

**A1**  
**Apsley Farm, Hurstbourne Priors,**  
**Hampshire**  
**ALC Map and Report**  
**August, 1994**

# AGRICULTURAL LAND CLASSIFICATION REPORT

## Apsley Farm, Hurstbourne Priors, Hampshire

### Summary

- 1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on approximately 21 hectares of land west of Hurstbourne Priors in Hampshire. This work was in connection with a planning application to extend the existing waste disposal site and to extract chalk.
- 1.2 The site was surveyed in August, 1994, at a detailed level of approximately one boring per hectare. A total of 17 borings and 1 soil inspection pit were assessed 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 long term limitations on its use for agriculture.
- 1.3 The work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.
- 1.4 At the time of survey, the agricultural land use was cereals. The Non-agricultural area in the south of the site (3.0 ha) was being used as part of a shooting school.
- 1.5 All of the agricultural land on the site (17.8 ha) has been classified as Subgrade 3b land (moderate quality) as shown on the attached 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. This map supersedes any previous survey information for this site.
- 1.6 A general description of the grades, subgrades and land use categories is provided in Appendix I. 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.
- 1.7 The land quality on the site is related to a soil droughtiness limitation. The soils are typically shallow over chalk deposits with limited rooting into the chalk.

## 2. Climate

- 2.1 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.
- 2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature, as a measure of the relative warmth of a locality. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation.

**Table 2 :Climatic Interpolation**

Grid Reference	SU427469
Altitude (m, AOD)	105
Accumulated Temperature (°days, Jan-June)	1421
Average Annual Rainfall (mm)	783
Field Capacity Days	170
Moisture deficit, wheat (mm)	102
Moisture deficit, potatoes (mm)	93
Overall Climatic Grade	1

### **3. Relief**

3.1 The site occupies a crest top and upper crest slope location. The slopes throughout are gentle and nowhere on the site do gradient or microrelief affect the land quality.

### **4. Geology and Soils**

4.1 The published geology map for the site area, (BGS, 1975) shows the site to be underlain by Upper Chalk (soft white chalk with many flint nodules).

4.2 The published soils information for the area (SSEW, 1983) shows the site to comprise soils of the Carstens association, described as "Well drained fine silty over clayey, clayey and fine silty soils, often very flinty". However, a detailed inspection of soils on the site revealed the presence of shallow fine silty soils over pure chalk, often below the topsoil.

### **5. Agricultural Land Classification**

5.1 The ALC classification of the site is shown on the attached ALC map.

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

#### **Subgrade 3b**

5.3 The soil profile described in Pit 1 is typical of the soils that occur throughout the site. Medium silty clay loam topsoils overlie weathered chalk. The topsoils are approximately 25 cm deep with 10% flint stone (7% >2cm) and no evidence of soil wetness. At the time of survey, the roots from the harvested cereal crop penetrated only a further 20cm into the chalk; the roots were evidently concentrated in the topsoil and only a few extended into the chalk.

5.4 The depth of the soil resource and the limited rooting beneath significantly restricts the flexibility of this land in terms of the range of plants that would produce satisfactory yields here.

ADAS Reference : <sup>1501</sup>~~1501~~/204/94  
MAFF Reference : EL 15/817

Resource Planning Team  
Guildford Statutory Group  
ADAS Reading

### Sources of Reference

British Geological Survey (1975), Sheet Number 283, Andover (Drift edition), 1:50,000 scale.

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 England and Wales (1983), Sheet Number 6, Soils of South East England, 1:250,000 scale and accompanying legend.

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

## APPENDIX I

### DESCRIPTION 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 (eg. 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.

## **Urban**

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

## **Non-agricultural**

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

## **Woodland**

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

## **Agricultural Buildings**

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

## **Open Water**

Includes lakes, ponds and rivers as map scale permits.

## **Land Not Surveyed**

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

## APPENDIX II

### FIELD ASSESSMENT OF SOIL WETNESS CLASS

#### SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

#### Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging <sup>1</sup>
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years. <sup>2</sup>
II	The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

<sup>1</sup> The number of days specified is not necessarily a continuous period.

<sup>2</sup> 'In most years' is defined as more than 10 out of 20 years.

