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Arun District Local Plan

Site 41 : Land south of Church Lane, Eastergate

Agricultural Land Classification

ALC Map and Report

April 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

ARUN DISTRICT LOCAL PLAN
SITE 41 : LAND SOUTH OF CHURCH LANE, EASTERGATE

1. Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the Arun District of West Sussex. The work forms part of MAFF's statutory input to the preparation of the Arun District Local Plan.

1.2 Site 41 comprises 8.3 hectares of land located to the south-west of Eastergate, West Sussex. An Agricultural Land Classification, (ALC), survey was carried out during April 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 8 borings and one soil inspection pit were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land, (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose a long term limitation on its use for agriculture.

1.3 At the time of the survey the land use was ley pasture. A small area of scrub was denoted as non-agricultural land.

1.4 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent are given in the table below. The map has been drawn at a scale of 1:5,000. It is accurate at this scale, but any enlargement would be misleading.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
2	5.8	69.9	69.9
3b	2.5	30.1	30.1
Non-agricultural land	<0.1	—	100 (8.3 ha)
Total area of site	8.3	100.0	

1.5 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.6 The agricultural land on this site has been classified as a mixture of Grade 2 and Subgrade 3b. Land assigned to Grade 2, very good quality, comprises silty clay loam soils which have signs of slight soil wetness and/or are slightly droughty due to the interaction of soil factors and a relatively dry climatic regime.

Profiles may be slightly stony throughout and impenetrable over gravelly horizons below about 70-80 cm. Subgrade 3b is mapped where very stony and gravelly soils give rise to limitations in terms of soil droughtiness and topsoil stone volumes.

2. Climate

2.1 Estimates of climatic variables relevant to the assessment of agricultural land quality were obtained by interpolation from a 5km grid point dataset (Met. Office, 1989) for a representative location in the survey area.

Table 2 : Climatic Interpolation

Grid Reference	SU944050
Altitude (m)	10
Accumulated Temperature (degree days, Jan-June)	1537
Average Annual Rainfall (mm)	776
Field Capacity (days)	159
Moisture Deficit, Wheat (mm)	117
Moisture Deficit, Potatoes (mm)	113
Overall Climatic Grade	1

2.2 Climatic factors are considered first when classifying land since climate can be overriding in the sense that adverse climatic conditions may restrict land quality irrespective of favourable site and soil conditions. The details in the table above show that there is no overall climatic limitation affecting this site. In addition, no local climatic factors such as exposure or frost risk affect the land quality.

2.3 However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. At this locality, the climate is relatively warm in regional terms giving rise to high values for soil moisture deficits. The likelihood of droughtiness limitations may therefore be increased whilst soil wetness limitations may be reduced.

3. Relief

3.1 The site lies at an altitude of 9-10 metres, falling gently from east to west towards the stream on the western site boundary. Nowhere on the site do gradient or relief affect agricultural land quality.

4. Geology and Soil

4.1 British Geological Survey (1972), Sheet 317, Chichester shows the site to be predominantly underlain by valley gravel deposits with small areas of alluvium adjacent to the stream and former course of ditch and an area of brickearth in the south-eastern corner of the site.

4.2 *Soil Survey of Great Britain (1967), Sheet SU90, Soils of the West Sussex Coastal* Plain shows a complex pattern of soil series across the site. Most of the northern and eastern part of the site is shown to comprise soils of either the Hook or Park Gate series, (shallow phase over flinty Head). These are described as 'imperfectly drained silty soils over very compact gravel of fine angular flints,' (SSGB, 1967). The Lyminster and Gade series have been mapped in association with the alluvial deposits. The former soils are described as 'brown earths developed on pebbly and loamy marine deposits', whilst Gade series are described as 'soils developed in freshwater alluvium overlying gravel at shallow depths' (SSGB, 1967). A small unit of the Calcetto series is indicated to the south of the site. These 'loamy pebbly soils have developed in marine drift', (SSGB, 1967).

4.3 Detailed field examination of the soils on the site found them to comprise two main types. On the higher land, deep silty clay loam soils slightly affected by a fluctuating ground water table were found to occur. Across the remainder of the site, silty clay loam profiles resting over gravelly horizons at variable depths, some very shallow, but some much deeper, were observed.

5. Agricultural Land Classification

5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

5.2 The location of the soil observation points are shown on the attached sample point map.

Grade 2

5.3 The majority of the agricultural land surveyed has been assigned to this grade on the basis of a minor soil wetness and/or droughtiness limitation. Profiles typically comprise non-calcareous medium silty clay loam topsoils which may contain 1-5% total flints by volume. These overlie similar upper subsoils and may extend as such to at least 120 cm. More usually though, lower subsoils become heavier, passing to heavy silty clay loam or clay below about 60-80 cm. Occasional profiles were found to be impenetrable, to soil auger, below 70-80 cm over gravelly horizons containing up to 50% flints by volume. Commonly soils in this mapping unit were slightly gleyed or gleyed in the subsoil at variable depths between 35 and 78 cm. This is caused by the seasonal fluctuation of the watertable rather than impeded drainage through clay horizons. Profiles are thus assessed as Wetness Class I or II. Where Wetness Class II is assigned, the land is limited by slight soil wetness given the local climatic regime and topsoil textures. Land in this mapping unit is also limited by slight soil droughtiness caused by the interaction of soil properties, (ie

textures, structures and stone contents) with relatively high moisture deficits. Moisture balance calculations indicate that there may be inadequate reserves of available water for all or part of the growing season. Slight soil wetness and/or droughtiness may affect the flexibility of cropping and the level of yield.

