	30		MCL	N	10YR42				5	HR						III	3a	18		1		17.38	2	0.06	2
				50		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD	50	30			16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				
148		P	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
149		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		16.15	2	-6.34	2
				40		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
150		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		23.60	2	4.36	2
				60		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
151		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		23.60	2	4.36	2
				60		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
152		B	≤7	25		MCL	N	7.5YR43				5	HR						III	3a	18		1		19.73	2	-0.89	2
				50		C		5YR56	10/25	FC		5	HR	G	MAB	MD	50	25			16	10	1	0.5				
				70		C		7.5YR46	10/50	7.5YR58		5	HR	P	M	WK					12	7	1	0.5				
				120		CH						0									10	7	0	0				
153		B	≤7	35		MCL	N	10YR43				10	HR						III	3a	18		1		16.13	2	4.51	2
				50		HCL		10YR53				10	HR	G	FAB	MD	50	30			16	10	1	0.5				
				70		C		10YR53	10/50	10YR56		5	HR	P	MPR	MD					16	8	1	0.5				
				120		C		10YR54	20/70	10YR56		5	HR	P	M	WK					13	7	1	0.5				
154		B	≤7	35		MCL	N	10YR43				10	HR						III	3a	18		1		16.13	2	4.51	2
				50		HCL		10YR53				10	HR	G	FAB	MD	50	30			16	10	1	0.5				
				70		C		10YR53	10/50	10YR56		5	HR	P	MPR	MD					16	8	1	0.5				
				120		C		10YR54	20/70	10YR56		5	HR	P	M	WK					13	7	1	0.5				
155		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		25.70	2	9.71	2
				70		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
156		B	≤7	30		MZCL	Y	10YR43				10	HR/CH						I	1	19		6		25.70	2	9.71	2
				70		MZCL		10YR71				15	HR/CH	P	MSAB	MD					17	10	6	4				
				120		CH						0									10	7	1	0.5				
				120								0									0	0	0	0				
157		B	≤7	30		MCL	N	10YR42				5	HR						III	3a	18		1		15.48	2	-1.84	2
				45		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD	45	30			16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				
158		B	≤7	35		MCL	N	10YR43				10	HR						III	3a	18		1		16.13	2	4.51	2
				50		HCL		10YR53				10	HR	G	FAB	MD	50	30			16	10	1	0.5				
				70		C		10YR53	10/50	10YR56		5	HR	P	MPR	MD					16	8	1	0.5				
				120		C		10YR54	20/70	10YR56		5	HR	P	M	WK					13	7	1	0.5				
159		B	≤7	30		MCL	N	10YR42				5	HR						III	3a	18		1		15.48	2	-1.84	2
				45		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD	45	30			16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				
160		B	≤7	30		MCL	N	10YR42				5	HR						III	3a	18		1		15.48	2	-1.84	2
				45		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD	45	30			16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				

Obs point	Grid ref. if off intersection	Boring or Pit	Grad. (deg)	Base Depth (cm)	OFFICE USE	Text.	Calc	Matrix colour	Motts./ black ferro. conc. %/ depth	Mott colour or FC if ferro. conc.	Ped face colour	Stns %	Stns type	Porosity	Struct (/F=firm consistence)	Degree of development	SPL depth (cm)	Gleying depth (cm)	SWC	Grade (wetness)	TAv	EAv	StTAv	StEAv	MBW	Grade (Drought. WHEAT)	MBP	Grade (Drought. POTATOES)
161		B	≤7	30		MCL	N	10YR42				5	HR				45	30	III	3a	18		1		15.48	2	-1.84	2
				45		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD					16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				
162		B	≤7	30		MCL	N	10YR42				5	HR				45	30	III	3a	18		1		15.48	2	-1.84	2
				45		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD					16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				
163		P	≤7	30		MCL	N	10YR42				5	HR				45	30	III	3a	18		1		15.48	2	-1.84	2
				45		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD					16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				
164		B	≤7	30		MCL	N	10YR42				5	HR				45	30	III	3a	18		1		15.48	2	-1.84	2
				45		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD					16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				
165		B	≤7	30		MCL	N	10YR42				5	HR				45	30	III	3a	18		1		15.48	2	-1.84	2
				45		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD					16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				
166		B	≤7	30		MCL	N	10YR42				5	HR				45	30	III	3a	18		1		15.48	2	-1.84	2
				45		HCL		7.5YR54	5/30	FC	7.5YR54	5	HR	P	MAB	MD					16	10	1	0.5				
				80		HCL		7.5YR56	20/55	7.5YR58		5	HR	P	MPR	WK					12	7	1	0.5				
				120		C		10YR56	10/80	7.5YR56		5	HR	P	M	WK					13	7	1	0.5				

APPENDIX B

Adjacent ALC survey report and maps

A1
Proposed Motorway Service Area,
Scratchers Lane,
West Kingsdown, Kent
Agricultural Land Classification
February 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

ADAS Reference: 2009/014/96
MAFF Reference: EL 20/01386
LUPU Commission: 02391

AGRICULTURAL LAND CLASSIFICATION REPORT

PROPOSED MOTORWAY SERVICE AREA SCRATCHERS LANE, WEST KINGSDOWN, KENT.

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately 30 hectares of land at Scratchers Lane, West Kingsdown, in Kent. The site is situated on either side of the M20 near to Brands Hatch. The survey was carried out during February 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF), from its Land Use Planning Unit in Reading, in connection with a planning application for a motorway service area. The results of this survey supersede any previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey the majority of the agricultural land on this site was in cereal cropping. To the north of the M20 land use includes both permanent and ley grassland. Gabrielspring Wood has been shown as 'Other Land'.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1 below.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% Total site area	% Surveyed Area
3a	24.3	80.7	100
Other land	5.8	19.3	-
Total surveyed area	24.3	-	100
Total site area	30.1	100	-

7. The fieldwork was conducted at an average density of approximately 1 boring per hectare. A total of 27 borings and 2 soil pits were described.

