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**ARUN DISTRICT LOCAL PLAN-OBJECTOR SITES
Land at Angmering, West Sussex
(Objector Site 10119)**

**Agricultural Land Classification
ALC Map and Report**

July 1998

**Resource Planning Team
Eastern Region
FRCA Reading**

**RPT Job Number: 4202/057/98
MAFF Reference: EL 42/0460**

AGRICULTURAL LAND CLASSIFICATION REPORT

ARUN DISTRICT LOCAL PLAN - OBJECTOR SITES

LAND AT ANGMERING, WEST SUSSEX, OBJECTOR SITE 10119

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 6.6 ha of land directly south of Poling Furzefields and to the east of the B2225, to the north of Angmering village, in West Sussex. The survey was carried out during July 1998.
2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)¹ on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with its statutory input to the Arun District Local Plan. The survey covers Objector Site 10119. This survey supersedes any previous ALC information for this land.
3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. 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, all of the agricultural land was in permanent grassland (horse grazing). A footpath running north to south through the centre of the site has been mapped 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 Objector Site 10119 are summarised in Table 1.

Table 1: Area of grades - Objector Site 10119, Land at Angmering

Grade/Other land	Area (hectares)	% surveyed area	% site area
3a	2.5	39.1	37.9
3b	3.9	60.9	59.1
Other land	0.2	-	3.0
Total surveyed area	6.4	100.0	97.0
Total site area	6.6	-	100.0

¹ FRCA is an executive agency of MAFF and the Welsh Office

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. In total, six borings and one soil pit were described.

8. The western half of the site has been classified as Subgrade 3a (good quality); the eastern half as Subgrade 3b (majority quality). The key limitation to land quality is soil wetness. Soil wetness acts to restrict the flexibility of cropping, stocking and cultivations and adversely affects yields.

9. Where the land is classified as Subgrade 3a, medium textured topsoils overlie similarly textured, permeable upper subsoils. These profiles pass into poorly structured clay lower subsoils, which act to impede soil drainage. In profiles where the clay occurs at shallower depths the ensuing soil wetness is more severe. Subgrade 3b is appropriate.

FACTORS INFLUENCING ALC GRADE

Climate

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

11. 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	
		TQ 072 052	TQ 069 052
Grid reference	N/A		
Altitude	m, AOD	25	20
Accumulated Temperature	day°C (Jan-June)	1516	1522
Average Annual Rainfall	mm	785	780
Field Capacity Days	days	162	161
Moisture Deficit, Wheat	mm	116	117
Moisture Deficit, Potatoes	mm	111	113
Overall climatic grade	N/A	Grade 1	Grade 1

12. 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.

13. 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 (AT0, January to June), as a measure of the relative warmth of a locality.

14. The combination of rainfall and temperature within this survey area means that there is no overall climatic limitation. However, climatic factors do interact with soil properties to influence soil wetness and soil droughtiness. At this locality, the climate is relatively warm

in regional terms. As a result the likelihood of soil droughtiness problems may be increased. No local climatic factors, such as exposure or frost risk, are believed to adversely affect the land quality on the site. This site is climatically Grade 1.

Site

15. The survey area falls through gentle slopes (1-3°) from 25m, in the north-east of the site, to 15m AOD, in the south-west corner. Nowhere on the site do gradient or microrelief adversely affect agricultural land quality.

Geology and soils

16. The most detailed published geological information for this area (BGS, 1972) shows the entire site to comprise London Clay, overlain by valley gravel deposits in the extreme south of the site.

17. The most detailed published soils information covering the area (SSGB, 1967) shows the north-east half of the site, where the land is relatively higher, to comprise soils of the Titchfield Complex. These soils are described as a 'range of poorly and imperfectly drained surface-water gley soils developed in Eocene Clay with a variable cover of non-calcareous, more or less flinty, loamy or clayey drift.' (SSGB, 1967). The south-west half of the site is shown to comprise soils of the Park Gate Series (deep phase). Park Gate are described as a 'range of gley soils developed in brickearth.... the soil drainage is generally imperfect but poorly drained soils are widespread.' (SSGB, 1967). Detailed field examination found both imperfectly and poorly drained soils across the site.