## **APPENDIX III**

### **SOIL PIT AND SOIL BORING DESCRIPTIONS**

#### **Contents :**

**Auger Sample Point Map**

**Soil Abbreviations - Explanatory Note**

**Soil Pit Descriptions**

**Database Printout - Boring Level Information**

**Database Printout - Horizon Level Information**



## 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.

<b>ARA</b> : Arable	<b>WHT</b> : Wheat	<b>BAR</b> : Barley
<b>CER</b> : Cereals	<b>OAT</b> : Oats	<b>MZE</b> : Maize
<b>OSR</b> : Oilseed rape	<b>BEN</b> : Field Beans	<b>BRA</b> : Brassicae
<b>POT</b> : Potatoes	<b>SBT</b> : Sugar Beet	<b>FCD</b> : Fodder Crops
<b>LIN</b> : Linseed	<b>FRT</b> : Soft and Top Fruit	<b>FLW</b> : Fallow
<b>PGR</b> : Permanent Pasture	<b>LEY</b> : Ley Grass	<b>RGR</b> : Rough Grazing
<b>SCR</b> : Scrub	<b>CFW</b> : Coniferous Woodland	<b>DCW</b> : Deciduous Wood
<b>HTH</b> : Heathland	<b>BOG</b> : Bog or Marsh	<b>FLW</b> : Fallow
<b>PLO</b> : Ploughed	<b>SAS</b> : Set aside	<b>OTH</b> : Other
<b>HRT</b> : Horticultural Crops		

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

4. **GLEYSPL** : 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.

<b>MREL</b> : Microrelief limitation	<b>FLOOD</b> : Flood risk	<b>EROSN</b> : Soil erosion risk
<b>EXP</b> : Exposure limitation	<b>FROST</b> : Frost prone	<b>DIST</b> : Disturbed land
<b>CHEM</b> : Chemical limitation		

9. **LIMIT** : The main limitation to land quality. The following abbreviations are used.

<b>OC</b> : Overall Climate	<b>AE</b> : Aspect	<b>EX</b> : Exposure
<b>FR</b> : Frost Risk	<b>GR</b> : Gradient	<b>MR</b> : Microrelief
<b>FL</b> : Flood Risk	<b>TX</b> : Topsoil Texture	<b>DP</b> : Soil Depth
<b>CH</b> : Chemical	<b>WE</b> : Wetness	<b>WK</b> : Workability
<b>DR</b> : Drought	<b>ER</b> : Erosion Risk	<b>WD</b> : Soil Wetness/Droughtiness
<b>ST</b> : Topsoil Stoniness		

## Soil Pits and Auger Borings

1. **TEXTURE** : soil texture classes are denoted by the following abbreviations.

<b>S</b> :	Sand	<b>LS</b> :	Loamy Sand	<b>SL</b> :	Sandy Loam
<b>SZL</b> :	Sandy Silt Loam	<b>CL</b> :	Clay Loam	<b>ZCL</b> :	Silty Clay Loam
<b>ZL</b> :	Silt Loam	<b>SCL</b> :	Sandy Clay Loam	<b>C</b> :	Clay
<b>SC</b> :	Sandy Clay	<b>ZC</b> :	Silty Clay	<b>OL</b> :	Organic Loam
<b>P</b> :	Peat	<b>SP</b> :	Sandy Peat	<b>LP</b> :	Loamy Peat
<b>PL</b> :	Peaty Loam	<b>PS</b> :	Peaty Sand	<b>MZ</b> :	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:

<b>F</b> :	Fine (more than 66% of the sand less than 0.2mm)
<b>M</b> :	Medium (less than 66% fine sand and less than 33% coarse sand)
<b>C</b> :	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.

<b>HR</b> :	all hard rocks and stones	<b>SLST</b> :	soft oolitic or dolimitic limestone
<b>CH</b> :	chalk	<b>FSST</b> :	soft, fine grained sandstone
<b>ZR</b> :	soft, argillaceous, or silty rocks	<b>GH</b> :	gravel with non-porous (hard) stones
<b>MSST</b> :	soft, medium grained sandstone	<b>GS</b> :	gravel with porous (soft) stones
<b>SI</b> :	soft weathered igneous/metamorphic rock		

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                          **VC** : very 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      **VF** : very friable      **FR** : friable      **FM** : firm      **VM** : very firm  
**EM** : extremely firm      **EH** : extremely hard

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 : APSLEY FARM WASTE DISPOS Pit Number : 1P

Grid Reference: su427 471 Average Annual Rainfall : 783 mm  
 Accumulated Temperature : 1421 degree days  
 Field Capacity Level : 170 days  
 Land Use : Cereals  
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MCL	10YR43 00	7	10	HR		MCSAB	FR		
25- 45	CH		0	0					P	