8. All of the agricultural land on this site has been classified as Subgrade 3a (good quality) the key limitation being soil wetness. The profiles generally comprise moderately drained medium and heavy silty clay loams over poorly structured, slowly permeable clays. Despite the locally dry climatic regime, these soils may restrict crop growth and yields as wet soils can inhibit seed germination and root development. The medium textured topsoils may also limit the timing of cultivations as trafficking by agricultural machinery or grazing livestock may lead to structural damage.

9 The stone content in these profiles ranges from 6-14% flints > 2&6 cm and 12-20% total flint in the topsoil with 2-25% total flint below. Where more than 10% large flints (i.e. greater than 2cm in diameter) occur in the topsoil the land is also limited to Subgrade 3a on topsoil stoniness as large flints can damage agricultural machinery and wear tyres. They can also adversely affect crop growth and establishment.

10. A few borings were also found to be of slightly better quality but were not mapped separately due to their limited number and extent.

Factors Influencing ALC Grade

Climate

11. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

12. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values	Values
Grid reference	N/A	TQ 568 656	TQ 576 655
Altitude	m, AOD	135	140
Accumulated Temperature	day°C (Jan-June)	1353	1347
Average Annual Rainfall	mm	692	689
Field Capacity Days	days	141	140
Moisture Deficit, Wheat	mm	102	102
Moisture Deficit, Potatoes	mm	93	93

13. The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

14. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (ATO, January to June), as a measure of the relative warmth of a locality.

15. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation (Climatic Grade 1). However, climatic factors can interact with soil properties to influence soil wetness and droughtiness. At this location the field capacity day values are comparatively low thus decreasing the effects of soil wetness.

16. Local climatic factors such as frost risk and exposure are not thought likely to adversely affect agricultural land use on this site.

Site

17. The land on this site slopes gently from 140m AOD in the east to 130m AOD in the west. Nowhere on the site do either gradient or microrelief affect agricultural land quality.

18. Flooding does not appear to be limiting on this site.

Geology and soils

19. The relevant geological sheet (BGS, 1978) maps the entire site as the Upper Cretaceous Chalk overlain by clay-with-flints.

20. The most recently published soils information for this area (SSEW, 1983) maps the Batcombe soil association across the entire site. These soils are described as 'fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some well drained clayey soils over chalk.' (SSEW, 1983).

Agricultural Land Classification

21. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

22. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III.

Subgrade 3a

23. All of the agricultural land on this site has been classified as Subgrade 3a. The key limitation is soil wetness with occasional topsoil stoniness restrictions. The soil profiles typically comprise slightly to moderately stony (12-29% total flints including 6-14% flints >2cm) medium silty clay loam topsoils over very slightly to moderately flinty (2-20% stone) medium or heavy silty clay loam upper subsoils. Occasionally clay occurs immediately below the topsoil but it is generally found in the lower subsoil. These horizons are similarly stony but invariably become impenetrable over flinty deposits between 45-85cm depth.

24. All clays are slightly gleyed and most become poorly structured and slowly permeable from between 28-60 cm depth. Soil inspection pits 1 and 2 revealed that the moderately

structured clays are browner in colour (10YR54) with much less vibrant mottles than the poorly structured variety (75YR56). Drainage through the profile is slightly impeded by the presence of the slowly permeable horizons. In this locally dry climatic regime such soils have been assigned to Wetness Class III (see Appendix II), Wetness Grade 3a as wet soils can inhibit seed germination and root development. The medium textured topsoils may also slightly restrict the timing of cultivations as trafficking by agricultural machinery and grazing livestock may lead to structural damage.

25. Where more than 10% flints, larger than 2cm in diameter, occur in the topsoil the land is also limited to Subgrade 3a by topsoil stoniness. Large stones such as these can cause increased wear to tyres and damage farm machinery, and they can also disrupt crop establishment and growth.

Helen Goode
Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1978) *Sheet No. 271, Dartford.* 1:50,000 Series. Solid & Drift.
BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.*
MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.*
Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South East England.*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*
SSEW: Harpenden

DESCRIPTIONS OF THE GRADES AND SUBGRADES

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 or horticultural crops can usually be grown but on some land of this 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 land.

Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

APPENDIX II

SOIL WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Wetness Class	Duration of waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years.[2]
II	The soil profile is wet within 70 cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

[1] The number of days is not necessarily a continuous period.
[2] 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL DATA

Contents:

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF**: national 100 km grid square and 8 figure grid reference.

2. **USE**: Land use at the time of survey. The following abbreviations are used.

ARA:	Arable	**WHT:**	Wheat	**BAR**:	Barley
CER:	Cereals	**OAT**:	Oats	**MZE**:	Maize
OSR:	Oilseed rape	**BEN**:	Field Beans	**BRA**:	Brassicae
POT:	Potatoes	**SBT**:	Sugar Beet	**FCD**:	Fodder Crops
LIN:	Linseed	**FRT:**	Soft and Top Fruit	**FLW**:	Fallow
PGR:	Permanent Pasture	**LEY**:	Ley Grass	**RGR**:	Rough Grazing
SCR:	Scrub	**CFW**:	Coniferous Woodland	**DCW**:	Deciduous Wood
HTH:	Heathland	**BOG**:	Bog or Marsh	**FLW**:	Fallow
PLO:	Ploughed	**SAS**:	Set aside	**OTH**:	Other
HRT:	Horticultural Crops				

3. **GRDNT**: Gradient as estimated or measured by a hand-held optical clinometer.

4. **GLEY/SPL**: Depth in centimetres (cm) to gleying and/or slowly permeable layers.

5. **AP (WHEAT/POTS)**: Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)**: Moisture Balance. (Crop adjusted AP - crop adjusted MD)

7. **DRT**: Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

MREL:	Microrelief limitation	**FLOOD:**	Flood risk	**EROSN**:	Soil erosion risk
EXP:	Exposure limitation	**FROST**:	Frost prone	**DIST**:	Disturbed land
CHEM:	Chemical limitation				

9. **LIMIT**: The main limitation to land quality. The following abbreviations are used.