AGRICULTURAL LAND CLASSIFICATION

18. The details of the classification of the survey area are shown on the attached ALC map and the area statistics of each grade are given in Table 1.

19. 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 II.

Subgrade 3a

20. The slightly lower land in the west of the site has been classified as Subgrade 3a (good quality) because of soil wetness and workability limitations. This land occurs in broad conjunction with the soils mapped as the Park Gate Series. Profiles comprise non-calcareous medium silty clay loam topsoils which pass into permeable similarly textured upper subsoils. At approximately 50-70 cm depth, these pass into slowly permeable silty clay lower subsoils. These profiles are imperfectly drained (Wetness Class III), as indicated by gleying (which usually occurs within 40 cm depth). Such profiles are represented by Pit 1 (see Appendix II). The interaction between the medium textured topsoils, imperfect soil drainage and the prevailing climate means that this land may be subject to some restrictions on the flexibility of cropping, stocking and cultivations.

Subgrade 3b

21. The eastern half of the site has been classified as Subgrade 3b (moderate quality) because of significant soil wetness and workability restrictions. This land is associated with soils of the Titchfield Complex. Profiles comprise non-calcareous medium silty clay loam topsoils. Across most of the area, these overlie permeable medium silty clay loam upper subsoils which pass into slowly permeable silty clay and clay at 30-45 cm depth. In the extreme east of the site, the slowly permeable horizons occur directly below a thin topsoil, at 15 cm depth. All of these profiles are gleyed within 40 cm and are poorly drained which, at this locality, equates to Wetness Class IV. The interaction between the medium topsoil textures, poor soil drainage and the local climate means that this land is limited to Subgrade 3b by soil wetness. Soil wetness can adversely affect seed germination and survival and can inhibit the development of a good root system. It also influences the sensitivity of soil to structural damage and is, therefore, a major factor in determining the number of days when cultivation, trafficking or grazing can take place.

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SOURCES OF REFERENCE

British Geological Survey (1972) *Sheet No. 317, Chichester, 1:63,360, Drift Edition*.
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 Great Britain (1967) *Bulletin No. 3, Soils of the West Sussex Coastal Plain and accompanying maps (Sheets TQ 00 and 10, Worthing, 1:25,000)*.
SSGB: Harpenden

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South East England, 1:250,000*.
SSEW: Harpenden.

APPENDIX I

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 DATA

Contents:

Sample location map

Soil abbreviations - explanatory note

Soil pit descriptions

Soil boring descriptions (boring and horizon levels)

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	OTH: Other
DCW: Deciduous woodland	BOG: Bog or marsh	SAS: Set-Aside
HTH: Heathland	HRT: Horticultural crops	PLO: Ploughed

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

4. **GLEYS/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	ST: Topsoil Stoniness
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
EX: Exposure		

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. **GLEYS:** 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	FSST:	soft, fine grained sandstone
ZR:	soft, argillaceous, or silty rocks	CH:	chalk
MSST:	soft, medium grained sandstone	GS:	gravel with porous (soft) stones
SI:	soft weathered igneous/metamorphic rock	GH:	gravel with non-porous (hard) stones

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	MD: moderately developed
	ST: strongly developed	
Ped size	F: fine	M: medium
	C: coarse	
Ped shape	S: single grain	M: massive
	GR: granular	AB: angular blocky
	SAB: sub-angular blocky	PR: prismatic
	PL: platy	

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

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

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 appropriate 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

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--				-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYS	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
1	TQ06800520	PGR S	1	30		2	2	116	0	10	3a				WD 2	Imp80 ProbG2	
2	TQ06900520	PGR SW	1	28	70	3	3A		0	0					WE 3A	Near G2 WE	
3	TQ07020520	PGR SW	3	20	50	3	3A		0	0					WE 3A		
4	TQ07100520	PGR SW	3	30	30	4	3B		0	0					WE 3B		
5	TQ07200520	PGR S	2	15	15	4	3B		0	0					WE 3B	Thin t/soil	
6	TQ07010510	PGR SW	3	25	42	4	3B		0	0					WE 3B	Near 3a WE	
P	TQ07020520	PGR SW	3	21	50	3	3A	131	15	106	-5	2			WE 3A		