Wetness Grade : 1 Wetness Class : I  
 Gleying : cm  
 SPL : cm

Drought Grade : 3B APW : 061mm MBW : -41 mm  
 APP : 061mm MBP : -32 mm

FINAL ALC GRADE : 3B  
 MAIN LIMITATION : Droughtiness

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--				-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	
1P	su427 471	CER				1	1	061	-41	061	-32	3B			DR	3B	ROOT45
2	su426 476	CER				1	1	054	-48	054	-39	3B			DR	3B	SEE PIT1
10	su426 474	CER				1	2	090	-12	093	0	3A			DR	3A	NOGLEY
15	su426 473	CER				1	1	056	-46	056	-37	3B			DR	3B	SEE PIT1
16	su427 473	CER				1	1	045	-57	045	-48	4			DR	3B	SEE PIT1
20	su426 472	CER				1	2	053	-49	053	-40	3B			DR	3B	SEE PIT1
25	su426 471	CER	S	02		1	1	058	-44	058	-35	3B			DR	3B	IMPSTONY
30	su426 470	CER				1	1	068	-34	068	-25	3B			DR	3B	SEE PIT1
31	su427 470	CER	SW	02		1	1	059	-43	059	-34	3B			DR	3B	SEE PIT1
32	su428 470	CER				1	1	058	-44	058	-35	3B			DR	3B	SEE PIT1
35	su425 469	CER	SW	02		1	2	080	-22	080	-13	3B			DR	3A	IMPQDR
36	su426 469	CER	SW	02		1	2	000	0	000	0	3B			DR	3B	SEE PIT1
37	su427 469	CER				1	2	067	-35	067	-26	3B			DR	3B	SEE PIT1
38	su428 469	CER				1	1	055	-47	055	-38	3B			DR	3B	SEE PIT1
41	su426 4685	CER	NW	02		1	2	067	-35	067	-26	3B			DR	3B	SEE PIT1
42	su426 468	CER	NW	02		1	2	087	-15	095	2	3A			DR	3A	IMPQDR
43	su427 468	CER				1	2	056	-46	056	-37	3B			DR	3B	SEE PIT1
44	su428 468	CER				1	1	069	-33	069	-24	3B			DR	3B	SEE PIT1

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL.	----STONES----			STRUCT/		SUBS				
				COL	ABUN	CONT		GLE	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL
1P	0-25	mc1	10YR43 00					7	0	HR	10	MCSAB	FR	Y			
	25-45	ch						0	0		0			P			
2	0-20	mc1	10YR43 00					2	0	HR	5						
	20-40	ch						0	0		0			P			
10	0-25	hc1	10YR43 00					2	0	HR	5						
	25-50	c	10YR54 00					0	0	CH	2			M			
	50-60	ch						0	0		0			P			
15	0-20	mzc1	10YR43 00					2	0	HR	5						
	20-40	ch						0	0		0			P			
16	0-20	mc1	10YR43 00					2	0	HR	2						
	20-30	ch						0	0		0			P			
20	0-18	hc1	10YR43 00					2	0	HR	5						
	18-40	ch						0	0		0			P			
25	0-20	mzc1	10YR43 00					2	0	HR	5						
	20-35	hc1	10YR54 00					0	0	HR	10			M			
30	0-20	mc1	10YR43 00					2	0	HR	5						
	20-35	hc1	10YR54 00					0	0	CH	5			M			
	35-45	ch						0	0		0			P			
31	0-20	mc1	10YR43 00					2	0	HR	5						
	20-45	ch						0	0		0			P			
32	0-22	mzc1	10YR43 00					2	0	HR	5						
	22-40	ch						0	0		0			P			
35	0-20	hc1	10YR43 00					2	0	HR	5						
	20-50	hc1	10YR54 00					0	0	CH	15			M			
36	0-22	hc1	10YR43 00					5	0	HR	7						
	22-28	hc1	10YR54 00					0	0	CH	10			M			
	28-48	ch						0	0		0			P			
37	0-28	hc1	10YR43 00					5	0	HR	7						
	28-48	ch						0	0		0			P			
38	0-20	mzc1	10YR43 00					5	0	HR	7						
	20-40	ch						0	0		0			P			
41	0-28	hc1	10YR43 00					5	0	HR	7						
	28-48	ch						0	0		0			P			

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED		----STONES----				STRUCT/		SUBS	
				COL	ABUN	CONT	COL.	GLE	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP
42	0-25	hc1	10YR43 00						2	0	HR	5				
	25-50	hc1	10YR54 00						0	0	HR	10			M	
	50-60	c	10YR64 00						0	0	CH	10			M	
43	0-22	hc1	10YR43 00						7	0	HR	10				
	22-42	ch							0	0		0			P	
44	0-30	mc1	10YR43 00						7	0	HR	10				
	30-50	ch							0	0		0			P	