OC:	Overall Climate	**AE**:	Aspect	**EX**:	Exposure
FR:	Frost Risk	**GR**:	Gradient	**MR**:	Microrelief
FL:	Flood Risk	**TX**:	Topsoil Texture	**DP**:	Soil Depth
CH:	Chemical	**WE**:	Wetness	**WK**:	Workability
DR:	Drought	**ER**:	Erosion Risk	**WD**:	Soil Wetness/Droughtiness
ST:	Topsoil Stoniness				

Soil Pits and Auger Borings

1. **TEXTURE**: soil texture classes are denoted by the following abbreviations.

S:	Sand	**LS**:	Loamy Sand	**SL**:	Sandy Loam
SZL:	Sandy Silt Loam	**CL**:	Clay Loam	**ZCL**:	Silty Clay Loam
ZL:	Silt Loam	**SCL**:	Sandy Clay Loam	**C**:	Clay
SC:	Sandy Clay	**ZC**:	Silty Clay	**OL**:	Organic Loam
P:	Peat	**SP**:	Sandy Peat	**LP**:	Loamy Peat
PL:	Peaty Loam	**PS**:	Peaty Sand	**MZ**:	Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:

F: Fine (more than 66% of the sand less than 0.2mm)
M: Medium (less than 66% fine sand and less than 33% coarse sand)
C: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (<27% clay) **H**: Heavy (27-35% clay)

2. **MOTTLE COL**: Mottle colour using Munsell notation.

3. **MOTTLE ABUN**: Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2-20% **M**: many 20-40% **VM**: very many 40% +

4. **MOTTLE CONT:** Mottle contrast

F: faint - indistinct mottles, evident only on close inspection
D: distinct - mottles are readily seen
P: prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL**: Ped face colour using Munsell notation.

6. **GLEY:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH**: Stone Lithology - One of the following is used.

HR:	all hard rocks and stones	**SLST**:	soft oolitic or dolimitic limestone
CH:	chalk	**FSST**:	soft, fine grained sandstone
ZR:	soft, argillaceous, or silty rocks	**GH**:	gravel with non-porous (hard) stones
MSST:	soft, medium grained sandstone	**GS**:	gravel with porous (soft) stones
SI:	soft weathered igneous/metamorphic rock		

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

8. **STRUCT**: the degree of development, size and shape of soil peds are described using the *following notation:*

degree of development	**WK**: weakly developed **ST**: strongly developed	**MD**: moderately developed
ped size	**F**: fine **C**: coarse	**M**: medium **VC**: very coarse
ped shape	**S** : single grain **GR**: granular **SAB**: sub-angular blocky **PL**: platy	**M**: massive **AB**: angular blocky **PR**: prismatic

9. **CONSIST**: Soil consistence is described using the following notation:

L: loose **VF**: very friable **FR**: friable **FM**: firm **VM**: very firm
EM: extremely firm **EH**: extremely hard

10. **SUBS STR**: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G**: good **M**: moderate **P**: poor

11. **POR**: Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP**: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropiate horizon.

13. **SPL**: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC**: If the soil horizon is calcareous, a 'Y' will appear in this column.

15. Other notations
    - **APW**: available water capacity (in mm) adjusted for wheat
    - **APP**: available water capacity (in mm) adjusted for potatoes
    - **MBW**: moisture balance, wheat
    - **MBP**: moisture balance, potatoes

SOIL PIT DESCRIPTION

Site Name : MSA SCRATCHERS LANE Pit Number : 1P

Grid Reference: TQ56906560 Average Annual Rainfall : 692 mm
Accumulated Temperature : 1353 degree days
Field Capacity Level : 141 days
Land Use : Cereals
Slope and Aspect : 01 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	MZCL	10YR42 00	7	9	HR					
29- 47	HZCL	10YR54 00	0	15	HR		MDCSAB	FR	M	
47-120	C	75YR56 00	0	20	HR	M	MDCAB	FM	P	

Wetness Grade : 3A Wetness Class : III
Gleying : cm
SPL :047 cm

Drought Grade : 2 APW : 120mm MBW : 18 mm
APP : 101mm MBP : 8 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : MSA SCRATCHERS LANE Pit Number : 2P

Grid Reference: TQ56906560
Average Annual Rainfall : 692 mm
Accumulated Temperature : 1353 degree days
Field Capacity Level : 141 days
Land Use :
Slope and Aspect : 01 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	MZCL	10YR42 00	7	9	HR					
29- 47	HZCL	10YR54 00	0	15	HR		MDCSAB	FR	M	
47-120	C	10YR54 00	0	2	HR	M	MDCSAB	FR	M	

Wetness Grade : 1
Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 1
APW : 136mm MBW : 34 mm
APP : 113mm MBP : 20 mm

