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WOKINGHAM DISTRICT LOCAL PLAN
SITE SW15 -SWALLOWFIELD, BERKSHIRE

Agricultural Land Classification Report
February 1997

Ministry of Agriculture Fisheries and Food

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Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

WOKINGHAM DISTRICT LOCAL PLAN
SITE SW15 - SWALLOWFIELD, BERKSHIRE

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 8ha of land between Trowes Lane and Charlton Lane, Swallowfield near Wokingham in Berkshire. The survey was carried out in February 1997.

2. The survey was commissioned by Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit (Reading) in connection with the Wokingham District Local Plan. The results of this survey supersede any previous ALC information for this land.

3. The work was coordinated by the Resource Planning Team in the Guildford Statutory Group in ADAS, and was carried out under sub-contracting arrangements by NA Duncan and Associates. 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 northern end of the site was in grass, whilst a triangular area at the southern end comprised an area of recently planted woodland, with the central area being under winter wheat. The small extension on the western side of the site which was a continuation of a garden, comprised a pony paddock.

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	3.5	52.2	43.8
3a	3.2	47.8	40.0
Other land	1.3	N/A	16.2
Total surveyed area	6.7	100	83.8
Total site area	8.0	-	100

7. The fieldwork was conducted at an average density of 1 boring per hectare. A total of 10 borings and 2 soil pits was described.

8. The northern part of the site has been classified as Grade 2, very good quality agricultural land, with the land restricted to this grade by a minor droughtiness limitation. The soils in the area have medium sandy loam topsoils and upper subsoils, becoming sandy clay loam and sandy clay with depth. The assessment of droughtiness indicates that these soils have a moderately high available water capacity but, in this locally dry climatic regime, this will result in a slight droughtiness limitation restricting the land to Grade 2.

9. The central and western parts of the site have been mapped as Subgrade 3a, good quality agricultural land, with the slightly higher, western side of the site restricted to this grade by soil droughtiness and the remainder by soil wetness. On the western side, the soils are moderately shallow overlying very stony material and the assessment of droughtiness indicates that such soils will be moderately droughty restricting the land quality to Subgrade 3a. To the east, the soils are typically fine loamy overlying poorly structured clay. This results in a moderate wetness limitation such that Subgrade 3a is appropriate in this area.

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	SU 724 647
Altitude	m, AOD	45
Accumulated Temperature	day°C (Jan-June)	1475
Average Annual Rainfall	mm	668
Field Capacity Days	days	139
Moisture Deficit, Wheat	mm	113
Moisture Deficit, Potatoes	mm	107

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 there is no overall climatic limitation. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. At this locality the moderately high crop adjusted soil moisture deficits may increase the likelihood of soil droughtiness whilst the correspondingly low average annual rainfall may reduce the likelihood of soil wetness.

16. Local climatic factors such as exposure or frost risk are not believed to affect this site. The site is climatically Grad 1.

Site

17. The site slopes very gently toward the east, with the altitude on the western side being approximately 50 m AOD and 47 m AOD along the eastern boundary. Nowhere on the site do either altitude or gradient adversely affect the agricultural land quality.

Geology and soils

18. The relevant geological map (BGS, 1971) shows the western side of the site to comprise London Clay with the east mapped as Valley Gravel.

19. The most recently published soil information for the site (SSEW, 1983) shows the Wickham 4 soil association on the western side, with the Hurst association corresponding to the valley gravel in the east. The former are described as 'slowly permeable seasonally waterlogged fine loamy over clayey and fine silty over clayey soils associated with similar clayey soils, often with brown subsoils.' (SSEW, 1983). The latter are said to be 'coarse and fine loamy permeable soils mainly over gravels variably affected by groundwater.' (SSEW, 1983).

AGRICULTURAL LAND CLASSIFICATION

20. 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.

21. 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.

Grade 2

22. Grade 2 (very good quality agricultural land) has been mapped over the northern part of the site. The soils in this area typically have a very slightly stony (1-5% v/v mainly small flints) medium sandy loam topsoil overlying a slightly stony, medium sandy loam upper subsoil. Between 45-70 cm depth, subsoil textures are invariably slightly stony sandy clay loam with distinct ochreous mottles and moderate soil structure. Below this depth, poorly structured (coarse angular blocky), slowly permeable sandy clays are found, giving rise to impeded drainage through the soil profile. The soils are assessed as Wetness Class II.

