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East Hampshire Local Plan
Site 512: Land At Boyneswood Road,
Four Marks.
Agricultural Land Classification,
ALC Map and Report (revised).
March 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

EAST HAMPSHIRE LOCAL PLAN
SITE 512: LAND AT BOYNESWOOD ROAD, FOUR MARKS.

1. Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the East Hampshire District. The work forms part of MAFF's statutory input to the preparation of the East Hampshire Local Plan.

1.2 The site comprises 3.6 hectares of land to the north of Four Marks in Hampshire. An Agricultural Land Classification (ALC) survey was carried out during February 1995. The survey was undertaken at a detailed level of approximately two borings per hectare of agricultural land surveyed. A total of 5 borings and one soil inspection pit were described 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 a long term limitation on its use for agriculture.

1.4 At the time of the survey the agricultural land was under permanent grass being grazed by cattle. The woodland shown comprises an area of deciduous trees. The agricultural building appeared to be a derelict barn.

1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent are given in the table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading.

Table 1: Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
3b	3.0	83.3
Agricultural Buildings	<0.1	<0.1
Woodland	0.6	16.7
Total area of site	3.6ha	100.0

1.6 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. 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 at this site has been classified as moderate quality (Subgrade 3b). The principal limitation to land quality is soil wetness due to the presence of slowly permeable clayey soils over Chalk. Due to the heavy subsoil textures, drainage is impeded, such that within the moist nature of the local climate, Subgrade 3b is

appropriate. Soil wetness at this location has the effect of restricting the opportunities for landwork and/or grazing by livestock.

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.

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office, 1989). The details are given in the table below, these show that there is an overall climatic limitation affecting the site, restricting the area to Grade 2 at best. Also, according to unpublished Met. Office data (1971), the site may be considered as being rather exposed. However there was no evidence of this on the site.

2.4 Climatic and soil factors interact to influence soil wetness, workability and droughtiness limitations. Given the other limitations acting to affect land quality on this site, overall climate and exposure (see para. 2.3) do not have overriding significance. At this locality, average annual rainfall and field capacity days are relatively high, in regional terms. Therefore the likelihood of soil wetness and/or workability limitations will be enhanced

Table 2: Climatic Interpolation

Grid Reference	SU671358
Altitude, (m, AOD)	215
Accumulated Temperature (day degrees C., Jan.-June)	1295
Average Annual Rainfall (mm)	948
Field Capacity Days	204
Moisture deficit, wheat (mm)	76
Moisture deficit, potatoes (mm)	60
Overall Climatic Grade	2

3. Relief

3.1 The site lies at approximately 215m AOD. Overall the land falls slightly from north east to south west. Nowhere in this area does relief or gradient affect agricultural land quality.

4. Geology and Soils

4.1 The published geological information (BGS, 1975), shows the site to be underlain by clay with flints and Tertiary debris over Cretaceous Upper Chalk.

4.2 The published soils information (SSEW, 1983), shows the site to be underlain by soils of the Carstens Association. The legend accompanying the map describes these as, 'well drained fine silty over clayey, clayey and fine silty soils, often very flinty,' (SSEW, 1983). Soils of these broad types were found on the site.

5. Agricultural Land Classification

5.1 Paragraph 1.5 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

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

Subgrade 3b

5.3 Land of moderate quality is mapped for all of the agricultural land at this site. The principal limitation is soil wetness. Profiles typically comprise non-calcareous medium silty clay loam topsoils which may contain up to 10% total flints by volume (up to 5%>2cm). These overlie gleyed upper subsoils of slightly heavier texture (ie, heavy silty clay loam) with similar stone contents, passing to reddish gleyed clay lower subsoil horizons, which were commonly impenetrable to the soil auger due to single large flints in the matrix. Pit 1 (see Appendix III) shows the clay to be poorly structured and to lie over Chalk at depth. The clay horizons are slowly permeable and impede downward water flow, with gleying also indicating imperfect drainage. The depth at which gleying and the slowly permeable clay horizon occurs in the locally relatively wet climatic conditions leads to Wetness Class IV being applied, which equates with Subgrade 3b given the prevailing climate and topsoil texture. Soil wetness may affect crop growth and development and cause restrictions on the timing of cultivations and/or grazing.

SOURCES OF REFERENCE

British Geological Survey (1958), Sheet 316, Fareham, Drift Edition. 1:63,360

MAFF (1988), Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

Meteorological Office (1971), Unpublished Climate data relating to Sheet 169, 1:63,360.