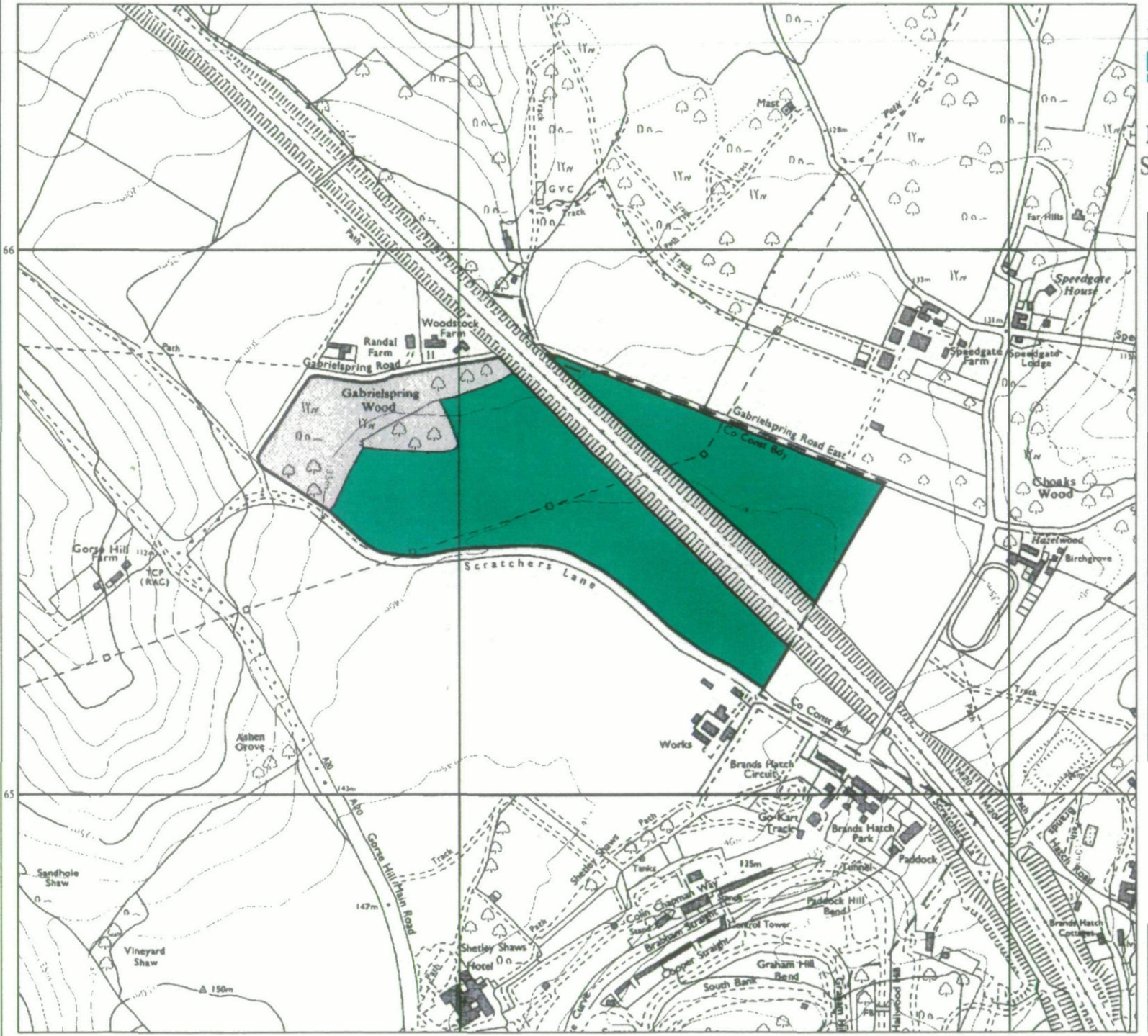
FINAL ALC GRADE : 2
MAIN LIMITATION : Topsoil Stoniness

AMPLE O.	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ57216578	LEY			028		2	2	074	-28	074	-19	3B				DR	2	Q Disturbed
1P	TQ56906560	CER	W	01		047	3	3A	120	18	101	8	2				WE	3A	B11 S1 Gley 47
2P	TQ56906560	GER	W	01			1	1	136	34	113	20	1				ST	2	S1 Gley 47
5	TQ57006570	CER				028	3	3A		0		0					WE	3A	3A T/S Stones
6	TQ57106570	CER				045	3	3A		0		0					WE	3A	3A T/S Stones
7	TQ57406570	LEY				028	3	3A		0		0					WE	3A	3A T/S Stones
8	TQ57306570	LEY				035	3	3A	121	19	098	5	2				WE	3A	S1 Gleyed 35
10	TQ56826578	CER				050	2	2	095	-7	100	7	3A				WD	2	2 T/S Stones
11	TQ56906560	CER	W	01		045	3	3A		0		0					WE	3A	S1 Gleyed 45
12	TQ57006560	CER			050	060	2	2	128	26	105	12	2				WD	2	2 T/S Stones
13	TQ57106560	CER				028	3	3A		0		0					WE	3A	3A T/S Stones
14	TQ57206560	CER				040	3	3A		0		0					WE	3A	3A T/S Stones
15	TQ57406560	LEY				030	3	3A		0		0					WE	3A	3A T/S Stones
16	TQ57506560	LEY					1	1	070	-32	070	-23	3B				DR	2	2 T/S Stones
17	TQ57606560	LEY				030	3	3A		0		0					WE	3A	S1 Gleyed 30
18	TQ56806550	CER	S	01		035	3	3A		0		0					WE	3A	S1 Gleyed 35
19	TQ56906550	CER	W	01		030	3	3A		0		0					WE	3A	S1 Gleyed 30
20	TQ57006550	CER	W			060	2	2	094	-8	106	13	3A				WD	2	2 T/S Stones
21	TQ57106550	CER				030	3	3A		0		0					WE	3A	S1 Gleyed 30
22	TQ57206550	CER				028	3	3A		0		0					WE	3A	S1 Gleyed 28
23	TQ57306550	CER	E	02		027	3	3A		0		0					WE	3A	S1 Gleyed 27
24	TQ57506550	PGR				085	1	1	141	39	116	23	1				ST	2	S1 Gleyed 85
25	TQ57606550	PGR				035	3	3A		0		0					WE	3A	S1 Gleyed 35
26	TQ57706550	PGR			050	028	3	3A		0		0					WE	3A	3A T/S Stone
27	TQ57306540	CER	E	02		030	3	3A		0		0					WE	3A	S1 Gleyed 30
28	TQ57406540	CER	E	02		028	3	3A		0		0					WE	3A	S1 Gleyed 28
29	TQ57506530	CER	E	02		035	3	3A		0		0					WE	3A	S1 Gleyed 35
30	TQ57555022	CER	E	01		040	3	3A		0		0					WE	3A	S1 Gleyed 40
31	TQ57645038	PGR	N	01		035	3	3A		0		0					WE	3A	3A T/S Stone

