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LAND AT DUCKETTS FARM, NEAR MIZENS FARM, CHERTSEY ROAD, WOKING, SURREY

Agricultural Land Classification
ALC Map and Report

October 1998

Resource Planning Team
Eastern Region
FRCA Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

LAND AT DUCKETTS FARM, NEAR MIZENS FARM, CHERTSEY ROAD, WOKING, SURREY

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 8.1 ha of land to the north of Ducketts Farm and south-west of Mizens Farm to the north of Woking in Surrey. The survey was carried out during October 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 an ad hoc planning application. This survey supersedes any previous ALC information for this land. Information from the adjacent ALC survey at Mizens Farm (FRCA reference number 4011/158/95) has been used to assist the classification of this site. It should be noted that the 1995/96 survey included areas which had access to irrigation water. This allowed much of the land to be classified as Grade 1. This is not the case in this area as irrigation is not available here and, hence, the classification along the boundary of the two survey areas does not match.

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 agricultural land across the area surveyed was in permanent grass. The areas mapped as 'Other land' include drainage channels, an abandoned residence, a metalled track, barns, stabling and a metalled yard area.

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
2	4.8	71.6	59.3
4	1.9	28.4	23.4
Other Land	1.4	-	17.3
Total surveyed area	6.7	100	82.7
Total site area	8.1	-	100

[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, 10 borings and two soil pits were described.

8. The agricultural land at this site has been classified as Grade 2 (very good quality) and Grade 4 (poor quality). Principal limitations include soil wetness and soil droughtiness; these factors were equally limiting in some areas.

9. Land of very good quality has been mapped across the majority of the agricultural land at this site. The majority of the observations are equally compromised by slight soil wetness and slight soil droughtiness limitations. The soils comprise fine sandy loam topsoils and upper subsoils which overlie sandy clay loam and clay lower subsoils. These lower subsoils slightly impede soil drainage in the winter months so reducing the versatility of the land in terms of access by machinery (eg for cultivations or harvesting) and grazing by livestock if damage to the soil is to be avoided. Grade 2 is also applied on the basis of soil droughtiness as the light sandy topsoils and upper subsoils contain limited amounts of available water creating a slight soil droughtiness restriction. This is likely to slightly restrict crop yields especially during drier periods. Nevertheless, a wide range of agricultural and horticultural crops can be grown in this area.

10. Land of poor quality has been mapped in the south of the site. This area is limited by soil wetness. The soils comprise organic loamy and peaty topsoils overlying shallow slowly permeable sandy clay loam and heavy clay loam subsoils. The presence of hydrophilous vegetation is suggestive of semi-permanent waterlogging and the low-lying nature of the area suggests that it cannot easily be drained effectively although drainage channels are present.

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
Grid reference	N/A	TQ 009 614
Altitude	m, AOD	25
Accumulated Temperature	day°C (Jan-June)	1493
Average Annual Rainfall	mm	649
Field Capacity Days	days	137
Moisture Deficit, Wheat	mm	118
Moisture Deficit, Potatoes	mm	114
Overall climatic grade	N/A	Grade 1

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 (AT0, 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. Local climatic factors, such as exposure and frost risk do not affect land quality at this location. The site is climatically Grade 1. However, climatic factors do interact with soil properties to influence soil wetness and soil droughtiness.

Site

16. The site lies at altitudes in the range of approximately 24-28m AOD. The highest land occurs in the north of the site where the boundary lies along the summit of a small crest. From here the land falls gently to the south onto flat land which comprises approximately one third of the site. The gradients of these slight slopes are insufficient to adversely affect land quality. Land quality is also not adversely affected by microrelief. There may be a slight flood risk on the lower-lying flat land in the south of the site as it lies between two drainage channels and contained some standing water at the time of the survey. However, no detailed flooding information was available before the survey took place.

Geology and soils

17. The most detailed published geological information for the site (BGS, 1981) shows the north of the site to be underlain by Bagshot Beds. The southern area is mostly mapped as being underlain by alluvial drift deposits with a small area of floodplain gravels as a drift deposit towards the south-west of the survey area.

18. According to the most detailed published information available for this area (SSEW, 1983) the site contains soils from the Hucklesbrook association. These are described as, 'Well drained coarse loamy and some sandy soils, commonly over gravel. Some similar permeable soils affected by groundwater. Usually on flat land' (SSEW, 1983). The soils encountered at this site are not consistent with this description because they were, towards the north, coarse loamy overlying slowly permeable fine loams and clays, and towards the south, organic and peaty loams overlying slowly permeable fine loamy subsoils affected by groundwater.

