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East Hampshire Local Plan
Site 1084: Land At Headley Road,
Liphook.
Agricultural Land Classification,
ALC Map and Report.
March 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

EAST HAMPSHIRE LOCAL PLAN

SITE 1084: LAND AT LOWSLEY FARM, HEADLEY ROAD, LIPHOOK.

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 1.5 hectares of land to the north of Liphook in Hampshire. An Agricultural Land Classification (ALC) survey was carried out during February 1995. The survey was undertaken at a detailed level of approximately one boring per hectare of agricultural land surveyed. A total of 3 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 this land was under a winter cereal crop.
- 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
2	0.8	53.3
3a	<u>0.7</u>	<u>46.7</u>
Total area of site	1.5ha	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 very good quality (Grade 2) and good quality (Subgrade 3a). The principal limitation to land quality is soil wetness. Subgrade 3a land is affected by soil wetness due to the presence of moderate and deep slowly permeable horizons which cause drainage to be moderately impeded. Grade 2 land has only slight evidence of soil wetness, with no slowly permeable horizons apparent within 120cm. This leads to a slight or moderate restriction on the number of days when landwork and/or stocking may occur without the possibility of causing structural damage to the soil.

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 and these show that there is no overall climatic limitation affecting the site.
- 2.4 No local climatic factors such as exposure or frost risk are believed to affect the site. However, climatic and soil factors interact to influence soil wetness and droughtiness limitations.

Table 2: Climatic Interpolation

Grid Reference	SU837323
Altitude, (m, AOD)	105
Accumulated Temperature (day degrees C., Jan.-June)	1419
Average Annual Rainfall (mm)	883
Field Capacity Days	194
Moisture deficit, wheat (mm)	98
Moisture deficit, potatoes (mm)	88
Overall Climatic Grade	1

3. Relief

- 3.1 The site lies at approximately 105m AOD. Overall the site falls slightly from west to east. Nowhere in this area does relief or gradient affect agricultural land quality.

4. Geology and Soils

- 4.1 The published geological information (BGS, 1981), shows the site to be underlain by Cretaceous Bargate Beds.
- 4.2 The published soils information (SSEW, 1983), shows the site to be underlain by soils of the Frilford Association. The legend accompanying the map describes these as, 'deep well drained sandy and coarse loamy soils. Some ferruginous soils variably affected by groundwater. A risk of water erosion.' (SSEW, 1983). Soils encountered at this site were affected by slight to moderate soil wetness and comprised either deep light and medium loamy topsoil and subsoils, or light and medium loamy topsoil and upper subsoils over slowly permeable clayey lower subsoils.

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.

Grade 2

- 5.3 Very good quality land extends over an area of the east of the site in a single unit where minor soil wetness and soil droughtiness limitations exist to an equal degree. Profiles in this area typically comprise a medium sandy loam topsoil, passing to a loamy medium sand upper subsoil. This overlies a deep sandy clay loam lower subsoil horizon. Profiles in this area are generally very slightly stony (2 - 3% total flints by volume), and are affected by wetness in the form of gleying in the upper and lower subsoil. The sandy nature of the profile gives rise to a slight soil droughtiness limitation, as the textures encountered are not particularly moisture retentive. Soil droughtiness affects plant growth and yield. The presence of shallow gleying due either to an elevated groundwater level or deep (>120cm) slowly permeable horizons also leads to there being a slight soil wetness limitation at this location such that Wetness Class II has been applied. In a regional context, this area has a relatively wet climate and as such Grade 2 is appropriate. Soil wetness affects the versatility of the land, principally in terms of the timing of cultivations and stocking, if structural damage to the soil is to be avoided. Pit 1 (Appendix III) is typical of this soil unit.

Subgrade 3a

- 5.4 Good quality land is shown towards the west of the site where soil properties and climatic factors combine to give rise to a soil wetness limitation. Profiles in this area typically comprise a very slightly stony (3% total flints) medium sandy loam topsoil, passing to a stoneless similarly or slightly heavier (sandy clay loam) upper subsoil. From 50 - 55cm the profiles became gleyed and heavier, sandy clay loam or clay, passing to slowly permeable heavy clay loam or clay lower subsoils from between 60 and 75cm. The structural nature of the slowly permeable horizons was confirmed in a survey of adjacent land (ADAS Ref: 1502/011/95). The depth to gleyed and slowly permeable horizons in the local, relatively wet, climate leads to Wetness Class III and subsequent Subgrade 3a being most appropriate. A moderate soil wetness limitation such as this leads to significant limitations on landwork and/or stocking if structural damage to the soil is to be avoided.