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
1	0-28	mzcl	10YR43 00						9	2	HR	15							
	28-40	mzcl	10YR42 00	75YR46 00	M			Y	0	0	HR	25		M					
	40-50	mzcl	10YR54 00						0	0	HR	25		M					Imp Flinty
1P	0-29	mzcl	10YR42 00						7	0	HR	9							
	29-47	hzcl	10YR54 00						0	0	HR	15	MDCSAB	FR M					
	47-120	c	75YR56 00	05YR58 00	M		00MN00 00	S	0	0	HR	20	MDCAB	FM P	Y		Y		
2P	0-29	mzcl	10YR42 00						7	0	HR	9							
	29-47	hzcl	10YR54 00						0	0	HR	15	MDCSAB	FR M					
	47-120	c	10YR54 00	75YR58 00	M			S	0	0	HR	2	MDCSAB	FR M					
5	0-28	mzcl	10YR43 00						14	3	HR	20							
	28-50	c	10YR56 00	75YR58 56	M		00MN00 00	S	0	0	HR	20		P			Y		
	50-65	c	75YR56 00	75YR58 68	M		00MN00 00	S	0	0	HR	25		P			Y		Imp Flinty
6	0-28	mzcl	10YR43 00						12	0	HR	20							
	28-45	mzcl	10YR54 00						0	0	HR	15		M					
	45-70	c	10YR56 00	75YR56 58	M		00MN00 00	S	0	0	HR	15		P			Y		Imp Flinty
7	0-28	mzcl	10YR43 00						14	4	HR	20							
	28-55	c	75YR54 00	75YR58 00	M		00MN00 00	S	0	0		0		P			Y		
	55-80	c	75YR54 00	75YR58 68	M		00MN00 00	S	0	0	HR	15		P			Y		Imp Flinty
8	0-28	mzcl	10YR43 00						8	2	HR	15							
	28-35	mzcl	10YR44 00						0	0	HR	15		M					
	35-55	c	75YR54 00	75YR56 00	M		00MN00 00	S	0	0	HR	15		P			Y		
	55-120	c	75YR54 00	75YR68 56	M		00MN00 00	S	0	0		0		P			Y		
10	0-20	mzcl	10YR42 00	75YR46 00	F				9	0	HR	15							
	20-50	hzcl	10YR54 00	75YR46 00	F				0	0	HR	15		M					
	50-80	c	10YR56 00	75YR66 00	M		00MN00 00	S	0	0	HR	10		P			Y		Imp Flinty
11	0-30	mzcl	10YR42 00						7	3	HR	15							
	30-45	hzcl	10YR54 00						0	0	HR	15		M					
	45-60	c	10YR56 00	75YR66 00	M		00MN00 00	S	0	0	HR	25		P			Y		Imp Flinty
12	0-28	mzcl	10YR43 00						8	2	HR	15							
	28-50	mzcl	10YR44 00						0	0	HR	15		M					
	50-60	hzcl	10YR53 00	10YR58 62	M			Y	0	0	HR	15		M					
	60-120	c	10YR53 00	10YR58 62	M			Y	0	0		0		P			Y		
13	0-28	mzcl	10YR43 00						11	3	HR	20							
	28-65	c	10YR56 00	75YR56 00	M		00MN00 00	S	0	0	HR	15		P			Y		
	65-120	c	10YR56 00	75YR68 58	M		00MN00 00	S	0	0		0		P			Y		
14	0-28	mzcl	10YR43 00						11	3	HR	20							
	28-40	hzcl	10YR54 00						0	0	HR	15		M					
	40-60	c	75YR54 00	75YR56 58	M		00MN00 00	S	0	0	HR	15		P			Y		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
15	0-30	mzcl	10YR43 00						12	3	HR	20						
	30-55	c	75YR46 00	75YR58 00	M		00MN00 00	S	0	0	HR	20		P		Y		Imp Flinty
16	0-28	mzcl	10YR43 00						7	2	HR	15						
	28-40	mzcl	10YR54 00						0	0	HR	15		M				
	40-45	mzcl	10YR54 00						0	0	HR	25		M				Imp Flinty
17	0-30	mzcl	10YR42 00						7	3	HR	15						
	30-65	c	10YR56 00	75YR68 00	M			S	0	0	HR	20		P		Y		Imp Flinty
18	0-28	mzcl	10YR43 00						7	0	HR	15						
	28-35	hzcl	10YR54 00						0	0	HR	15		M				
	35-60	c	10YR56 00	75YR68 00	M		00MN00 00	S	0	0	HR	20		P		Y		Imp Flinty
19	0-30	mzcl	10YR42 00						6	2	HR	12						
	30-78	c	10YR56 00	75YR58 00	M		00MN00 00	S	0	0	HR	10		P		Y		Imp Flinty
20	0-30	mzcl	10YR42 00						6	0	HR	12						
	30-60	c	10YR54 00	75YR66 00	M		00MN00 00	S	0	0	HR	5		M				See 1P
	60-70	c	10YR56 00	75YR68 00	M		00MN00 00	S	0	0	HR	25		P		Y		Imp Flinty
21	0-30	mzcl	10YR42 00						7	4	HR	15						
	30-70	c	10YR56 00	75YR66 00	M		00MN00 00	S	0	0	HR	20		P		Y		
	70-95	hzcl	10YR54 00	75YR66 00	C			S	0	0	HR	5		M				
	95-120	hzcl	10YR56 00						0	0	CH	15		M				
22	0-28	mzcl	10YR43 00						8	2	HR	15						
	28-70	c	75YR54 00	75YR56 68	M		00MN00 00	S	0	0		0		P		Y		
	70-120	hcl	25Y 63 00	10YR56 00	M			Y	0	0		0		P		Y		
23	0-27	mzcl	10YR42 43						10	0	HR	13						
	27-45	c	75YR46 00	05YR56 00	C		00MN00 00	S	0	0	HR	15		P		Y		Imp Flinty
24	0-35	mzcl	10YR42 00						6	0	HR	12						
	35-85	mzcl	10YR54 00						0	0	HR	5		M				
	85-120	c	10YR56 00	75YR68 00	M			S	0	0		0		P		Y		
25	0-35	mzcl	10YR42 00						6	0	HR	12						
	35-60	c	10YR56 00	75YR68 00	M			S	0	0	HR	2		P		Y		Imp Flinty
26	0-28	mzcl	10YR42 00						11	5	HR	20						
	28-50	c	75YR56 00	05YR58 00	C			S	0	0	HR	2		P		Y		
	50-120	hcl	25Y 63 00	75YR58 00	M			Y	0	0	HR	8		P		Y		V Firm
27	0-30	mzcl	10YR42 00						6	0	HR	8						
	30-45	c	75YR56 00	75YR58 00	C		00MN00 00	S	0	0	HR	2		P		Y		
	45-50	c	75YR56 00	75YR58 00	C		00MN00 00	S	0	0	HR	25		P		Y		Imp Flinty

