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Aylesbury Vale District Local Plan
Land at Fleet Marston, Aylesbury, Buckinghamshire

Agricultural Land Classification
ALC Map and Report

April 1997

Resource Planning Team
Eastern Region
FRCA Reading

RPT Job Number: 0301/070/97
FRCA Reference: EL 03/01385B

AGRICULTURAL LAND CLASSIFICATION REPORT

Aylesbury Vale District Local Plan
Land At Fleet Marston, Aylesbury, Buckinghamshire

INTRODUCTION

1. This summary report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 6 ha of land at Fleet Marston, north west of Aylesbury in Buckinghamshire. The survey was carried out during April 1997.

2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA) for the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with the Aylesbury Vale District Local Plan. 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 the land use on the site was arable production, predominantly cereals.

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.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
3b	6.2	100.0	100.0
Total surveyed area Total site area		100 -	- 100

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. A total of 6 borings and 1 soil pits were described.

8. The agricultural land of the entire site has been classified as Subgrade 3b (moderate quality). The principal limitation is soil wetness.

9. Subgrade 3b land on this site comprises deep, but imperfectly to poorly drained profiles having fine loamy topsoils over less permeable clayey subsoils. Soil wetness and heavy textured topsoils restricts land utilisation by reducing the number of days when trafficking by machinery or grazing by animals may occur without damaging the soil. Wetness can also adversely affect seed germination and survival, and inhibit the development of a good root system.

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
Grid reference	N/A	SP 782 157
Altitude	m, AOD	75
Accumulated Temperature	day°C (Jan-June)	1417
Average Annual Rainfall	mm	635
Field Capacity Days	days	133
Moisture Deficit, Wheat	mm	111
Moisture Deficit, Potatoes	mm	103
Overall Climatic Grade		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 (ATO, January to June), as a measure of the relative warmth of a locality.

14. The combination of rainfall and temperature at this site mean there is no overall climatic limitation. Other local climatic factors such as exposure and frost risk are not believed to adversely affect the site. The site is climatically Grade 1.

Site

15. The site lies at altitudes of 70-80m AOD and falls very gently to the south east. Nowhere on the site does gradient or microrelief adversely affect agricultural land quality.

Geology and soils

16. The most detailed published geological information for the area (BGS, 1994), maps the site, almost entirely, as the Ampthill Clay Formation. This is described on the map legend as 'grey mudstone with sporadic bands of Limestone nodules.' In the extreme south east of the site alluvium is mapped.

17. The most detailed published soils information for the area (SSEW, 1983) shows the site to be predominantly mapped as the Denchworth Association - 'Slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils. Some fine loamy over clayey soils with only slight seasonal waterlogging and some slowly permeable calcareous soils' (SSEW, 1983). In the extreme south east, soils of the Fladbury Association have been mapped where the alluvial deposits occur. These are described as 'stoneless clayey soils, in places calcareous, variably affected by groundwater.'

AGRICULTURAL LAND CLASSIFICATION

18. 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.

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 3b

20. Subgrade 3b (moderate quality) agricultural land covers the whole of the survey area. The principal restriction is a moderate soil wetness limitation.

21. Typically, Subgrade 3b soil profiles are deep and comprise, stoneless heavy clay loam topsoils. These pass into stoneless clay upper subsoils which continue to depth.

22. This land experiences a moderate wetness limitation indicated by the presence of gleying within 40cm and slowly permeable subsoils (from approximately 35cm). Pit 1 is typical of land on this site which was assessed as soil wetness class IV. This wetness class, in combination with the heavy topsoil texture and the prevailing field capacity level (133 FC days), restricts this land to Subgrade 3b. This wetness limitation will restrict the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock. Wetness can also adversely affect seed germination and survival, and inhibit the development of a good root system.

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SOURCES OF REFERENCE

British Geological Survey (1994) *Sheet No.* 237, *Thame*.
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, South East England*.
SSEW: Harpenden.