AGRICULTURAL LAND CLASSIFICATION

19. 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 on page 1.

20. 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.

Grade 2

21. Land classified as Grade 2, very good quality, has minor soil droughtiness and wetness limitations. The profiles are represented by soil pit 2 (see Appendix II) and typically comprise non-calcareous fine sandy loam topsoils and upper subsoils. These pass to sandy clay loam and/or clay lower subsoils. The profiles as a whole are very slightly stony or stone free, containing up to 4% total flints by volume. These soil characteristics in the local climate mean that the available water content of these soils is slightly restricted and, as such, this area is classified as Grade 2 on the basis of soil droughtiness. This limitation is likely to adversely affect crop growth as water supply may not match demand, especially during the drier summer months.

22. All of the profiles examined also exhibited indications of soil wetness. This was in the form of gleying between 28 and 60cm depth and where sandy clay loam and/or clay horizons were present they were assessed as being slowly permeable in common with the lower subsoil at soil pit 2 (see Appendix II). The depth to gleyed and slowly permeable horizons (where present) leads to Wetness Classes III and II being applied given the local climatic parameters. When combined with the light topsoils Grades 2 and 1 are appropriate on the basis of soil wetness. Where present, this slight soil wetness limitation restricts the number of days, especially in the winter months, when either cultivations or grazing should occur without damaging the soil. It can also adversely affect crop quality and yield. Nevertheless this land is suitable for a wide range of agricultural and horticultural uses.

Grade 4

23. Poor quality (Grade 4) land is mapped in the south of the site on the lower-lying flat land. It is principally limited by soil wetness. The soils in this area are characterised by the soil pit 1P (see Appendix II). They typically comprise a peaty loam or organic sandy clay loam topsoil which overlies a saturated (at the time of survey) organic heavy clay loam upper subsoil passing to a blue green, sulphurous smelling, saturated heavy clay lower subsoil. The profiles were stone-free. In the pit, the gleyed subsoils were also assessed as being poorly structured and slowly permeable. Therefore this area is principally limited by soil wetness. This restriction is exacerbated by the low-lying nature of the area which appears to preclude effective drainage and, as such, it is felt that this land cannot be classified any better than Wetness Class V and Grade 4. Further evidence of virtually permanent waterlogging in this area includes an abundance of hydrophilous vegetation such as *Juncus Sp.* as well as the presence of large willows.

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SOURCES OF REFERENCE

British Geological Survey (1981) *Sheet No. 269 Windsor. Solid and Drift Edition. 1:50,000 Scale.* 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

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 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. **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

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	TQ00706140	RGR	W	1	48	75	2	1	154	36	119	5	2				DR	2	SEE 2P
2	TQ00806140	RGR	S	2	45	45	3	2	153	35	112	-2	2				WD	2	
3	TQ00906140	RGR	S	3	28	60	3	3A	159	41	113	-1	2				WE	3A	
4	TQ01006140	RGR			28	60	3	2	147	29	119	5	2				WD	2	
5	TQ00706130	RGR			45	60	2	1	151	33	121	7	2				DR	2	2P LOCATION
6	TQ00806130	RGR			30	50	3	2	150	32	119	5	2				WD	2	
7	TQ00906130	RGR			25	50	5	4	182	64	156	42	1				WE	4	1P LOCATION
8	TQ01006130	RGR			20	50	5	4	221	103	191	77	1				WE	4	SEE 1P
9	TQ00986124	RGR			30	30	5	4	168	50	139	25	1				WE	4	SEE 1P
10	TQ00646135	PGR	S	1	60		1	1	178	60	117	3	2				DR	2	
1P	TQ00906130	RGR			30	30	5	4	118	0	128	14	3A				WE	4	PIT70 WATER30+
2P	TQ00706130	RGR			39	60	3	2	148	30	118	4	2				WD	2	PIT 85 AUG 120

