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Basingstoke & Deane Borough Local Plan
Site 14: North Waltham
Agricultural Land Classification
ALC Map & Report
October 1993

BASINGSTOKE & DEANE BOROUGH LOCAL PLAN
SITE 14: LAND AT NORTH WALTHAM
AGRICULTURAL LAND CLASSIFICATION, REPORT

1. Summary

1.1 In August 1993, a detailed Agricultural Land Classification (ALC) survey was carried out on approximately 5 hectares of land at North Waltham. ADAS was commissioned by MAFF's Land Use Planning Unit to determine the quality of 22 sites around Basingstoke in Hampshire. The work forms part of MAFF's input into the Basingstoke and Deane Borough Local Plan.

1.2 The survey was conducted by members of the Resource Planning Team in the Guildford Statutory Group at an observation density of approximately one boring per hectare. A total of eight 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 long term limitations on its use for agriculture.

At the time of survey, the land was under permanent grass.

1.3 The ALC information is shown on the attached map at a scale of 1:5000. It is accurate at this scale, but any enlargement may be misleading.

1.4 A general description of the grades and subgrades is provided as an appendix. 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.

1.5 All of the site (5.2 ha) has been classified as Subgrade 3b. Soil wetness is the key limitation related to the presence of poorly structured clay upper subsoils which cause a significant obstruction to drainage.

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 the 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 affect the site.

Table 2: Climatic Interpolations

Grid Reference:	SU 564 467
Altitude (m):	140
Accumulated Temperature (days):	1379
Average Annual Rainfall (mm):	847
Field Capacity (days):	184
Moisture Deficit, Wheat (mm):	93
Moisture Deficit, Potatoes (mm):	81
Overall Climatic Grade:	1

3. Relief

3.1 The land at this site lies between 130 and 140m AOD. The majority of the site is relatively flat, however the land falls steadily towards the north. At no point does gradient, or microrelief affect the classification.

4. Geology and Soil

4.1 The British Geological Survey published map, Sheet 284, Basingstoke (BGS, 1981) shows the area to be underlain by Quaternary Clay-with-Flints, an unstratified dark reddish brown stiff stony clay overlying Cretaceous Upper Chalk.

4.2 The Soil Survey of England and Wales published map Sheet 6, Soils of South East England (SSEW,1983), shows the site to be underlain by soils of the Carstens and Charity 2 Associations. Carstens soils are described as well drained fine silty and clayey soils, often very flinty. Soils similar to this description were found at the site except that drainage was found to be significantly impeded. Charity 2 soils are described as well drained calcareous fine silty soils over chalk or chalk rubble on valley sides, sometimes shallow. Soils of this description were not found at the site.

5. Agricultural Land Classification

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

5.2 Subgrade 3b

The entire site has been mapped as moderate quality agricultural land. This is due to a drainage impedence in the clay subsoil evidenced by gleying and slowly permeable structures (see Pit 1). The soils consist of a non-calcareous slightly to moderately stony (c. 5 to 22% flints by volume) medium clay loam or medium silty clay loam,occasionally heavy clay loam topsoil, overlying a gleyed and slowly permeable slightly to moderately stony (c. 10 to 25% flints by volume) non-calcareous clay. Due to the depth of the slowly permeable layers, Wetness Class IV has been applied in most cases (see Appendix II), this, in combination with the workability restrictions of medium textured topsoil leads to Subgrade 3b being applied. Occasional observations were of a better quality, but were an insufficient quantity to justify

separate mapping. Land of this quality could be expected to produce moderate yields of a narrow range of crops, principally cereals and grass.

5.3 Wetness affected land can, depending on the severity of the problem, be subject to restrictions on the number of days when cultivation by machinery and/or grazing by livestock may occur, such that structural damage to the soil would not take place. Soil wetness can also affect seed germination and development due to soil temperature reduction and anaerobism caused by water in the soil matrix.

ADAS REFERENCE: 1501/156/93
MAFF REFERENCE: EL 15/144

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

* British Geological Survey (1981) Sheet No. 284 Basingstoke, 1:50,000, Solid and Drift Edition

* 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 No. 6, Soils of South East England, 1:250,000.

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

APPENDIX I

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 on the 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.

Grade 3 : Good To Moderate Quality Agricultural Land

Land with moderate limitations which affect the choice of crops, 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.

