Basingstoke & Deane
District Local Plan
Land at Cliddesden
Agricultural Land Classification
ALC Map and Report
May, 1995

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

BASINGSTOKE & DEANE DISTRICT LOCAL PLAN
LAND AT CLIDDESDEN

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 6 hectares of land on the south western edge of the village of Cliddesden, south of Basingstoke in Hampshire. The survey was carried out in May, 1995.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Reading, in connection with the preparation of the Basingstoke and Deane District Local Plan. This survey supersedes previous ALC surveys on this land. Existing ADAS information from a reconnaissance survey (see ADAS 1501/200/89) in the area was used in drawing up this map.

3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group in ADAS. 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 permanent grassland. The area of Urban includes the grounds of a large house, a tennis court, converted barns and smaller areas of non-agricultural use.

SUMMARY

5. The findings of the detailed 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)	% of site	% of Agricultural Area
2	2.9	50	72.5
3a	1.1	19	27.5
Urban	3.2	31	N/A
Total survey area	5.8	100	N/A
Total agrucultural area	4.0	N/A	100

7. The fieldwork was conducted at an average density of one boring per hectare. A total of 4 borings and 1 soil pit were described.

8. The agricultural land has been classified as mostly Grade 2 (very good quality) with some Subgrade 3a (good quality). Soil droughtiness is the key limitation across the site. A soil pit on the higher Subgrade 3a land reveals reasonably shallow soils developed over Chalk geology. The lowerlying Grade 2 land contains deeper soils where the droughtiness limitation is less severe.

FACTORS INFLUENCING ALC GRADE

Climate

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

10. 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 629 490
Altitude	m, AOD	125
Accumulated Temperature	days°C	1393
Average Annual Rainfall	mm	824
Field Capacity Days	days	179
Moisture Deficit, Wheat	mm	95
Moisture Deficit, Potatoes	mm	84

11. 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.

12 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.

13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. There are also no significant local climatic factors at this site. The site can be placed in climatic Grade 1.

Site

14. The site occupies gently sloping east and nort-east facing slopes. There are no site limitations active on this land.

Geology and soils

15. The published geological information for this area (BGS, 1978) shows all of the site to be underlain by Upper Chalk.

16. The published soils information for the area(SSEW, 1983 and 1984) shows the site to be lying on the boundary between Carstens soils and Andover 1 soils. Field survey work discovered soils similar to the Andover 1 association - calcareous silty soils over chak.

AGRICULTURAL LAND CLASSIFICATION

17. 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.

18. 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

19. The lower lying land on the site has been placed in this grade with soil droughtiness as the main limitation. Soils are deeper here than on the higher land where the pit was located, though the subsoils could not regularly be penetrated due to the dry conditions in the profile and the presence of flints. Only one of the two borings in this map unit was able to describe the subsoil to depth. The boundary between the Grade 2 and the Subgrade 3a has been drawn partly on topography and using data from the adjacent reconnaissance survey; this survey also found deeper soils on the lower slopes, with the soil resource thinning upslope. The full extent of the deep subsoils was not known, due to their impenetrable nature but it has been assumed that they overlie Chalk at depth and that the amount of available water restricts this land to Grade 2.

Subgrade 3a

20. One soil pit was described in this map unit to allow investigation of the depth of the soil resource over the chalk, the stoniness of the profile and the degree of root penetration into the chalk. The depth of soil was confirmed as approximately 40 cm, with a medium silty clay loam topsoil overlying a subsoil of heavy silty clay loam. Both topsoil and subsoil contained approximately 18% flints. The chalk was reasonably soft and rootable down to 70 cm, becoming very compact below that depth. The calculation of available water in the profile has therefore been stopped at 70 cm; this causes a droughtiness limitation and restricts the range of crops that can successfully tolerate such conditions. Crops would experience drought stress for periods of the growing season. Other subsoils in this map unit could not be penetrated due to the dry conditions and the presence of flints.

SOURCES OF REFERENCE

British Geological Survey (1978) *Sheet No.284, Basingstoke,*
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 WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

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.

Wetness Class	Duration of waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years.[2]
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.

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

[1] The number of days is not necessarily a continuous period.
[2] 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

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	**DCW** :	Deciduous Wood
HTH :	Heathland	**BOG** :	Bog or Marsh	**FLW** :	Fallow
PLO :	Ploughed	**SAS** :	Set aside	**OTH** :	Other
HRT :	Horticultural Crops				

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	**EX** :	Exposure
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
ST :	Topsoil Stoniness				

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	**SLST** :	soft oolitic or dolimitic limestone
CH :	chalk	**FSST** :	soft, fine grained sandstone
ZR :	soft, argillaceous, or silty rocks	**GH** :	gravel with non-porous (hard) stones
MSST :	soft, medium grained sandstone	**GS** :	gravel with porous (soft) stones
SI :	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 **ST** : strongly developed	**MD** : moderately developed
ped size	**F** : fine **C** : coarse	**M** : medium **VC** : very coarse
ped shape	**S** : single grain **GR** : granular **SAB** : sub-angular blocky **PL** : platy	**M** : massive **AB** : angular blocky **PR** : prismatic

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 appropiate 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 : BASINGSTOKE LP CLIDDESDN Pit Number : 1P

Grid Reference: SU62804893
Average Annual Rainfall : 824 mm
Accumulated Temperature : 1393 degree days
Field Capacity Level : 179 days
Land Use : Permanent Grass
Slope and Aspect : 02 degrees E

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 21	MZCL	10YR42 00	8	18	HR					
21- 40	HZCL	10YR54 00	0	18	HR				M	Y
40- 70	CH	10YR81 00	0	2	HR				P	Y

Wetness Grade : 2
Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 3A
APW : 083mm MBW : -12 mm
APP : 089mm MBP : 5 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Droughtiness

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
1P	SU62804893	PGR	E	02			1	2	083	-12	089	5	3A				DR	3A	ADD CHLK
3	SU62804900	PGR					1	2	048	-47	048	-36	3B				DR	3A	IMPX4QDR
4	SU62904900	PGR					1	2	048	-47	048	-36	3B				DR	3A	IMPX4QDR
6	SU62804890	PGR	E	02			1	2	060	-35	060	-24	3B				DR	3A	IMP35HR
7	SU62904890	PGR	E	02			1	2	106	11	109	25	2				DR	2	IMP80QCH

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
1P	0-21	mzcl	10YR42 00						8	0	HR	18						
	21-40	hzcl	10YR54 00						0	0	HR	18		M				Y
	40-70	ch	10YR81 00						0	0	HR	2		P				Y
3	0-25	mzcl	10YR43 00						0	0		0						
4	0-25	mzcl	10YR43 00						0	0		0						
6	0-25	mzcl	10YR43 00						0	0	HR	2						
	25-35	mzcl	10YR44 00						0	0	HR	20		M				
7	0-20	mzcl	10YR43 00						0	0	HR	2						
	20-30	mzcl	10YR43 00						0	0	HR	20		M				
	30-50	mzcl	10YR44 00						0	0	HR	20		M				
	50-80	mzcl	10YR54 65						0	0	CH	25		M				Y