However, due to the light textured topsoil horizons that are prevalent in this area this degree of waterlogging does not impose any limitation on the agricultural quality of the land. Moisture balance calculations, however, indicate that, in this low rainfall area, these soils will be slightly droughty for both reference crops. As a result the level of crop growth and yields will be slightly affected thus restricting this land to Grade 2 on the basis of the minor droughtiness limitation.

Subgrade 3a

23. Subgrade 3a (good quality agricultural land) has been mapped on the central and western part of the site, with the slightly higher land on the western side restricted to this subgrade due to a droughtiness limitation and the remainder having a wetness restriction.

24. The soils on the slightly higher land to the west of the site typically have a slightly stony (5-6% v/v small and medium subangular flints) medium sandy loam topsoil horizon overlying a slightly stony sandy clay loam upper subsoil with moderate soil structure. Beneath 50-60 cm depth, the sandy clay loam subsoil becomes markedly more stony with stone contents in the range 25-30% (v/v). The soil pit in this area showed that below 80 cm depth the soil texture became loamy coarse sand whilst below 95 cm the texture was coarse sand. Stone contents at these depths were in the range 60-70% (v/v) small and medium subangular and subrounded flints and no roots were seen to penetrate this very stony material. Due to the high stone contents in the lower subsoil horizons and the restricted rooting depth, moisture balance calculations indicate that such soils are moderately droughty under the prevailing climatic conditions. Such conditions are likely to result in reduced crop growth and yields restricting this land to Subgrade 3a.

25. On the slightly lower land, wetness is the major limitation to agricultural land quality. The soils in this area typically have a medium clay loam/sandy clay loam topsoil overlying a gleyed sandy clay loam upper subsoil. Below 55 cm depth, the lower subsoil is a slowly permeable, poorly structured clay/sandy clay, giving rise to impeded soil profile drainage. These soils have been assessed as Wetness Class III and due to the medium textured topsoils that are prevalent, the land will be susceptible to workability restrictions limiting the land quality to Subgrade 3a.

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ADAS Reading

SOURCES OF REFERENCE

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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.* 1:250,000 scale. SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England.* Bulletin 15. 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).

SOIL PIT DESCRIPTION

Site Name : WOKINGHAM LP, SITE SW15 Pit Number : 1P

Grid Reference: SU72226460 Average Annual Rainfall : 669 mm
Accumulated Temperature : 1470 degree days
Field Capacity Level : 139 days
Land Use : Cereals
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MSL	10YR43 00	2	6	HR					
30- 50	SCL	10YR54 00	0	6	HR		MDCSB	FR	M	
50- 80	SCL	10YR54 00	0	30	HR		WKCSB	FR	M	
80-120	CS	10YR64 00	0	60	HR		SG	VF	M	

Wetness Grade : 1 Wetness Class : I
Gleying :000 cm
SPL : No SPL

Drought Grade : 3A APW : 098mm MBW : -15 mm
APP : 098mm MBP : -9 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : WOKINGHAM LP, SITE SW15 Pit Number : 2P

Grid Reference: SU72326470 Average Annual Rainfall : 669 mm
Accumulated Temperature : 1470 degree days
Field Capacity Level : 139 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	MSL	10YR43 00	1	2	HR					
28- 50	MSL	10YR54 00	0	7	HR	F	MDCSB	FR	M	
50- 70	SCL	10YR64 00	0	7	HR	C	MDCSB	FR	M	
70-120	SC	25Y 73 00	0	3	HR	M	MDVCAB	FM	P	

Wetness Grade : 1 Wetness Class : II
Gleying :050 cm
SPL :070 cm

Drought Grade : 2 APW : 135mm MBW : 22 mm
APP : 106mm MBP : -1 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : *Droughtiness*

SAMPLE NO.	GRID REF	ASPECT USE	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	SU72406470	PGR	045	065		2	1	133	20	109	2	2				DR	2	
1A	SU72326470	PGR	033	065		2	1	136	23	107	0	2				DR	2	
1P	SU72226460	CER	000			1	1	098	-15	098	-9	3A				DR	3A	
2	SU72226460	CER	000			1	1	000	0	000	0					DR	3A	SEEPIT1PIT80CM
2P	SU72326470	PGR	050	070		2	1	135	22	106	-1	2				DR	2	
3	SU72306460	CER	055	055		2	1	130	17	105	-2	2				DR	2	
4	SU72406460	CER	050			1	1	115	2	107	0	3A				DR	3A	NEAR 2 IMP90
5	SU72206450	CER	030			2	1	000	0	000	0					DR	3A	SEEPIT1 IMP65
6	SU72306450	CER	034	055		3	3A	128	15	105	-2	2				WE	3A	
7	SU72406450	CER	030	065		3	2	000	0	000	0					WE	2	
8	SU72306444	CER	035	055		3	2	000	0	000	0					WE	2	LIGHT TOPSOIL
9	SU72406442	CER	030	055		3	3A	000	0	000	0					WE	3A	