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	PED GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
28	0-28	mzcl	10YR42 00						9	0	HR	13							
	28-60	c	75YR56 00	75YR58 00	C		25 Y63 00	S	0	0	HR	2		P		Y			
	60-85	c	75YR56 00	75YR58 00	C		25 Y63 00	S	0	0	HR	10		P		Y			Imp Flinty
29	0-35	mzcl	10YR42 00						9	0	HR	12							
	35-50	c	75YR56 00	05YR58 00	C		00MN00	00 S	0	0	HR	2		P		Y			
	50-90	c	75YR56 00	05YR58 00	M		00MN00	00 S	0	0	HR	15		P		Y			
30	0-25	mzcl	10YR42 00						7	0	HR	10							
	25-40	hzcl	10YR54 00						0	0	HR	15		M					
	40-120	c	10YR56 00	75YR56 00	M		00MN00	00 S	0	0	HR	2		P		Y			
31	0-35	mzcl	10YR42 00						11	0	HR	20							
	35-55	c	75YR56 00	05YR58 00	M			S	0	0	HR	25		P		Y			Imp Flinty



MAFF Ministry of Agriculture Fisheries and Food

Agricultural Land Classification

Proposed Motorway Service Area Scratchers Lane, West Kingsdown Kent

Legend

	Quality	Area (ha)
Grade 1	Excellent	nil
Grade 2	Very Good	nil
Grade 3a	Good	24.3
Grade 3b	Moderate	nil
Grade 4	Poor	nil
Grade 5	Very Poor	nil
	Agricultural land not surveyed	nil
	Other land	5.8
	Boundary of survey area	
	Total agricultural land area	24.3
	Total survey area	30.1

* Not present within survey area

Scale - 1:10,000

0 100 200 300 400 500 600 Metres

Further details contained in MAFF (1988) Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land. Maff (publications), London SE99 7TP.
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Reference no: 2009/014/96
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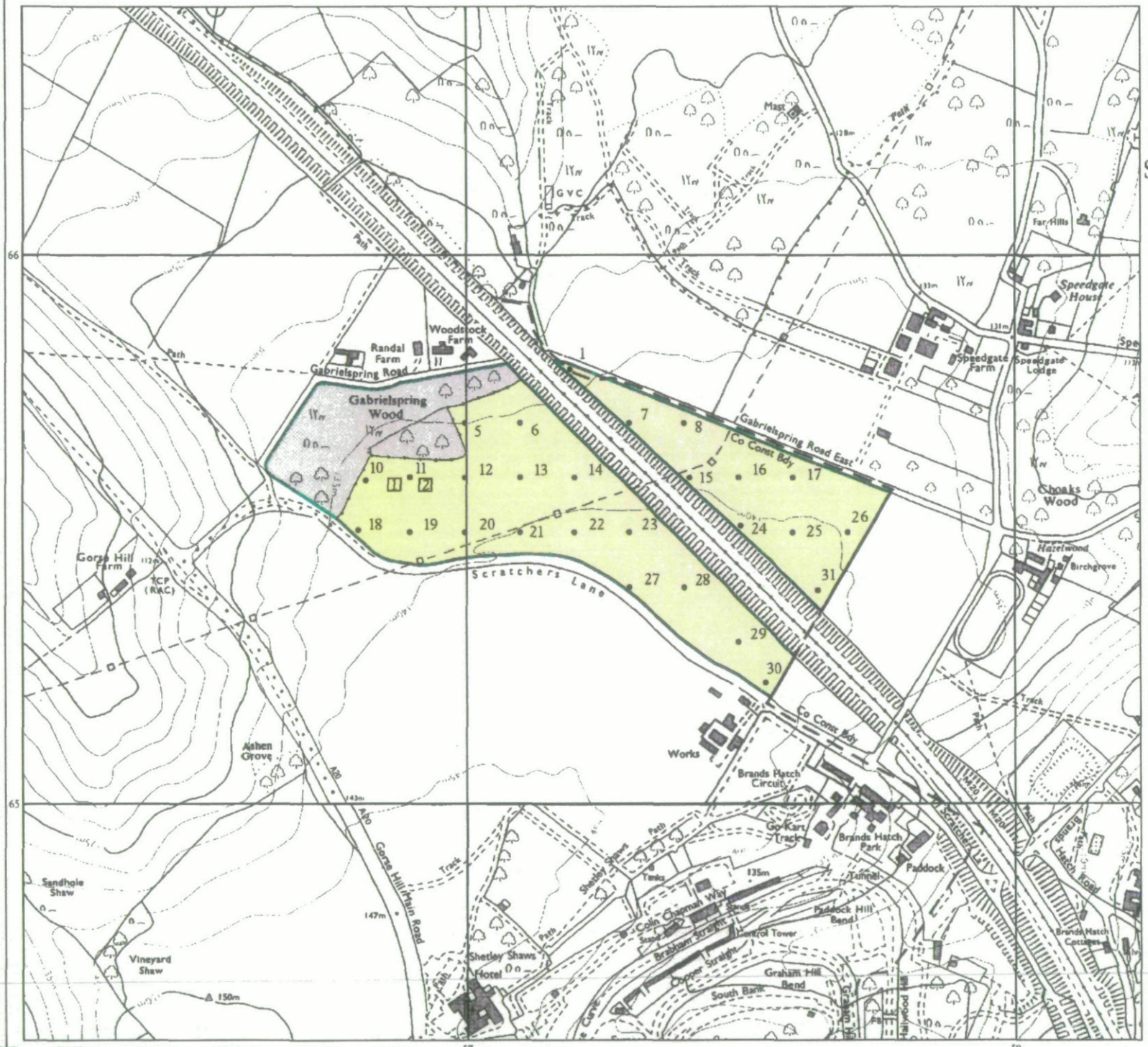

MAFF Ministry of Agriculture Fisheries and Food

Agricultural Land Classification

Proposed Motorway Service Area
Scratchers Lane, West Kingsdown
Kent

SAMPLE POINT MAP

[1] LOCATION OF SOIL PIT

• 1 LOCATION OF AUGER SAMPLE POINT

AREA OF SURVEY

	Area (ha)
Agricultural land not surveyed	nil
Other land	5.8
Total agricultural land area	24.3
Total survey area	30.1

* Not present within survey area

Scale - 1:10,000

0 100 200 300 400 500 600 Metres

Further details contained in MAFF (1988) Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land. Maff (publications), London SE99 7TP.
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Statement of competence - Agricultural land Classification

SES Ltd undertake several dozen Agricultural Land Classification (ALC) or Land Capability Classifications for Agriculture (LCCA- Scotland) surveys a year and have worked on sites up to 1000 ha including housing, roads, solar farm and mineral extraction developments.. We have been undertaking ALC surveys for 25 years and have won many contracts to supply Land Classification reports to local authorities as part of their strategic development plans. A number of our staff have attended the training course Agricultural Land Classification: England and Wales. Working with Soil – The IPSS Professional Competency Scheme. BSSS & DEFRA.