Meteorological Office (1989), Climatic datasets for Agricultural Land Classification.

Soil Survey of England and Wales (1983), Sheet No.6, Soils of South-East England, 1:250,000, and Accompanying Legend.

Soil Survey of England and Wales (1984), Bulletin No.15, Soils and their use in South-East England.

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 (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.

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 (e.g. 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, e.g. 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

DEFINITION OF SOIL WETNESS CLASS

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class 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 180 days, but only wet within 40 cm depth for 31-90 days in most years.

Wetness Class 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.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth fro 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.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most 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 database. This has commonly used notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF** : national 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 measured by a hand-held optical clinometer.

4. **GLEY/SPL** : Depth in cm to gleying or slowly permeable layers.

5. **AP (WHEAT/POTS)** : Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)** : Moisture Balance.

7. **DRT** : Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, an entry of 'Y' will be entered in the relevant column.

MREL : Microrelief limitation	**FLOOD** : Flood risk	**EROSN** : Soil erosion risk
EXP : Exposure limitation	**FROST** : Frost	**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 **ST** : Topsoil Stones
CH : Chemical	**WE** : Wetness	**WK** : Workability
DR : Drought	**ER** : Erosion Risk	**WD** : Soil Wetness/Droughtiness

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	**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 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

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

6. **STONE LITH** : 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	**GH** : gravel with non-porous (hard) stones
SI : soft weathered igneous/metamorphic rock	

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

7. **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

8. **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

9. **SUBS STR** : Subsoil structural condition recorded for the purpose of calculating profile droughtiness : **G** : good **M** : moderate **P** : poor

10. **POR** : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

11. **IMP** : If the profile is impenetrable a 'Y' will appear in this column at the appropriate horizon.

12. **SPL** : Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

13. **CALC** : If the soil horizon is calcareous, a 'Y' will appear in this column.

14. 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

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AMPLE O.	GRID REF	ASPECT USE	GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	DRT	M.REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT		ALC	COMMENTS
1	SU67003590	PGR		20	45	4	3B	90	14	96	36	2				WE		3B	IMP 60 FLINTS
2	SU67003580	PGR		25	40	4	3B	103	27	108	48	2				WE		3B	IMP 80 FLINTS
3	SU67103580	PGR		22	40	4	3B	92	16	101	41	2				WE		3B	IMP 65 FLINTS
4	SU67003570	PGR		22	40	4	3B	95	19	106	46	2				WE		3B	IMP 70 FLINTS
5	SU67103570	PGR		25	35	4	3B	129	53	106	46	1				WE		3B	
1P	SU67003570	PGR		16	26	4	3B	123	47	100	40	1				WE		3B	PIT95 AUG120

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	0-20	MZCL	10YR44						0	0	HR	5						
	20-45	HZCL	75YR46	10YR42	C	D		Y	0	0	HR	5			M			
	45-60	C	05YR46	10YR42	C	D		Y	0	0	CH	5			P			Y
2	0-25	MZCL	10YR44						0	0	HR	5						
	25-40	HZCL	10YR42	75YR46	C	D		Y	0	0	HR	5			M			
	40-80	C	05YR46	10YR42	C	D		Y	0	0	CH	5			P			Y
3	0-22	MZCL	10YR43 53						0	0	HR	5						
	22-40	HZCL	10YR53	10YR58	C	D		Y	0	0	HR	5			M			
	40-65	C	05YR58	25Y 53	M	D	COM MN	Y	0	0	CH	5			P			Y
4	0-22	MZCL	10YR43 53						0	0	HR	5						
	22-40	HZCL	10YR53	10YR58	M	D		Y	0	0	HR	5			M			
	40-70	C	05YR46	10YR41	M	D	COM MN	Y	0	0	HR	5			P			Y
5	0-25	MZCL	25Y 42 52						0	0	HR	5						
	25-35	MZCL	10YR53	10YR58	C	D		Y	0	0	HR	5			M			
	35-90	C	25YR48	25Y 53	M	D	COM MN	Y	0	0	HR	3			P			Y
	90-120	C	25YR48	25Y 53	M	D	COM MN	Y	0	0	CH	5			P			Y
1P	0-16	MZCL	10YR43						5	0	HR	10		FR				
	16-26	HZCL	10YR53	10YR58	C	D		Y	0	0	HR	10	MDCSAB	FR	M			
	26-95	C	05YR56	75YR52	C	D		Y	0	0		0	MDMSAB	FM	P			Y
	95-120	CH	10YR81						0	0	HR	2			P			