Sub-grade 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 very 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 : 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/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial 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

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

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

Wetness Class II

The soil profile is wet within 70cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for 31-90 days in most years.

Wetness Class IV

The soil profile is wet within 70cm depth for more than 180 days but not wet within 40cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer within 80cm depth, it is wet within 40cm depth for 91-210 days in most years.

Wetness Class V

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

Wetness Class VI

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

(The number of days is not necessarily a continuous period. '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 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 HRT : Horticultural Crops PGR : Permanent Pasture LEY : Ley Grass RGR : Rough Grazing
SCR : Scrub CFW : Coniferous Woodland DCW : Deciduous Woodland HTH : Heathland BOG : Bog or Marsh
FLW : Fallow PLO : Ploughed SAS : Set aside OTH : Other

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 CH : Chemical WE : Wetness WK : Workability
DR : Drought ER : Soil Erosion Risk WD : Combined 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
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 MSST : soft, medium or coarse grained sandstone
SI : soft weathered igneous or metamorphic SLST : soft oolitic or dolimitic limestone
FSST : soft, fine grained sandstone ZR : soft, argillaceous, or silty rocks CH : chalk
GH : gravel with non-porous (hard) stones GS : gravel with porous (soft) stones

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 appropiate 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 : BSTOKE LP (2) SITE 14 Pit Number : 1P

Grid Reference: SU56324675 Average Annual Rainfall : 847 mm
Accumulated Temperature : 1379 degree days
Field Capacity Level : 184 days
Land Use : Permanent Grass
Slope and Aspect : 02 degrees N

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 38	MZCL	10YR42 00	7	22		
38- 60	C	05YR46 00	0	10	C	MDCAB
60- 85	C	05YR46 00	0	10	C	

Wetness Grade : 3B Wetness Class : IV
Gleying :038 cm
SPL :038 cm

Drought Grade : APW : mm MBW : 0 mm
APP : mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

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	SU56304680	PGR	N	03			1	2	0		0						WE	3B	IMPST 20 1P
1P	SU56324675	PGR	N	02	038	038	4	3B	0		0						WE	3B	PIT 60 AUG 85
2	SU56404670	PGR					1	2	0		0						WE	3B	IMPST 20 1P
3	SU56404660	PGR					1	2	0		0						WE	3B	IMPST 30 1P
4	SU56254690	PGR	N	05			1	2	0		0						WE	2	IMP 65 NO SPL
5	SU56324666	PGR	W	02			1	2	0		0						WE	3B	IMPST 20 1P
6	SU56364655	PGR	N	02	025	050	3	3B	0		0						WE	3B	IMPST 90 1P
7	SU56214675	PGR	N	02			1	2	0		0						WE	3B	IMPST 31 1P
8	SU56504657	PGR	S	02			1	3A	0		0						WE	3B	IMPST 32 1P

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	0-20	mcl	10YR44 54						0	0	HR	15						
1P	0-38	mzcl	10YR42 00						7	0	HR	22						
	38-60	c	05YR46 00	05YR58 00	C		75YR43 00	Y	0	0	HR	10	MDCAB	VM P	Y		Y	
	60-85	c	05YR46 00	05YR58 00	C		00MN00 00	Y	0	0	HR	10		P	Y		Y	
2	0-20	mcl	10YR44 00						0	0	HR	5						
3	0-30	mzcl	10YR42 00						0	0	HR	5						
4	0-35	mzcl	10YR56 00						0	0	HR	5						
	35-50	hzcl	75YR56 00						0	0	HR	10		M				
	50-65	c	75YR46 00						0	0	HR	20		M				
5	0-20	mcl	10YR44 00						0	0	HR	20						
6	0-25	hcl	10YR54 00						0	0	HR	5						
	25-50	c	05YR53 00	05YR46 00	C			Y	0	0	HR	8		P				
	50-90	c	75YR53 00	05YR56 00	M			Y	0	0	HR	10		P			Y	
7	0-28	mcl	10YR44 00						0	0	HR	10						
	28-31	mcl	10YR66 00						0	0	HR	25		M				
8	0-28	hcl	10YR44 00						0	0	HR	10						
	28-32	c	05YR46 00						0	0	HR	20		P				