Subgrade 3b

5.4 Moderate quality land has been mapped where very shallow, gravelly soils were observed which suffer the risk of severe soil droughtiness. Non-calcareous medium silty clay loam topsoils typically contain up to 20% total flints by volume, (16% > 2 cm, 8% of which are > 6 cm). Profiles were commonly found to be impenetrable, to soil auger, at shallow depth as a result of very stony subsoil horizons (as observed in the pit, 1P), containing up to 50% flints by volume. Such shallow stony soil profiles, in combination with restricted rooting into the gravelly horizons, have severely reduced reserves of available water for crop growth. The relatively high moisture deficits at this locality combine with such soil characteristics to give moisture balance figures which indicate the possibility of land which is severely drought prone. Crops will suffer drought stress for all or part of the growing season and the flexibility of the land and yield potential will be affected as a consequence.

This land is also limited to Subgrade 3b on the basis of high topsoil stone contents. These will adversely affect seed drilling operations, crop establishment and will increase the wear and tear to farm machinery.

SOURCES OF REFERENCE

British Geological Survey (1972) Sheet No. 317, Chichester, 1:63,360. (drift edition).

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

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

Soil Survey of Great Britain (1967), Bulletin No. 3, Soils of the West Sussex Coastal Plain and accompanying maps.

SAMPLE NO.	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	SU94400520	LEY	N	01	045		1	1	112	-6	118	3	3A				DR		2	GR 2 TO 120
1P	SU94300510	LEY	S	01			1	1	80	-38	70	-45	3B				DR		3B	ROOT 120
2	SU94300510	LEY	S	01			1	1	59	-59	59	-56	4				DR		3B	IMP 32
3	SU94300500	LEY	S	01	036		2	2	114	-4	122	7	3A				DR		2	GR 2 TO 120
4	SU94300490	LEY	S	01			1	1	56	-62	56	-59	4				DR		3B	IMP 30
5	SU94400500	PGR			035	090	2	2	155	37	125	10	1				WD		2	
6	SU94500500	PGR			078		1	1	160	42	124	9	2				DR		2	ALMOST 1
7	SU94500490	PGR			035	100	2	2	156	38	124	9	2				WD		2	
8	SU94250474	LEY	W	01	045		1	1	109	-9	123	8	3A				DR		2	GR 2 TO 120

SOIL PIT DESCRIPTION

Site Name : ARUN LP, SITE 41 Pit Number : 1P

Grid Reference: SU94300510
Average Annual Rainfall : 776 mm
Accumulated Temperature : 1543 degree days
Field Capacity Level : 159 days
Land Use : Ley
Slope and Aspect : 01 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	MZCL	10YR42 00	16	20		
28-120	MZCL	10YR54 00	0	50		

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

Drought Grade : 3B
APW : 80 mm MBW : -38 mm
APP : 70 mm MBP : -45 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

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	
1	0-30	mzcl	10YR41 00						0	0	HR	5							
	30-45	mzcl	10YR41 00						0	0	HR	10		M					
	45-65	mzcl	10YR52 00	75YR58 00	C			Y	0	0	HR	3		M					
	65-78	hzcl	10YR62 00	75YR58 00	C			Y	0	0	HR	10		M					IMP 78+
1P	0-28	mzcl	10YR42 00						16	8	HR	20							
	28-120	mzcl	10YR54 00						0	0	HR	50		P					
2	0-29	mzcl	10YR42 00						0	0	HR	1							TS STONE, SEE 1P
	29-32	mzcl	10YR54 00						0	0	HR	20		M					IMP 32+
3	0-36	mzcl	10YR42 00						0	0	HR	1							
	36-60	mzcl	10YR53 00	75YR58 00	C		10YR62 00	Y	0	0	HR	5		M					
	60-75	mzcl	10YR53 00	75YR58 00	C			Y	0	0	HR	10		M					IMP 75+
4	0-30	mzcl	10YR42 00						0	0	HR	1							IMP 30+,TS STONE 1P
5	0-35	mzcl	10YR43 00	75YR46 00	F				0	0	HR	1							
	35-59	mzcl	10YR53 00	75YR58 00	C			Y	0	0	HR	1		M					
	59-90	hzcl	10YR54 00	75YR58 00	C		10YR62 00	Y	0	0	HR	1		M					
	90-120	c	10YR54 00	75YR58 00	F			S	0	0	HR	1		M					SEE 1P, SITE 38
6	0-32	mzcl	10YR43 00						0	0	HR	1							
	32-78	mzcl	10YR54 00						0	0	HR	1		M					
	78-120	hzcl	10YR54 00	75YR58 00	C		10YR63 00	S	0	0	HR	1		M					
7	0-30	mzcl	10YR43 00						0	0	HR	1							
	30-35	mzcl	10YR54 00						0	0	HR	1		M					
	35-78	mzcl	10YR53 00	75YR58 00	C			Y	0	0	HR	1		M					
	78-100	hzcl	10YR54 00	75YR58 00	C			S	0	0	HR	1		M					
	100-120	c	10YR54 00	75YR58 00	C			S	0	0	HR	1		M					SEE 1P, SITE 38
8	0-30	mzcl	10YR42 00						0	0	HR	1							
	30-45	mzcl	10YR54 00	75YR58 00	F				0	0	HR	1		M					
	45-70	mzcl	10YR53 00	75YR58 00	C			Y	0	0	HR	3		M					IMP 70+