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	ms1	10YR43 00						0	0	HR	1						
	28-45	ms1	10YR63 00	10YR65 00	F				0	0		0		M				
	45-65	scl	25Y 63 62	75YR46 56	C			Y	0	0	HR	1		M				
	65-100	sc	25Y 63 00	75YR68 00	M			Y	0	0		0		P			Y	
	100-120	lms	10YR54 00					Y	0	0		0		M			Y	
1A	0-33	ms1	10YR43 00						0	0	HR	2						
	33-50	ms1	10YR63 00	75YR46 00	F			S	0	0	HR	3		M				
	50-65	scl	10YR63 00	05YR46 00	C		00MN00 00	Y	0	0	HR	6		M				
	65-120	sc	25Y 64 00	10YR68 00	M			Y	0	0	HR	5		P			Y	
1P	0-30	ms1	10YR43 00						2	0	HR	6						
	30-50	scl	10YR54 00						0	0	HR	6	MDCSB	FR	M			
	50-80	scl	10YR54 00						0	0	HR	30	WKCSB	FR	M			
	80-120	cs	10YR64 00						0	0	HR	60	SG	VF	M	Y		
2	0-32	ms1	10YR43 00						2	0	HR	6						
	32-55	scl	10YR54 00						0	0	HR	5						
	55-65	ms1	10YR54 00						0	0	HR	35						
2P	0-28	ms1	10YR43 00						1	0	HR	2						
	28-50	ms1	10YR54 00	75YR56 00	F				0	0	HR	7	MDCSB	FR	M			
	50-70	scl	10YR64 00	75YR68 00	C			Y	0	0	HR	7	MDCSB	FR	M			
	70-120	sc	25Y 73 00	75YR68 00	M			Y	0	0	HR	3	MDVCAB	FM	P	Y		Y
3	0-35	ms1	10YR43 00						1	0	HR	4						
	35-55	scl	10YR54 00	10YR56 00	F				0	0	HR	2		M				
	55-95	sc	25Y 64 00	10YR68 00	C			Y	0	0	HR	7		P			Y	
	95-120	sc	25Y 63 00	10YR56 00	C			Y	0	0	HR	20		P			Y	
4	0-35	ms1	10YR43 00						2	0	HR	5						
	35-50	ms1	10YR63 00						0	0	HR	5		M				
	50-75	scl	25Y 63 00	10YR66 00	C			Y	0	0	HR	5		M				
	75-90	ms1	10YR63 00	10YR66 00	C			Y	0	0	HR	25		M				
5	0-30	ms1	10YR43 00						1	0	HR	4						
	30-60	scl	25Y 53 00	10YR56 00	C			Y	0	0	HR	4						
	60-65	ms1	25Y 52 00	75YR46 00	F			S	0	0	HR	30						
6	0-34	scl	10YR42 00						1	0	HR	4						
	34-55	scl	10YR53 52	10YR46 56	C			Y	0	0	HR	6		M				
	55-120	c	10YR63 64	75YR68 00	M			Y	0	0	HR	2		P			Y	
7	0-30	ms1	10YR43 00						1	0	HR	3						
	30-50	scl	25Y 63 00	75YR46 56	C			Y	0	0	HR	4						
	50-65	scl	25Y 63 00	75YR56 46	M		00MN00 00	Y	0	0	HR	5						
	65-100	sc	25Y 63 00	75YR58 00	M			Y	0	0	HR	2					Y	
	100-120	scl	25Y 63 00	75YR58 00	M			Y	0	0	HR	2					Y	

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
8	0-35	msz1	10YR43 00						1	0	HR	4						
	35-55	scl	10YR53 00	75YR56 00	C		00MN00 00	Y	0	0	HR	7						
	55-100	sc	25Y 63 00	75YR58 00	M			Y	0	0	HR	5					Y	
	100-120	sc	25Y 63 00	75YR58 00	M			Y	0	0	HR	20					Y	
9	0-30	mcl	10YR43 00						1	0	HR	3						
	30-55	scl	25Y 63 00	75YR56 00	C			Y	0	0	HR	5						
	55-80	c	25Y 63 00	75YR68 00	M			Y	0	0	HR	1			P		Y	
	80-85	scl	10YR53 00	00MN00 00	M			Y	0	0	HR	25					Y	