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	0-25	FSL	10YR32						0	0		0							
	25-48	FSL	10YR43						0	0		0		M					
	48-75	LFS	10YR53	75YR58	M	D		Y	0	0		0		M					
	75-100	SCL	25Y 62	10YR58	M	D		Y	0	0		0		P			Y		
	100-120	LMS	25Y 53	10YR66	C	D		Y	0	0		0		M					
2	0-30	FSL	10YR32 42						0	0	HR	2							
	30-45	FSL	10YR44						0	0		0		M					
	45-60	C	25Y 53	10YR58	M	D		Y	0	0		0		P			Y		SLIGHTLY SANDY
	60-90	C	25Y 61	10YR58	M	D		Y	0	0		0		P			Y		SLIGHTLY SANDY
	90-120	FSL	05Y 61	10YR68	M	D		Y	0	0		0		M					
3	0-28	MCL	10YR42						0	0		0							SOME FINE SAND
	28-60	SCL	10YR53	10YR56	C	D		Y	0	0		0		M					FRIABLE NOT SPL
	60-100	SCL	25Y 53	10YR68	M	D		Y	0	0		0		P			Y		
	100-120	LFS	25Y 63	10YR68	C	D		Y	0	0		0		M					
4	0-28	FSL	10YR31						0	0	HR	2							
	28-60	FSL	10YR52	10YR58	C	D		Y	0	0	HR	2		M					
	60-85	C	25Y 52	10YR58	M	D		Y	0	0		0		P			Y		SOME FINE SAND
	85-120	SCL	25Y 52	10YR58	M	D		Y	0	0		0		P			Y		FINE SCL
5	0-30	FSL	10YR32						0	0		0							2P LOCATION
	30-45	FSL	25Y 63						0	0		0		M					
	45-60	FSL	25Y 63 72	10YR68	C	D		Y	0	0		0		M					
	60-120	SCL	25Y 62	10YR58	M	D		Y	0	0		0		P			Y		FINE SCL
6	0-30	FSL	10YR32	10YR46	F	F			0	0	HR	2							
	30-50	FSL	10YR41	10YR46	C	D	FEW MN	Y	0	0		0		M					
	50-75	SCL	25Y 41	10YR46	C	D		Y	0	0		0		P			Y		
	75-120	SCL	25Y 61	10YR58	M	D		Y	0	0		0		P			Y		
7	0-25	SCL	10YR21	10YR46	C	D		Y	0	0		0							ORG SCL 1P LOC
	25-50	PL	10YR21						0	0		0		M					1P LOCATION
	50-80	SCL	25Y 62	10YR68	M	D		Y	0	0		0		P			Y		FINE SCL
	80-120	HCL	05BG61	10YR68	M	D		Y	0	0		0		P			Y		SOME FINE SAND
8	0-20	PL	10YR21						0	0		0							V. WET THROUGHOUT
	20-25	HCL	25Y 52	10YR58	M	D		Y	0	0		0		M					SHALLOW NOT SPL
	25-50	PL	10YR21						0	0		0		M					
	50-60	HCL	25Y 21	10YR46	C	D		Y	0	0		0		P			Y		ORGANIC HCL
	60-120	SCL	05B 61	10YR58	C	D		Y	0	0		0		P			Y		
9	0-22	PL	10YR21						0	0		0							V. WET THROUGHOUT
	22-30	FSL	10YR32						0	0		0		M					
	30-80	HCL	25Y 51	10YR58	M	D		Y	0	0		0		P			Y		WITH FINE SAND
	80-120	SCL	05BG61	10YR68	M	D		Y	0	0		0		P			Y		FINE SCL

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
10	0-25	FSL	10YR32						0	0	HR	2							
	25-45	FSL	10YR43						0	0	HR	2		M					
	45-60	LFS	10YR54						0	0		0		M					
	60-120	LFS	10YR53 62	10YR58	C	D		Y	0	0		0		M					
1P	0-30	PL	10YR21	10YR46	F	D			0	0	HR	1		FR					V. WET THROUGHOUT
	30-42	HCL	10YR21 31	10YR46	C	D	FEW MN	Y	0	0	HR	2	MDCAB	FM	P	Y		Y	WATER SEEPING 30+
	42-70	HCL	25Y 61	10YR68	M	D	25Y 51	Y	0	0		0	WKCPR	FM	P	Y		Y	
2P	0-32	FSL	10YR42						0	0	HR	2		FR					
	32-39	FSL	25Y 62	10YR56	F	D			0	0	HR	2	MDCAB	FR	M				
	39-60	FSL	25Y 52	10YR58	M	D	25Y 72	Y	0	0	HR	4	MDCAB	FR	M				
	60-120	SCL	25Y 52	10YR58	M	D		Y	0	0		0	WKCAB	FM	P	Y		Y	