SOURCES OF REFERENCE

British Geological Survey (1981), Sheet 301, Haslemere, Solid & Drift Edition. 1:50,000

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

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 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.

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 :

Sample Point Map

Soil Abbreviations - explanatory note

Database Printout - soil pit information

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 database. This has commonly used notations and abbreviations as set out below.

Boring Header Information

- GRID REF** : national grid square and 8 figure grid reference.
- 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		
- GRDNT** : Gradient as measured by a hand-held optical clinometer.
- GLEYSPL** : Depth in cm to gleying or slowly permeable layers.
- AP (WHEAT/POTS)** : Crop-adjusted available water capacity.
- MB (WHEAT/POTS)** : Moisture Balance.
- DRT** : Best grade according to soil droughtiness.
- 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		
- 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 **GII** : 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

SOIL PIT DESCRIPTION

Site Name : SITE 1084-LIPHOOK EHANTS Pit Number : 1P

Grid Reference: SU83753230 Average Annual Rainfall : 883 mm
 Accumulated Temperature : 1419 degree days
 Field Capacity Level : 194 days
 Land Use : Cereals
 Slope and Aspect : 02 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	MSL	10YR42 00	0	3	HR			FR		
27- 43	LMS	10YR53 00	0	2	HR	C	MDCSAB	FR	M	
43-120	SCL	25YR74 00	0	2	HR	C	MDCSAB	FR	M	

Wetness Grade : 2 Wetness Class : II
 Gleying : 27 cm
 SPL : cm

Drought Grade : 2 APW : 135mm MBW : 37 mm
 APP : 096mm MBP : 8 mm

FINAL ALC GRADE : 2

MAIN LIMITATION : Soil Wetness/Droughtiness

SAMPLE NO.	GRID REF	USE	ASPECT		--WETNESS--			-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYS	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT		
1	SU83653230	CER W	02	35	75	3	3A		0		0					WE	3A	
1P	SU83753230	CER W	02	27		2	2	135	37	096	8	2				WD	2	PIT 80 AUG 120
2	SU83753230	CER W	02	30		2	2	126	28	086	-2	2				WD	2	
3	SU83653225	CER W	01	50	60	3	3A		0		0					WE	3A	

SAMPLE	DEPTH	TEXTURE	COLOUR	-----MOTTLES-----			PED		-----STONES-----			STRUCT/ CONSIST	SUBS				
				COL	ABUN	CONT	COL.	GLEYS	>2	>6	LITH		TOT	STR	POR	IMP	SPL
1	0-25	msl	10YR42 00						1	0	HR	3					
	25-35	msl	10YR44 54						0	0		0			M		
	35-55	sc1	10YR53 52 10YR56 00 C					Y	0	0		0			M		
	55-75	sc1	25Y 62 00 10YR68 00 M					Y	0	0		0			M		
	75-120	hc1	25Y 61 00 10YR68 00 M					Y	0	0		0			P		Y
1P	0-27	msl	10YR42 00						0	0	HR	3			FR		
	27-43	lms	10YR53 00 10YR56 00 C					Y	0	0	HR	2	MDCSAB	FR	M		
	43-120	sc1	25YR74 00 10YR68 00 C					Y	0	0	HR	2	MDCSAB	FR	M		
2	0-30	msl	10YR43 00						0	0	HR	3					
	30-60	lms	10YR53 00 10YR56 00 C					Y	0	0	HR	0			M		
	60-120	sc1	25YR74 00 10YR68 00 C					Y	0	0	HR	4			M		
3	0-28	msl	10YR42 00						0	0		0					
	28-50	sc1	10YR53 00						0	0		0			M		
	50-60	c	25Y 63 00 000C00 00 M					Y	0	0		0			M		
	60-80	c	25Y 63 00 000C00 00 M					Y	0	0		0			P		Y