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

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. **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	**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. **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	**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

SOIL PIT DESCRIPTION

Site Name : LAND AT FLEET MARSTON Pit Number : 1P

Grid Reference: SP78101570
Average Annual Rainfall : 635 mm
Accumulated Temperature : 1417 degree days
Field Capacity Level : 133 days
Land Use : Cereals
Slope and Aspect : 02 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	HCL	10YR42 00	0	0		C				
30- 60	C	05Y 52 00	0	0		C	WKCAB	FM	P	
60- 70	C	05Y 62 00	0	0		M	WKCAB	VF	P	

Wetness Grade : 3B
Wetness Class : IV
Gleying :0 cm
SPL :030 cm

Drought Grade : 3A
APW : 094mm MBW : -17 mm
APP : 106mm MBP : 3 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

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	SP78201580	CER	E	01	0	030	4	3B	128	17	105	2	2				WE		3B	SEE 1P
1P	SP78101570	CER	S	02	0	030	4	3B	094	-17	106	3	3A				WE		3B	AT AB 3
2	SP78001570	CER	S	01	0	028	4	3B	128	17	105	2	2				WE		3B	SEE 1P
3	SP78101570	CER	S	02	0	032	4	3B	129	18	106	3	2				WE		3B	SEE 1P
4	SP78201570	CER	SE	01	025	037	4	3B	000	0	000	0					WE		3B	BORD WC3
5	SP78301570	CER	S	01	028	028	4	3B	000	0	000	0					WE		3B	SEE 1P
6	SP78301560	SAS	SE	01	025	025	4	3B	099	-12	102	-1	3A				WE		3B	SEE 1P

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
1	0-30	hcl	10YR32 00	10YR46 00	C			Y	0	0	HR	1						
	30-55	c	05Y 52 00	10YR56 00	C			Y	0	0		0		P			Y	
	55-75	c	05Y 53 00	10YR56 00	C			Y	0	0		0		P			Y	Y
	75-120	c	05Y 62 53	10YR56 00	C			Y	0	0		0		P			Y	Y
1P	0-30	hcl	10YR42 00	10YR46 00	C			Y	0	0		0						
	30-60	c	05Y 52 00	10YR56 00	C			Y	0	0		0	WKCAB	FM P			Y	
	60-70	c	05Y 62 00	10YR56 00	M			Y	0	0		0	WKCAB	VF P			Y	
2	0-28	hcl	10YR32 00	10YR46 00	C			Y	0	0	HR	1						
	28-75	c	05Y 53 00	10YR56-00	C			Y	0	0		0		P			Y	
	75-90	c	05Y 52 00	10YR56 00	C			Y	0	0		0		P			Y	
	90-120	c	05Y 41 42	10YR56 00	C			Y	0	0		0		P			Y	
3	0-32	hcl	10YR42 00	10YR46 00	C			Y	0	0	HR	1						
	32-62	c	05Y 52 00	10YR56 00	C			Y	0	0		0		P			Y	
	62-120	c	05Y 62 00	10YR56 00	C			Y	0	0		0		P			Y	
4	0-25	hcl	10YR42 00						0	0		0						
	25-37	hcl	10YR53 54	10YR46 00	C			Y	0	0		0		M				
	37-47	c	10YR53 00	10YR58 00	C			Y	0	0		0		P			Y	
	47-80	c	25Y 53 52	10YR58 00	M			Y	0	0		0		P			Y	
5	0-28	hcl	10YR42 32						0	0		0						
	28-60	c	25Y 53 52	10YR58 00	C			Y	0	0		0		P			Y	
	60-80	c	25Y 52 42	10YR58 00	C			Y	0	0		0		P			Y	
6	0-25	hzcl	10YR32 00						0	0		0						
	25-80	zc	25Y 53 51	10YR58 00	C			Y	0	0		0		P			Y	