DR ROBIN DAVIES BSc PhD F.I.SoilSci. (Managing Director)

- Fellow of The British Society of Soil Science
- Council Member of The Institute of Professional Soil Scientists for 4 years.
- PhD Soil Physics - Agricultural land drainage - University of Newcastle upon Tyne
- Founder and Managing Director of Soil Environment Services Limited for 25 years.

Selected peer reviewed scientific papers:

* **Soil nitrogen depletion - the threat from soil stockpiling**. Environmental Scientist: Journal of The Institution of Environmental Sciences, 1997.

* **Nitrogen loss from a soil, restored after surface-mining**. Journal of Environmental Quality, 1995

* **The influence of soil factors on the growth of a grass/clover sward on a restored site in Northumberland.** Grass & Forage Science, 1994.

* **The effect of post-restoration cropping regime on some physical properties of a restored soil.** Soil Use & Management, 1994

* **Water availability in a restored soil.** Soil Use & Management, 1992.

* **A laboratory Method for Investigating the Stabilisation of Mole** Channels.J.Agric.Eng.Res.1991.

LOUISE TAVASSO BSc (Hons) . (Soil surveyor/ Environmental Consultant)

Member of British Society of Soil Science

Postgraduate short course Contaminated Land Risk assessment – LQM Nottingham University

Worked for Soil Environment Services Limited for 16 years. Environmental consultant with initial work in contaminated land risk assessment and since 2011 as assistant soil surveyor with last three years as lead consultant on agricultural land classification surveys. All work areas have required field survey and identification and description of soils combined with an understanding of soil processes for reporting.


BRITISH SOCIETY OF SOIL SCIENCE

This is to certify that

Louise Tavasso

has completed the British Society of Soil Science's

Agricultural Land Classification Course

(18 hours)

7 December 2021

Date

Dr Bruce Lascelles, President

Completed the BSSS Agricultural Land Classification Course – 2021.

Main areas of specialisation

1 Agricultural Land Classification

Soil survey and Agricultural Land Classification for planning applications –, roads, housing, solar parks. Fully conversant with the procedures of the *Agricultural Land Classification of England and Wales, Guidelines and criteria for grading the quality of agricultural land,* 1988, MAFF, London.

2 Soil survey for habitat restoration

Soil survey and nutrient analysis assessment for conversion of farmland to species rich grassland.

3 Contaminated land risk assessment

Phase 1 site survey risk assessment of contaminated land; site investigation, on-site monitoring; risk analysis, modelling and communication; recommendations for Phase 2 and remediation options.

Examples of Agricultural Land Classification (ALC or LCCA Scotland) consultancy work

Kier Mining. Greenburn Opencast Coal Site. Soils and deep peat survey for LCCA report soil resources planning. 2011

Newcastle International Airport Ltd. ALC survey for solar park development. 2021.

Examples of soil survey habitat creation consultancy work

BSG Ecology. Backwork Estate – farmland conversion to wildflower meadow. 2020.

Private garden owner. Soil survey and recommendation for drainage system design. 2021

Examples of contaminated land consultancy work

Numerous risk assessments on petrol stations for hydrocarbon leakages (2006-2019)

Farm building risk assessments for conversion to residential housing (2006-2019)

GENERAL INFORMATION SOURCES

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

2. ***Soil Survey Field Handbook.*** Technical Monograph No.5. Soil Survey of England and Wales.1976.

3. ***Climatological Data for Agricultural Land Classification***, The Met. Office 1989

4. ***Soil Map of England and Wales: 1:250 000***. Soil Survey of England and Wales, Harpenden.

5. ***Soils and Their Use in South East England.*** Soil Survey of England and Wales,

6. ***Agricultural Land Classification Map*** 1:250 000. MAFF 1983.

7. ***Risk of Flooding:*** https://flood-warning-information.service.gov.uk/long-term-flood-risk

8. ***Geology of Britain Viewer.*** *Reproduced with the permission of the British Geological Survey ©NERC. All rights Reserved*

9. ***Butler, B E.*** *Soil Classification for Soil Survey Monographs on Soil Survey (1980) Clarendon Press, Oxford*

10. ***Munsell Soil Colour Charts****, Munsell Colour, Grand Rapids* ***1994.***

GLOSSARY

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report. Terms used and abbreviations are set out below. These conform to definitions contained in the Soil Survey Field Handbook (Hodgson, 1997).

1. Terms used on computer database, in order of occurrence.

GRID REF: National 100 km grid square and 8 figure grid reference.

LAND USE: At the time of survey

WHT:	Wheat	**SBT:**	Sugar Beet	**HTH:**	Heathland
BAR:	Barley	**BRA:**	Brassicas	**BOG:**	Bog or Marsh
OAT:	Oats	**FCD:**	Fodder Crops	**DCW:**	Deciduous Wood
CER:	Cereals	**FRT:**	Soft and Top Fruit	**CFW:**	Coniferous Woodland
MZE:	Maize	**HRT:**	Horticultural Crops	**PLO:**	Ploughed
OSR:	Oilseed Rape	**LEY:**	Ley Grass	**FLW:**	Fallow (inc. Set aside)
POT:	Potatoes	**PGR:**	Permanent Pasture	**SAS:**	Set Aside (where known)
LIN:	Linseed	**RGR:**	Rough Grazing	**OTH:**	Other
BEN:	Field Beans	**SCR:**	Scrub		

GRDNT: Gradient as estimated or measured by hand-held optical clinometer.

GLEY, SPL: Depth in centimetres to gleying or slowly permeable layer.

AP (WHEAT/POTS): Crop-adjusted available water capacity.

MB (WHEAT/POTS): Moisture Balance. (Crop adjusted AP - crop potential MD)

DRT: Best grade according to soil droughtiness.

If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

MREL:	Microrelief limitation	**FLOOD:**	Flood risk	**EROSN:**	Soil erosion risk
EXP:	Exposure limitation	**FROST:**	Frost prone	**DIST:**	Disturbed land
CHEM:	Chemical limitation				

LIMIT: The main limitation to land quality: The following abbreviations are used.

OC:	Overall Climate	**AE:**	Aspect	**EX:**	Exposure
FR:	Frost Risk	**GR:**	Gradient	**MR:**	Microrelief
FL:	Flood Risk	**TX:**	Topsoil Texture	**DP:**	Soil Depth
CH:	Chemical	**WE:**	Wetness	**WK:**	Workability
DR:	Drought	**ER:**	Erosion Risk	**WD:**	Soil Wetness/Droughtiness

ST: Topsoil Stoniness

TEXTURE: Soil texture classes are denoted by the following abbreviations:-

S:	Sand	**LS:**	Loamy Sand	**SL:**	Sandy Loam
SZL:	Sandy Silt Loam	**CL:**	Clay Loam	**ZCL**	Silty Clay Loam
ZL:	Silt Loam	**SCL:**	Sandy Clay Loam	**C:**	Clay
SC:	Sandy clay	**ZC:**	Silty clay	**OL:**	Organic Loam
P:	Peat	**SP:**	Sandy Peat	**LP:**	Loamy Peat
PL:	Peaty Loam	**PS:**	Peaty Sand	**MZ:**	Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:-

F: Fine (more than 66% of the sand less than 0.2mm)
M: Medium (less than 66% fine sand and less than 33% coarse sand)
C: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (< 27% clay) **H:** heavy (27 - 35% clay)

MOTTLE COL: Mottle colour using Munsell notation.

MOTTLE ABUN: Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2 - 20% **M:** many 20 - 40% **VM:** very many 40%+

MOTTLE CONT: Mottle contrast

F: faint - indistinct mottles, evident only on close inspection
D: distinct - mottles are readily seen
P: Prominent - mottling is conspicuous and one of the outstanding features of the horizon.

PED. COL: Ped face colour using Munsell notation.

GLEY: If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

STONE LITH: Stone Lithology - One of the following is used.

HR:	All hard rocks and stones	**SLST:**	Soft oolitic or dolimitic limestone
CH:	Chalk	**FSST:**	Soft, fine grained sandstone
ZR:	Soft, argillaceous, or silty rocks	**GH:**	Gravel with non-porous (hard) stones
MSST:	Soft, medium grained sandstone	**GS:**	Gravel with porous (soft) stones
SI:	Soft weathered igneous or metamorphic rock		

Stone contents are given in % by volume for sizes >2cm, >6cm and total stone >2mm.

STRUCT: The degree of development, size and shape of soil peds are described using the following notation

Degree of development	**WA:**	Weakly developed Adherent	**WK:**	Weakly developed
	MD:	Moderately developed	**ST:**	Strongly developed
Ped size	**F:**	Fine	**M:**	Medium
	C:	Coarse	**VC:**	Very coarse
Ped Shape	**S:**	Single grain	**M:**	Massive
	GR:	Granular	**AB:**	Angular blocky
	SAB:	Sub-angular blocky	**PR:**	Prismatic
	PL:	Platy		

CONSIST: Soil consistence is described using the following notation:

L:	Loose	**VF:**	Very Friable	**FR:**	Friable	**FM:**	Firm
VM:	Very firm	**EM:**	Extremely firm			**EH:**	Extremely Hard

SUBS STR: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G:** Good **M:** Moderate **P:** Poor

POR: Soil porosity. If a soil horizon has poor porosity with less than 0.5% biopores >0.5mm, a 'Y' will appear in this column.

IMP: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

SPL: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

CALC: If the soil horizon is calcareous with naturally occurring calcium carbonate exceeding 1% a 'Y' will appear this column.

2. Additional terms and abbreviations used mainly in soil pit descriptions.

STONE ASSESSMENT:

V: Visual **S:** Sieved **D:** Displacement

MOTTLE SIZE:

EF:	Extremely fine <1mm	**M:**	Medium 5-15mm
VF:	Very fine 1-2mm>	**C:**	Coarse >15mm
F:	Fine 2-5mm		

MOTTLE COLOUR: May be described by Munsell notation or as ochreous (OM) or grey (GM).

ROOT CHANNELS: In topsoil the presence of 'rusty root channels' might also be noted as RRC.

MANGANESE CONCRETIONS: Assessed by volume

N:	None		**M:**	Many	20-40%
F:	Few	<2%	**VM:**	Very Many	>40%
C:	Common	2-20%			

POROSITY:

P: Poor - less than 0.5% biopores at least 0.5mm in diameter
G: Good - more than 0.5% biopores at least 0.5mm in diameter

ROOT ABUNDANCE:

The number of roots per $100cm^2$:		Very Fine and Fine	Medium and Coarse
F:	Few	1-10	1 or 2
C:	Common	10.25	2 - 5
M:	Many	25-200	>5
A:	Abundant	>200	

ROOT SIZE

VF:	Very fine	<1mm	**M:**	Medium	2 - 5mm
F:	Fine	1-2mm	**C:**	Coarse	>5mm

HORIZON BOUNDARY DISTINCTNESS:

Sharp:	<0.5cm	**Gradual:**	6 - 13cm
Abrupt:	0.5 - 2.5cm	**Diffuse:**	>13cm
Clear:	2.5 - 6cm		

HORIZON BOUNDARY FORM: Smooth, wavy, irregular or broken.*

* See Soil Survey Field Handbook (Hodgson, 1997) for details.